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TECHNOLOGIES IN THE
SERVICE OF DEVELOPMENT

SYNOPSIS

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HUMAN DEVELOPMENT REPORT VENEZUELA 2002
TEAM

Antonio Molpeceres
Resident Representative

Coordination

Ángel Hernández (Human Development Report Coordinator), Vanessa Cartaya (Consultant), Oscar Floreani (Human Development Consultant), Alba García (Consultant), Claudia Giménez (Human Development Promotion Project Coordinator), Pablo Giolito (TIC Development Programme Officer), Benigno Rodríguez (Development Programme Unit Coordinator).

Panel of Consultants

Víctor Álvarez, Pedro Antonuccio, Ignacio Ávalos, Jorge Baralt, Adelaida Bianchini, Vanessa Cartaya, Sara Da Rocha, Susana Funes, Alba García, Silverio González, Lorenzo Lara, Pablo Liendo, Luis Núñez, Patrick O'Callaghan, Mauricio Phélan, José Silva, Edna Ruckhaus.

INTRODUCTION

The Human Development Reports published by the UNDP since 1990 have introduced a new conception of development, offered as an alternative to the development models that are narrowly circumscribed to economic growth. The human development concept has been broadened since that time, both conceptually and in terms of the methods for evaluating the achievement of objectives. At the same time, the mission, purposes, and content of the Human Development Reports have been broadened as well, at both the world level (WHDR) and the national level (NHDR). That is perfectly understandable, since the enormous complexity of the human development process makes it essential to approach it from a variety of perspectives, addressing the particular needs of each population and using relevant data and research to provide support for the recommendations generated on the basis of this perspective.

At the present time, human development can be described as a process whereby the breadth of the total spectrum of choices open to people is increased, embracing everything from a favorable environment to political and economic freedom. Its core is the expansion of human capabilities, which are what allow people to meet their responsibilities for the achievement of individual and collective well-being, and to seize of the opportunities at their disposal or those which they themselves can create when they have such basic freedoms as education, medical care, food security, employment and income, among others.

Human development must be "sustainable", meaning that we cannot undermine future generations' well-being to enhance our own. That also implies people's direct participation in decision making. In a nutshell, human development understood as freedom takes the person as an agent and not a patient; it is in those terms that its efficiency needs to be assessed.

For more than a decade, the assessment of human development –measured by the Human Development Index (HDI), constructed with indicators of achievement in the dimensions of health (life expectancy), education (combined school enrollment and literacy rate), and income (per capita income parity in US$)– has also undergone important changes. Most importantly, complementary indices have been created and the Index has been broken down by region, state, and municipality. The complementary indices created to date are: the Human Poverty Index, the Gender-related Development Index, the Gender Empowerment Measure, and the Index of Technological Advance.

Two messages emerge from the aforementioned progress in the assessment of human development on the basis of these indicators. First, measurement is normative in nature: we measure how much has been achieved and how much remains to be achieved in order to reach a desirable state of human development. Here the key is not only the standards attained, but also the progress made over time, such as increasing prosperity for the disadvantaged or excluded populations, and their more rapid incorporation into the trend of development.

Second, the progress that has given rise to the set of indices now available teaches us that human development is more than what is measured with the HDI. Its true assessment requires more indicators, such as those which generally accompany or complement the human development reports, or the complementary topical studies and analyses that address the needs and perceptions of the agents in the development of the country in which a given report is generated. These must reflect criteria of quality, intellectual honesty, and relevance, in order to form a basis for recommending development policies and strategies that are viable in their context.

These requirements for the NHDRs provide support for the UNDP's policy mandate to make its reports the key product in the search for human development and a more equitable and just society. It should be stressed that, for the UNDP, the policy or strategy recommendations presented in the NHDR's must be grounded in concepts, data, and inquiries with the key agents in the country's development, and the reports' greatest value lies in the adoption and implementation of those recommendations for the country in question, and in the possibility of making a favorable assessment of a society's progress from the human development standpoint.

Guided by these concepts and criteria, the UNDP now places at the disposal of the reader and the country as a whole its Human Development Report Venezuela 2002, titled Information and Communication Technologies in the Service of Development. Unlike the previous reports we have produced, this one has been preceded by the publication of the Human Development Index and Milieu in Venezuela 2001 report, done by the National Institute of Statistics with the UNDP's support. Our recommendation is that both documents be read together in order to gain a comprehensive view of the state of our human development. In support of that idea, this Report includes an appendix called "A Look at Human Development in Venezuela" over the last 25 years.

The preparation, writing, and production of this Report has gone through a series of phases, a familiarity with which will help the reader more easily understand its content and recommendations.

The choice of the topic, and part of its orientation, is the outcome of inquiries with representatives of the public sector and civil society, including members of academic institutions, communication media, private enterprise, non-governmental organizations, and others. During this period of inquiries we selected the principal authors of the basic works included in the Report, among whom are representatives of several agents in the national development process: businessmen, scholars, and journalists.

The subsequent steps were by no means free of challenges and difficulties. Among those worth mentioning here is the very definition of Information and Communication Technologies (ICT), in view of the controversy surrounding its connotations.

In this Report, and as an operational definition, ICT is conceived as a universe comprised of two sets: the traditional Communication Technologies (CT), chiefly radio, television, and conventional telephone service, and the Information Technologies (IT), characterized by the digitalization of the technologies for recording content (information processing), for communication (telematics), and for interfaces (media), all of which has become possible due to the adaptability of computing. ICT's flagship product is the Internet, and it is there that the greatest emphasis is placed in regard to each of the concepts and topics discussed in this Report, except when that would not be justified by observed reality.

Throughout all the chapters we try to find answers to a question that is crucial in a globalized world: how to put ICT at the service of enhanced human development, so as to narrow the equity gaps and help achieve the substantive freedoms (nourishment, avoidance of premature death, and the ability to read, write, and calculate, among others) and the instrumental freedoms (political liberty, economic services, social opportunities, assurance of transparency, and security) for the Venezuelan people, as is required for human development to take place.

In the search for answers to this question, we note that ICT is a means and not an end. We envisage it as an enabler of the country's economic and social development, in the framework of a broader policy thrust whose objectives are those of human development.

The basis for this judgment lies in the conclusion of an international comparative study that analyzes sectoral and national strategies, with their different objective foci of attention and in which it is demonstrated that not all countries can benefit from the approach that takes ICT as a productive sector of the economy, while all countries can benefit from the approach that defines its use as an enabler. That is especially the case when ICT is incorporated into development strategies and goals, such as those of reducing exclusion and improving health care and education.

The choice of the topics to be addressed, and in particular that of the strategic areas consistent with the Report's purpose, proved to be the most difficult part of the process. It was accomplished by tapping expert judgments and reviewing an extensive national and international documentation, the conclusions from which were compared with Venezuela's current conditions.

In the three chapters ("Human Development and Globalization Trends", "ICT: an Enabler of Human Development", and "A Situational Diagnosis of ICT in Venezuela"), we express the theoretical-conceptual framework within which the role of ICT as an enabler of human development is examined, and answer questions such as: How can human development and the knowledge society be conceptualized? What are ICT's linkages with human development? Where does Venezuela stand and what is the path it must traverse in the application of ICT for human development purposes?

Starting from this overall conceptual and empirical foundation, we then go on in the following six chapters to examine a set of strategic areas whose progress is considered indispensable for ICT to become a tool capable of accelerating human development and overcoming the dilemmas and risks inherent in the tendencies toward exclusion that have accompanied its dissemination up to the present. These chapters are: "The National Innovation System: creating networks", "Education: from access and use to social appropriation of ICT", "Digital convergence of the communication media in Venezuela and social development", "The digital economy: new roles, new jobs, new opportunities", "Electronic government and the promotion of human development", and "ICT, inclusion, and human development".

In the light of the principles which inspire the human development approach, the lessons drawn from experience lead us to conclude this Report with a chapter on "ICT and human development: a strategic approach". Here we describe some paths toward fostering a greater understanding of ICT as a powerful tool for the achievement of economic and social development. These ideas are organized into cross-cutting components which influence the orientations of a national strategy, as well as specific components of the strategic areas that are singled out for analysis.

Experience has shown that one of the essential foundations for the success of any human development strategy is the political will to formulate strategies and policies and to put them into execution on the basis of a national consensus grounded in knowledge and generated by dialog. The political and technical dimensions go hand in hand.

It is our hope that this contribution will become an excellent vehicle for discussion and dialog aimed at achieving the best possible use of ICT for the benefit of the Venezuelan population, and very especially for the benefit of the groups presently excluded for a variety of reasons. Accordingly, the invitation is for you to accompany us in the dissemination stage, which is an integral part of this Report. With profound conviction, we believe nothing belonging to people and intended to be achieved by and for people can be planned without their participation.

Before concluding, we would like to express our gratitude to all the individuals and institutions whose support and contributions allowed us to produce the *Human Development Report Venezuela 2002*.

Antonio Molpeceres
United Nations Development Program
(UNDP) Resident Representative

ICT IN THE SERVICE OF DEVELOPMENT

In the 21st Century it is impossible to ignore the influence and importance of Information and Communication Technologies (ICT) in every sphere of life. Our dilemma does not lie in whether to accept or resist ICT, but in how to use it so as to minimize its risks and maximize its benefits for people's well-being.

This Report seeks answers to a key question for a globalized world: How can ICT be used to improve human development, narrow the equity gaps, and help achieve substantive and instrumental freedoms for the Venezuelan people?

Adopting the view that ICT can be an engine of human development as long as it is conceived as a tool to be used in the framework of a comprehensive strategy aimed at achieving that goal, the Report assesses where we are now and what we must do in policy terms to strengthen and accelerate ICT's adoption.

Given ICT's all-embracing and adaptable nature, which makes it applicable to practically any activity, the choice of strategic areas in terms of this study's core objective was by no means an easy task. It was addressed on the basis of national experts' judgments and a review of extensive national and international documentation, the conclusions from which were compared with the country's current conditions.

FIRST PART

The first part of this Report describes the theoretical-conceptual framework within which ICT's role as an engine of human development is analyzed, and answers the following questions: How are human development and the knowledge society conceptualized, and how do they relate to ICT? Where does Venezuela stand as regards the application of ICT for human development purposes, and what remains to be accomplished?

The achievement of human development as freedom: from the knowledge society to the acknowledgment society

In this Report we define human development as the freedom to achieve what people consider valuable, and we review the dilemmas for its attainment in the "knowledge society", which at the same time as it provokes segmentation, gaps, and exclusions, also facilitates the installation of communication networks with an immense potential for uniting all the diverse parts of society, enhancing freedom of choice, and doing away with privations.

When we say that human development is liberty, we understand liberty as the expression of the substantive and instrumental freedoms. The substantive freedoms are the purpose of development: freedom from hunger, premature death, preventable disease, ignorance, restrictions on political expression, among others. The instrumental freedoms are the means to achieve development: the opportunities and rights provided through the economic, social, and political systems, on which the individual's ability to achieve the substantive freedoms depends.

How can ICT be used to improve human development, narrow the equity gaps, and help achieve substantive and instrumental freedoms for the Venezuelan people?

The critique of technological determinism opens up prospects for an "acknowledgment society".

Two features that accompany the rapid development of ICT play contradictory roles in terms of human development, implying the need to take action to maximize their positive potential and minimize their risks. Though we must guard against false optimism, since the trends toward growing exclusion in today's world are by no means easy to reverse and the globalized economy shows a troublesome tendency to make itself independent of politics, it is also possible to identify other trends tending in the direction of greater democracy and acknowledgment, which are favorable to human development.

The concentration of capability and knowledge for the processing and dissemination of information has been selective, oriented by the search for profitability. This has given rise to enormous disparities between the sectors, activities, regions, and cities that are connected to each other and those that lie outside the networks. The outcome is a set of intense polarizations, shifting centers, and fragmentation.

But though the technological revolution has had a powerful impact on social activities, it does not determine the form taken by information development in each particular historical context. The critique of technological determinism opens up prospects for an "acknowledgment society" that subsumes the information society and redefines it on the basis of the principles of freedom for all and respect for the differences among people. From this conceptualization springs a differentiation between information development and human development; in the former, the goal is to enhance productivity and spur globalization through technological development and economic growth, while in the latter, technology and growth are understood as means to enhancing people's substantive freedoms in the course of a search for a collective future in freedom.

Networking, as a key possibility created by ICT development, can be used to advance development, but success in that endeavor requires social change more than technological change. The horizontality, self-organization, multidirectionality, and indeterminacy that inspire the networks pose major opportunities for the creation of a new political arena free of causal and mechanistic linearities. Networks make it possible to conceive society as "fabrics progressively woven by the weavers" –the agents in their own intercommunication build up reality in each contingency, with the aid of the telecommunications networks, permitting the creation of a field of political action less concentrated in the State, and in which public regulation is facilitated and made viable.

The networks make it possible to conceive society as "fabrics progressively woven by the weavers".

Institutional weakness goes far toward explaining the meager utilization of this potential. Even though ICT, with the Internet at its core, could generate enough value to humanize the planet, this would require the participation of new agents, policies, and institutional capabilities determined to appropriate the potential of technological "Doing" and bring it into line with the "Being" of universal and local human culture.

The balance between "infostructure" and "infoculture": a positive link between ICT and human development

According to the conceptual framework adopted in this Report, ICT expresses itself in two dimensions: "infostructure" and "infoculture". The first includes the technologies of telecommunications, information storage and retrieval, interfaces, digitalization, and switching, among others, all integrated and driven by computing technologies. It includes what is known as "hardware" and the entire universe of basic and application programs ("software"), along with the content records in the different fields of application. Infostructure is tangible, and it is what is usually sold in the marketplace; hence, there is a false belief that it is all that is needed to solve the problems of human development.

Infoculture is the part of culture focused on understanding and using infostructure in the best possible way to overcome the many problems that accompany society's evolution. In the cultural dimension, what counts is organization, regulation, competencies, content, attitudes, and responsibilities. Infostructure's influence on culture is undeniable, and this effect is the source of ICT's importance for human development.

The infostructure technologies are enablers; they are necessary but not sufficient conditions. Their effectiveness cannot be assured in the absence of a concurrent development of the different aspects of the cultural dimension. That is why an adequate incorporation of ICT into human development demands a parallel and balanced development of both dimensions.

The linkage between ICT, understood as discussed above, and development can be approached from two perspectives. Up to now the process has been guided mainly by the technology and the market, in a sequence that can be outlined as follows: through a technology-driven process, knowledge produced in the academy and some companies is translated into technological "know-how". Then, through a demand-driven process, the know-how is converted by industry into marketable products. But as stated in the UNDP Global Report for 2001, "the market is a powerful driver of technological progress, but it is not powerful enough to create and disseminate the technologies needed to eradicate poverty".

Viewed from a more inclusive perspective –as is required for human development– the desired sequence would be as follows: demand, including the "non-solvent" demand that finds no expression in the marketplace, would be represented by growing segments of society that, in their role as final users, perceive ICT not as an end but as a means for enhancing the exercise of valued capabilities. Technological innovation would be used when appropriate to respond to social demands with ICT-based solutions. Then it would be up to industry to assess the potential for generating solutions to be marketed to the public at large. The State would adopt policies to ensure the broadest possible distribution of opportunities. The academy and civil society would represent the public interest, preventing industry from pursuing strategies tending toward exclusion and inhibiting the State from going beyond its proper normative and regulatory role. This would be a process guided by the objectives of human development, with the aim of serving a generally excluded population.

The use of ITC as a "development enabler" requires a holistic vision and a strategic approach

For ITC to contribute to the achievement of development objectives, it is necessary for ITC –as an enabler of human development– to spur economic and social development in the framework of a strategy inspired by a holistic vision in which the different components are mutually reinforced and developed. The benefit will not spring from ICT per se, but from its potential for creating powerful institutional, political, economic, and social networks by improving communication and information exchange.

Examination of the ICT strategies applied by different countries shows that these policies may be sectoral or national in scope. In the latter case, each country's chosen strategy will have unique features and the role assigned to ICT may be that of a productive sector as such, that of an enabler of socioeconomic development, with ICT being used to improve the country's competitive position in the world, or that of a contributor to economic and social development. The latter appears to be the strategy pursued by Venezuela.

A comparative analysis of national strategies with their differing orientations shows that not all countries can benefit by conceiving ICT as a productive sector, but all can benefit from using it as a development enabler, especially if it is incorporated into development strategies and concrete development goals such as enhancing inclusion and improving health care and education. Examples of all these applications are present in Venezuela.

It should be noted that the categories outlined above are not mutually exclusive. The purpose of this typology is to call attention to the main focus of each strategy, for application to case studies undertaken to improve our understanding of the likely effects of different policies and strategies.

Finally, we can conclude from our analysis of ICT application strategies in other national contexts

Viewed from a more inclusive perspective –as is required for human development– this would be a process guided by its objectives with the aim of serving a generally excluded population.

The benefit will not spring from ICT per se, but from its potential for creating powerful institutional, political, economic, and social networks by improving communication and information exchange.

As is the case in other countries, highly advanced expressions of ICT development can be seen in Venezuela. But we cannot conclude that they reflect the expressions of ICT development available to the population in general.

that a holistic vision is essential for ICT to make a significant contribution to development, along with an orderly and consistent effort with appropriate leadership and professional management. Strategies must be grounded in strong public and private institutional support, and above all, they must include an intense commitment to participation, satisfaction of local needs, and political will at the highest level. It is indispensable to acknowledge the roles played by the different agents in development, and to support strategic alliances among them.

Where do we stand? The path traveled to date is comprised of major successes but also of lags that need to be overcome

As is the case in other countries, highly advanced expressions of ICT development can be seen in Venezuela. There are local niches in which the available infostructure or the prevailing infoculture are as advanced as those of the most intensely technified societies. But we cannot conclude that they reflect the expressions of ICT development available to the population in general if the spread of the knowledge society to the entire population is our goal.

The set of indicators universally applied to describe a given country's position in the information society –components of the Information Society Index (IDC, 2001)– serves to illustrate Venezuela's current situation. Though the average index value places the country in an intermediate position as regards utilization of these technologies, the strengths and weaknesses revealed by the four components tell us where greater emphasis needs to be placed in the design of future strategies and policies.

Regarding the first component of the Index, Information (which includes basic telephone service, open and subscription television access, and other indicators), Venezuela is in a relatively strong position. Venezuela is also fairly strong in terms of the indicators in the Social component (human resources, newspaper circulation, press freedom, and others). Its weakest areas are the components reflecting access to Computers and access to the Internet, wherein Venezuela is at a disadvantage *vis-à-vis* other Latin American countries.

But most of these indicators –particularly the number of subscribers and teledensity or penetration of a given service– tell us nothing about the composition of the user population or about specific geographic coverage. In fact, Venezuela has had a type of development resulting in a high concentration of population and public service availability in the northern coastal region, and telecommunication services are no exception to this general rule. Studies done in the country have revealed major areas of shortcomings and unmet needs in this respect. The Universal Service concept, as expressed in the Organic Telecommunications Act and the plans for its implementation, poses a number of interesting challenges for achieving the goals of national integration, maximization of access to information, development of educational and health care services, and reduction of inequalities in access to telecommunication services.

Venezuela's regulatory framework governing the institutional structure of ICT has developed very rapidly in the last three years, ranging from the National Constitution, the Organic Telecommunications Act and the Organic Science, Technology, and Innovation Act, to a number of specific laws serving as enablers for different strategic areas of ICT application – all of these reflect an equity-oriented approach. Though this regulatory framework still has some limitations and has encountered certain practical obstacles to its implementation, it is nevertheless an important achievement.

In addition, a National Information Technologies Plan has been drawn up, whose stated mission is "to develop and consolidate a national information technologies platform that will make it possible to enhance human capabilities and improve quality of life", along with a National Telecommunications Plan. The social impact of telecommunications plays a key role in the latter instrument, being the point of convergence of the goals for the telecommunication sector's development, the development of legal instruments and regulations, international projection, and strengthening of the regulatory agency.

To sum up, Venezuela is a country in which an adequate national strategy for ICT's incorporation into social development has a strong potential. There is a growing technological infrastructure and a higher education system that has produced a substantial number of well-trained professionals and technicians, as well as an availability of advanced equipment that permits major steps towards the progress of the information society. But the great task lies in the development of an "information culture," which is a requirement for ICT's integration into social and economic life, and for its conversion into an enabler of human development.

SECOND PART

On the basis of this conceptual and empirical foundation, we can now examine a set of strategic areas whose participation is essential for ICT to become a tool for accelerating human development and overcoming the dilemmas and risks posed by the tendencies toward exclusion which have heretofore accompanied its dissemination.

The National Innovation System: from a "concert of soloists" to networks of cooperation for innovation and technology transfer

Until quite recently, scientific activity was structured on the basis of a justification of research for its own sake, validated by peer review and performed at individual scientific institutions within the boundaries of mutually isolated disciplines. It reflected the premise that increasing the supply of scientific knowledge was all it took to generate technological innovation. In this scientific model, research policy was parallel to technology policy. The "scientific sector" almost never engaged in fruitful interaction with the "productive sector," and attempts to bring them together often fell by the wayside.

The current model, on the other hand, springs from the idea that research is justified within a context of utility and is performed in institutional networks comprised of very heterogeneous organizations, with flexible work arrangements permitting multidisciplinarity, interdisciplinarity, and a focus on generating innovations. These are social networks in which research and development centers, universities and technological institutes, productive enterprises, banks and other financial institutions, consulting and engineering firms, the central government and local governments, non-governmental organizations, and organized communities all participate.

The articulation of this broad range of agents is powerfully enabled by ICT. If the system's components have access to technological and cognitive tools which allow them to work in a networked mode, they can build up the cooperative advantages required to multiply each one's contribution, with a view to achieving a better quality of life.

That is the vision which inspired the creation and development of the Ministry of Science and Technology in Venezuela. Its basic mission is to foster a National Science, Technology, and Innovation System, but the challenge before it lies in expanding the economic, political, and institutional space, i.e., incorporating new agents into the tasks of generating, disseminating, and using knowledge and technologies, while orienting these activities toward a harmonization of science and technology policy with social and economic policies.

By the same token, a look at Venezuela's economy shows that, though considerable change has taken place, industry continues to be more a sum of individual firms than a full-fledged institutional fabric. The idea of a "chain" as a set of "upstream" and "downstream" agents, interlinked by common interests, is almost entirely absent, and there are very few relationships between companies and university research centers.

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Innovation networks rely for their feasibility not only on investments in infrastructure but –and above all– on the development of social capital.

As shown in many cases, both in Venezuela and in other countries, innovation networks rely for their feasibility not only on investments in infrastructure but –and above all– on the development of social capital, i.e., the set of institutions (values, regulations, laws, organizations, administrative routines) that make it possible to work on the basis of agreements grounded in the partners' mutual trust. Hence, the National Innovation System is a concept whose implementation is directly contingent on the existence of social capital.

Education: reasons for concern and action

Among the most important strategic issues, education is one of capital importance, since it creates a virtuous circle in which the use of ICT facilitates access to high-quality education, while a better-educated population is more able to make use of ICT for its own development and that of the country.

In this Report, ICT is viewed as an opportunity to influence the processes for improving capabilities, attitudes, skills, and abilities in the intellectual, physical, and moral dimensions, through schemes provided by formal education at all its levels and in all its forms, as well as through informal education. One of its greatest values is that ICT makes it possible to provide education in a variety of physical locations and social conditions. Accordingly, it fosters the creation of educational communities out of school, thereby demolishing the barrier between school and society.

ICT makes it possible to provide education in a variety of physical locations and social conditions.

Venezuela has achieved successes in terms of basic education coverage, equality of access to education for boys and girls, and a reduction of illiteracy. But in its effort to enhance equity, the country found itself forced to improvise in relation to teachers and school buildings, and not enough has been done to compensate for the shortcomings of children from lower-income homes. The outcome has been a low-quality education, in which many children do not learn fundamental contents and instrumental skills, and more than 30% of the teachers are not fully familiar with the knowledge required for the grade they are teaching or are not skilled in the strategies required to foster learning. Under these circumstances, what role can ICT play, to close the education gap?

An analysis of current curricular plans indicates that the traditional tools are not enough to generate effective learning. The educational model in the information society focuses on an individualized education, in which students construct their own learning with the support of interaction with other members of their community, and the teacher's role is to serve as a mentor or guide. The new paradigm relies on interdisciplinary and cooperative learning styles, which encourage students to work together. Technology's role is to facilitate the discovery and construction of knowledge through exploration and communication.

What role can ICT play to close the education gap?

Regarding the application of ICT to the country's educational processes, though there are extremely valuable experiences, coverage is still quite minimal. Three distinct stages can be identified for pre-school and basic (elementary) education: a pioneering stage reflecting fragmentary local initiatives; an intermediate stage beginning in 1996 when a national policy was adopted but the regulatory framework needed to back it up was not put in place; and the current stage in which a constitutional framework defines ICT as a right but in which that right has yet to be reflected in a national policy with broad coverage.

Most of the handful of experiences in secondary and technical education have taken place in private schools. They have tended to focus on access and use, especially for the development of technical skills. The outstanding case in higher education, in view of its extent and level of sophistication, is at the University of the Andes, which launched its RedULA Data Network in 1991.

Chief among the lessons of a decade of applying ICT to educational processes is that, for ICT to have the impact promised by its potential, the programs and projects must include a concurrent development of the two dimensions: both the infostructural (access and use) and the cultural (appropriation). This approach must be reflected in the design of the digital materials and administration of their use, and in the design of the attitudinal aspects such as motivation and constancy, among others. Experi-

ences oriented solely to the infostructural dimension –many of which are circumscribed exclusively to provision of equipment– do not ensure any educational impact.

Another implication drawn from these experiences is ICT's enormous potential to provide equitable service to the different beneficiaries (children, adults, elderly) in their different formal or informal roles (students, teachers), in different milieus (academic, technical, complementary), in spite of different cultural conditions (ethnicities, customs, beliefs), physical conditions (with or without disabilities), and economic and social conditions (poor, rich), and regardless of geographic location (urban, rural).

Considerable success has also been achieved in the use of ICT to train teachers in the use and command of content designed for children, especially in the areas of mathematics and language; this has also had a positive impact on students. All these experiences are essentially outcomes of the decentralization process.

But many weaknesses remain. The first of these is the lack of continuity in programs and projects; they generally come to a halt or are reoriented without prior evaluation. Another is the general absence of management teams in the institutions conducting these programs and projects, which need professionals trained in the two technical fields (didactics and telematics) and equipped with management skills.

Finally, we note that priority has been given to ICT's implementation in the universities' scientific and technological faculties and schools, but not their education faculties. ICT began arriving in elementary and high schools before it made its presence felt in the teacher education schools.

The digital convergence of the communication media, a powerful educational tool for human development

Today, Venezuelans receive information, culture, and entertainment through the impact of the progressive symbiosis among the national media, information technologies, and the universalization of knowledge on their quality of life. The potential educational impact of these media cannot be ignored.

Information –a source of equity and democracy– is broadcast by 33 public and private television stations which have the potential to be powerful channels for the promotion of human development. With a four-hour average exposure per day per person, open-broadcast television's strength lies in its nationwide coverage, high velocity of communication, and audience amounting to 80% of the population. Even so, Venezuela is still below the world average for television sets per inhabitant.

At the same time, its audience segmentation, ease of implementation, and broad nationwide coverage have made radio (approximately 647 AM and FM stations in the country) a very important tool for information dissemination, one heard by 74% of the country's lower and middle-income (Strata D-C) population. And the imbalances of the past, as between the densely populated north-central coastal region and the rest of the country, have been steadily reduced as far as this medium is concerned.

In Venezuela the information society has a democratization program at its disposal, under the Non-Profit Public Service Community Sound and Open Television Broadcasting Regulations, whose aim is to give the population a channel for participation in which information of local interest predominates. Use of the community radio and TV platform, in combination with that of the Internet, to meet the disadvantaged communities' need for information increases the population's level of interactivity. But connectivity continues to be dependent on the establishment of communication networks and on direct Internet access from the community TV-radio stations' physical plant, which is scarce at the present time.

Newspapers and magazines have been steadily incorporating ICT for purposes of complementarity. Here priority is given to information, entertainment, democratic oversight and freedom, opening up of channels for citizen participation and reflecting the aspiration of providing content generators as development choices. Thirty one of the 100 most important hard-copy newspapers and magazines in 2002 have digital supports. These media are turning into public orientation tools which enhance knowledge by en-

ICT began arriving in elementary and high schools before it made its presence felt in the teacher education schools.

Newspapers and magazines are turning into tools of public orientation which promote knowledge.

The digital economy involves a different way of doing business, performing managerial processes, and creating value.

hancing group access and posting interviews, news reports, infography, photojournalistic reports, laws and judicial sentences in their electronic versions in real time, thereby making those resources useful for the promotion of human development.

Since most national media have electronic mail services, there has been an intensification of citizen demand for government accountability, expressed through Readers' Defense, Ombudsman, and Letters to the Editor sections, Internet-based assistance modules, and provision of space for reader opinion columns.

The digital economy, though incipient, is pioneering the utilization of the milieu's resources

The digital economy —which comes into being when productive sectors assimilate and make use of ICT— involves a different way of doing business, performing managerial processes, and creating value. Well conducted, it can help narrow the exclusion gap by opening up new windows of opportunity, facilitating the handling, assimilation, and exchange of knowledge, and improving the country's overall productivity. This would result in a higher per capita income and a broader coverage for education, which —in a virtuous circle- in turn foster a more balanced distribution of income, and hence, an improvement in the population's quality of life.

Internet-based businesses have taken advantage of four conditions of the Venezuelan milieu to pursue their development: the telecommunications industry's rapid growth, the software industry's development (with internationally acknowledged quality), young professionals' rising entrepreneurial spirit in response to the labor market crisis, and the ICT sector's institutional growth in both the public and the private sectors.

The digital economy really began to develop in Venezuela in 1999. The first e-businesses were launched by young pioneers who were quick to see the economic opportunities offered by the Internet. Most of them were not experienced businessmen, but people who had held traditional jobs. Electronic business provided them with a window of opportunities allowing them to compete with the traditional leaders in their chosen fields.

Though the traditional companies are not systematically present on line, some major initiatives have come from them. Today they handle less than 1% of their transactions through the Internet, and must face the same barriers as the dot.coms: a small market and a culture with a preference for seeing and touching before buying.

The banking industry is the one that has invested most heavily in the automation and digitalization of processes, following by the communications media. Large "brick & mortar" companies are now just beginning to go beyond the publication of a digital catalog and are exploring the electronic chain of value in search of cost savings and higher productivity.

On the demand side, entrepreneurs and companies have viewed Venezuela as an attractive market, in view of its people's interest in staying ahead of the curve and acquiring advance technology early, though it is still a poorly developed market. But though final consumers have experimented gingerly with e-commerce, the incorporation of small and medium-scale businesses ("PYMES") is a major pending challenge. Though they have competitive standards far below their installed capacity, they are not familiar with what ICT can do for their productivity and with the offerings on the market that are well suited to their needs and purchasing power.

Venezuela is not among the leading countries in the Latin American region. A weak and not very diversified economy has prevented Venezuelans from having the vision and resources needed to advance in a strategy of building an information society. As a result, two countries coexist in a single territory: one country of entrepreneurs and world-class supply of services, and another whose majority has yet to reap any real benefit from that supply in their daily lives.

However, there have been some qualitative advances which, on being reinforced through policies,

could have a powerful impact on company productivity, the maturing of the market, and the collective use of ICT to generate well-being. The experiences of new agents, the evolution of the traditional companies, and the development and maturing of public and private promotional institutions are building up a body of know-how on doing electronic business in our market, which in turn is helping to it to mature.

Furthermore, the digital economy should not be viewed as an isolated phenomenon. Internet business empowers an entire ecosystem of industries, ranging from connectivity through hardware and software to energy. The hardware, software, and information technology service industries were estimated to be comprised of 739 companies with nearly 68,000 employees in 2001.

Above and beyond the numbers, the Internet economy's impact can be noted in developments like the creation of new roles, new jobs, and new opportunities for the creation of businesses and innovative sources of employment for people who would never have ceased to be traditional job-holders had the Internet not come on the scene.

Finally, ICT's ability to spur inclusion by enhancing access to jobs for people from disadvantaged backgrounds cannot be ignored. It does this by fostering a more intensive use than has heretofore been made in the country of mechanisms such as market information systems and on-line transaction facilities for "microbusinesses".

Electronic government: multiplying ICT's impact for increasing the effectiveness and transparency of public actions and opening up channels for citizen participation

"Electronic government" includes all activities based on modern information and communication technologies (the Internet in particular) used by the government to enhance the efficiency of public administration, improve the services provided to citizens, and place government actions in a far more transparent framework.

Two challenges must be overcome to achieve this goal. The first is to transform the government's external services, and the second is to transform its internal processes. The external challenge consists of satisfying the citizens' needs and expectations, and simplifying its interaction with them through on-line services. The internal challenge lies in the modernization required to make way for a rapid, transparent, efficient, and effective conduct of administrative activities.

To promote electronic government, it is necessary to have a telematic platform that operates at a reasonable cost and with good quality of service, and to train the personnel properly. Under current conditions, the main barriers to a massive implementation of electronic government in Venezuela are a general lack of the necessary skills in the public administration and infrastructure constraints. There are networks with nationwide coverage, but they do not operate in a coordinated manner or communicate among each other. Furthermore, but the meager budgets allocated to the agencies involved undermine their ability to bear the costs of connectivity and up-to-date technology.

Moreover, Internet penetration and the availability of collective connection centers are still quite limited. That poses a direct limitation on the potential success of electronic government programs, for which it is a prerequisite that the citizens –individuals, groups, and companies- have the means for on-line communication with the different government agencies.

According to the government's plans, the key government services in Venezuela will be rendered in electronic form by 2007. On the path toward an electronic government, progress has already been made in the definition of a legal, institutional, and policy framework under Decree 825, the National Information Technology Plan, the National Telecommunications Plan, the Agenda for the Development of Information, Connectivity, and Content, and the design of financing sources.

Since the issuance of Decree 825, the agencies of the Central Public Administration have been setting up web pages to promote and provide information on the services they render. Other agencies have

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Both the plans and the legal framework developed up to the present point to a vision of electronic government as a key tool for enhancing the effectiveness of service provision and strengthening democracy.

placed administrative procedures on line; among them are the Integrated National Tax Administration Service and some state and municipal governments.

The Information Technology Regulatory Framework is now under development. When completed, it will provide the mechanisms needed to guide the agencies of the National Public Administration in making appropriate use of technological tools and foster a uniform, coherent, and comprehensive development of content, systems, and applications, as well as a development of technological platforms operating under criteria of interoperability and integration.

Projects such as the Public Service and Information Portal have been launched in the country. This portal provides citizens with a single entry point for information, communications, transactions, and statistics via Internet. Other projects now under way include: Digital City Hall, whose aim is to provide technological resources and human competencies to local governments, in order to bring about a qualitative change in municipal administration; and the Management System for Democratic Governability (SIGOB), intended to strengthen the public sector's strategic and operational capabilities. And in addition, topical servers for health care, productive activities, science and technology, and library resources, are under development. Finally comes what is viewed as the "cornerstone" for the development of electronic government: the program for democratization and massification of Internet access, which began with the opening of Infocenters to reduce the lower-income population's exclusion.

Both the plans and the legal framework developed up to the present point to a vision of electronic government as a key tool for enhancing the effectiveness of service provision and strengthening democracy. But there is a need for more effort to coordinate the actions taken to date and those planned for the future.

ICT, inclusion, and development goals: from connection to content

The digital divide is one more expression of inequality in access to productive assets and public goods and services.

The digital divide –differential access to information and knowledge resources– is one more expression of inequality in access to productive assets and public goods and services. As a result, the spread of ICT, like any other technological advance, will not lead directly to a narrowing of that gap.

This part of the Report concludes by offering a contribution to the identification of specific paths and models which, based on the use of ICT as a tool, can foster the achievement of human development. We focus on the areas where this encounter between technology and the expansion of human beings' substantive freedoms can be more fruitful.

To place this issue in perspective, it is desirable to recall the principal features of exclusion in Venezuela: the excluded are all citizens who live in a state of vulnerability that restricts their fundamental freedoms. For reasons of brevity, we will focus exclusively on poverty. One out of every five Venezuelan households cannot afford to eat well, and nearly half cannot meet all their basic needs. These are households whose members have not gone beyond elementary school. As regards the "digital divide", fewer than one in 10 poor households has access to a computer, and an even smaller proportion are Internet users; their most common point of access to the Internet is a collective access center such as a cybercafé, a school, an infocenter, or the like.

The question of how ICT can have a positive impact on living conditions needs to be addressed at several levels, since not all the benefits (not even the most important ones) the population receives from ICT come from direct use of a keyboard or a telephone.

In the first place, fostering inclusion means building a more competitive economy in a globalized world. There is no possibility of human development in a country whose insufficient use of ICT leaves it with a weak economy, which in turn prevents job creation and income generation and leaves inadequate resources available for investment in its people.

In the second place, ICT plays an important role in strengthening efforts to achieve specific

development goals, such as employment opportunities, health care, nutrition, education, eradication of gender discrimination, environmentally sustainable development, and access for all groups in society to decision making affecting their own destiny. Here we refer to the possibilities that are opened up by ICT-based applications both to render more effective and efficient services to the population and to facilitate the population's access to knowledge and broaden the society's range of freedoms and its governability.

Starting from every citizen's right to both knowledge and participation, the third way to overcome exclusion is to increase people's direct access to ICT through programs such as the telecenters and the massification of computer-assisted education in the country's schools.

The promise of ITC's potential applications for the solution of concrete human problems in Venezuela is just now beginning to materialize, and the demonstration of its social impact is thus far essentially anecdotal at best.

Our review of the different areas reveals, as concrete results achieved in a very short space of time, progress in the design of a legal and institutional framework with a clear-cut social orientation, and efforts (quite limited in their application) that demonstrate ICT's potential to create jobs, improve health conditions, and enhance citizen participation.

To massify ICT's impact in applications to health care, education, or the world of productive work, it is necessary for the agencies responsible for the policies in those fields to make content available. The greatest advances in Venezuela reflect strategies for the science and technology sector, and those achieved by the agencies responsible for telecommunications policy. But no such progress is as yet visible in sectoral strategies to speed up the achievement of human development objectives through a generalized application of ICT. As in many other areas requiring resolute and direct action by the State, institutional weakness has kept existing applications from transcending the narrow limits of the universities or pilot projects and spreading to all of society.

As regards democratization of access, the experience of the infocenters indicates ICT's potential. It can be used, for example, to train women in prison, protect crime victims, connect students and doctors in the Amazon jungle, or provide teachers with distance education courses. But problems of sustainability have emerged in this area, both in the financial dimension and regarding the development of content capable of ensuring social appropriation, i.e., making it possible for access to produce substantial changes in the users' living conditions.

For results such as these to be achieved, it is essential to consider the complexity of the process. Access to physical infrastructure at reasonable cost is only one aspect of a problem whose other components also include an institutional infrastructure for sustainable provision of service, the existence of local content that is appropriate and relevant to the users, and training for those responsible for operating the services and for their users.

To date, ICT's development has been driven essentially by the market, and there is a risk of its continuing to follow that pattern. In that event, there can be no guarantee that applications conducive to the interests and needs of the currently excluded populations will be developed.

THIRD PART

In the light of the principles that inspire the human development approach, experience leads us to conclude this Report by proposing certain paths, intended to encourage ICT's incorporation as a powerful enabling tool for economic and social development. These ideas are organized as cross-cutting components –reflecting the orientations of a national strategy– and as components specific to the strategic areas discussed herein.

ICT plays an important role in strengthening efforts to achieve specific development goals.

The experience of the infocenters indicates ICT's potential. It can be used, for example, to train women in prison or provide teachers with distance education courses.

These orientations are based on the premise that the foundations for a rapid development of ICT applications to human development have been laid in Venezuela.

The following orientations are the product of a consensus stemming from a process of collective reflection by the team responsible for this Report, to whose members were added —through their active participation in workshops held to that end— public sector decision makers, academics, representatives of civil society, consultants, and UNDP Office staff members.

These orientations are based on the premise that the foundations for a rapid development of ICT applications to human development have been laid in Venezuela, and that there are excellent examples showing how ICT can be used to benefit society so that people can achieve greater social equity and seize opportunities. The enormous challenge ahead is to expand these cases to a national scale.

The principal lesson to be drawn from the situational diagnosis is that, given the level already achieved, the point is not to acquire more equipment, offer more services, or encourage a greater random supply of content. All this —and more— may well be required, but the real aim is to intensify the general public's awareness of the fact that there are ways to be freer and there are potentially available technological developments that could contribute to making that aspiration come true.

Society is, in fact, a network. Regardless of the policies in force, society has advanced through initiatives by isolated promoters. And it is possible to capitalize on all this energy, with the aim of achieving a better balanced and more equitable society. By actively contributing to the training of people, fostering better collective communication, providing a sound stimulus for commercial activity, and promoting innovation and collective creativity, we can have a society capable of making use of the available synergies to improve quality of life.

CROSS-CUTTING CHALLENGES

Reflecting a comprehensive view of where we now stand as far as joining the knowledge society is concerned, we can now proceed, in this section, to discuss a set of cross-cutting orientations that reflect the principal features of a comprehensive strategy for applying ICT to human development purposes.

The use of ICT as a development enabler requires a comprehensive and strategic approach

The challenge before us is to adopt a strategic plan that mobilizes and commits all sectors, within and outside the government.

According to the vision expressed in this report, for ICT's contribution to human development to be a significant one, a holistic perspective is required, along with a process for its implementation, led at the highest levels of government and incorporating highly-qualified human resources in management positions.

The strategy must be backed up by a strong public and private institutional structure, acting in a coordinated manner and oriented toward the satisfaction of needs defined by the users themselves.

The creation of such a development trend involves —as is illustrated by international experience— the application of a strategy embracing five components: infrastructure development, provision of content and applications relevant to the country's needs and at a cost the users can afford, appropriate training, favorable commercial legislation, and transparent and inclusive policy formulation processes.

Cultural change: toward a strategy that takes advantage of ICT's interconnection potential for the creation of networks that will facilitate coordination

The regulatory and institutional framework for ICT's application in Venezuela is oriented toward the goals of enabling development and intensifying equity of access. But this is a very recent development;

the principal legal instruments were only promulgated in 2000 and 2001. The challenge before us is to adopt a strategic plan that mobilizes and commits all sectors, within and outside the government, to adopt aims that facilitate the enactment of many laws and programs already on the drawing board, overcome the country's shortcomings and basic needs in the telecommunication field, expand its current stock of computers, and increase Internet penetration.

The most important pending task is to formulate strategies designed to raise the value added to that infrastructure, by promoting massive projects capable of contributing ICT-based solutions in health care, education, job creation, and income generation, among other human development needs.

Making further progress along the chosen path is not a purely technological problem. It implies a far-reaching social and cultural change, in favor of the promotion of networked communities that facilitate interconnection among a variety of agents –and hence, facilitate policy coordination– and alliances among the public sector, the private sector, and civil society. The aim must be to make intensive use of the potential implicit in the "knowledge society" for the purpose of creating horizontal and multidimensional communication networks that will pose an opportunity to define a new political arena, as is asserted in the first chapter of this Report.

Consensus on policy formulation and implementation will ensure their application and successful development

A successful process of public-private consensus formation has occurred in Venezuela, resulting in the Organic Telecommunications Act. This precedent implies that the lessons learned can be adapted in the future to the design and implementation of policies and programs for ICT applications.

It has been fully demonstrated that when policies are engendered through participatory processes, there is a stronger likelihood of their appropriation, and hence, of their successful application.

In the infrastructure area, the challenges consist of increasing coverage and reducing access cost

Here the most important problems are those of limited access and geographic and social imbalances in fixed telephone coverage, computer availability, and Internet access; these are the fundamental "knowledge transport media" in the 21st Century, and they play a role analogous to that of the highways or electric power grids in the past.

The articulation of efforts by the telecommunication companies and the government, through the application of principles such as Universal Service, will unquestionably lead to a reduction of present-day inequities and imbalances.

Other policies, such as expansion of (public or private) community access centers, generalization of "flat tariff" plans, and provision of financing programs to facilitate the acquisition of computers, can help achieve a very substantial expansion of coverage.

The development of appropriate content: a key challenge

In this review of different experiences, we have identified examples of underutilization or abandonment of costly infrastructure, because content appropriate to the specific needs of different groups of users has not been made available.

We feel the need to emphasize the importance of content in the implementation of access policies.

The design of integrated programs and projects covering all aspects from the outset –i.e., uniting the infostructural and infocultural dimensions, with a clear understanding of the "why" element– can help avoid the loss of resources implicit in the underutilization of equipment.

Chief among the aspects that can contribute to success in this regard is support for the national software industry, to enable it to provide Venezuelan developments. This support includes financing facilities under which the products' commercial potential –and not only tangible goods– can be used as security. Tax stimulus for developers of applications to social programs (health care, education, social assistance) would make another contribution that merits serious consideration.

Higher education can play a major role in this regard, by making sure the curricular plans used to train professionals in ICT–related fields include not only aspects useful for professional or business development, but also the challenges of meeting all society's demands.

Fostering inclusion: from a market-driven process to one guided by social demand

Considering the digital divide as one more expression of the exclusion from access to multiple resources that is suffered by a large proportion of the population, the promotion of ICT development as a high-priority effort makes sense only to the extent that it contributes to overcoming those barriers. The development of ICT to date has been driven essentially by the market, which as noted above spurs technological progress but not necessarily in the technologies needed to reduce exclusion. In this context, a key component of any ICT development policy aimed at enhancing inclusion is its cultural dimension (content development, training, and institutional management), rather than as a tool for the connectivity as a whole.

From the standpoint of democratization of access, it is desirable to intensify the current policy of opening community centers giving access to telecommunications, so as to expand their coverage and improve their territorial balance; this is a way to add to both public and private access alternatives for socially useful ends, in a coordinated manner. But above all, it is essential to pay more attention to content development and training than has been the case up to the present, in order to stimulate social appropriation of technology.

However, promotion of ICT in the framework of a strategy pursuing social equity implies that its utility will not be limited to direct access to telephones, computers, or the Internet for currently excluded populations. That is undeniably important, but the overall and sectoral ICT plans must also be conceived as tools for enhancing effectiveness, efficiency, and user participation. This premise assumes that not only representatives of the science and technology or telecommunications sector must be involved in the plans' development, but also officials responsible for the areas most directly linked to human development, such as health care, education, justice, political participation, and others.

Finally, in societies like Venezuela, where the meager number of jobs of acceptable quality is a serious problem that contributes to exclusion, it is essential to pay more attention to the use of ICT as a source of employment opportunities and higher productivity for operators of small and "micro"-businesses. Telemarketing of "microbusiness" products, market information systems, electronic job exchanges, and telecommuting are among the alternatives that have yielded good results in other parts of the world but have been used to a very limited degree in Venezuela. Nevertheless, experience has shown that utilization of these opportunities by the socially disadvantaged requires strenuous public or private institutional support.

A key component of any ICT development policy aimed at enhancing inclusion is its cultural dimension, rather than as a tool for the connectivity as a whole.

THE CHALLENGES IN THE STRATEGIC AREAS CITED IN THE REPORT

This Report analyzes ICT's specific impact on the National Innovation System, education, the economy, the communication media, and government activities. Accordingly, it presents certain lessons drawn from the path traveled to date, and proposes clues to the path that still remains to be trodden.

International experience regarding ICT's application to specific sectors suggests that the greatest success occurs when the projects meet their users' real needs, are formulated with the users' direct participation, and focus on explicit goals, while incorporating the growth and scale factors into their development from the planning stage.

The effectiveness of the scientific and technological effort depends on the ability to create information networks that improve dialog in the innovation processes

Two key features of national innovation systems in today's world suggest the areas in which Venezuela can still make significant progress.

For one thing, these systems involve broad networks of agents, including the public and private sectors, the academy, producers, and financiers. Venezuela still needs a greater incorporation of agents in the tasks of generating, disseminating, and using knowledge and technologies, as well as those of harmonizing the scientific and technological approach with the social and economic one. To that end it needs to promote cooperation and interaction among the National Innovation System's components, to avoid a dispersal of effort and increase efficiency in the use of the resources allocated thereto.

It has also been proven that the feasibility of innovation networks lies not only in the investment in infrastructure, but above all, in the development of social capital and the set of institutions that make it possible for work to be done through a variety of agreements based on trust among partners. In this respect Venezuela has a great deal to learn.

Using ICT to empower social innovation networks implies the need to provide incentives and make sure public information available on hard copy is progressively transferred to electronic formats, while stimulating a growth of content and ensuring legal protection of intellectual property and copyrights in order to elicit confidence among the providers and users of that content.

Education and training at every level is the key to making use of ICT's advantages for spurring human development

In a country like Venezuela, education at every level needs to be declared a top national priority, to be pursued through a State commitment that transcends the successive administrations and incorporates all agents in society. In the efforts made to increase the coverage of education, but above all in those made to improve its quality, ICT can play a very important role. The country must formulate national plans which include and integrate the states and municipalities, and in which ICT is used as a mandatory tool at the preschool, elementary, and secondary levels.

Its use must integrate all agents and roles into virtual learning communities. To that end, there must be applications and contents for all: for teachers, in their dual role as facilitators of learning and as students who need to improve their professional training; for students, as active citizens who comprise the core of the system; for executives, in their administrative role and as motivators of institutional change in the teaching function; for parents, who must participate and develop themselves as bearers of responsibility in the educational process; and finally, for the public officials in charge of the system's administration, who need

Venezuela still needs a greater incorporation of agents in the tasks of generating, disseminating, and using knowledge and technologies, as well as those of harmonizing the scientific and technological approach with the social and economic one.

The success of ICT in Venezuelan schools requires the consideration of several factors: what; how to do it and how to use it; at whom is it aimed; where are the schools and what is their condition; and why and for what purpose to do it.

to improve their knowledge and stay in permanent contact with the schools through the Network.

In those cases in which ICT has been successfully applied in Venezuelan schools, this has been accomplished thanks to an explicit consideration of six key factors: content (what); teaching technique and technology (how to do it, how to use it); sociology (at whom is it aimed, what are the children, teachers, and communities like and how do they live); geography (where are the schools located and what is their condition); and philosophy (why and for what purpose to do it).

It is equally necessary to make intensive use of distance education, which makes it possible to create virtual educational communities outside the school system's physical plant; this is especially useful for education and training of excluded children, youths, and adults (those living in rural areas, street children, early drop-outs, disabled individuals). Moreover, formal education, vocational education (especially for unemployed youths and workers in the economy's informal sector), and adult education comprise a strategic triangle which should have distance education at its center.

Nevertheless, using ICT as a teaching resource is no guarantee of its proper use; this is a widely acknowledged problem, since today's educators have been trained in a technology-poor milieu. It is therefore important for the higher education institutions to draw up curricular plans for teacher training consistent with the changes being generated by today's technologies, and to equip future teachers to adapt to the changes on the way.

Finally, as mentioned above when discussing the principal features of a national strategy, among its critical components is technical training and qualification to endow the country with a labor force prepared to make use of high-technology tools. As expressed in the Final Report of the Digital Opportunity Initiative (Accenture, Markle Foundation and UNDP, 2001), countries "must concentrate on the education and retention of a core of professionals with the technical skills to provide and maintain an ICT-based infrastructure, and to adapt it to local requirements". This implies both university training and corporate training.

However, to make the potential user population "computer literate", it is also necessary to offer simpler educational programs on a mass scale, so as to provide essential training at a low cost, through the existing network of collective access centers.

A more intensive use of the communication media as human development tools

In Venezuela, with their growing incorporation of ICT, the communication media have come to play a role as vehicles for mass education and citizen participation, to an increasing degree. What still remains is to create the campaigns and innovative messages needed to reinforce human development.

Content, however, is not always adequate to the media's potential educational role, so there is a need to adopt standards equivalent to those that regulate the tangible world, to ensure the transmission of relevant and high-quality content.

In the framework of economic and social progress, and expansion of civil liberties, there is a clear need to have an independent, participatory, and pluralistic public television service, coexisting with private television and giving users access to content that private television –whether national or foreign– cannot broadcast.

In Venezuela, with their growing incorporation of ICT, the communications media have come to play a role as vehicles for mass education and citizen participation, to an increasing degree.

The development of the Internet economy, a top-priority component of the national development strategy

For a national development strategy designed to enhance competitiveness, electronic commerce, conceived as a tool for transparency and efficiency of investment, is a top-priority focus of attention.

The public sector has an important role to play in encouraging the private economy's development on the Internet. On-line purchases by public agencies can make a valuable contribution to enhancing transparency, and can cut operating costs as well. Moreover, simplification of procedures and the opportunity to carry out administrative procedures on-line can bring about a major reduction of the cost and magnitude of operations, thereby providing a significant opportunity for small and midsized companies to provide goods and services to government agencies.

The main problems that need to be overcome are: cost and speed of access, the public's distrust, and legal barriers. As regards the first, bundling of services to make them more attractive (such as the simultaneous provision of telephone, Internet access, and cable TV services) could provide a solution, as could a proliferation of public access establishments.

Regarding the second problem, the spread of encrypting software should reduce resistance on the part of users fearful that confidential data transmitted through public or private applications could fall into the wrong hands.

As far as legal barriers are concerned, what is most needed is to speed up the implementation of laws already on the books, as by setting up the Superintendency prescribed in the Digital Signatures and Messages Act.

The government's unbreakable commitment to the use of ICT as a human development tool must be expressed through electronic government

As said above, the government's active presence is indispensable, since market-driven ICT alone will not contribute to the solution of the problems affecting provision of public goods. Hence, the implementation of electronic government is the concrete expression of a public commitment to human development.

Among the national government's medium-term objectives is that of making it possible for 80% of public administrative procedures and 50% of State transactions to be performed electronically.

A policy articulating the different actions in the realm of electronic government that have been taken in Venezuela requires mechanisms to:

- Facilitate ICT management on a basis of transparency, service, and follow-up for technological operativity by public agencies.
- Orient and supply the State's modernization and transformation by updating processes and minimizing barriers to change.
- Ensure a harmonious development of electronic government, ensuring a proper relationship with electronic commerce and on-line society, as a basic step for the country to take its place in the world knowledge society and the new economy.

It is important to stress the need for continuity in the projects undertaken, so as to avoid institutional deterioration and waste of resources.

International experience identifies the following success factors:

- There is a central agency to promote and coordinate the different activities associated with electronic government.

The main problems that need to be overcome are: cost and speed of access, the public's distrust, and legal barriers.

The implementation of electronic government is the concrete expression of a public commitment to human development.

- This central agency adopts medium and long-term strategies for the development of the plans and projects.
- Electronic government is most effectively implemented from jurisdictions with a unitary political organization –such as parish boards, municipalities, or states– to more complex organizations.
- Significant amounts of resources are channeled into the projects' development.
- A necessary first step is the improvement and standardization of the platforms and of all the telecommunication infrastructure involved in the project's implementation.
- A process of digitalization of information, debugging, and consolidation of the public sector's data bases is conducted.
- The project's emphasis goes beyond mere cost reduction; rather, it is focused on its impact on citizens, public employees, other government agencies, and the private sector.

Finally, there is a need for channels to spread information about the achievements and the opportunities electronic government provides for the citizens. The consolidation and publication of information on the progress of the different initiatives is essential for the public agencies to make full use of, and obtain full benefit from, shared experiences.

The inefficiency of public sector procedures exerts a decisive impact on the quality, timeliness, and relevance of ICT investments and effectiveness as a social means for the satisfaction of needs.

STRENGTHENING PUBLIC ADMINISTRATION AND MODERNIZING ITS PROCESSES, INDISPENSABLE ACTIONS FOR PROMOTING THE USE OF ICT AS ENABLERS OF HUMAN DEVELOPMENT

No successful implementation of electronic government, or of any other program for that matter, can be envisioned if the government itself is not one of the major beneficiaries of ICT use, deriving greater efficiency and effectiveness for its actions therefrom.

Unlike other areas, ICT has certain weaknesses associated with obsolescence, the pace of technological change, installation lead time, learning for its use, and the steady but slow pace of appropriation. In this respect, inefficiency of public sector procedures exerts a decisive impact on the quality, timeliness, and relevance of ICT investments and effectiveness as a social means for the satisfaction of needs. Therein lies the importance of making a place for all these challenges in the plans when ICT-aided national policies are formulated.