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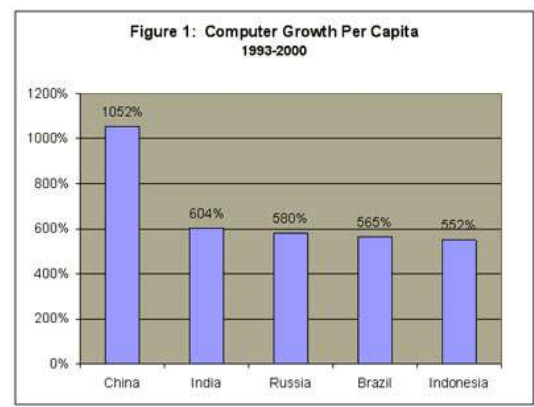
From the Archives

Posted on February 15, 2006

Previously filed under: [Technology](#) ^[1]

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Recent advances in our ability to process and share information in digital form are reshaping the economies and social infrastructures of many countries around the world. Information Technology (IT) is a driving factor in the process of globalization. Improvements in the early 1990s in computer hardware, software, and telecommunications have caused widespread improvements in access to information and economic potential. These advances have facilitated efficiency gains in all sectors of the economy. IT provides the communication network that facilitates the expansion of products, ideas, and resources among nations and among people regardless of geographic location. Creating efficient and effective channels to exchange information, IT has been the catalyst for global integration.



Recent advances in our ability to communicate and process information in digital form - a series of developments sometimes described as an "IT revolution" - are reshaping the economies and social lives of many countries around the world.

Products based upon or enhanced by information technology are used in nearly every aspect of life in contemporary industrial societies. The spread of IT and its applications has been extraordinarily rapid. Just 20 years ago, for example, the use of desktop personal computers was still limited to a fairly small number of technologically advanced people. The overwhelming majority of people still produced documents with typewriters, which permit no manipulation of text and offer no storage. Fifteen years ago, large and bulky mobile telephones were carried only by a small number of users in just a few U.S. cities. Today, half of all Americans use a mobile phone, and in some developing countries, mobile phones are used by more people than the fixed line telephone network.

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But perhaps most dramatically, just ten years ago, only

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scientists were using, or had even heard about, the Internet, the World Wide Web was not up and running and the browsers that help users navigate the web had not even been invented yet. Today, of course, the Internet and the Web have transformed commerce, creating entirely new ways for retailers and their customers to make transactions, for businesses to manage the flow of production inputs and market products, and for job seekers and job-recruiters to find each other. The news industry has also been dramatically transformed by the emergence of numerous Internet-enabled news-gathering and dissemination outlets. Websites, chat rooms, instant messaging systems, e-mail, electronic bulletin boards and other Internet-based communication systems have made it much easier for people with common interests to find each other, exchange information,

and collaborate with each other. Education at all levels is being transformed by communication, educational, and presentational software and by Websites and other sources of information and analysis on the Internet.

The IT revolution has been driven by the extraordinarily rapid decline in the cost and rapid increase in the processing power of digital technologies. The digital device whose technological advance has perhaps been most crucial to the IT revolution is the microprocessor, the collections of millions of tiny circuits that serve as the "brains" of personal computers and that are being embedded in an ever-expanding number of products, from video games to cars to refrigerators. Over the past two decades, the processing power of microprocessors has doubled roughly every six months.

Another set of advances that has been critical to the IT revolution has occurred in fiber optics. Fiber optics technology enables data, including voices captured in digital form, to be converted into tiny pulses of light and then transmitted at high speeds through glass fibers wrapped into large capacity telecommunication cables. Hundreds of thousands of miles of these cables have been installed over the past ten years, boosting the speed and capacity of telecommunications networks.

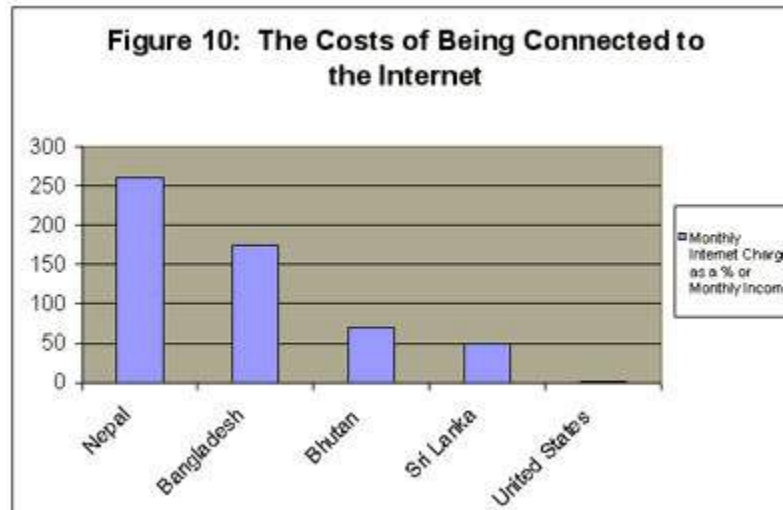
Advances in microprocessors, fiber optics, and a number of other complementary technologies, such as telecommunications switching devices and memory chips, have dramatically increased the speed, processing capacity, and storage space of computers and dramatically increased the speed and carrying capacity of telecommunications networks.

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A key reason why these advances in IT have spread so quickly is that they have progressively reduced the cost of a unit of computing power or the transmission of a message. For less than \$2000, Americans without any advanced technical training can purchase and use a desktop computer whose data processing power far exceeds the room-sized computers that powered the spacecraft that carried

astronauts to the moon and back in the late 1960s and early 1970s.

The decline in computing prices has been a factor in spurring the growth of computers in the developing world (See graphic). Countries such as China, Russia, Indonesia, India and Brazil experienced tremendous growth in the number of personal computers. Between 1993-2000 the growth rate of personal computers per capita exceeded 500% for each of these nations.



The spread of digital technologies has also been spurred by several unique attributes of information, the principal input and product of many IT industries. In contrast to more tangible products, like consumer goods, one person's "consumption" of a piece of information does not necessarily reduce or eliminate the possibility that another person might benefit from the same piece of information. Furthermore, networks built upon the exchange of information, like the Internet, tend to become more valuable to existing participants as new participants link up with them. Finally, the cost of using digital technologies, such as Internet service providers, decreases as the number of users increases. All of these factors have worked together to promote rapid growth in the demand for and supply of IT products and services. During the second half of the 1990s, as more people bought computers and went on-line, the average cost of the equipment and services necessary to access the Internet declined.

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Advances in IT are producing many changes in our society. These changes have produced many benefits, but they have also raised several concerns. Innovations in IT have created new jobs, promoted the growth of new markets, and increased international trade and investment. However, the expansion of IT also introduces costs. Workers in certain sectors of the economy lose their jobs as innovations in IT create a greater demand for high-tech workers and introduce efficiencies that make jobs obsolete. Another negative consequence of the IT revolution is the inequitable distribution of access to IT, called the digital divide.

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If the new technologies are to fulfill their promise, these costs and concerns will need to be addressed. Experience with previous technologies suggests that prudent policies can help us effectively manage the risks associated with new technologies without harm to their benefits. Experience also suggests that the required policies must be developed through close consultation between government and private

sector experts and stakeholders.

GLOSSARY OF TECHNOLOGY TERMS ^[3]

Contributed by Center for Strategic & International Studies (CSIS) and Globalization101.org ^[4].

To read another Global Envision article about technology and globalization, see Offshore Outsourcing of Information Technology Services ^[5].

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