Preface

Technology has always played a decisive role in humanity's progress. Many international organizations have already stated that there is no doubt about the interrelationship that takes place between the adoption of information and communication technologies and economic development.

Throughout history, technology has not only strengthened economic development, but it has become a powerful tool for human development from a Senian point of view. There are many examples that endorse this thesis. Since the late '30s, and for a period of three decades, antibiotics and new vaccines gave rise to an important mortality reduction in Asia, Africa, and Latin America (a process that took about 100 years in Europe alone). In the same way, famine and undernourishment levels dropped in South Asia from 40% in 1970 to 23% in 1997 as a result of the application of technologies to crops and to the use of fertilizers and pesticides that tripled rice and wheat production levels. Finally, it is also true that, in this age of globalization, nongovernmental organizations and other civil-society movements and coalitions have become vastly diverse and influential thanks to more fluent and fast flows of information allowed by the emergence of new technologies. Due to these changes, knowledge has been widely spread.

The set of new available tools also imposes challenges to human development. New technologies establish what and how things can be done because they create new capacities to be developed by people so that they can achieve the objectives that make sense to their lives. Also, new technologies allow a better management and redistribution of resources to achieve these goals. Therefore, technology is key to human development because it improves how well resources are allocated and expands the possibilities of capacities fulfillment.

However, the positive impacts technology may have on human development may become tainted by the risks it entails. Left adrift, the technological tools may become a dangerous and wicked instrument. Their use may give rise to social exclusion, economic inequality, tension, and violence growth. That is why it is so important to design human-development policies in the context of the information and knowledge society that promote the use of new technologies in the widening of the basic structure of rights and opportunities. These should allow individuals to exercise their freedom to develop those capacities and to fulfill those achievements that make sense in their lives.

It is not easy. Today, many initiatives are still in their early stages. There is not a solid background to learn from, and many projects have been designed on a trial–and-error basis.

It is therefore the intention of this book to compile some international experiences from which to draw some lessons that could be of use to those interested in how ICT can make a difference in human development.

Human Development

The idea of development is a complex one. When the subject began in the 1940s, it was primarily driven by the progress in economic-growth theory that had occurred during the preceding period. It was dominated by the basic vision that poor countries are just low-income countries and therefore it was focused on transcending the problems of underdevelopment through economic growth. This perspective proved to be an insufficient way of thinking about development, and since the early 1990s, a new approach, pioneered by Mahbub ul-Haq, Amartya Sen, and the United Nations Development Program (UNDP), among others, began to take shape.

The human-development approach, as it was called, is the development paradigm that conceptually frames this book. It is understood as the process of expanding people's choices, that is, the range of things that a person could do and be in life, or the functioning and capabilities to function such as to be healthy and well nourished, to be knowledgeable, or to participate in the life of a community (Sen, 1989). The idea behind the concept is that development is about improving human lives and, therefore, about removing the obstacles to the things that a person can do in life.

This way of conceptualizing development has two main connotations (Sen, 1999). On one hand, development is understood as a process of expanding the real freedoms that people enjoy. If that is the case, there is a major argument for concentrating on the ends that make development important rather than merely on the means that, inter alia, play a prominent part in the process. As a result, enhancing the development process goes beyond pursuing the growth of gross national product. It requires the removal of any major sources of unfreedom such as "poverty as well as tyranny, poor economic opportunities as well as systematic social deprivation, neglect of public facilities as well as intolerance or overactivity of repressive states" (p. 3). That is why Sen distinguishes five different types of freedom: political freedoms (in the form of free speech and elections), economic facilities (in the form of opportunities for participation in trade and production), social opportunities (in the form of education and health facilities), transparency guarantees, and protective security.

On the other hand, the achievement of development is thoroughly dependent on the free agency of people. What's more, not only is free agency itself a constitutive part of development, it also contributes to the strengthening of free agencies of other kinds. As Sen wisely puts it:

what people can positively achieve is influenced by economic opportunities, political liberties, social powers, and the enabling conditions of good health, basic education, and the encouragement and cultivation of initiatives. The institutional arrangements for these opportunities are also influenced by the exercise of people's freedoms, through the liberty to participate in social choice and in the making of public decisions that impel the progress of these opportunities. (pp. 4-5)

Seeing freedom as the principal ends of development but also as its primary means is the conceptual perspective this book has adopted. As a result, the chapters included not only approach the impact of new technologies on economic development, but on the process of expanding different types of freedom. Human rights, political participation, health, and education are, therefore, some of the issues that have been sensibly tackled by our authors.

Information and Communication Technologies and Human Development: Digital Opportunities for the World

The conceptualization of the digital divide is moving beyond that of a lack of ICT infrastructure. It reflects the differences in opportunities presented to individuals, communities, or organizations by ICT and the digital revolution, mainly as a consequence of deficits in access to the technologies, capacity to use them, and relevant contents and applications. It is a consequence of other developmental divides at the same time that contributes to them. Just as ICTs are horizontal tools that span applications from agriculture to zoology, so does informational poverty have a pervasive tendency to spread to all areas of human development. It is a classic example of vicious cycles of poverty: Insufficient access to the proper resources (in this case, ICTs as information tools) results in a decreasing ability to successfully overcome development challenges and improve the quality of life, which in turn diminishes the possibilities of accessing the proper resources, and so on.

The main question is whether ICT can help reduce poverty, or as brilliantly put by Nobel laureate Nadine Gordimer, "the sum of all hungers." The answer may ultimately reside in the value of information for confronting those hungers. What is the value of information about food prices to a farmer? Or information about legal rights to someone in the "wrong" ethnic minority? Or that about pedagogic materials to a teacher in a village? In collective terms, we could also consider the aggregate value of information to an entire community. In addition, it should be noted that the "last mile of connectivity" does not need to be the last mile of information. Often the true value of ICT for poor people will reside in how their intermediaries—local government, public-service institutions like schools or clinics, nongovernmental organizations, community radio stations, and so forth—can use ICT to better address their individual needs.

It is only after assessing the value (and thus the need) of information that informed choices can be made about whether and how to use particular ICTs in specific settings. This is why, for example, there are cases of poor and marginalized women who have taken enthusiastically to the Internet for the chance to expand their horizons and communicate with others (e.g., other marginalized women) or, in other words, to expand their freedoms (in Senian terms). Thus, one way of assessing the utility of ICT in a particular context is by directly relating it to the value of information (and communication) to the people in it.

There are parallels with education worth considering. Today, education is considered a basic human right and universally accepted as fundamental for ending poverty. Yet basic education, or even just simple literacy, is at the very core of being able to access and process information, and to enable us to communicate properly, for which ICTs are practical tools.

However, only 100 years ago (and in some countries like Afghanistan, much more recently for girls) education was not a right. It was more important to have the skills for a job, and indeed many illiterate people managed to live adequately by older standards. This implies that access to ICT may in time be considered very important for individuals and a necessity for human-development processes. In fact, the very concept of literacy increasingly incorporates basic ICT skills.

In some development circles, even more importance is assigned to knowledge than to information as a critical resource. Knowledge can be described in many ways. One is through the flow from information to knowledge, where information becomes knowledge as it is interpreted and made concrete in light of personal or organizational understanding of a particular context and previous experience. Fukuda-Parr, Lopes, and Malik (2002) offer a succinct development approach to knowledge management: "scan globally, reinvent locally" (p. 18). Knowledge is increasingly perceived as one of the principal drivers of economic growth and development, whether in the north or south, as expressed in international fora like ECOSOC (Economic and Social Council), or by organizations like the World Bank, UNDP, or OECD (Organization for Economic Cooperation and Development). Most development organizations have more to provide in terms of knowledge resources than of financial resources.

The application of ICT modifies how resources are used to produce outputs, particularly when this is mediated by knowledge. Hence, gaps in the means to generate knowledge (like those resulting from the digital divide) add to the disparities in resource availability. Stiglitz (2002) claims that it is the compounded gap of resources, knowledge, and organization that really separates developed from developing countries today. Taking a cue from advanced resource-constrained countries (like Japan, Singapore, South Korea, Ireland, and now Estonia), we could propose the notion that knowledge generation is the critical link for socioeconomic development. If this is correct, modern cooperation strategies must be aimed at supporting and enabling local knowledge generation and in its wider access and sharing. In this regard, ivory towers should give way to adobe lighthouses, and ICTs are key tools for this purpose.

The issue is not so much whether ICT causes further exclusion or not, but whether it is appropriately utilized for development purposes. ICT in itself is not the cause of exclusion. This is not unlike considering whether public libraries in developing countries contribute to the exacerbation of differences because illiterate people cannot benefit from them. ICTs are tools that can be used in practical, beneficial ways, and there are myriad examples around the world to prove it; some of these uses are analyzed in this book. The problem is that the inability to apply important resources for development (and ICT is among them) will constrain the advance of human development, causing some people and communities to fall further behind. For all the concerns of the techno-skeptics, the reality is that ICT is the fabric that weaves the nervous system of the network society. Hence, the need to accelerate the developmental appropriation of ICT so that it is put to use to meet people's needs is indicated in the millennium development goals (MDGs).

Developing countries have little option but to integrate into the global network society described by Castells (1996, 1998). If the costs of these efforts are substantial (for infrastructure, capacity, and contents), they should be compared with the price of inaction, which is likely sky-high. Castells' notion of a fourth world, lacking the ability to connect or disconnect from the network society and not marked by traditional geopolitical boundaries, symbolizes

collective and extreme exclusion. No wonder there are more critics of ICT for development in the north than in the south, for it is in the south that people better understand the effects and impacts of being in that fourth world.

The digital divide is the "dark side" of ICT for development. On the brighter side, however, there is an array of digital dividends, demonstrating the opportunities and resulting benefits from the developmental appropriation of technology. The problem is that they most often come in the form of small pilot projects, and pilots, in development jargon, amount to little more than anecdotes that with luck may be significantly replicated for real human impact. As Jeffrey Sachs put it in the address to the UN ICT Task Force in June 2002, speaking as special advisor to the UN secretary general on the millennium development goals and director of the UN Millennium Project, "you can't put out a forest fire with one fireman." Pilots cannot end poverty.

Pilots (and also larger projects) do, however, offer more-than-sufficient evidence to demonstrate that there are practical and valuable applications of these technologies in just about every development area. The list of applications is as wide as there are development problems. The following give just a flavor:

- Posting coastal weather information accessed through the Internet to warn fishermen of threatening conditions
- Awareness of real market prices for agricultural produce, positioning farmers in a better bargaining condition, and contributing to increase their income
- Access to legal information for human rights organizations
- Electronic networks to support the work of HIV/AIDS workers
- E-tenders in government to diminish corruption and increase efficiencies
- Telemedicine to improve medical care for people in isolated areas
- Electronic communications for coordination and real-time information during natural disasters
- Geo-referenced information systems to facilitate water-basin management
- Remote information processing as a means of job generation (sometimes for people with disabilities)
- Telecenters that become local development centers with access to information and ICT

The targeted, widespread, and innovative harnessing of ICT will make an important contribution to reaching the MDGs, which serve as a kind of present global blueprint for development. The UN ICT Task Force, a multistakeholder group under UN auspices active from 2001 to 2005, created resources to guide the use of ICT for the achievement of the MDGs in timely conjunction with the World Summit for the Information Society process. However, in the larger picture of digital dividends, we just need to return to the concept of human development: The best digital dividends come through increased choices and freedoms for increasing the quality and dignity of human life.

So do we invest in health or ICT? Even if it is a little oversimplified, that is the type of dilemma that decision makers ponder while weighing the need to shorten a particular digital

divide. And when someone as well known and informed as Bill Gates publicly discusses this dilemma and questions the rationale of ICT for development, as he did during the Digital Dividends Conference in Seattle (October 18, 2000), the debate is served. There is, however, a starting problem with the way the question is formulated. Health is a human need while ICTs are tools, and therefore they cannot be compared. A similar question regarding health vs. X-ray machines more clearly illustrates the dissonance of this false dilemma. Key development objectives, such as those contained in the MDGs, should be articulated first at the national and local level. Then, in the case of health, the ICT-for-development question would be better posed as "Can ICT tools help to achieve a given health objective, and, if so, what are its costs and benefits?"

For decisions on the use of ICT for human-development processes, one perspective comes, for example, from the field of a given project or activity. Objective and methodical analysis about the use of ICT in a specific context is needed to make informed decisions on whether to use it for a defined objective, what type of ICT should be used, how much should be spent, and how those technologies should be integrated in the specific development activity. This type of analytical capacity will be practical for development actors and stakeholders, particularly during the formulation phase of projects and programs.

From the macro perspective, deciding over priorities and choices is the essence of management and at the core of public policy. Can we really say that ICTs can and should be applied for all areas of development? The short answer might be yes if and only if they are cost effective in advancing development policies. The UN ICT Task Force (2003, p. 7), referring to ICT and policy making, claims that "their potential contribution to the achievement of development objectives reinforces the need to place ICT in the mainstream of development strategies and thinking, both nationally and internationally." Moreover, UNDP (2001) and the UN Millennium Project (2003) indicate that technology is a tool for development and economic growth, and not simple reward or consequence of them. Mansell and Wehn (1998), in one of the early groundbreaking works on ICT and development, wrote the following about ICT and development priorities:

investment in ICT competes with other investments necessary for addressing development goals. This competition has sometimes suggested that there is an "either/or" question to be resolved before substantial investments in ICT or related capabilities can de decided upon. A key message of this report is that combining existing social and technological capabilities is likely to produce spin-offs in terms of social and economic value. The tensions created by competing investment priorities will not disappear. However, it is more productive to view the use of ICT as an enabler of development and a source of skills and capabilities that can make contributions in many different development contexts, than as an isolated sector for investment. This is a strong argument for establishing an effective ICT strategy. (p. 257)

If evidence and analysis (admittedly together with a bit of instinct and risk taking) lead one to accept the notion that ICT has important potential for advancing human development and empowering people, the challenge that resides is how to properly (and rapidly) harness that potential. In particular, it is how to use these technological tools for socioeconomic inclusion instead of further exclusion. The risks of the gap widening between the information "haves" and "have-nots" in a political economy characterized by globalization and competition are unacceptably high, to the point that the gap may become insurmountable, at least for many decades.

In this context, two key messages emerge from our book. First, without extensive and deliberate emphasis on building human and institutional capacity to apply ICT to development processes, any investments in infrastructure will miss the mark (and no digital divides will be bridged). Second, development stakeholders in both the south and north cannot afford to sit idle and ignore ICT in development policies and actions because of the value of information and knowledge as development resources and the emerging context of the network society (or knowledge societies). Applied to human-development concepts, ICTs become tools to address needs (or curtail unfreedoms) as well as to access opportunities (thus increasing choices). They do so across the thematic spectrum of development as the horizontal tools they are.

So what are we to make of ICT? The authors in this book provide a diverse range of approaches—some geographic, some thematic—all providing useful knowledge for policy makers. A shorthand recommendation might be to make the best of it, and to make the best with it. The key is to be realistic, objective, and practical. Leaving the hype out of the ICT-for-development equation will help: ICT is surely no development panacea. While ICTs provide access to information and stimulate the creation of knowledge, they are only part of the development puzzle. They do not provide direct benefits like food, medicine, shelter, or credits. Whoever expects development miracles needs to look elsewhere. However, ICT can be one of the pieces of the development puzzle. We do not eat information, but we can use information to grow more food and learn better nutrition habits. And in some circumstances, like natural disasters, the AIDS epidemic, or simply being in the face of rough seas (for fishermen), information simply saves lives. Most importantly, let us listen intently to stakeholders from the south as they are in the best position to understand what is best to address their own development needs.

International cooperation agencies can have significant influence on the introduction of ICT into development processes through their catalyst role as funders of pilot (experimental) projects and the support of human and institutional capacity building in developing countries. The catch is that ICT mainstreaming in cooperation agencies is in its infancy in most agencies. They integrate ICT in their operations and fieldwork to a lesser extent that what they themselves recommend to the countries they support. Data from an OECD/Development Assistance Committee (DAC) study (available at http://www.oecd.org/document/55/0,2340,en_2649_34835_34906999_1_1_1_1,00.html), which includes data up to December 2003, indicated that less than half of the 23 main donor countries represented in the DAC has an appreciable level of ICT integration in their cooperation practices; additionally, they do not explicitly contemplate it in their policies. Insufficient human capacity in ICT for development is the probable main factor to explain this, as staff from the agencies do not have sufficient understanding about the uses and possibilities of ICT for the work they do, nor do they have specialists (in most cases) to support them. A report from the UN Millennium Project (2004) goes further when it indicates that "the general attitude in a number of international agencies towards technology is skeptical or even hostile" (p. 133).

Moreover, ICT mainstreaming into development agencies will feed change processes that go far beyond instrumental changes. In many respects, development cooperation practices remain much the same as in pre-Internet days. The process of informational and technological updating should be inserted in a more comprehensive renovation in the modus operandi of these agencies. This is not that much different from what has been occurring in companies, governments, and universities, where ICT has allowed renewed models related to e-business, e-government, and virtual and online universities, respectively. To better adapt to the context

of globalization and the emergence of the information society, the international cooperation sector would do well to restructure along some type of e-cooperation or network-cooperation models, where the agencies (and their projects) would function much more as networks and through networks than is the case today.

About this Book

Information Communication Technologies and Human Development: Opportunities and Challenges is a book aimed at enlightening the above concepts and therefore at understanding how ICT can contribute to human development in several areas. In particular, its overall objectives are as follows:

1. To describe the link between ICT and human development (which includes economic, social, and political development)
2. To identify the potential applications of ICT in several areas
3. To provide insightful analysis about those factors (also contextual and institutional ones) that affect ICT for development initiatives' success or failure
4. To propose strategies to move forward and to address future challenges

The book presents insights gained by leading professionals from the practice, research, academic, and consulting side of the ICT-for-development field. This is why it should be useful to a variety of constituencies who are interested in the interrelationships between information and communication technologies and human development, including the following:

1. Politicians and public-sector officials (civil servants) who need a convenient source of information on what ICT can do for the development of their communities
2. Development professionals and practitioners who want to further explore the potential of ICT for development. This target includes headquarters and field-offices staff of large development organizations (such as the World Bank or the United Nations Development Program), staff and volunteers of nongovernmental organizations, or bilateral development agencies' staff (such as USAID, AECI, or CIDA).
3. Academicians, researchers, and students interested in the field of ICT for development

The book is presented in two sections. The first, **Section I**, "Digital Dividends and Digital Divides around the World," is a wide-ranging section that contains six chapters focused on the use of information and communication technologies in poverty-reduction initiatives as well as on the problem of the digital divide and the challenges to overcome it at regional, national, and local levels.

In particular, **Chapter I** examines the digital divide that exists within Latin American countries. It argues that ICTs are creating new opportunities that can be seized to support

human development and poverty-reduction strategies. However, it also clarifies that ICT on its own cannot leapfrog the old institutional and organizational weaknesses of Latin American economies and societies.

Chapter II reviews the role of ICTs in socioeconomic development and poverty-reduction programs in sub-Saharan countries, providing an overview of the status of ICT and national ICT strategies in sub-Saharan Africa, and analyzing three major policy documents that provide the framework for economic growth and poverty-reduction efforts in most developing countries: national poverty-reduction strategies, country assistance strategies of the World Bank, and poverty-reduction support credits.

Chapters III and **IV** state shortly the basic components and the manifestations of the problem of the digital divide, as well as the ways of its solution in a specific country with its specific regional, social, historical, and political features: Moldova.

Chapter V invites readers to rethink basic questions of what the benefits of community-compatible ICT for the poor are in the context of Botswana and other African countries.

Chapter VI presents a case study of an ICT-based attempt to reduce poverty in a rural Indonesian community. Differences between the theoretical approaches adopted by the implementing agencies and the difficulties inherent in achieving these aims in practice are outlined, emphasizing, particularly, how issues relating to implementation impact on efforts to move toward greater beneficiary inclusion in socioeconomic networks.

Section II, "How ICT Promote Development? Lessons from Different Fields," reviews several initiatives that have taken place all over the world and that illustrate the use of ICT to enhance the different dimensions of the human-development concept.

Therefore, **Chapter VII** focuses on microcredit-microfinance and ICT as synergistic coagents and powerful poverty intervention tools to reach the poorest people and narrow the digital divide, thereby reducing poverty significantly in developing countries and contributing to achieving the MDGs.

Chapter VIII looks at the impact of the Internet on the worldwide human rights movement, and examines the opportunities and pitfalls of the technology and its applications for human rights organizations.

Chapter IX discusses Africa's experiences with ICT for education initiatives in current schooling systems, analyzing examples of the successful application of ICT in African schools and their actual and potential developmental spin-offs with caution. It warns of the disconnection with glaring social, infrastructural, economic, and political realities that mitigate against further system-wide success.

Chapter X approaches ICT for health applications in developing countries and argues that these projects require a deep understanding of various contextual factors, such as health and ICT infrastructure, disease burden, and sociocultural issues.

Chapter XI presents an empirical investigation of the introduction of health information systems in the primary health-care sector in India (India Health Care Project, Family Health Information Management System, and Integrated Health Information Management Systems).

Finally, **Chapter XII** seeks to build the basis for an explanatory model that establishes which factors affect and condition different political uses of ICT and which principles underlie that behavior both in developed and developing countries.

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