

Bridging the Digital Divide

Bringing Connectivity to the Underserved

1 Narrowing the Divide

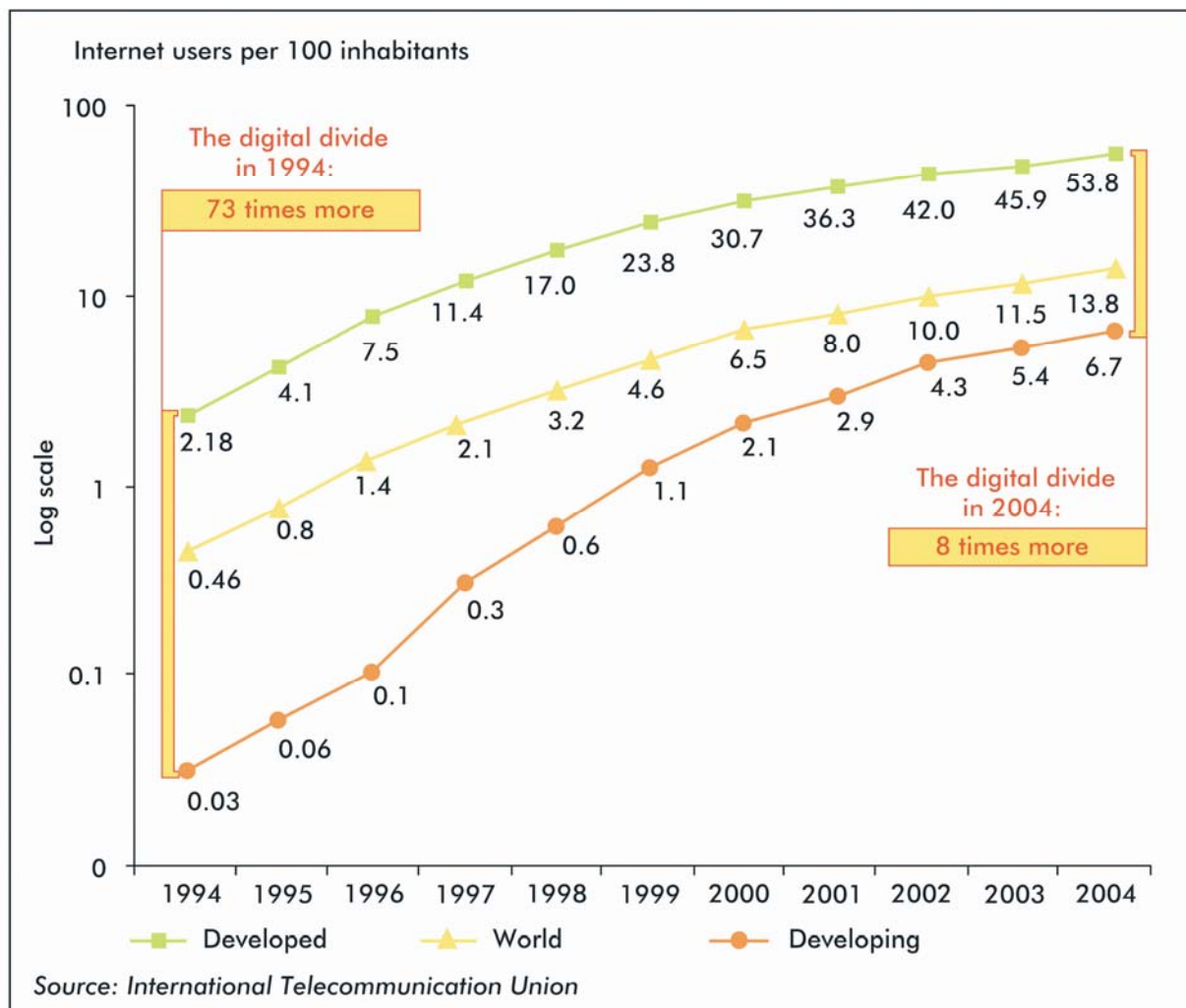
Many critics of providing telecommunication services to the underserved, usually poor regions, argue that before providing ICT (information, communication, and technology) services, the people of these areas first need food, safe drinking water, increased health services, and employment. There is an easy answer to this, by bringing ICT services to the people, the rest of living conditions have the possibility to improve. By increasing ICT services, bringing knowledge to the people, it can lead to better informed health care workers, employment opportunities, alerts of wells that are no longer safe, and improved methods of growing crops. Knowledge access would be further improved by providing bi-directional access; enabling communities to not only access information, but also to send it, therefore increasing communication and cooperation between neighbours. Internet access in rural areas can allow for e-government services, such as providing local and national election information. E-learning can also be utilized, allowing even the smallest villages access to a quality education. E-physicians can provide the poor with accurate diagnosis and the latest suggestions for treatment of disease and other impairments.

1.1 Limiting Factors

There are several factors that prevent all citizens of the world from receiving ICT services. The largest limiting factor is cost. The cost to bring access to the underserved is often hard to justify. Typically, the underserved, are poor, rural, remote villages/communities, that are hundreds of miles away from urban areas. Even in urban areas, ICT services are usually restricted to use by the wealthy and privileged class. The cost of deploying a typical copper network would be outrageous in these remote areas. The cost of even providing any ICT service seems to inhibit the private sector due to those served, would not have enough money to pay for these services, and the company then would not be able to recover their deployment and maintenance expenses. The government can also prevent growth of ICT services by limiting funding, and/or the lack of proper regulatory and incentives to foster development. There can also exist a lack of education, even if ICT services are offered, there has to be someone who can educate users.

1.2 The Gap is Closing

There has been much progress in the last ten years to provide connectivity to undeveloped areas around the globe. The chart below illustrates how much the gap has decreased in the last decade. In 1994, there were 73 times more internet users in developed vs. undeveloped nations. In 2004, the gap has narrowed to only eight times more internet users in developed vs. undeveloped nations. The reason for the increase in internet users can be attributed to falling costs of technology and increased initiative by private organizations, governments, and business, who are slowly recognizing the benefits to these areas, and to the rest of the world.



2 Enabling Mechanisms

In the proceeding text, mechanisms enabling the expansion of connectivity to underserved areas, will be discussed. These mechanisms have been divided up into four main categories: Technological, Sociological, Government, and Business/Private Organizations. Each of these areas have been crucial in the growth of ICT service providers around the globe.

2.1 Technology

2.1.1 Wireless Infrastructure

The cost to provide connectivity in undeveloped nations is one of the largest prohibitive factors. When an area has no underlying infrastructure, the deployment of ICT services can be extremely high, especially when considering the installation of many miles of copper, and the hardware to control it. There have been many developments in infrastructures without wires, wireless technology can provide a much more cost effective solution when deploying ICT services to an area with no existing infrastructure. There are many options available, fixed wireless: WiFi, WiMax(soon), Satellite, and mobile wireless: Traditional Cellular, 3G, and GSM. For example, the estimated cost per telephone line in an area lacking infrastructure is around \$1000. By using a wireless local-loop technology like corDECT, per line costs can be reduced to \$400. (Kirkman, 2001:13) The corDect solution provides line of site access to each subscriber around a central transmission tower. Without the cost of running lines to each customer, the cost per subscriber is drastically reduced. For broadband internet access, WiFi and WiMax use similar methods, able to provide high-speed internet without running individual lines, utilizing receivers and repeaters that

are located across the geographic area to be served. Cell phones are the obvious choice for providing voice communication service due to the lower infrastructure cost, and the falling prices for handsets. 3G also provides high-speed data access, but is targeted at mobile, not fixed, users.

2.1.2 Computer Hardware

The cost of computer hardware has rapidly declined, assisting their distribution to undeveloped areas. Donation programs also exist around the world that accept aging computer hardware, not suitable for complex data processing, but do provide simple functionality, like internet and email, as to provide computers to areas that need them for such uses. In order to further reduce hardware costs, some communities utilize a thin-client approach. In this method, there is one server that provides processing power, storage, and application access to simple, cheaper client computers.

2.1.3 Computer Software

Open-source software is free, and the code is published, allowing users to find and repair bugs, and customize the software to meet individual needs. Linux is an open-source operating systems that many choose for the public nature of the code, but undeveloped areas choose it because it is free. This saves a lot of money over more expensive, proprietary solutions like those provided by Microsoft and other operating system manufacturers.

2.2 Sociological

Computers are still too expensive to be provided for each household, therefore communities provide computer access in public areas, usually allowing residents to access the internet and email from one central location. This also enables the training of users, and the ability to ask questions when they should arise. Internet kiosks also exist in some areas, providing the public with the same services as the community centers, while allowing the freedom of locating them around a village. These terminals would need to be connected, usually wirelessly. In the case of mobile telephony, one of the most famous examples is Grameen Phone, who provides GSM mobile telephones across Bangladesh. Grameen Phone had a revolutionary business model that provided a few local individuals in each community, usually women, with mobile handsets, and people would pay them to make phone calls. This provided money to the company, while at the same time, employing local women who were responsible for the handsets.

2.3 Government

Local and national Government efforts have played a large role in bringing connectivity to less developed communities. China, through its Ministry of Information Industry, has been working on the “Village Connected” project since 2004, to promote universal service in rural areas. In Indonesia, the Ministry of Communications and Information technology seeks to provide telephone access to all villages by 2010. In Nigeria, the Ministry of Communications, began the National Rural Telephony Program, that aims to provide telecommunication services to 343 Local Government Areas. When complete, they will have added 150,000 new telephone lines to currently unserved areas. Those are just a few examples of Governments who recognize the need to bring connectivity to even its most rural communities. (Afrin, 2006)

2.4 Organizations/Entrepreneurs

Since governments often lack funds for ICT services, organizations and private entrepreneurs provide funding to connect the unconnected. The World Bank International Finance Corporation provides loans, guarantees, and equity to private companies in the ICT sector in developing markets to extend ICT access to unserved locations, improve current infrastructure, and support manufacturing operations. Often it is hard for companies to find funding for projects to connect rural areas due to the risk involved on getting a return, or generating profit from such ventures. The World Health Organization also provides funding and information to organizations to improve health, promote health standards, and foster the growth of E-health services, especially to rural and remote communities that often lack quality health services.(Afrin, 2006)

3 Conclusion

The above text was a brief summary of the digital divide, attempts to close it, benefits, and limiting factors further fuelling its growth. I think that the nations around the world are slowly realizing that even though their countries may be connected with ICT services, it is to their benefit to improve the rest of the world's connectivity. In today's world of ever growing security concerns, the only way to fight terrorism is with information and education. Education and information are greatly improved through the use of technology, and it should be one of the primary goals of each modernized nation. Education can solve many of the world's problems, including: hunger, the spread of disease, clean water, pollution, and violence. Technology will be essential in educating individuals across the planet. People need to realize that they are no longer simply a citizen in the country they were born in, but a global citizen as well.

4 References:

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