MANAGING CHANGE IN THE KNOWLEDGE ECONOMY: HARMONIZING STAKEHOLDER INTERESTS IN A DEMOCRATIC PROCESS OF EFFICIENT, EQUITABLE AND SUSTAINABLE DEVELOPMENT[1]

By Danilo Piaggesi and Robert A. Vitro, Inter-American Development Bank

The predominant attitude towards information and knowledge defines, to a large measure, what a society is, how it will evolve and what it will become. If that attitude reflects a belief that information and knowledge are fixed and absolute, one type of society will evolve; most likely closed, doctrinaire and authoritarian. If the predominant attitude is open-ended and expanding, another type of society might evolve; most likely curious, deliberative and better able to deal with complexity. Clearly this is not an "either-or issue", but subtle shifts in emphasis in these attitudes can have profound implications for the kind of enabling environment that emerges as well as on the rate and character of development.

An expanding knowledge economy is a product of change, provokes change and is a vehicle for managing change throughout a society. This expansion contributes to and emerges from a democratic process of efficient, equitable and sustainable development. The increasing and diverse demand for information resulting from this process provides incentives for innovative applications of information and communication technologies (ICT). For knowledge economy expansion to reflect the values, needs, resources, conditions and aspirations of each society, diverse stakeholder interests need to be mediated and harmonized through an ongoing process of managing change. An enabling environment should enhance the capacity to manage change.

Managing change involves knowing when, how and with what resources to make and implement the decisions to change or not to change. The accumulated impact of these decisions shapes the character and size of the knowledge economy and the capacity of the society to manage change. Decision-making effectiveness depends on access to timely, reliable, relevant and complete information.

Creating a climate for change and developing a capacity to manage change in knowledge economy expansion have a significant impact on the contribution of information and communication technology applications to the rate and character of economic growth as well as on the degree to which the capacity to manage change permeates an entire society.

This paper discusses knowledge economy expansion as a common denominator for achieving the Millennium Development Goals (MDGs) and as a means for managing the change needed to achieve them. The discussion includes the role of cultural values and the character of information in defining the enabling environment and orienting the institutional transformation provoked by and resulting from ICT advances. The importance of political will and institutional transformation in ensuring the effective contribution of ICT to overarching development objectives, such as sustainable economic growth, human capital

[1] The ideas and opinions expressed in this paper are those of the authors and do not necessarily represent the official position of the Inter-American Development Bank (IDB).

formation and strengthening democracy, are also discussed. One section is devoted to how these processes are being reflected in initiatives that foster a more successful partnership between the Inter-American Development Bank and beneficiary countries in Latin America and the Caribbean. Strengthening this partnership can make enabling environments more effective, accelerate knowledge economy expansion, facilitate efforts to achieve the MDGs and strengthen the capacity of citizens to manage change in the personal, social, economic and civic aspects of their lives.

Information – the organization of data in image, text, audio and multimedia audio formats – is understood in this paper as an input that people use to construct knowledge in their mind. The quality of this "construction" is enhanced through the constant strengthening of learning skills and learning. When a person reproduces the knowledge in his or her mind – in print, text, audio and multimedia format – the product is information that others might use. This sharing of information contributes to a common knowledge base that shapes the sense of community that an enabling environment can leverage to mobilize resources for development.

Furthermore, knowledge economy expansion can be understood as reflecting the capacity of an economy to add value (increase the information content) to resources to create and distribute new wealth. ICT for development is understood in this document as the evolution of mechanisms and tools for matching supply and demand for a diverse and increasing volume of information, in text, audio and image formats, and communication services while ensuring that the institutional, legal and technological safeguards exist for all citizens to participate in and benefit from accessing needed information and the skills to use it to create and apply knowledge. This definition seeks to avoid an interpretation that more and more information is needed and explain to the reader why the phrase "information society" is not used anywhere else in this discussion. Finally, this perspective – humans as unique knowledge producers – underscores the fact that knowledge economy expansion and human development are inextricably linked. These and related terms will be elaborated throughout this document.

Managing Change: Cultivating Many Solutions

There is no one "solution" to development. An enabling environment can be defined by the degree to which they encourage the ongoing search for marginal and cumulative practical "solutions" about what works and what does not work to solve their individual and collective challenges (a culture for innovation). The cumulative impact of these decisions defines the character and rate of development. Creating such environments is as important as any specific change that is made.

The ongoing interaction of market, technological, price and competitive forces combines to drive constant change in the knowledge economy and underscores the need to manage it effectively throughout a society. An effective enabling environment that harmonizes stakeholder interests can facilitate adjustments to the constant disequilibrium these forces provoke in the knowledge economy and throughout society.

Knowing when, how and with what resources to change effectively is a core difference among people, groups, organizations, countries and regions. What one knows determines how one behaves. Consequently, creating conditions and mechanisms that facilitate timely

access to relevant, precise and accurate information, whether in image, audio, text format, in order to apply knowledge, is at the core of development. More precisely, producing information on information and knowledge about knowledge are imperatives for any enabling environment and essential for managing change in the knowledge economy and enhancing the capacity to have an impact on the rate of change throughout society. More about this meta-information appears further on in this discussion.

Cultural Values: The Foundation of an Enabling Environment

Culture plays a critical but often under-estimated role in defining an enabling environment and managing change. Cultural values towards what is known and knowable play a crucial role in mediating stakeholder interests and managing change involving the deployment of information and communication technologies to achieve development objectives. To increase the rate of expansion and guide the character of knowledge economy growth, key cultural values that have an impact on the capacity to deal with change must be identified, understood and strengthened. Values define the enabling environment just as much, perhaps more, as its institutional, economic and human resource elements.

Numerous conference papers, speeches and studies propose very specific sets of activities that societies could carry out for deploying ICT for development. However, whether or not stakeholders actually carry out such activities often depends on cultural values such as: the balance between change and tradition, propensity for risk taking and willingness to explore the unknown though learning, without bias.

Change for the sake of change is not the issue. Any change must respect the roots out of which it emerges. To detach change from its roots often increases the risk of failure; even apparent "breakthroughs" have their history. The balancing point between tradition and change is in constant flux and shifts according to context. Mechanisms that facilitate constant dialogue among stakeholders promote greater understanding of this shifting balance. Expanding mechanisms for broadening this dialogue is a crucial component of any effective enabling mechanism.

Incomplete information and uncertainty inevitably determine the context for all decision-making. The effectiveness of the decisions depends on the quality, completeness and timeliness of the information that is accessible. Taking risks does not have to be too risky. When understood as a continuous process, involving learning and a willingness to decide what to do next, the "risk" in taking risks can be reduced. While taking large risks can lead to breakthroughs, the process of innovation can be understood as the accumulation of decisions that make marginal changes for improving processes and products.

Along with advances in information and communication technologies, groups of people emerge, who, for a variety of reasons, unduly increase risk by over-exaggerating what these tools can accomplish or under-estimating what is involved in finding out under what conditions deployment of them can be effective. Motivated by a desire to increase sales, manufacturers of these technologies can be prone to exaggerations in their capabilities. Numerous experts and supposed gurus emerging from academia, the consulting community and futurists sometimes offer exaggerated visions that either under-estimate the level of risk needed to achieve effective change or they over-estimate the capacity of the technology. Clearly, "vision" is needed to stimulate people to consider new possibilities. However,

anyone offering simple solutions to complex problems should be treated with skepticism. The truth is that to know what kinds of innovations work under what conditions, one must take calculated and deliberate risks, make adjustments based on the results and move forward.

An enabling environment encourages deliberate risk taking. No one knows everything needed for making and implementing a decision. Questions function as a compass for navigating in the knowledge economy. Learning helps define the path. Being aware and admitting what one does not know are essential for finding out what one needs to know. In societies where such admissions are considered signs of weakness and not valued, change is less likely to take place. Consequently, an enabling environment for shaping the knowledge economy in development must facilitate a culture of learning in traditional and non-traditional learning environments by all stakeholders. A common knowledge base about the knowledge economy can increase the likelihood that the accumulation of individual and collective stakeholder decisions and their implementation will achieve their desired outcomes.

Cultural values such as these can amplify qualities of information that by their very nature demand communication and collaboration among diverse stakeholders.

Information Imperatives for Harmonizing Stakeholder Interests

Certain inherent qualities of ICT, information and knowledge drive the need for harmonizing stakeholder interests for carrying out knowledge economy expansion. An enabling environment that promotes widespread understanding of these qualities can contribute to facilitating stakeholder involvement and cooperation.

ICT Potential for Increasing Access

As advances in information and communication technologies, particularly digitalization, significantly increase the capacity of these technologies to store, process, distribute, transmit and access data in text, image, audio and multimedia formats, the per unit costs of accessing the technology and the content is reduced. Whether or not the corresponding shift in the costs of producing, distributing and accessing information and communication technologies as well as the information itself is translated into greater access for more and more people depends on the nature of the corresponding institutional transformations and incentives for innovation that evolve. Inevitably, the effective institutional transformation needed to liberate the potential of ICT advances requires an enabling environment that expands stakeholder participation and harmonizes their diverse interests.

Knowledge Economy Expansion as a Core of Human Development

As a general premise, an enabling environment that focuses on the contribution of ICT to human development is likely to be most effective. People affected by change should be involved in shaping that change. If the enabling environment is fair, open and accessible, these qualities will characterize the knowledge economy. There is an inextricable relationship between an enabling environment and the capacity for managing change. Since there are no simple solutions for growth and development, a combination of values, incentives and other

mechanisms, is needed to create an environment that encourages the search for practical, viable and self-funding solutions. Within such a context, the degree to which a person or group can deal with changes in markets, technology, competition and prices, determines whether or not a country will be able to develop according to its own values, conditions, needs, resources and aspirations.

Furthermore, neither sex has a monopoly on creative and communications skills. Consequently, knowledge economy expansion levels the "playing field" for men and women and creates development opportunities for each. As women, indigenous and trade groups come to understand this dynamic process, their involvement in knowledge economy is likely to accelerate the expansion. Similarly, an effective enabling environment is crucial for mobilizing non-government stakeholders, inside and outside the ICT field, to shape the character of the knowledge economy.

Knowledge Application as Socializer

The type and format of knowledge that can effectively be part of a solution to any problem usually comes from a variety of people with different perspectives. No one person sees the entire "picture"; people must share their knowledge to approximate accurately the nature of the problem and consider their options for addressing it. This is true in all human endeavours, including the integration of knowledge economy expansion into development. Consequently, bringing different disciplines together is an unavoidable condition for achieving knowledge economy expansion.

Enhancing the Development Paradigm: Making the Invisible Visible

The call for a new development paradigm is being heard with increasing frequency. Yet advances in information and communication technologies reveal an historic truth about development: all economies are knowledge economies, they differ to the degree to which each society leverages conditions that facilitate access to information and the skills to use it to build and apply knowledge. Through knowledge economy expansion, the capacity of economies to add value (i.e., increase the information content of the factors of production) is enhanced so that more wealth can be created and distributed. A new paradigm may not be needed, a deeper understanding of the role that information and knowledge may play to help people see the familiar through a different lens.

Shaping a Shared Vision

A knowledge economy is not an end in itself. While it is a powerful tool for social transformation, the societal values out of which it emerges will always orient how ICT are deployed and the character of knowledge economy expansion. Consequently, the society must decide for itself what it wants to become: more efficient? more equitable? more sustainable? more just? The challenge for political leaders seriously concerned with the future of their country is to structure a process through which that vision can be refined and progress towards its achievement measured and, when needed, adjusted The use of information and communication technologies can mediate this process of shaping a shared vision as well as be an important element in that vision.

Interdependent Stakeholder Interests in Information and ICT

Public, private and civil society organizations have different, yet complementary, objectives and interests in shaping the structure of the knowledge economy. However, no single group can achieve its objectives without the collaboration and some degree of support from the other groups. Consequently, new platforms and patterns of communication and cooperation are essential to build consensus on common outcomes, outputs and indicators.

Meta Information Imperative: Defining and Measuring the Knowledge Economy Links in Development

Just as the effectiveness of all decision-making depends on access to precise, complete and accurate information on a timely and reliable basis, so, too, do decisions involving the integration of knowledge economy expansion into a democratic process of efficient equitable and sustainable development. Clearly, volumes of such information on information (meta-information) has been produced, much of it useful in understanding the phenomenon being experienced. However, if this meta information is to become an effective tool for managing change, much more of it, particularly in the form of economic statistical indicators, linking the role of information and knowledge to overarching development outcomes and outputs, needs to be produced.

Bringing Stakeholders Together: Forget about the "e"

Advances in information and communication technologies have not changed the basic nature of development challenges. They are, however, potentially powerful tools for addressing the challenges. Whether or not these technologies exacerbate or contribute to overcoming these challenges, and at what pace, depends on how they are deployed. In essence, the challenges continue to involve the creation and distribution of new wealth efficiently, equitably and in a sustainable manner, while carrying out a democratic process for formulating and implementing public policies to ensure that all citizens participate and benefit in the process. An increasing understanding of the functions of ICT deployment and knowledge economy expansion in identifying and addressing these challenges remains a crucial aspect in the effective management of change.

Building consensus on the contribution of ICT to over-arching development outcomes can be a means for achieving greater stakeholder collaboration in managing and implementing change. Often building consensus on such "macro" outcomes (the contribution of ICT to growth, employment and trade) can get lost behind the numerous and diverse "micro" ICT activities that take place in sector areas throughout a society. Consequently, an enabling environment should promote consensus on outcomes regarding the contribution of the knowledge economy expansion to shared, overarching development outcomes. This would complement and underscore the importance of the individual contributions to such outcomes.

The deployment of advances in information and communication technology is part of a process of the diffusion of innovation. In spite of the numerous changes that have already been provoked by ICT, many believe that the fundamental impacts have yet to be fully experienced. Regardless of where in the process of diffusion of innovation a society actually is, it is clear that continuing change is unavoidable. One aspect of this diffusion process has been the widespread addition of the letter "e" to almost everything: e-business, e-commerce,

e-learning, e-government, e-health, et al. Although the use of the prefix "e" can be helpful in popularizing the use of ICT in development, its use may risk being interpreted as suggesting that technology is an end rather than a means. It may be time to return to basics and reassert the contribution of ICT to achieving overarching development objectives. In the process the potential of ICT may be better appreciated and more highly valued.

In other words, by not diluting common efforts, stakeholder involvement could be enhanced. Individual stakeholder are already doing a great deal, but the value of their effort could be enhanced if each was part of a consensus that link knowledge economy expansion to specific "macro" outcomes and outputs related to development.

Similarly, the emphasis on the "e" can obscure the distinctions and the relationship between the two areas through which ICT, information and knowledge economy expansion actually contribute to economic growth and development. The information sector, the core of a knowledge economy, has two parts, as defined by Marc Porat and Michael R. Ruben, in their groundbreaking work, "The Information Economy: Towards Definition and Measurement", published in 1981, and subsequently applied by the Organization for Economic Cooperation and Development (OECD). These parts are:

- Primary information sector (those economic activities involving the production, distribution and use of information). Those information and communications goods and services that are traded in the marketplace

- Secondary information sector (the application of ICT to specific sectors of macroeconomic activity). Those information and communication technology goods and services that are produced and consumed within non-information related economic activities.

These two parts of the information sector reinforce the need to integrate ICT in support of sector activities such as health, education, environment, modernization of the state, with the ICT intersectoral contribution to "macro" objectives. An enabling environment that respects these differences and the inextricable relationship between them can clarify the roles of the different stakeholders.

Furthermore, these two parts of the information sector might well turn out to have a crucial role in linking micro and macro-economic growth and development. All too often, macro and micro development efforts are incongruent: macro policies may not have the desired impact on micro-activities while micro-activities are not reflected in macro policies. Access to information and the application of knowledge are common and mutually supporting in the primary/macro and secondary/micro areas. Synchronizing primary and secondary information sector expansion could contribute to generating greater synergy between these efforts.

An enabling environment that focuses on achieving ICT/knowledge economy outcomes in three basic development areas such as creating wealth, distributing wealth and formulating and implementing strategies and policies through a democratic process for ensuring that all participate in and benefit from a process of efficient, equitable and sustainable growth, could contribute to greater harmonization of diverse stakeholder interests. The complementary

character of the diverse activities and interests of stakeholders are likely to become clearer and serve as an incentive for bringing them together. Consider the following:

- ICT in sustainable economic growth (creating new wealth). Possible overarching outcome: increase the rate of sustainable economic growth by adding value to resources (i.e., increasing the information content). The functions of information and knowledge in economic growth and development are not yet sufficiently applied or appropriately integrated into development planning.

- ICT in building human capital (distributing new wealth). Possible overarching outcome: increase human factor productivity and local purchasing power through lifelong opportunities to access diverse learning environments. The crucial issue here is to focus on increasing human factor productivity through lifelong learning so that citizens can be more productive and have a better quality of life.

- ICT in governance (rule making for fairness, access and equity). Possible overarching outcome: Use ICT to build trust between citizens and the public sector representatives in order to ensure policies and regulations evolve to increase opportunities and ensure that all can participate and benefit from using ICT to create and distribute new wealth in a sustainable manner.

An enabling environment that clarifies overarching outcomes can assist individual stakeholders in identifying their special role in achieving them and facilitate their adjustment to change.

Even if an enabling environment is successful in linking knowledge economy expansion with overarching development outcomes, this will not be enough to achieve effectiveness. Since information flow defines all organizations, any change, technological or otherwise, that modifies how information flows will have a profound change on the structure of the organization, whether it be the family, firm, public agency, non-governmental group or the society itself. Consequently, enabling environments must anticipate the need for processes that lead to profound institutional transformations.

Translating Political Will into Mechanisms: Institution-Building

One key factor in translating theory into practice is the need for a society to build the political will and commitment to formulate, work towards and refine, over time, regardless of changes in government, a collective vision of what it wants to become. An enabling environment is defined by this vision and is the means for pursuing it. Without such a commitment, a great deal of ICT-for-development activity may be generated without contributing to any fundamental change that addresses the roots of poverty and inequality. In this context, it is important to remember that information has value depending on what is at stake in the decision it will be used to make. If the shared vision has value and is legitimate to all citizens, then the value of information and knowledge economy expansion as a means for achieving it will come into focus.

However, vision and political will are not enough. The second factor is how to organize for change when change is the only constant. This involves promoting, throughout the society,

the creation of flexible learning organizations, capable of difficult deliberations and risk taking. Vision is constantly being refined and political will modified by shifts in priorities and new conditions created by collective deliberation and effort. The specific adjustment mechanisms within organizations will vary from context to context. What is important is that adjustment mechanisms be integrated into overall operations and that a culture of innovation emerges from them.

At the level of national government, it is important for ICT-for-development and knowledge economy expansion efforts to be mainstreamed as part of overall development planning. Within this context, stakeholders from different functional areas (i.e., economics, social development, governance, law, organizational development, et al) need to acknowledge their relationship with each other. This is why formulating and pursuing overarching outcomes, as discussed in the previous section, is so important.

Managing change does not mean changing for the sake of change but knowing what to retain, for how long. It involves finding new ways to do things as well as new things to do. This, of course, begs the question of who decides and when is a decision made. The answer to these questions is that there is no one answer: there are numerous answers. The most effective answers emerge, as stated previously, when an organizational approach – an enabling environment – if you will, permits involvement by all stakeholders in bringing about the change that inevitably will have an impact on all of them.

Many of the concepts and processes described in the previous sections of this paper are part of the ongoing adjustment of the Inter-American Development Bank (IDB) to "development" in the context of a global knowledge economy and between it and beneficiary member countries. The adjustment is ongoing with much needed learning still taking place. The following section highlights some aspects related to institutional evolution to strengthen the capacity to manage change.

Towards a Regional Partnership for Managing Change in the Knowledge Economy: the Role of the IDB

On various, public occasions, Enrique V. Iglesias, IDB President, and other senior Bank officials, have stated that knowledge economy expansion serves as a "bridge" between the two objectives of the Bank's institutional strategy: increase the rate of sustainable economic growth while reducing poverty and promoting equity. Such statements are intended to reflect the general direction of the partnership between the Bank and the countries in the region to strengthen capacity to manage change at all levels and, thereby, leverage the creative, communication and intellectual capacities of the people in the region to carry out a democratic process of efficient, equitable and sustainable development.

The countries of the region have been building a consensus in this direction over several years during high-level regional summits and inter-governmental as well as international meetings. However, not all countries have the same priorities nor do they have the same level of accumulated experience in accelerating the rate of increase of their knowledge economy. The IDB works with the countries in the region to build consensus on outcomes, outputs and indicators so that diverse country needs can be effectively matched with the Bank's resources and experience. Together, the Bank and the countries are seeking ways to deploy ICT to increase the rate of sustainable economic growth while reducing poverty and

promoting equity. Generating synergy between activities that support the use of ICT in specific sectors and the intersectoral contribution of knowledge economy to consensual overarching goals is crucial to this effort.

The IDB has been following a deliberate process for strengthening its own capacity to manage change regarding knowledge economy expansion in development, in strengthening its working partnership with the countries in this area, and in harmonizing its cooperation with other international institutions. It seeks to improve the enabling environment for policy and development at all levels.

The IDB has a long history of funding ICT activities in sector projects. However, during the mid-1990s, the Board of Executive Directors completed a series of reports on ICT for development and made a set of decisions to strengthen its capacity to manage change provoked by the widespread use of ICT by beneficiary member countries in their development planning. At the end of 1998, IDB Board of Executive Directors created an Information Technology for Development Unit to provide added support and serve as a "change agent" in this area as well as promote synergies among the extensive and diverse ICT for development activities in Bank-funded projects. In so doing, the Board acknowledged institutionally that ICT was an intersectoral activity and included support of these activities in the Unit's mandate. Two years later, the Unit was upgraded to a Division in the Sustainable Development Department, in order to facilitate more effective mainstreaming of ICT and knowledge economy expansion into operations. The Bank is involved in strengthening the institutional capacity of countries to manage change in the areas of: ICT in sustainable economic growth, ICT in human capital formation and ICT in governance, much as described in a previous section of this paper.

A number of other institutional changes have been evolving as new patterns of cooperation emerge organically among the ICT for Development Division, the regional operations departments and other groups in the Bank. A Strategy Group on ICT for Development, presided by the Vice President for Planning and Administration and composed of the senior managers of the Bank's major departments, began to meet periodically to share information, refine the IDB institutional response and harmonize cooperation with other international organizations. This includes Bank involvement in ICT support for the Millennium Development Goals, preparations for the World Summit on the Information Society (WSIS) Second Phase – Tunis and involvement in the United Nations ICT Task Force, as well as preparations for the Summit of the Americas.

In addition, the IDB Consultative Meeting process on ICT for Development was continued in order to provide the ICT leaders in the government of each country to meet with their counterparts and with the Bank to explore ways for better align the needs of the countries with the experience and knowledge of the Bank.

Deployment of information and communication technologies and expansion of a knowledge economy are common denominators of the four pillars of the IDB institutional strategy mentioned at the beginning of the section. Competitiveness and regional integration are crucial elements in the Bank's efforts to promote sustainable economic growth. Access to information about resources, competition, prices and markets are essential for operation of a fair open and competitive market economy, conditions essential for improving productivity

and competitiveness. Similarly, harmonization of national efforts to deploy information and communication technology and the concomitant expansion of the information sector of the economy, are being recognized as a sector that can reinforce regional integration of all other sectors. Human capital formation is the nucleus of a knowledge economy. Learning, whether it takes place in a clinic, community center, home, factory, office or farm, has always been the core of social development. With Latin American and Caribbean countries expanding their knowledge economy, access to traditional and non-traditional learning environments is becoming a cornerstone of social development. At the same time, human capital formation is slowly emerging as an essential framework for integrating educational reform and transformation of the labor force. Information and communication technologies are tools for administration, delivery and content of learning. In addition, to ensure that all participate and benefit from these new conditions of development, governments are evolving new patterns of dialogue and collaboration with civil society and the private sector. As expanded deployment of information and communication technologies transforms modernization of the state efforts into comprehensive e-governance programmes, opportunities increase for improving public administration, increasing efficiency and access to public services and making elected officials more responsive to citizens.

Similarly, the information Technology for Development Division has been working closely with the Regional Operations Departments of the Bank in order to mainstream national ICT-for-development strategies as part of development planning. Other outputs resulting from a commitment to greater intra-institutional collaboration include an Information and Communication Technology for Development Trust Fund for pilot projects and studies that expedite the translation of new ideas to concrete projects. Similarly, the Multilateral Investment Fund (MIF) and the Information Technology for Development Division created and recently carried out the second round grants that facilitate use of ICT by small and medium-sized enterprises to become more productive and competitive.

All of these and numerous related activities are being channeled into the formulation of the Bank's information technology for development strategy. This document, to be submitted to the IDB Board of Executive Directors, will recommit the Bank efforts to effectively work with beneficiary member countries to accelerate the rate of knowledge economy expansion as a means to carry out a democratic process of efficient, equitable and sustainable development.

Development Effectiveness and the Harmonization of Stakeholder Interests in the Knowledge Economy

Beneficiary countries, donors and international organizations are currently devoting much attention to the issue of development effectiveness. However, these discussions do not yet appear to adequately reflect the strategic role of knowledge economy expansion in the new paradigm of development. Perhaps this is due to too much fragmentation of approaches among the diverse stakeholders of various segments of the knowledge economy and insufficient dialogue about how to link their individual efforts as part of a collective effort for achieving a set of overarching "macro" development objectives.

In Latin America and the Caribbean, the economic, social and political reforms of recent decades increased the demand for information, knowledge and the deployment of the knowledge economy. It may well turn out that the called for "second generation" reforms

will require the effective integration of a comprehensive approach to knowledge economy expansion into development planning. Clearly, this is a two way process – reforms provide incentive for knowledge economy expansion while knowledge economy expansion ensures that all participate and benefit from the reforms. However, subtle shifts of emphasis can have profound implications on development strategy and project design.

To validate this hypothesis, it will be necessary for the collective effort of all stakeholders in the ICT-for-development field to learn to speak the economic and financial language of finance ministers, policy makers, development planners and decisions makers. More specifically, it is essential to produce more economic statistics that link ICT and knowledge economy expansion to overarching development objectives.

Just as the Organization for Economic Cooperation and Development (OECD) began doing almost two decades ago, developing countries need to provide measures of the contribution of the information sector to gross national product, the number of information workers in the labor force and the percentage of information goods in total international trade. By the same token, collective stakeholder efforts are needed to produce measures that document the size of the human capital industry contribution to economic growth by understanding, testing and integrating methodologies such as the one developed by the Canadian Government agency, Statistics Canada, that links skills development to economic growth. Furthermore, governments should measure under what conditions ICT can contribute to overcoming the weakening trust and confidence between citizens and democratic institutions (as documented in the UNDP report on "Democracy in Latin America" and research carried out by the Chilean firm Latinobarómetro) – as the IDB is currently doing with the London School of Economics, in order to provide a framework for measuring the effectiveness of the ICT contribution to public sector transformation. Governments might also consider how their regional integration efforts could be strengthened by harmonization of knowledge economy expansion efforts. The members of the European Union made a political decision more than a decade ago that growth of an information industry in European had to be a strategic component for achieving economic, social and political integration.

The results of such measurements should promote stakeholder cooperation, add focus to debate on development effectiveness and facilitate the formulation of shared outcomes, outputs and indicators for knowledge economy contribution to overarching objectives involving growth, employment, trade and strengthening democracy.

Conclusion

The previous discussion has suggested that an enabling environment must strive to link effectively knowledge economy expansion with achieving overarching development outcomes. The effectiveness of such linkages depends, in large measure, on bringing stakeholders together to strengthen the institutional capacity to manage change and integrate into development planning a deeper understanding of the historical role of information and knowledge in carrying out a democratic process of efficient, equitable and sustainable development. The entire society is more likely to benefit when individual stakeholders are part of a collective effort to achieve this type of development.

ENABLING WIRELESS BROADBAND COMMUNICATIONS INFRASTRUCTURE DEPLOYMENTS: LESSONS FOR LOCAL AUTHORITIES

By Axel Leblois and Peter Orne, Wireless Internet Institute

Broadband Internet connectivity and the information access it brings unleash human capital and increase productivity as well as knowledge sharing in underserved areas where it has been most constrained. New wireless Internet technologies are ready to fulfill this promise, supported by universally accepted standards set by the Institute of Electrical and Electronics Engineers (IEEE) for both wireless local area networking (the 802.11 standards known as "Wi-Fi") and long-distance point-to-point connectivity (the 802.16 standards known as WiMax).

These two standards-based solutions are good examples of broadband-wireless technologies meeting different requirements that complement each other more often than they compete. Wi-Fi is ideally suited for providing coverage to limited areas where it can provide high data rates, secure access, and robust performance in the license-exempt spectrum with a very low capital expenditure. Base stations and customer premises equipment may be purchased for less than $100, though costs for external carrier-grade equipment may be considerably higher.

Mesh networks based on Wi-Fi can provide wider coverage by creating a wireless network among neighboring access points and cost-effective coverage for wider areas. Mesh networks do require the deployment of a dense network of access points, which may be difficult or expensive to maintain mostly because of right-of-way issues. Still, this technology can lower the cost of infrastructure while increasing the cost to users only marginally and provides welcome connectivity redundancy in dense areas.

Although often compared to Wi-Fi, WiMax is best suited to networks designed to cover large areas and that need carrier-grade service and advanced quality-of-service functionality. At first, WiMax will require a higher capital expenditure because base stations and customer premises equipment are more expensive, but WiMax requires fewer base stations over all.

A multitude of devices, software, and services currently on the market are designed to interoperate with unified protocols in the frequency spectrums defined by the Wi-Fi and WiMAX standards. In recent years, the definitions of unlicensed spectrum have normalized around two major sets of frequencies: the Instrument, Scientific, and Medical band at 2.4 GHz; and a newer allocation in the 5-Ghz to 6-Ghz range adopted by the World Radiocommunication Conference in 2003.

More and more devices are reaching the market with chip sets that will allow the instant detection and connectivity to local hotspots where they are available. Support for portability will be limited for a time because WiMax PCMCIA cards or laptops will not be available until 2006.