20 INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

"...The United Nations - like all other institutions in the world today - must fully exploit the great promise of the Information Age. Used responsibly, it can greatly improve our chances of defeating poverty and better meeting our other priority objectives."
From the *Millennium Report*

Vital Statistics:
- It took radio broadcasters 38 years to reach an audience of 50 million, television 13 years, and the Internet just four.
- In 1998, there were an estimated 143 million Internet users, with numbers expected to exceed 700 million by 2001.
- There were 50 pages on the World Wide Web in 1993; today there are more than 50 million pages.
- It is estimated that in just over five years some 900 million electronic devices could be connected to the Internet-equaling the number of telephones in the world.
- From just over twenty in 1990, there were more than 200 nations connected by July 1998.
- Some 88% of all users in 1998 lived in industrial countries, home to less than 15% of the world's people.
- A computer costs one month's salary for the average American, compared with eight years' income for the average Bangladeshi.
- A quarter of the world's countries still do not have one telephone per 100 people.
- The United States has more computers than the rest of the world combined, and Thailand has more cellular phone than the whole of Africa.

P R O G R E S S

Expanding boundaries

The farming community in Pastocalle, Ecuador, located 3,000 meters high in the Andes, found itself directly in the path of crop-eating army ants. Local agricultural authorities were called in, but the ants remained unstoppable. The community had previously pooled funds to buy a single computer with Internet access, and a call was sent out. Within days, a community in Peru suggested an organic material that is easily found in the Andes, and spreading in on the fields proved an effective deterrent to the ants.

Information and communications technology (ICT) have changed the face of the world we live in. Defined as computers, software, telecoms, such as mobile and fixed phones, the Internet and satellite technologies, ICT enables people to communicate with family, friends and colleagues

around the world instantaneously, gain access to global libraries, information and resources, and enumerable opportunities.

The digital revolution
 "The Internet is the fastest growing instrument of communication in the history of civilization, and it may be the most rapidly disseminating tool of any kind ever. The convergence of information technology and the Internet may well become as transformative as the industrial revolution."

Like the invention of the steam engine, ICT has changed the way people work, interact and live. However, unlike past technological revolutions, ICT took only four years to reach an audience of 50 million people. How was this possible? What are the characteristics of ICT that have enabled it to have such a wide impact so quickly?

- **Cost.** It is estimated that the real price of computer processing declined by 99.999% in just 30 years, making ICT accessible to people from all economic brackets all over the world.

- **The core product: Knowledge and Information.** ICT uses knowledge and information as its core products as opposed to material resources. Unlike the steel used to construct a building, information and knowledge are available for multiple uses and users simultaneously, and become more valuable the more they are used.

- **The "new economy."** Idea-based, and giving an edge to innovators, forward thinkers and information-haves as opposed to primarily the capital rich, this new economy opens up high value space for new global players. This, indeed, is how the "emerging" economies emerged in the past, when other sectors were vacated.

- **ICT is truly global.** ICT does not distinguish between gender, age, social or economic standing. With access and the requisite skills and knowledge, ICT offers all peoples the same resources and digital opportunities.

> **Zulfendi Zulhisam**, a 13-year-old living three hours from the capital of Malaysia, Kuala Lumpur, can learn to build Web sites and surf the Internet *at the same time* as Mama Dominica Lacombi, 57 years-old, uses ICT to find information on modern techniques for breeding livestock in Cameroon. Mama Dominica Lacombi is illiterate, but because of digital opportunities that has not stopped her from being a successful entrepreneur.

ICT for development: Knowledge as empowerment
When harnessed, ICT constitutes a key tool for human and economic development. By opening up opportunities to boost a nation's economy, improve standards of education and health, and protect the environment, ICT brings us one step closer to eradicating poverty. (For a discussion of poverty refer to: http://www0.un.org/cyberschoolbus/briefing/poverty/index.htm).

Toomas Kokovkin lives on Hiiumaa, a small Estonian island. Although geographically isolated, Toomas is able to earn a living as a digital cartographer working for a Swedish company to digitize a stack of hand-made maps of Uganda!

Toomas is an example of how Internet-based electronic commerce (e-commerce) gives small, medium and large enterprises access to the global economy. Not only does it remove geographic boundaries, but it also alleviates costs such as office space and opens up the global market.

Through distance learning and telemedicine, ICT considerably increases the possible number of educated, trained and healthy people in a nation. In 1995, more than 2.2 million people in developing countries educated themselves through on-line courses. At the same time, initiatives, such as the Health Internetwork, open up communication lines and provide physicians and patients with up-to-the-minute medical information and access to resources.

ICT also enables people to learn about the environment and how to care for and protect the world we live in. And, in countries such as Peru, where the government has placed all the current laws and policies on-line (http://www.minjus.gop.pe), the Internet provides people with the means to ensure their governments are protecting the environment as well as their own human rights.

"Leapfrogging"
"New Technology offers an unprecedented chance for developing countries to "leapfrog" earlier stages of development. Everything must be done to maximize people's access to new information networks."

Specific to ICT is the unique opportunity for countries to "leapfrog" technologies, and thus leap to higher levels of development. Leapfrogging is when nations and businesses build on already established and effective technologies to both meet their own needs and create new technologies – or new uses for old technologies.

> **Cellular Pay Phones**
> Instead of waiting the 10 or so years for fixed telephone lines to be installed, Bangladeshi women in remote villages have leapt directly to mobile phones, using them as a means of communication, and as a means of revenue. Through small grants, entrepreneurial Bangladeshi women can invest in mobile phones they then rent out as the village pay phone. (http://www.grameen.org)

But can ICT hurt development efforts? The Digital Divide
There is a darker side to information and communications technology. While some countries and people have benefited greatly, more than 95% of the world still does not have electronic access. This gap between information-haves and information-have nots, that exists both between countries and between communities within countries, is known as the "digital divide" or "information poverty."

This divide is growing bigger instead of smaller each day. It is responsible for increased income inequality and the marginalization of people and nations who, because of lack of skills or access, are unable to board the "Internet Express."

This divide also makes it increasingly difficult for developing countries to "catch-up" to industrialized countries that have harnessed ICT and are moving even more quickly ahead.

In addition to the yawning digital divide, nations also fear that ICT will hurt development efforts by diverting funds away from basic needs, and compromising national and regional diversity:

- **Diversion of Funds:** When devising a development strategy, leaders must choose how and where to allocate funds. Because most developing countries lack funds, a decision to invest in one sector corresponds to the disinvestments in another sector. Hence the fear that investment in ICT will take away from investment education, healthcare, and the environment – all of which are basic needs and rights still denied to people all over the world.

- **Homogenizing Tendencies: Culture and Content:** 80% of Web pages are in English, with more Internet hosts in Finland than in all of Latin America and the Caribbean. In light of this increased exposure to the norms and cultures of industrialized countries, the Group of 77 (http://www.g77.org/Docs/Declaration_G77Summit.htm) has expressed concern for the preservation of national and regional diversity of traditions, identities and cultures.

F O C U S

Why Invest In ICT when there are people who still do not have enough to eat?

Why Invest In ICT when there are people who still do not have enough to eat? This is a pressing question for all those concerned with the intersection of information and communications technology and development. In 1998, 108 out of every 1000 babies born in low-income countries died before their fifth birthday, 18 times the rate in high-income countries. Adult literacy rates were under 50% in almost 20 of the 34 low-income countries, and populations without access to safe water or sanitation reached as high as 69% in some low-income countries, with an overall average of 30%.

With these chilling realities in mind, how can investment in information and communications technology be justified? What will a computer do for someone who is hungry, sick, or illiterate? The answer is probably very little today, but the benefits tomorrow are potentially enormous.

Among the various digital opportunities, nations able to harness the benefits of ICT enjoy access to global markets, which spurs GDP growth; greater access to educational opportunities and up-to-the minute medical information, which improves standards of living; and a means of monitoring the government to ensure protection of human rights.

Furthermore, a country that chooses not to board the "Internet Express" in order to respond to the immediate emergency needs of its people, runs the risk of being further and further marginalized, and possibly left out of the new global market and its economic and social opportunities.

The consensus among member countries, as outlined in the Report of the high-level panel of experts on information and communication technology "…is not whether to respond to the challenges brought about by the revolution in ICT, but how to respond and how to ensure that the process becomes truly global and everyone shares the benefits."

In general, the strategy deemed most effective comprises a combination of basic needs and ICT development. By investing in both the immediate needs of the country, such as education, healthcare and the environment, as well as the creation of an ICT friendly environment through infrastructure and policies, nations are able to meet the needs of the people while keeping one eye on the future, and not missing the "Internet Express."

Some countries, such as Cuba, have even managed to combine the two.

Cuba's InfoMed

Cuba was in the midst of a blockade and an epidemic when it launched InfoMed, a national network of the public health system. Created when there was no information infrastructure in the country, it began as a simple network approach to sharing knowledge and facilitating access to information via e-mail. It used the best available technologies. Since its inception, the network has been expanded to enjoy nationwide coverage with regional and provincial nodes; it has a virtual library component covering medical journals; and it has contributed to the building of national capacity to manage new information technologies and empower people.

What had begun as an emergency solution, thus evolved into a long-term medical resource for Cuba and its people. Positively impacting the country by increasing the number of people informed, knowledgeable and thus empowered.

N E X T   S T E P S

A key priority at the UN

Recognizing the great possibilities, as well as the expanding divide, the Secretary-General has highlighted the bridging of the divide and the promotion of digital opportunities as a main priority area of the *Millennium Report, "We the Peoples."*

"Everything must be done to maximize...peoples' access to new information networks, and make sure they are not denied the opportunities offered by the digital revolution."

While harnessing the benefits of ICT in the face of lacking resources and skills, inadequate basic infrastructures, illiteracy, language barriers, and prohibitive costs will not be easy; it is not impossible.

Nations, private corporations, and international organizations must demonstrate global solidarity to bridge the divide, and achieve universal Connectivity, Capacity and Content.

"Knowledge is the only resource whose potential impact on human development is constrained not by its scarcity, but by our current inability to use it adequately."

Connectivity: Without access, people cannot harness ICT, or its benefits. Efforts to achieve universal access require innovative approaches, such as wireless connections and low cost access devices. Also indispensable are partnerships, including group and community connectivity and private sector investment.

Capacity: Without the capacity to exploit connectivity, universal access is meaningless. Investment in education, both basic and digital, gives individuals the skills and knowledge to use ICT effectively. From primary school on up to life-long learning, education and capacity building should be at the heart of any national, regional and international technology strategy.

Content: Without pertinent content, connectivity and capacity become irrelevant. The development of local content on the Internet will help foster a culturally and linguistically diverse cyberspace and can also facilitate entrance to the knowledge-based economy.

The Secretary-General has outlined three key initiatives to be undertaken by the United Nations and its partners around the world to help countries maximize the benefits of ICT:

- **A volunteer corps**, called the United Nations Information Technology Service ('UNITeS'), to train groups in developing countries in the uses and opportunities of the Internet and information technology.

- **A Health InterNetwork**, to establish 10,000 on-line sites in hospitals and clinics in developing countries to provide access to up-to-date medical information. WHO, the United Nations Foundation and other partners support this initiative.

- **A disaster response initiative**, "First on the Ground", which will provide mobile and satellite telephones as well as microwave links for humanitarian relief workers in areas affected by natural disasters and emergencies. The communications company Ericsson will lead this project, with United Nations partners and the International Federation of Red Cross and Red Crescent Societies.

Through collaboration, dedication, effective policies and strategies, nations can ensure every individual's access to digital opportunities and the ability to exploit the great promise of the Information Age.

A C T I V I T I E S

1. This exercise is meant to give a sense of how information technology impacts the every day world we live in, and how its affects might change for every individual.
   a. Make a list of the ways in which your community has been impacted by ICT.
   b. Now choose which three you feel had the most significant impact. What criterion did you use to decide if one impact was more or less important than another?
   c. With this list in mind, interview a friend about the ways in which she or he sees ICT as having impacted the community you live in and which three she or he feels has had the greatest impact. (You might want to define ICT for the person you are interviewing).
   d. Were your answers and those of the person you interviewed the same or different? Think about why this might be. Does ICT affect every person in the same way?
   e. Now interview a parent or grandparent, or a friend's parent or grandparent, and ask how ICT has impacted their lives and their community. How do this person's answers compare to yours and your friend's? Does the impact of ICT change by generation?

2. Use this exercise to understand how information communications and technology is different from past technological innovations, and to think about why the United Nations Secretary-General has called the impact of information and communications technology a "revolution."

   a. In order to think about how ICT resembles or differs from past revolutions, first make a short list of past technological innovations you think have had a particularly strong impact on the world we live in today.
   b. After compiling your list, make a second list of why one or two of these are labeled revolutions. Compare this list to the four key characteristics of the digital revolution. Keep in mind impact, degree and rapidity of penetration. How are your two lists different or the same? Was distribution of past revolutions equitable? Or did they have their own type of digital divide?

3. Use this exercise to think about the role each and every one of us plays in the fight to bridge the digital divide, one of the Key Objectives of the Secretary-General's *Millennium Report "We the peoples"* (http://www0.un.org/cyberschoolbus/briefing/report/index.htm).
   a. First think about what the digital divide is. Can you think of examples both between countries and within countries? Looking at your own community, do you see examples of the digital divide? You might want to collaborate with friends or classmates to compile a list of examples.
   b. Looking at your list can you think of ways that the divide might be bridged and how you can contribute to this effort?

4. Visit e-pals.com, a UN partner site, and join the global discussion on the Digital Divide (http://www.epals.com/projects/digital_divide/results_en.html). Do the experiences of any

of these students resemble your own? Can you make of list of at least three reasons why different countries might have different experiences?

R E S O U R C E S

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http://www.undp.org
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