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ICT Policies and e-Strategies in the Asia-Pacific

A critical assessment of the way forward

Edited by

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Foreword

The extraordinary transformations taking place around the globe herald a challenging new millennium ahead for all nations and their citizens. The state of the world today in its many political, social, economic and cultural extractions, reveals a demanding plateau of issues and challenges for nations. Debilitating poverty and insufficient access to health care services; exclusion of women and children from their basic rights; ecological destruction and encroachments, are but the tip of the iceberg of issues for governments and citizens alike. Much needs to be done, especially to ensure that the progressive nature of developmental politics gravitates towards a more equitable, just and efficient society.

The information revolution has effectively captured the imagination of not only the private sector and civil society, but also solicited strong interest from international leaders and policy makers, leading to an ever-growing number of policies, strategies and initiatives undertaken to ensure that nations are not left behind in the new information age. The information age, however, does not take place in a state of vacuum as the globalization process plays a dominant role in the structure, direction, and development of the international political, economic and social systems, alongside with temporal and spatial barriers that are being brought down significantly in a matter of years.

This is clearly demonstrated with the ease of conducting international trade and fluidity and mobility of financial flows within the region facilitated by enhanced global communications and networking. On the flip side, governments are beginning to realize that trade, services, capital, information and people are crossing borders rapidly; and their various national interests are interlocked with those of other nations in an increasingly interconnected world.

In the wake of such rapid, ICT-driven developments, governments are beginning to re-assess policy options and instruments as global developments in the field of ICT, if left unchecked, have the potential to tip the balance against social costs and benefits of national inaction. Initiatives have ranged from ambitious macro national economic repositioning, to addressing micro fundamental developmental needs—in an effort to encourage, promote, and effectively harness the capabilities and potential offered by Information Communication Technologies (ICTs) for the impending information age.

The success of such initiatives is dependent on several key elements—complimentary domestic strategies and policies, states willing to increasingly transform their focus and perception, liberalization and deregulation, capacity building coupled with long-term research to ensure the viability of ICT policies and e-strategies and ensuring universal access to the digital benefits.

This book emphasizes the critical need for strategic national level policies, long-term in its vision and comprehensive in nature, targetting both the immediate needs of the populace and long-term needs of nations being integrated in the information age. Only via coherent and complimentary policies that engage both the private sector and civil society organizations, can nations move forward towards creating a digital society that addresses the macro economic viabilities of nations within the digital economy and also leveraging capabilities of ICT to address the social, economic, and political issues on the ground. It is with this regard that the United Nations' Millennium Development Goals provide an excellent starting point.

It is my hope that this book will be able to shed light and create interest among readers on the importance of re-assessing the modalities and practices of existing ICT policies and e-strategies in tandem with the rapid developments taking place.

Hafiz A. Pasha

UN Assistant Secretary General
UNDP Assistant Administrator and
Regional Director – Bureau for
Asia and the Pacific

Preface

As nations in the Asia-Pacific region continue to conceptualize, implement and monitor their respective information and communication technology policies and e-strategies, it is imperative that a critical assessment is undertaken on the way forward—that is, an analysis of strategies, modalities and best practices while weighing their impact, effectiveness and efficiency. The needs, motivations and incentives of various governments for adopting, adapting and implementing ICTs varies from country to country, with the variations reflecting diverse economic, social and political environments.

Be it for bridging the digital divide or re-positioning the nation in the new digital inter-connected economy, and ensuring that marginalized communities and cultures are not discounted in the move to embrace ICT, nations need to step back and evaluate where they stand. They need to ensure that national ICT policies and e-strategies address the core aspect of development—*human development.* In the final analysis, ICT policies and e-strategies should be the means to an end—the end being human development—and not the ultimate goal.

In line with the effort to ensure that human development is at the centre of discussions on ICT policies and e-strategies, the United Nations Development Programme's Asia-Pacific Development Information Programme (UNDP–APDIP) held the Asian Forum on ICT Policies and e-Strategies in Kuala Lumpur, Malaysia from 20–22 October, 2003. The Forum was attended by ministers and senior government officials, as well as private sector and civil society representatives from 22 countries and regional and international organizations.

A 17-point Kuala Lumpur (KL) Declaration was adopted at the Asian Forum, reflecting a regional perspective that should be considered in international discussions leading to the World Summit on the Information Society. The KL Declaration emphasizes the need for specific policies on poverty reduction, governance, gender, infrastructure and access, human resources, content and applications, enterprises and entrepreneurs, and regional cooperation. The specific needs and interests of the least developed countries and landlocked and developing island nations of the Asia-Pacific region are also highlighted.

This book features revised versions of the papers presented during the Forum, as well as an introductory chapter that seeks to encapsulate existing, as well as emerging, e-strategies within the region, and build upon the ideas, comments and feedback generated and discussed during the Forum. The book is part of a three-volume series that includes the *An Overview of ICT Policies and e-Strategies of Select Asian Economies*, as well as an *ICT Policy Formulation and e-Strategy Development: A Comprehensive Guidebook*. These three publications stemming from the Asian Forum have three distinct areas of focus: an analytical overview of the ICT policies and e-strategies in the region, fundamentals of policy formulation and the development process, and thematic priority areas to be addressed in the conceptualization and development of policies.

It is hoped that the three-volume series will provide the foundation for further discussions among policy makers, private sector and civil society representatives, and development and donor agencies, on the role and importance of ICT policies and e-strategies in ensuring that human development continues to occupy a central role in national developmental plans.

Shahid Akhtar
UNDP–APDIP

Kuala Lumpur Declaration on ICT Policies and e-Strategies in Asia and the Pacific

22 October 2003

Asian Forum on Information and Communications Technology Policies and e-Strategies Kuala Lumpur

20–22 OCTOBER 2003

Kuala Lumpur Declaration on ICT Policies and e-Strategies in Asia and the Pacific

22 October 2003

ASIAN FORUM ON INFORMATION AND COMMUNICATIONS TECHNOLOGY POLICIES AND e-STRATEGIES

The Asia-Pacific is one of the most dynamic regions in terms of ICT developments. Representing this vast, diverse and dynamic region, delegates, including ministers and senior government officials, private sector and civil society representatives, from 22 countries in the Asia-Pacific region and regional and international organizations, convened at a Forum on Information and Communication Technologies held on 20–22 October 2003 in Kuala Lumpur. The participants of the Forum engaged in productive deliberations, which are reflected in this declaration:

Underlining the importance of Poverty Reduction and the Millennium Development Goals (MDGs) as a focus of development aspirations in the region;

Recognizing the extraordinary potential for human development embodied in the cluster of goods, services, and practices described as ICTs;

Understanding the possibilities opened up by ICTs for creativity, decentralized decision-making, and innovation by persons, groups, and enterprises hitherto marginalized from full participation;

Accepting the responsibility of government to create the conditions for the optimal utilization of the new possibilities by citizens, groups, and enterprises through institutional reforms;

Emphasizing the importance of involving private sector and civil society, in particular women, in the development and implementation of ICT policies and e-strategies;

Giving weight to the values of equality of opportunity, non-discrimination, cultural and linguistic distinctiveness, and sustainability;

Acknowledging the benefits of mutual learning, cooperation, and coordination among the members of the Asia-Pacific region in the areas of ICT policies, strategies, and practices;

Realizing the important role of regional and international organizations in facilitating the application of ICT to development; and

Taking note of previous deliberations and declarations, including the Communiqué of the Ministerial Roundtable on 'Toward Knowledge Societies', held on 9–10 October 2003 during the 32nd session of UNESCO's General Conference; the Association of South East Asian Nations — Joint Statement for the World Summit on Information Society (WSIS) 2003; the Tokyo Declaration adopted at the WSIS Asia-Pacific Regional Conference held on 13–15 January, 2003; and the Pacific Islands Information and Communication Technologies Policy and Strategic Plan of 2002.

We the participants of the Asian Forum on ICT policies and e-strategies hereby endorse the formulation, adoption, and implementation of ICT policies and e-strategies at the national, bilateral, regional, and international levels, that include the following elements:

Poverty Reduction and the MDGs

1. Ensure that ICTs are harnessed in the pursuit of poverty reduction and the achievement of MDGs, thus helping to overcome the digital divide;
2. Deploy ICTs actively in the policies and strategies for empowering women.

Policy and Governance

3. Ensure transparency and accountability of governments and the participation of multiple stakeholders, including women and ethnic minorities, in the formulation and implementation of ICT policies and e-strategies, utilizing the technical features of ICTs;
4. Establish legal and technical principles to assure trust and confidence, and make possible trust-building actions by users, giving due regard to data protection, privacy and the security of persons, enterprises, and society against any harm;
5. Ensure that policies and strategies are periodically evaluated and modified as necessary to yield the desired results;
6. Encourage South-South learning through effective arrangements at an inter-agency level to initiate exchange of information, best practices, and explore possible collaborative development programmes.

Infrastructure and Access

7. Create the conditions and incentives for the provision of widest possible access to ICTs, particularly for rural and under-served areas in configurations responsive to demand;
8. Enable the private sector and civil society to participate in the provision of affordable ICT infrastructure, products, and services in forms of their choosing.

Human Capacity

9. Facilitate opportunities for human resource development and life-long learning through and on ICTs, with particular attention to women;
10. Support youth programmes related to ICT skills development.

Content and Applications

11. Reflect the appropriate balance between rewarding the originators of knowledge and creative content, and the fair and flexible use of information products;
12. Develop creative approaches to preserving and advancing cultural and linguistic distinctiveness and self-expression in the new ICT environment;
13. Balance considerations of software alternatives between open source and proprietary platforms and applications.

Enterprise and Entrepreneurs

14. Allow the greatest flexibility for entrepreneurs and enterprises to use ICTs to create wealth, trade, and employment opportunities;
15. Ensure the provision of sustainable sources of revenues to priority programmes.

Strategic Compacts and Cooperation

16. Engage in bilateral, multilateral, regional, and international cooperation, to fully realize the potential of ICTs, to learn from each other, and adopt best practices;
17. Take into account the special needs of least developed countries, landlocked and developing island nations of the Asia-Pacific in the application of ICT to development.

Governments, regional organizations, and international organizations responsible for the formulation and adoption of ICT policies and e-strategies are urged to develop and adhere to adequately resourced action plans that designate responsible actors, timelines, and priorities as appropriate for their particular circumstances.

This declaration is timed so as to be able to make a contribution to the Geneva phase of WSIS 2003. As a follow-up and in light of the outcomes of the Geneva phase of WSIS, we agree to convene the Asia-Pacific Forum on ICT Policies and e-Strategies, which will involve stakeholders from the public, private sector, civil society, regional and international organizations, during the inter-summit period (2003–2005) to:

- review national and regional action plans vis-à-vis the WSIS 2003 Plan of Action;
- discuss common challenges in implementation;
- exchange information on lessons learned and best practices; and
- establish solutions-oriented e-strategies.

Kuala Lumpur, 22 October 2003

Chapter One

Overview of ICT Policies and e-Strategies in the Asia-Pacific Region

— *Paul Ulrich, James George Chacko and Phet Sayo*

Introduction

Nations of the Asia-Pacific region have gone beyond questioning the potential of ICTs for development, and recognize that ICTs can be harnessed for great socio-economic benefits. Underlining this recognition is the realization that the existing digital divide has to be bridged, as nations can no longer risk being excluded from the process and progress of economic development taking place worldwide. ICTs are no longer just a socio-development tool, but a prerequisite for participation in the new digital, interconnected economy.

It is with this understanding that participants of the Asian Forum met to discuss the multidimensional challenges and issues relating to the formulation of effective ICT policies and strategies for development. The proceedings of the Asian Forum began with a ministers' roundtable where key questions[1] relating to ICTs for development and national policies and strategies were introduced, setting the stage for three days of discussions that culminated in the drafting and endorsement of the KL Declaration.

While the KL Declaration reflects succinctly the participants' collective recommendations, the deliberations that led to the Declaration provide a more complete picture of issues and concerns. This chapter is a synthesis of the ideas, discussions and findings derived from the Asian Forum. It provides a comprehensive analytical reading of the intellectual content that was generated (including forum presentations, thematic papers and country reports), and summarizes participants' and experts' thoughts on the present state of, and the way forward for, the national adoption of ICTs toward achieving development goals and related policies and strategies.

The need for national ICT agendas and the formulation of strategic e-policies, multi-stakeholder participation and a common set of priority areas were foremost throughout the deliberations.

[1] Please see 'Key Questions on ICT Policies and e-Strategies'.

Participants recognized the necessity of a cohesive ICT policy and strategic framework for socio-economic development, the execution of which includes national commitment and political will at the highest levels of government, and an environment that promotes stakeholder involvement in setting agendas and implementing plans and initiatives. This chapter provides insights into the challenges to national governments in formulating policies and strategies identified during the Asian Forum. It also points out the main stakeholders and highlights their recommended roles.

On the subjects of ICT policies and e-strategies, ten key priorities surfaced as common to all nations represented in the Forum. While each priority was discussed in depth and addressed in the KL Declaration, poverty reduction and gender equity were recognized as being more cross-cutting than others, and deserving due consideration in all areas. This chapter provides a synopsis of the deliberations and recommendations for each of the ten priority areas, highlighting country experiences as expressed by the participants and salient points raised, as well as examples given by regional experts. The ten priorities are as follow:

1. Poverty reduction;
2. Gender;
3. e-Government;
4. Infrastructure;
5. Human capacity and jobs;
6. Local content and managing knowledge;
7. Partnerships for mobilizing resources;
8. Regulation and privatization;
9. Intellectual property, legal frameworks and security; and
10. Economic development and global competitiveness.

Finally, this chapter concludes with a brief summary of key lessons gleaned from the issues raised. Although there is no standard template for formulating ICT policies and strategies that may apply uniformly to countries, based on the analysis of the Asian Forum, there are commonalities from experiences and lessons learned that are identified in the conclusion, providing a clear set of recommendations.

Guiding Principles for ICT Policies and e-Strategies

National ICT Agenda and Formulation of Strategic Policies

The Asia-Pacific region has examples of all the world's developmental problems, as well as all of the potential solutions. Countries of the region range from Japan, a leader in ICT adoption where half the country's cell phones function as digital cameras[2], to Bhutan, which introduced TV only four years ago, or to Afghanistan and Timor-Leste, now emerging from the ravages of war and destruction of basic telecommunications infrastructure. Each of these countries is at a different stage in

[2] Cable Network News, evening TV broadcast in Hong Kong, 2 October 2003.

the journey of ICT development, but all share the same overriding goal of using ICTs to enrich and improve their societies. By sharing experiences, those further along can illuminate the most suitable paths to take, as well as the common pitfalls to avoid. Figure 1 depicts the typical visioning exercise all countries must go through.

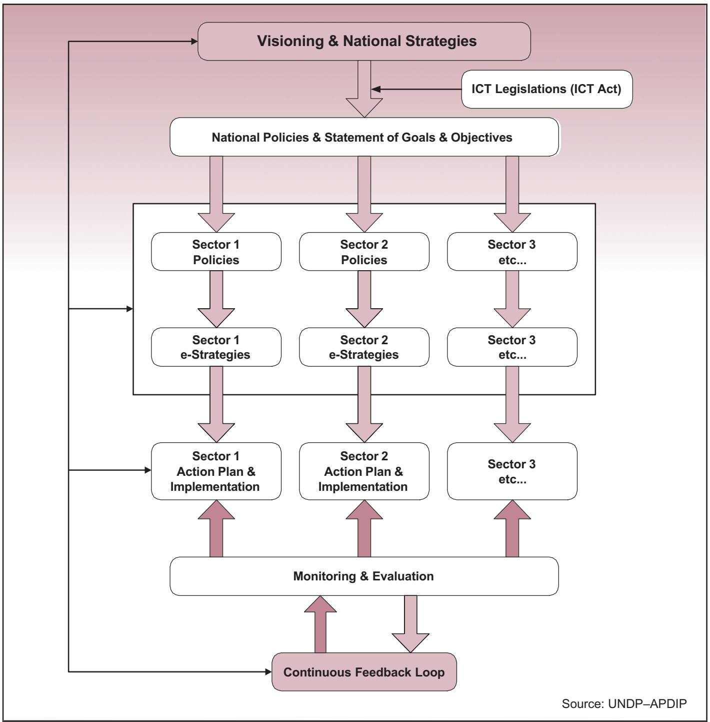

Figure 1 **Visioning & National Strategies**

In this metaphor of a journey, e-strategies represent a road map guiding countries to becoming an information society. As shown in Figure 2, Singapore has already released five strategic plans over the past several years. The worldwide technology revolution makes such strategies imperative. However, unlike the previous industrial revolution, the knowledge revolution encompasses all aspects of society,

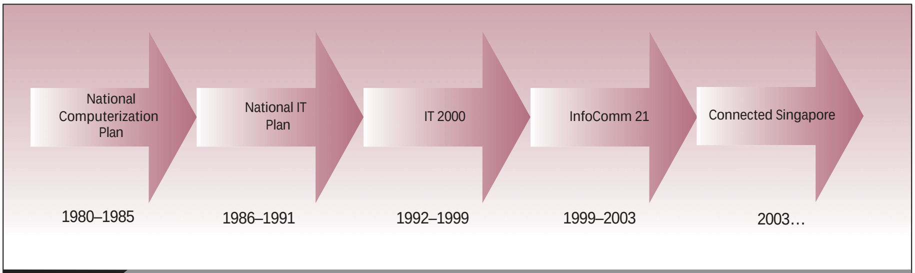

Figure 2 **Singapore's ICT Strategies**

so e-strategies must go beyond technical goals in addressing the challenge of universal access to, and the use of, ICTs. The responsibility for appropriate e-strategies rests not just with government, but also with civil society and the private sector. Moreover, much depends on how open governments want to be with their people in formulating and implementing their policies.

In crafting ICT policies, policy makers face nine major challenges:

1. A need for vision and leadership;
2. Consistency with other national development goals;
3. Coordination within government;
4. Consultation for consensus on objectives and approaches;
5. Implementation of articulated and realistic plans of action;
6. Resources prioritized and not based on mere wishful thinking;
7. Supportive legal framework to enable ICT policies;
8. Supportive policy frameworks to facilitate implementation; and
9. Objectives against which to monitor progress and produce defined results.

In economic terms, ICTs are a necessary but not sufficient condition for achieving development. Without ICTs, little can occur, but even their presence does not assure results. Similarly, policies and e-strategies alone cannot guarantee the desired outcome: development implies action, not just policy or strategy documents written but never implemented—a failing that frequently occurs when those who commission studies neglect to act upon their recommendations.

In determining what strategy to pursue, countries need to assess their degree of e-readiness—to see where they stand along the route to develop ICTs. By understanding their national strengths and weaknesses with respect to the use and development of ICTs, leaders can position their countries to take advantage of emerging opportunities and stave off competitive threats. Many governments have already carried out such assessments of their countries' e-readiness; others have had them done by external bodies that compile comparative e-readiness rankings and indices. Once completed, these analyses should make ICT policy makers better able to go after the 'low-hanging fruit'—the easier-to-implement approaches that will yield the most benefit at the least cost, and ideally, with a relatively quick return on investment.

One example of the right way to develop an e-strategy comes from Pakistan, which in 2000, demonstrated the appropriate actions for crafting and then acting upon an e-strategy. Pakistan began a nationwide ICT development programme by first reviewing best practices from around the world, adapting what it learned to the local context, introducing supportive policies, and then revising its budget allocation sharply upward to cover the cost of reaching its targets. More examples are provided in the 'Country Comparisons of National ICT Policies and e-Strategies' matrix, which focuses on ICT developments, policies, WTO issues and regulatory frameworks in place at the national level within some select countries of the Asia-Pacific region. These examples are derived from country reports submitted by the delegations and from UNDP–APDIP's 'An Overview of ICT Policies and e-Strategies of Select Asian Economies'.

Stakeholder Involvement in the Development of ICT

National Political Leadership and the Role of Government

Governments cannot do it all, nor should they try to. Rather, governments must enlist the help of civil society and the private sector to achieve multinational, national and local aims. Governments, however, must set the rules of the game and serve as a catalyst for ICT initiatives, particularly those related to public goods, and ensure that the proper enabling environment exists for all actors involved in the process. An enabling environment means not just the encouragement of ICT investments in human and physical capital, or better integration with a globalized economy, but also the protection of consumers' and businesses' rights as they make use of modern technology. Governments also face the dual task of harnessing ICTs for creating jobs through economic growth while promoting equitable development, especially for the marginalized, often overlapping, groups of the poor, women, ethnic minorities and rural inhabitants.

Since all companies are now using ICTs, they have become a basic utility rather than just a competitive advantage. Just as most companies cannot function without electricity, neither can they do without ICT. This same analogy extends to governments as well. Most experts now agree that, given the importance and pervasive nature of ICTs, a coordinating body directly responsible to the head of government is the preferred way to enabling the effective use of ICTs in society. Leaders in the adoption of ICTs have typically instituted some form of ICT council, chaired by the country's head of government, often with participation by both the public sector at the ministerial level and the private sector.

Governments must also keep abreast of ICT developments, even if they do not immediately adopt them. This monitoring is far from easy, as changes take place much faster in ICTs than in any other realm of development. For instance, the skeptics who question the attention devoted to modern ICTs when half the world has never even made a phone call are probably relying on data that may have been true five years ago but which are now outdated and misleading. Certainly, political leaders must ensure that their people have the basics, but they must also look to how their countries can apply the latest technologies to generate jobs, economic growth and ways to mesh efficiently with an increasingly globalized world. Hence, ICT should be seen as an enabler that complements other existing basic services. The challenge leaders face is in justifying high investments in ICTs when other basic services are lacking. ICTs should be adopted not for their own sake, but to provide the most appropriate, citizen-centric solutions.

National leaders also need to balance the economic and political aspects of ICTs. Modern ICTs permit the sharing of information, knowledge, and hence of power, as was never possible before. In this realm, governments have a duty not just to provide services as efficiently as possible, but also to make the government's operations transparent and civil servants accountable to those they serve. Along this track, ICTs can improve both the economic and the political system through e-government (the rendering of services) and e-governance (the enhancement of citizens' participation in the political process).

The Private Sector

While governments set the policies, much of the implementation falls upon the private sector. As such, private companies and organizations have a stake in ensuring that ICT policies and e-strategies match their priorities. They deserve a seat at the table—at least via open consultations, if not in ultimate decisions—when governments set national or local ICT agendas that will affect the private sector's ability to do business.

The nature of competition and vested interests means that policy makers must also ensure that ICT policies do not unduly favour certain entities at the expense of others, or benefit industry at the expense of civil society or the broader public goods of social and environmental well-being.

The private sector is a leading source of innovation for applying inventions developed internally or elsewhere with an awareness of consumers' requirements. When the free market functions properly, its natural winnowing process results in the fittest firms—often those most able to use and develop ICTs—becoming leaders in their respective fields. Through higher pay and other benefits, these same firms frequently attract and retain top managers and talent. Such companies are vital to ensuring the efficient working of ICT policies because they act as repositories of those persons possessing the very skills of managerial and technical expertise that are always in scarce supply.

Local Communities, Rural Areas and Appropriate Media

We can delineate ICTs into two strategic areas: (*a*) as a productive sector within a country's overall industrial development, and (*b*) as an enabler of development—to address socio-economic concerns to ensure wider applications and usage. Both strategic areas are mutually dependent: the first without the second will mean little; the second alone (without a developed productive infrastructure) cannot result in an information-based society. ICT strategies should balance economic and social concerns to combine sectoral growth with the development of society. In the economic arena, the private sector drives progress, but in the social arena, civil society organizations (CSOs) and local communities must assume prominence, particularly in rural areas far from the reach of central governments.

In looking for help in remote regions, governments should not neglect local or international representatives of CSOs. For what they may lack in funds, CSOs often make up for in their propensity to innovate and run some of the most creative ICT projects. Close to communities, they are best able to reflect local needs directly in the form of projects. Governments can then take successes from such small, pilot efforts and apply them more broadly.

At the local level, technologies ought to be appropriate to the economic level of the community and be subject to a rigorous cost-benefit analysis. Too often, late adopters adopt state-of-the-art technology rather than the most sensible systems for their country's level of development. For instance, trying to bring the Internet to rural areas, or even to poor urban centres with large illiterate populations, is not warranted if local governments have not yet tried cheaper (e.g. non-text-based) solutions from basic telephony or community radio. ICT adopters also have to recognize that successful solutions for one country do not necessarily apply to others. In the case of infrastructure, for instance, what works for a landlocked country such as Nepal, will not be suitable for a flat, archipelagic country like Maldives.

Community radio can be an effective means of providing basic voice services. India and Sri Lanka (a country that links radio call-in requests to mediated Internet searches for information) have some innovative, low-cost examples of this approach, which have now become widespread across rural Africa. However, before community radio can proliferate in Asia, governments like China, and presumably many others in the region, must relinquish the state's monopoly over all forms of public broadcasting and allow local development of programmes and content.

Seasonal, temporary, and more permanent rural-to-urban migration occur in most developing countries of the Asia-Pacific. ICTs can help keep families connected when family members travel. But what about underserved groups who move about more or less constantly—for example, the nomads in places like Mongolia? It is especially hard to provide ICT services to such mobile groups. Mongolia has, nevertheless, instituted a universal-service fund to promote rural access via basic telecommunications infrastructure. Mongolia also makes use of community-radio programmes for nomads.

Academia and Educational Systems

Academic institutions can play a role in helping design and evaluate ICT projects that may involve technically demanding research. In addition, their corporate research counterparts are also active in developing standards that are revolutionizing the spread and use of ICT: from open source software and the next-generation Internet IPv6, which will enable pervasive telemetry, to wireless local area networks (IEEE 802.11b or 'Wi-Fi'), the longer-reaching standard of 802.16 (or 'Wi-Max') and the proposed 802.20 'Wi-Mobile'.

At one end of the academic spectrum are scholars involved in cutting-edge innovations designed at leading research institutions and graduate schools; at the other are those toiling on the front lines of basic education. Each stage of the continuum has a stake in national e-strategies and input to provide into their design.

Developing a cadre of digitally literate workers is necessary for a country to participate in the ICT revolution. However, such a process takes time—in fact, education and the investment in human capital can have a longer horizon for payback than almost any other investment. In 1980, when Singapore first began looking at computerization, the island city-state had just 850 computer professionals among its three million people. Now it has 100,000. Similarly, India's policy of putting resources into tertiary ICT education took over two decades to bear fruit in creating global centres for outsourcing software development and business processes of multinational firms.

As President of Costa Rica in the mid-1990s, José Maria Figueres, the current head of the United Nations' ICT Task Force, helped convince global chipmaker Intel to make a major investment in that country. Within a few years, Intel's operations alone accounted for nearly two-thirds of Costa Rica's economic growth[3]. With a population of about three million, Costa Rica has the region's best-educated and most bilingual (in English) workforce for a largely Spanish-speaking area—two key criteria for attracting foreign direct investment (FDI) when a country lacks other advantages like a large domestic market.

No matter how undeveloped they are, virtually all countries recognize that ICT development is the key to future prosperity. Without knowledge workers, nations cannot move up to higher, more remunerative links in the global value chain. Hence, in Malaysia and elsewhere, digital literacy has become the highest priority, emphasizing math, technical skills and, for better or worse, English, as the prevailing *lingua franca* of international business and the Internet.

Regional Partners and International Collaboration

Policies and strategies are not restricted to national borders. Stakeholders include not just foreign individuals or organizations, but entire countries and the peoples they represent. The Pacific islands, for example, developed a regional ICT policy and strategy plan in 2002. Similarly, the Asian Development Bank's Mekong department—comprising Viet Nam, Lao PDR, Cambodia, part of south-west China and north-east Thailand—is currently trying to develop such a regional strategy for ICTs that is focused on rural telecommunications. However, such regional policy-making remains rare.

Throughout the Asia-Pacific region, a number of countries share historical or cultural similarities. For instance, Lao PDR has its closest ties with Thailand, with whom it shares mutually intelligible languages. More complete fiber-optic links from Laos to Thailand than to other countries in the Mekong region reflect these close links (while the proximity of the Lao capital, Vientiane, to the Thai border may also play a role). Efforts to enhance South-South cooperation might try to pair such neighbours, with economically more advanced countries advising their smaller or less developed counterparts—Thailand helping Lao PDR; India helping Sri Lanka, Bangladesh or Pakistan; Central Asian countries cooperating with Mongolia; Singapore with Malaysia; Indonesia with Timor-Leste; and so on.

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[3] Leinar, V. and Lindegaard, K. *New Economies and Innovation for Developing Countries. The Case of Intel in Costa Rica* (DRUID Summer Conference, Copenhagen, June 2002).

One of the region's biggest ICT success stories illustrates the role of advanced neighbours helping to develop their more backward brethren. As channels for FDI, Hong Kong and Taiwan have contributed enormously to China's development, particularly in its most dynamic region—the Pearl River Delta. Japan and Korea are more prominent in northeast China's Bohai rim. China also has a formal programme of pairing each of its most advanced eastern provinces with a relatively backward Western one as a means for spurring development and convergence of living standards.

Small countries in the Asia-Pacific region face a common problem in implementing new systems: a lack of economies of scale. It is hard for them to spread the upfront costs of researching, designing and acquiring equipment over a broad user base. Hence, they need to band together on joint initiatives or join those of larger neighbours.

There are other arguments for making common cause. No country today can afford to stay outside the global network. For most ICTs, Metcalfe's law states that due to internetworking effects, utility will rise with the square of the number of the network's users. Similarly, the global community's benefits rise exponentially with the number of connected countries. Nations or people that are left out fall that much further behind.

The 10 Priority Areas for ICT Policies and e-Strategies

ICTs within Poverty-Reduction Strategy Programmes and MDGs

The numbers and trends in poverty are stark: over one billion people live in extreme poverty, and 75 percent of these are in rural areas, which are far from markets, social services or policy attention. Within Asia, 40 percent of the population lives with incomes below US$1 per day. Worldwide, the top quintile of the population earns 83 percent of all income, the bottom quintile just over 1 percent, and these disparities have been getting worse.

In this context, ICTs represent a new engine for development. ICTs are currently characterized by uneven diffusion across countries and within societies. Market forces alone, however, will not fix the problem, as disparities grow between rich and poor, urban and rural, male and female. If deployed appropriately, ICTs can empower the poor, facilitate national strategies for reducing poverty and help bring nations closer to the MDGs established by the United Nations (UN) in 2000.

Poverty consists of three reinforcing characteristics: (*a*) lack of access to sources of income; (*b*) vulnerability and a paucity of coping mechanisms; and (*c*) inability to protect one's interests through political representation. How can ICTs help raise the bottom of the 'consumption pyramid' in which the top 10 percent of the world's population consume the most, while the bottom 40 percent consume hardly any of the production from the world's transnational corporations (TNCs)? There is a need for innovative processes to make the products of TNCs accessible to the poor, as the

Grameen Bank or BRI of Indonesia have done in making financial services available through microloans and microsavings accounts, for example.

For governments grappling with a perennial shortage of funds, the basic question arises: why ICTs (rather than roads or schools or hospitals or agricultural research and extension facilities)? Moreover, can governments continue to subsidize, or should they push for ultimate financial sustainability in ICT initiatives? For example, in Sri Lanka (a country with a long history of promoting an equitable society), non-ICT ministries contend that only about 10 percent of the country's 18 million people—primarily those in urban areas—would benefit from ICT expansion, whereas other initiatives could more directly help the poor.

In lobbying for more ICT funding, are countries proposing that a rising tide (in advanced parts of the country) can lift all boats elsewhere? Will the discredited notion of 'trickle-down, supply-side economics' lead to greater income disparities, as the already privileged get an ever-greater share of scarce resources? Or, as some maintain, can ICT investments—if made on both sides of the digital divide—both foster economic growth and bridge the gaps that seem to be ever widening in society?

Despite a consensus on the merit of ICTs for development and poverty alleviation or reduction, few countries have actually integrated ICTs into their national development plans or Poverty-Reduction Strategy Papers (PRSPs). PRSPs, as the core reference document for mobilizing resources, are 'where the (donor) money is'. Unless a government makes explicit mention of ICTs, donors cannot help fund ICTs for development projects and/or programmes. Likewise, a failure by donors to think about developing ICTs will lessen the likelihood that the poorest countries will be able to undertake any initiatives in that realm. Some donors in the field are not interested in ICTs for development, and a number of PRSPs reflect this: of 29 PRSPs examined in August 2003, only 12 had any notable reference to ICTs.

Some have advocated 'civic entrepreneurship' to build the collective capacity of the poor through their existing social and financial assets. Hernando de Soto of Peru, for example, has pointed out that these assets—of housing and land—dwarf the amount of FDI in poor countries, yet consist largely of 'dead' rather than liquid capital due to inadequate legal structures that, if properly functioning, could create markets where none now exist.

Collective capacity implies political change to give the poor and marginalized groups a greater say in their countries' development. By aggregating and transmitting a multitude of voices, ICTs, like the Internet, can do this—bring grassroots views to the leaders at the top. However, the process is fraught with uncertainty and potential danger. Countries must not only sign, but also enact into law Article 19 of the United Nations Universal Declaration of Human Rights, which guarantees to all the right to express their opinions and to communicate without fear.

All 191 United Nations Member States have pledged to meet the following goals by the year 2015:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environment sustainability
8. Develop a global partnership for development.

Source: www.un.org/www.un.org/millenniumgoals/

Millennium Development Goals

To reach the MDGs in an era of constrained resources, prevention offers the best cure. While developed countries have applied ICTs to curative procedures like telemedicine, remedial distance learning programmes and operations to clean up the environment, such complex and high-tech applications are beyond the means of most countries in the Asia-Pacific. However, ICTs are equally, if not more, powerful in their preventive impact—informing populations to keep health, educational, or environmental problems from occurring in the first place. Whether by providing information on HIV/AIDS, radio broadcasts of language lessons or messages on protecting the environment, ICTs offer unique ways of reaching people, affecting their behaviour and allowing feedback to monitor results.

To influence the PRSPs, donors need to first understand the multifaceted ways that ICTs can help reduce poverty, then educate the respective government personnel with whom they work, and lastly, ensure that the PRSPs reflect those lessons.

The Role of Gender in ICT

Women account for up to 70 percent of the world's poor. While the UN Declaration of Human Rights deals with women's roles, why do national policies fail to encourage women's participation?

When the Internet and World Wide Web first reached a mass audience in the mid-1990s, men predominated as users. However, as society recognized the social uses of these technologies, women's presence on the Net has steadily increased. In Thailand, for example, there are now more female than male Internet users—an uncommon phenomenon in much of the region. China has conducted biannual surveys of Internet usage since October 1997, when the country's female users of the Internet accounted for just 12 percent of the total, but that number rose steadily and by July 2001, had reached about 40 percent. However, since then, the percentage has held steady and not broken past that barrier.[4]

According to UN statistics, there has been no change in women's representation at the highest levels of government since the 1995 World Women's Conference in Beijing,

[4] Ulrich, P. *An Analysis of the Survey Results from the Social-Impact Assessment of Rural Information Centers in China* (internal, unpublished report for the Chinese Ministry of Science & Technology and UNDP China, 3 November 2003).

China. On average around the world, women hold only 13 percent of seats in parliament, despite being the majority of the electorate.[5] Some countries like China and, more recently, Pakistan, have set 20-percent quotas for the share of parliament seats to go to women, but that has not improved the lot of women in either country.

While technology is gender-neutral, policies are not. Society must ensure the gender sensitization of men and avoid the trap of men facilitating and intermediating access to the Internet for women. Mainstreaming gender requires increased literacy, sustainable opportunities and equitable access for women. Decision makers should consider the social and economic dynamics of, for example, how illiteracy hinders women, for they make up 64 percent of the 880 million illiterates in the world today.[6] Women are, therefore, more likely to lack basic skills.

Development economists recognize that empowering women is the key to reducing poverty. However, in ICTs, insofar as the emphasis goes to written media like the Internet rather than the oral media of basic telecommunications, such policies inherently discriminate against poor illiterate women.

Asia has had a high number of female heads of state, but most of them were linked somehow to male family members who had served before them. Studies elsewhere have shown that corruption in government tends to decline with a greater participation of women in higher political office.[7] Similarly, numerous economic findings have demonstrated that few interventions have a greater positive economic and social impact than education of poor mothers. Yet, many women remain illiterate, in subservient positions throughout most Asian societies.

Targeted subsidies are always preferable to blanket ones. In women, societies have a group that is comparatively easy to target for affirmative action. For instance, appropriate incentives for women who pass exams can remedy the disproportionately low number of women in ICT fields. Such techniques are a good way to spur achievement among targeted, underprivileged segments of society.

In recognition of the existing societal constraints that keep many women at home to care for children, but without advocating such traditions, governments should encourage teleworking and ever-growing outsourcing opportunities in call centres, medical transcription, Web design, and so forth. Such remotely conducted, potentially home-based jobs can provide opportunities for mobilizing women in rural areas.

Policies should ensure women's equal rights and encourage the representation of women at policy levels, with authority in decision making and as users of ICT. Policy

[5] Shahabudin, S. *Keynote Address to UNDP-APDIP Asian Forum from the President of the National Council of Women's Organizations* (Kuala Lumpur: Ministry of Education Malaysia, 21 October 2003).

[6] Ibid.

[7] Dollar, D., et al. *Are Women Really the 'Fairer' Sex? Corruption and Women in Government,* (World Bank Policy Research Report on Gender and Development, Working Paper No. 4,October 1999).

makers should also strive to identify key role models of women in ICT fields and create a database of female ICT experts for future consultations in the region.

Supportive Government Policies and e-Government

Governments, particularly in developing countries and especially with regard to ICTs, are often the driving force in the industry. Public expenditure in places like Viet Nam, for example, account for nearly a third of the entire ICT market. Some in the business community, however, believe that good government equals less government and attribute sprawling bureaucracies in South Asia, for example, to the colonial legacy. They call for smaller government, even if it means reducing the institutional capacity within the government, by shifting activities outside, turning civil servants into external consultants. They say, governments can create enabling environments, but should stay out of the 'doing' mode, and government intervention in markets is only warranted for limited periods to correct market dominance of an incumbent. Where the private sector fails, the government should not automatically move in to take over the services, but should re-examine and possibly correct the incentives, if necessary, using a supply push where demand does not suffice.

Much hinges on the policy environment and how this affects consumer prices. With policies like ensuring that access to the Internet costs no more than a local phone charge, Pakistan's government sparked a rapid growth in Internet coverage to 1,700 locations, covering 90 percent of the country's population. Cellular usage grew ten times to 2.5 million in the past 31 months, and a key driver for this was the shift from receiving party pays (RPP) to calling party pays (CPP). Prepaid cards costing less than US$ 0.50 per month, rather than monthly subscription fees, meant that owning a cell phone was no longer beyond the reach of the masses. Handset prices fell from over $300 to under a $100. Moreover, cell phone users could keep their phone number even after their six-month, prepaid card expired.

If not made flexible, as in Malaysia, existing regulations can hamper the introduction of new technologies. In Sri Lanka, for example, each frequency and every transmitting device requires a license, potentially making every local Wi-Fi hotspot subject to onerous registration. In the Philippines, while ownership in broadcasting must be 100 percent Filipino, the government allows foreigners to own only 40 percent or less of a company providing telecommunication services. As a result, broadcast firms may operate telecom services but not vice versa, which has presented an obstacle to technological convergence.

Many countries are now restructuring policy and regulatory frameworks. Malaysia began with its 1998 Communications and Multimedia Act for converged communications to create a technology- and service-neutral environment by replacing dozens of former vertical markets with just four horizontal areas of network facilities, network services, application services and content-application services. Malaysia also introduced the concept of self-regulation to promote voluntary industry codes with the incentive that companies could use the codes as a defense in the event of any litigation.

Malaysia has used this approach for developing content standards and protecting consumers. For example, the introduction of Voice over Internet Protocol (VoIP) telephony caused no regulatory debate as it did in most other countries. Third-generation (3G) cellular services require no new licenses, just an allocation of spectrum based on competitive bidding. The flexibility of the regulation means that regulators do not now have to figure out how new technologies and services fit in, but rather only what their impact might be. The legislation created a common language of shared terms for Internet service providers, network service providers and traditional telecom service providers with whom key companies like financial institutions are more familiar.

Vertically integrated facilities can drain resources by requiring heavy regulatory oversight. The new structure permits more intensive regulation on upstream, resource-intensive facilities, while allowing a more open and relaxed oversight of the downstream retail markets. Policies to promote the sharing of facilities also reduce visual pollution—the unwanted eyesore of a proliferation of cell towers and other redundant infrastructure.

e-Government

In advanced countries, e-government offers another channel for citizens to reach their government from their homes. Scarce resources mean that in less developed countries, citizens generally must use e-government programmes at community-service delivery centres. Due to the higher rates of illiteracy in many developing countries, e-government is sometimes not in the form of self-service but rather requires help from intermediaries at the centres who act as a kind of e-ombudspersons for those who cannot read or type.

Some successful examples of e-government include Computer-Aided Administration of Registration Department (CARD) in India, which streamlined the process of property deeds from 15 days to two, and mobile citizen-service centres in Brazil, which use large buses equipped with very-small-aperture terminal (VSAT) satellite connections to provide rural Internet access on pre-defined schedules and routes. In developed countries, e-government initiatives tend to be exclusively automated and online or via the telephone. By contrast, Asia's most successful projects are hybrids, involving some electronic interface (at steps where corruption and rent-seeking are likely to occur) and some manual (as in collecting cash).

The Bhoomi project in India's Karnataka state now has an electronic database of 20 million land records; hence, obtaining a land title takes only 15 minutes rather than 15 days as in the past. Computerization of records began nearly 20 years ago. The first-in, first-out (FIFO) aspect of the automated system reduces the likelihood of corruption: where traditionally people paid bribes to expedite matters, now that is no longer possible. The Bhoomi project reduced the number of locations for accessing land titles from 9,000 to 200 and raised charges from about US$ 0.02 to US$ 0.30 per transaction. Farmers, however, are willing to travel the extra distance and pay for what they now perceive as infinitely better and less time-consuming services. As a result, the US$4 million Bhoomi investment earns nearly US$2 million each year in fees and can break even in 24 months. Not surprisingly, some local politicians were initially unhappy about the changes as the system circumvented their local power base and a source of bribes to supplement their official salaries.

1. Transparency
2. Accountability
3. Strategic focus
4. Efficiency
5. Predictability.

Principles of Good Governance

Success factors for e-government projects, as with any other project, include having clearly identified goals and expected benefits. In enabling e-government services, perhaps 20 percent of the initiative's outcome hinges on the technology, 35 percent on re-engineering business processes, 40 percent on changing organizational behaviour, and five percent on luck. There is scope for outsourcing aspects of e-government projects to the private sector, but if the project's managers intend the initiative to reduce malfeasance, outsiders will not be aware of where corruption occurs and therefore, not know which design stands the best chance of reducing its likelihood.

Problems of insufficient governmental transparency and excessive corruption plague Asian countries. A survey of the Bhoomi project shows that it reduced corruption. Although governments can use ICT to make deliberations and processes more transparent and officials more accountable, technology itself, without changes in incentives and behaviour, may only shift schemes of siphoning public funds or subverting the common weal from traditional practices to those of more technologically savvy, but still corrupt, officials.

Even good sites and publicly available information, however, do not ensure better government. The media and NGOs are required to analyse information and suggest what may be wrong, and it is a long, slow process. For example, the US 'Open Secrets' site analyses Congressional funding and voting records to show the corrupting role of money in politics. Yet, voters continue to vote the same officials back into office.

No matter how good the design of an e-government's website may be, getting people's attention and encouraging its use in a world bombarded with information remains another matter. Studies have shown that repeat visits to very few sites for information and communication characterize most Web users. Even prolific Web users, often online for most of the workday, nevertheless, spend the vast majority of their time in just a few sites: to use email, to do Web searches, to read favourite sources of news, to chat or to play games online.

The human element is crucial to the success of projects. To illustrate, the acclaimed Gyandoot project, once hailed as one of the best models of sustainable telecentres, indeed, made money in its first year, but then closed many of its centres or moved to other businesses thereafter. It initially had a popular application—the online filing of complaints, which accounted for 40 percent of its traffic. However, once a key champion of the project had left, the administration became less responsive and the centre's key value proposition to the communities disappeared.

By some estimates, 80 percent of e-government initiatives are unable to keep to budget, time or objectives. However, the record is not necessarily worse than what happens in the 'real' world, where only about one in five start-up businesses survive beyond several years and relatively few regular government projects finish on time and within budget. Some wonder which should come first—technology or the re-invention of government. Actually, neither takes precedence over leadership in getting things done. Behind every successful e-government project is an individual champion.

Project designers need to first find out what users want and then implementers must continually ensure that the projects satisfy those needs—that they provide, in 'consultants' speak', a value proposition. If the e-government project intends to charge for services as a way of promoting self-sufficiency, project designers should ensure that the proposed products and services offered are viable, and they should re-examine the reasons for previous project failures. If the project revolves around a website, project designers should invest sufficiently not only to build the site, but also to have it maintained and updated regularly by professionals. There should be a clear policy on what documents or information to share online. Dormant and static sites turn visitors away and can defeat the initiative's intended purpose.

In e-government initiatives, not all steps need to be, or should be, automated. However, such projects need clearly identified goals and measurable benefits to citizens and business in terms of delivery times, reduced corruption and lower costs.

It makes no sense to make bad processes work faster through technology. The lion's share of the budget and time should be devoted to re-engineering processes and changing behaviours before introducing ICTs. This will require political commitment at the highest level as well as identifying champions at the level of implementation. Building capacities within departments is therefore critical, especially in the context of managing and championing projects.

At the national level, officials should empower and de-centralize government services and ensure national coordination between states and between ministries, while harmonizing policies across the board. Any nationwide rollout will require buy-in from citizens, which means a consultative process with civil society and the private sector to plan appropriate directions for the policy. Government must involve grassroots organizations and NGOs in interpreting the needs of rural citizens and making information or e-government services accessible to them. To solicit private investment, government facilities can be offered as a test-bed for new private-sector products and services.

Infrastructure, Access and Telecom Development

ICT ministries are competing for attention with other ministries that are also in need of scarce funds for infrastructure. If countries must address basic infrastructure before other questions, why should they give ICTs priority? So long as some narrowband needs remain unanswered, is there reason to invest in broadband until basic universal access prevails? ICTs should supplement and complement, rather than substitute for other developmental requirements. Like any long gestation project, it takes time to realize the benefits of ICTs.

The explosive growth of cellular communications in developing countries represents a relatively low-cost way to build infrastructure quickly. Worldwide, there are now more cell phones than fixed lines, while the numbers of subscribers in many countries are doubling every two or three years. Cambodia is, perhaps, the world's leader in this regard, with cell phones outnumbering fixed lines by a ratio of eight to one. Meanwhile, the Philippines has 3.6 million fixed lines sitting idle due to their lack of affordability and the presence of cheaper mobile options. Cellular subscribers there now outnumber fixed-line subscribers by four to one, with teledensities of 20 and five percent respectively.

Recent technological innovations are also driving down the cost of usage and helping to spur demand. In Thailand, the government's guarantee to buy 200,000 personal computers (PCs) meant a per-unit price of just $200. Short messaging service (SMS) gives the poorest access to telephony, and in the Philippines at least, is a killer application for GSM phones. The country sends 200 million messages per day at a cost of US$ 0.02 per message. Similarly, the cost-conscious Chinese are sending nearly three times that amount, accounting for half of the worldwide total.[8] Sending an SMS in China costs just 10 percent of the price of an already inexpensive local call.

In the past decade, with ever-declining equipment costs and retailing innovations from prepaid phone cards to PIN-activated virtual telephone accounts, planning forecasts by governments like Viet Nam have proved too conservative: for example, they had the mistaken belief that most people would have insufficient incomes or assets to use cell phones, which did not turn out to be the case. The minister expects much cheaper technologies like wireless local area networks (WLANs) or 'Wi-Fi' to push their planned targets even higher. Indeed, small countries like Bhutan, which introduced the Internet only four years ago, are now looking at 'Wi-Fi' to bring Internet access to rural communities. However, will such techniques survive the process of scaling up to large, geographically extended countries like India or China?

The poorest often live in the most remote areas that require the costliest technologies (VSAT satellite service) to reach. Efforts to reach these places in the past via, for instance, the Philippines' pilot telecentres, were dispersed, uncoordinated, small in scale, with limited content, and limited in scope to whoever happened to be funding the pilot. Now, however, the Philippine government is creating fee-based multipurpose centres under an umbrella brand with predictable set-up and operating costs in the hope of standardizing the approach.

Users will pay for a service that meets their needs. Thus, project designers looking for financial sustainability by charging fees should ask first of all: how much is this

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[8] 'China to send 200 billion text messages this year', *South China Morning Post*, 14 August 2003.

application saving the consumer—in opportunity, cost of time and money—relative to other available alternatives? In many cases, charging for services will exclude the very poorest that the project should be helping. For example, the Chinese government and UNDP have recently conducted a 1,200-household survey that quantifies the impact of government-funded Internet access centres in 22 villages across five Chinese provinces. Only about 20 percent of surveyed respondents consider the centres vital, and there is overlap between this group and the 20 percent of the sample who have benefited disproportionately in financial terms from information supplied by the centres—in finding new markets, better prices or suppliers. As central government and UNDP support for the project comes to a close, some wonder about charging for the formerly free services. If that happens, most will probably discontinue use. They have other options for communicating and obtaining information, because virtually all have television and over two-thirds of households in the surveyed areas have either fixed-line or cell phones.

By contrast, charging for payphones in remote areas with no other means of communication is more likely to succeed. While the fees may exclude the poorest from casual phone use, they will at least have the security of knowing that a phone is available for an emergency. Keeping rural tariffs artificially low is not the answer, just as subsidized microcredit programmes have not succeeded. Rates should cover costs, or else no private operators will venture into rural telephony. As detailed in a later section, when combined with other policies, this approach can make formerly unsustainable programmes economically viable for the private sector.

In undertaking infrastructure projects, one should think big, start simple, but scale up fast. Since applications such as e-government first need widespread infrastructure, there is no point in thinking about online delivery of government services, if the vast majority of the country's inhabitants lack the facilities to receive them. Once governments have privatized infrastructure, policy makers find it hard to effect further build outs. Demand drivers, based on content, have replaced the former supply-driven model of 'build it and they will come.' In some cases, private operators have undertaken massive expansions of infrastructure on their own initiative without government intervention. In other instances, subsidies are required. Many countries subsidize telecentres, for example, but if placed in peri-urban areas rather than the most economically unfeasible locations, such supported centres will compete unfairly with privately run phone shops or cybercafés. Governments should ensure that subsidized programmes do not stifle private initiatives.

Since over 88 percent of exports of digital products and most proprietary software license fees accrue to advanced countries, these countries and global businesses should contribute to the build out of ICT infrastructure in developing countries as a way, perhaps, of strengthening their marketing channels.

Building Human Capacity and Generating Jobs in a Knowledge-Based Economy

Governments are the largest employer in many countries, particularly in the least developed ones, so their role in maintaining public sector jobs is undisputed during cyclical downturns in business cycles, when private companies shed employees. From a policy standpoint, governments play a more important role in fostering an enabling environment for the business sector to hire and train the country's workforce.

Developing countries have a comparative advantage in their low-cost labour, which should be free to move to wherever there are jobs. However, problems with visas and work permits, resulting from the worldwide technology slowdown after 2000, have caused a backward flow of émigrés from the West. While this phenomenon has adverse consequences for the individuals involved, it could also be seen in a positive light: a reverse brain drain of technical talent back to developing countries that too frequently see their best and brightest emigrate.

One researcher calculates that improvements in productivity brought about by ICTs since the mid-1990s have meant the loss of millions of manufacturing jobs, not only in the US, but worldwide and in developing countries as well.[9] ICTs have accelerated the decades-old shift of employment in developing economies from agriculture to manufacturing and then to services. Over the years, however, the creation of new jobs by ICTs has more than offset the loss of old ones. During the burst of worker productivity in the latter half of the 1990s in the US, the economy's net employment grew. More recently, as ICTs enable American businesses to shift more jobs to lower-wage developing countries in Asia, the trend makes US worker productivity appear to rise still further, as businesses based there produce more goods with fewer local workers on their books.

Education and training are life-long endeavours. One can, and should, continue learning from cradle to grave. Now, ICTs can facilitate the process all along the way. However, just as governments determine what stage of education they emphasize—whether primary, secondary, or tertiary—they must decide how to commit their ICT resources to support their educational goals. Countries have chosen different strategies, with differing results. In previous decades, India, for example, emphasized tertiary education, whereas China put more stock in basic schooling. As a result, India developed a cadre of highly skilled programmers through university and postgraduate training, but they served largely overseas markets. China, by contrast, achieved much better results in overall literacy and thereby laid the foundation for fostering domestic demand and use of ICTs.[10] China retains a large lead over India in its society's adoption of the Internet and in the number of schools equipped with PCs, for example.[11]

Wiring schools for computers and the Internet is not as straightforward as it may seem. A widely praised Indian project provided what literally was a hole-in-the-wall computer for the poorest slum children to learn on their own how to use a

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[9] Hilsenrath, J. E. and Buckman, R. 'Factory Employment is Falling World-Wide', *Wall Street Journal,* 20 October 2003.
[10] Sen, A., Speech at China's First Annual ICT Exposition, Shenzhen, China, October 2000.
[11] Press, L., et al. 'The Internet in India and China', *First Monday,* September 2002.

computer and the Internet. The aim was to demonstrate that children could teach themselves basic functions and how to surf the Web, but without guidance, the device served as little more than a high-tech toy.[12] Other studies have shown that introducing computers into classrooms does not necessarily improve performance and can actually detract from it if students pay less attention to their teacher. Without complementary inputs of sufficient social structure, teacher contact and peer interaction, technology can easily turn into a wasted expense. It is also essential to better integrate PCs into the curriculum to teach, for example, math and science rather than use them for word processing.

Vocational and worker training are other areas where policy makers need to focus in enhancing capacities for participating in manufacturing of ICTs or in ICT-enabled service and product industries. The Sri Lankan government, for example, offers to cover the training costs of firms that establish centres for business-process outsourcing—a high-growth, high-value-added industry encouraged by the government. Other nations have used tax rebates or subsidized firms for hiring and training people to achieve particular goals: from hiring workers out of targeted poor communities, to employing ethnic minorities or other marginalized groups.

Naturally, government-sponsored programmes require funds. Although the resources committed do not necessarily correlate directly with the results achieved, some money must be forthcoming to pay for what is largely a public good. For instance, a huge increase from US$2 million to US$100 million in the Pakistani government's budget devoted to ICT development (of which 75 percent goes to education and human resources), enabled a nearly six-fold expansion of IT training for 'PC literacy', from 1.8 million in 2000 to 10 million today.

Illiteracy presents a major obstacle to the use of the Internet, but not generally to voice-based ICTs. In countries like Pakistan, where half the population is illiterate, some researchers are looking into ways of converting text to speech. Proprietary software like Dragon Systems already exist for this purpose, but cheaper open source solutions may also one day become available. As in India, Pakistan in the past focused more on tertiary than on basic education: the country even has a separate ministry for higher education. Now, Pakistan is trying high-tech solutions to address this problem of having a narrow segment of well-educated elite amid a broad base of illiterates: since village accountants' thumbprint signatures lend themselves to the use of biometrics for non-repudiation, some suggest this approach to giving those who cannot write a unique identifier.

For the hardcore poor, ICTs have limited scope to increase employment directly, but they could do so indirectly through greater access to information, with the help of intermediaries like CSOs.

[12] Warschauer, M. 'Demystifying the Digital Divide: The simple binary notion of technology haves and have-nots doesn't quite compute', *Scientific American,* August 2003.

Incubators and Technology Parks

Although a relatively recent phenomenon in the region, incubators and high-tech parks are growing rapidly. Most countries have at least some of these, and several have hundreds of high-tech zones and incubators, with special tax incentives to encourage specific ICT sub-sectors like software.

Research from the US and the Organization for Economic Cooperation and Development (OECD) have shown that publicly supported incubators can double the chance of a start-up's surviving its infancy and that incubators generate a lot of employment in surrounding communities.[13] Some believe that the physical proximity of companies, which encourages the sharing of knowledge and resources, accounts for this success.

Studies from the Massachusetts Institute of Technology (MIT) have also shown that successful high-tech start-ups typically have founders between the ages of 30 and 36—old enough to have experience and contacts, but not so old as to have become averse to risk. The findings also advocate that such companies have at least several founders—up to about five.[14] It is rare that one or even two persons can have the requisite variety of skills, from technical aptitude to marketing, management and accounting, needed by a start-up company.

India has 40 software technology parks throughout the country, and annual software exports have reached US$10 billion in value, with plans for growing to US$50 billion in yearly software revenues by 2008. It is interesting to note that China, which had a late start in software, is now growing so rapidly in this sector that the technology forecaster Gartner Group has predicted it will outpace India by 2006.

Less than five percent of India's public research expenditure goes to innovations for the poor. In fact, the amount of unused research funds, which India's institutes return to the government treasury each year, exceed the entire level of funding for pro-poor research. Asian governments should subsidize the research and development of pro-poor products like India's Simputer, a low-cost handheld computer for use in villages.

Countries outside Asia have tried virtual incubators—that is, those linked via communication networks. However, since much of innovation depends on the informal and serendipitous sharing of ideas fostered by proximity, it is doubtful that virtual connections can achieve the same results as more conventional ones. Asian policy makers should continue to focus on fostering incubators based on location, ideally sited near universities, which are a source of well-trained but low-cost student interns.

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[13] Scaramuzzi, E. *Incubators in Developing Countries: Status and Development Perspectives* (Washington D.C: InfoDev Program, World Bank, 2002).

[14] Roberts, E. *Entrepreneurs in High Technology: Lessons from MIT and Beyond* (Cambridge, MA: Oxford University Press, 1991).

The way forward

How can government retain IT staff with the right skills, or keep them from moving to more lucrative positions in the private sector? In Pakistan, the government hires its experts from outside the government, while hoping that core skills in the government sector will gradually evolve. An Indian report in 1968 advocated pumping money into higher education for developing a network of Indian Institutes of Technology (the IITs). A number of master's degree and PhD graduates from these IITs then went abroad (and helped fuel the Silicon Valley phenomenon). Of these, 70 percent did not return to India—a number consistent with the experience of overseas participant-training programmes elsewhere in the world.[15] From this foundation, India had its first software exports in 1992, after a 20-year gestation period. Most developing countries have a diaspora of talented professionals living and working outside the country. One potential use of the Internet might be to retain the ties of these overseas experts to the homeland (with locally generated content) and eventually recruit them back.

In future, the Internet could enable a 'variegated degree', whereby professors from the best departments of multiple universities offer online courses as part of a joint curriculum, accredited as a virtual university. There is also no reason to limit the universities to just one country, particularly for small nations that may lack a critical mass of either postgraduate students or professors.

Developing countries that are rushing to bring the Internet and computers to their schools, need to make sure they also provide complementary inputs of adequately trained teachers and teaching methodologies, incorporating computers into core curricula. Otherwise, the added investment may even detract from student performance if the computers distract pupils from their basic lessons.

Perhaps, the highest return on any developmental investment comes from educating poor young mothers, who thereby learn to care properly for their infants and children during their most formative years. Targeting basic messages on hygiene, for example, via simple TV and radio programmes in an engaging soap-opera format, could do more for a country's long-term prospects than many other flashier, high-profile ICT investments. As in all development projects, to prevent a mismatch between training and actual needs, projects should first undertake a survey of requirements.

Developing Local Content and Managing Knowledge

Is content a driver for ICT infrastructure? In the Philippines, a universal-service obligation resulted in private operators building fixed lines, but no one came forward to use them. For this reason, some advise that governments develop content instead because customers need compelling reasons to use multipurpose telecentres created for universal access. Should applications join the other 'a's' of

[15] Ulrich, P. *Increasing the Rate of Return* (unpublished report for the USAID Mission in Somalia, August 1988).

awareness, access and affordability? Are schools and local governments the source of content for e-government and other service applications? Certainly, governments need to decide what kind of content will ride on the infrastructure they build—that is, the nature of the 'info-structure'—and factor in the cost for creating content into costs of building infrastructure. However, should content development drive the optimization of infrastructure, or can users themselves create their own content?

With a 12 percent share, Chinese is gaining on English (at 36 percent) as the most commonly read and spoken native language among the worldwide population of Internet users.[16] Unicode text has now enabled the use of most of the world's major languages in Web pages, email and even Web addresses. There is also a long-term research initiative to codify less commonly spoken languages—those with five million users or less—a characteristic of traditional languages prevailing in a number of the participating countries at the Asian Forum.[17] Should countries try to preserve these traditional languages by erecting quotas for content or other barriers?

Conflicting desires to preserve local traditions but also to compete in a globalized economy, can pull policy makers in opposite directions. In human resource development, governments like Viet Nam have pushed English-language training, currently a necessary skill for most exported software, whereas in the tiny country of Samoa, the government uses ICTs to promote the local language and traditions among its 170,000 inhabitants. Conversely, the Internet's ability to segment and partition by language has actually provided a unifying arena for many of the world's dispersed diaspora. The Lao in America or Cambodians in Europe can now meet on line at linguistically tailored government-funded or private websites and portals.

Knowledge-based economies require knowledge-management systems to codify and make accessible the basic inputs in the production of goods and services. The popularity of search engines like Google and Yahoo illustrate the importance of having tools to find necessary information. Leading companies that rely most on information—such as global consultancies, law firms and financial houses—tend to be more advanced in their use of ICTs to develop online libraries and processes for managing knowledge. The public sector has lagged behind in this regard, but the World Bank Institute's Development Gateway represents a good example of a public arena of knowledge management. Among its many topic areas is ICTs for development, including e-strategies. Maintaining such resources is not cheap however, and funds are required to find, update and organize information for searchable databases.

Using online content requires appropriate tools, so the choice devolves to proprietary or open source software. Despite its widespread use, there are still too few case studies documenting the success of open source software. Open source's inherently better

[16] Global Reach. 'Global Internet Statistics (By Language)', available at http://www.glreach.com/globstats/index.php3; accessed on 30 September 2003.
[17] Erard, M. 'Computers Learn New ABCs: Efforts to encode the world's written languages will enable a truly global Internet', *M.I.T. Technology Review,* September 2003.

security features are uniquely suited to e-government applications, but potential new users first want some assurances from reputable authorities concerning its benefits. Given the lack of well-developed customer support for open source vis-à-vis proprietary systems like those of Microsoft, developing nations should not necessarily assume that the total cost of ownership for open source systems will be less. Nevertheless, given the lower costs of technical labour in the region, the likelihood of savings from open source are higher than they might be in developed countries.

Some have suggested that fees on e-government services like those of the Bhoomi database in India could be 'killer applications' to make rural telecentres financially viable. However, a look not only at the value of content delivered, but also at the frequency of any one individual's use of e-government services, calls this into question. Hong Kong, for example, has one of Asia's best Internet portals for delivery of e-government services. Yet, most of Hong Kong's residents—prolific Web surfers with one of the world's highest rates of broadband penetration—have only an infrequent need to use its functions.

Moreover, it is notoriously difficult to get users to pay for content. Internet cafés, for example, often make their money from games played by adolescents, not from adults looking for data online. The value proposition for business in getting customers online frequently revolves around lower costs (to the businesses) in serving them, rather than additional products to offer. In developed countries, for example, banks and brokerage houses provide online services for free—the savings of having customers serving themselves on line, rather than in line waiting for a teller, broker or customer-service representative means that businesses subsidize the users of their sites, rather than charge them more for the convenience.

Web-based content is also expensive to maintain. An audit of government websites in India found that most sites had few visitors and lacked professional design, regularly updated content or particular persons or departments responsible for the accuracy of the posted materials. The same is true of government sites in China, which one study found to be far worse and less informative than Indian counterparts.[18] Even more advanced countries in the region like Malaysia, have deficiencies in that regard, and the Internet in general is littered with dead sites, abandoned once the backers' initial enthusiasm has worn off or more pressing priorities have consumed management time.

Literacy is a priority for developing locally relevant online content in developing countries. Policy makers should emphasize content that is most accessible to the majority of their populations and choose technologies best suited for its transmission.

Some stress the importance of content with schools and governments as providers, but others might disagree with this emphasis. One of the world's most successful marketers, Bill Gates, said in 1996, "Content is king,"[19] only to find it much harder to

[18] Press, L., et al. 'The Internet in India and China', *First Monday*, September 2002.
[19] Gates, B. 'Content is King', 3 January 1996; available at http://www.microsoft.com/billgates/columns/1996essay/essay960103.asp.

develop new and compelling content for the Internet. His portal MSN, has since pulled out of a number of countries. Communication—such as basic plain old telephony, and to a lesser extent, email—could be the killer application. With telephony or community radio, users create their own content with no need for constant and expensive updating, translation or conversion to an oral medium that even an illiterate person can understand.

Tools for managing knowledge are at least as important as the knowledge itself. Concepts like metadata (or data describing data) make possible extensible mark-up language (XML) and allow seamless transactions between electronic systems that in the past could not communicate with one another. Similarly, an ever-increasing array of answers to questions from data mining to search engines based on neural networks, are becoming available for locating information, making sense of it, and even finding experts within organizations who can provide answers to solutions.

Public-Private Partnerships (PPPs): Mobilizing and Allocating Resources

Definitions of public and private are far from clear: State-owned enterprises, publicly-listed firms, private and public universities, NGOs and private donors all blur the distinction between public and private. Nevertheless, we commonly think of government as public and business as private, with civil society and academia somewhere in between. There is also a reason for 'public' appearing first before 'private' in the partnership terminology: government has to be the driving force behind partnerships.

Given the scale of the required resources, PPPs are necessary to enlist private funds for public projects. Private participation in ICT development can free up government resources for other social services, improve the efficiency of ICT use and delegate activities and risks to those best able to bear them. However, despite the rhetoric and frequent reference to PPPs, such partnerships are difficult to implement in practice.

Transparency is important, not just for governments who are responsible to their constituents or businesses accountable to their shareholders, but also for partnerships to ensure the fair tendering of public contracts, or other arrangements by which the government enlists participation from the private sector.

There are few studies on PPPs, but we can examine these alliances to understand the typical success factors. ICT industries, on average, have more alliances among themselves and a deeper integration of those alliances than other sectors of the economy. In business, looser arrangements of alliances have a greater chance of success than tighter bonds of joint ventures or mergers and acquisitions, whereby the acquirer or partner has little choice but to inherit the weaknesses as well as the strengths of the closely tied partner. After partner selection and commitment by senior management having clearly understood roles and clear communication between partners figure as the most frequently cited factors for success. ICTs can facilitate better communication but only if the organizational environment permits it.

PPPs inevitably involve negotiations, but getting to agreement can be easier than may at first seem. Even if the two (or more) parties have diametrically opposed views on key points of negotiation, as long as they place differing priorities on the interests in contention, there is a good deal of scope to reach an agreement, combining the top few priorities of each and a blend of those that rank equivalently in importance between them.

In financing arrangements for PPPs, some International Financial Institutions (IFIs) such as the International Finance Corporation of the World Bank or a similar facility at the Asian Development Bank (ADB) can take equity stakes in private ventures. Others cannot: they either provide loans, typically on concessionary terms (hence containing a grant component), give loan guarantees or provide outright grants. A few donors have also tried to use more complicated instruments, like subordinated debentures, to get around restrictions on obtaining equity shares. Such debentures resemble equity in having a subordinate claim on the investee's assets. Governments may also provide grants directly to a partnership, but more frequently offer grants in other ways: as discounted rates on the use of supporting infrastructure, as tax holidays or as exclusive territorial and service franchises. In return, they may take a share of revenues, royalties or licensing fees.

Partnerships need not involve equity or debt financing, but can be contractual in, for example, a marketing alliance. In China, one cell-phone manufacturer partnered with the government postal system to market its handsets at local post offices. No matter how loose the arrangement, however, alliances and partnerships require a standard legal contract that defines the terms, spells out the parties' responsibilities and provides recourse should any party fail to meet its commitments. Informal agreements based on intentions or goodwill are unlikely to produce meaningful results.

The two prominent forms of PPPs involve: (*a*) incubators—as a means to spur growth and jobs (discussed earlier); and (*b*) extending rural access to telecommunications as a way to enhance equity. The need to generate economic growth without compromising societal equity illustrates two potentially competing priorities for policy makers.

For rural access, the proliferation of wireless technology and retailing innovations like prepaid calling cards, which provide savings to users and lower administrative costs for operators, have made a wider geography of rural areas economically viable for service. However, supportive policies—shifting from RPP to CPP, allowing higher rural tariffs to cover costs, and asymmetric interconnection rates for terminating rural calls—are also necessary to enable rural operators to make money from the often substantial incoming telephone traffic to rural areas. Typically, interconnection is more of a commercial than a technical issue. Issues of termination rates, sharing revenue and occasional non-transmittal of fees also crop up.

When governments use public funds to encourage private investment in otherwise unprofitable areas, they should minimize the scale of required subsidies as much as possible. For instance, Sri Lanka will use 'least subsidy' schemes like those pioneered in Chile in the mid-1990s, to get private operators to set up rural call centres at the least possible cost to the state. Other sectors, like transportation, have already used a similar approach to getting economically unviable roads built by the private sector.

Apparently, half of all telecentres fail in the medium to long-term. If the telecentres are run as businesses, that is not a bad percentage compared to the failure rate of private sector start-ups. Often, donor-supported projects have unrealistic goals concerning the financial sustainability of their endeavours after initial pilot phases. For example, Mongolia's experience with its citizen-information centres demonstrates the problem of providing services that the poor are unable or unwilling to pay for, once donor funding has ended. Using the Internet, the centres undertook the expensive process of translating content into the local Mongolian language—an expense that apparently did not justify the benefits for the intended users.

The success of PPPs depends on creative design, conducive policies and constant re-assessment of the partnership, to ensure that the PPP is meeting the partners' objectives. It is important to experiment with new ideas. Furthermore, since one cannot manage what cannot be measured, implementers need to develop indicators to measure progress.

Investors rank access to markets as their top priority, followed by the policy environment, production costs, workforce competence and level of education. Therefore, to attract foreign or local direct investment, governments should provide fewer incentives like tax holidays, which merely start a competitive race to the bottom, with neighbours vying for the same business. While large countries like China can lure FDI with huge internal demand, others—particularly small countries—must focus on the policy environment and the quality of their workers. Conducive policies must include a transparent legal framework, good governance and accountability.

Since PPPs are particularly draining on management resources, governments must have the capacity to fulfil their obligations. Good candidates for PPPs have clear feasibility studies, business plans and legally binding contracts defining terms, responsibilities and recourse, should any partner fail to fulfil its commitments.

To promote rural telecom operators, governments can look to the examples of Bangladesh, Chile, Nepal and (soon) Sri Lanka, to see how policies and innovations like 'least-cost' subsidies can make rural operations viable and even profitable.

Smart subsidies are targeted and are no larger than necessary. For example, governments might try issuing prepaid calling cards for use in payphones to previously identified poor people in rural or urban areas.

Regulatory Frameworks and Privatization

In countries that have had political or military instability, security concerns make the availability of communication especially important. A number of governments still consider communications (like broadcasting) to be a sector vital to national security and have restricted foreign operators on that basis. However, those that use national security as a reason for retaining domestic or state control of operations in basic communications, do so largely as a pretext to keep potential foreign entrants out of the market.

In contrast to notions of 15 years ago, the generally accepted wisdom today is that governments should privatize their suppliers of telecom services, or at a minimum, corporatize them. Typical patterns of reform include the establishment of an independent regulatory agency, reform of the incumbent operator and introduction of competition, even in fixed-line services. However, with rapid technological change, the private sector might consider old government infrastructure as obsolete, thereby complicating attempts to privatize. The bursting of the telecom bubble in 2000 also renders sales more problematic.

Privatization can be a partial or a complete transfer of ownership from the state to the private sector, via initial public offerings, auctions (when an entity is too large for the local stock market to absorb), sale of stakes to a strategic investor (typically an operator with management experience) or liquidation, in which case state ownership can be a barrier to transfers, as some countries will not allow new entrants. Forms of involving the private sector can be: (*a*) joint ventures, as in Indonesia; (*b*) build and then transfer facilities back to the government entity; (*c*) build, operate for a fixed period, and then transfer, as in Macau; (*d*) build, transfer, and then operate, as in Thailand (where the country's constitution does not allow the private sector to own strategic assets); (*e*) some form of outsourcing arrangement; or (*f*) allowance of a new entry into the market. Governments also sometimes reserve assets for ownership by underprivileged groups: in the US, women and minority groups have precedence over some forms of spectrum allocation.

The old post-and-telecommunication model of cross subsidies for universal service has not worked, and the basis for that model—high international calling charges—has largely disappeared with tariff rebalancing. States also recognize the vulnerability of relying on a single telecom network.

Differing price packages make comparisons difficult across countries, but heavy-handed regulation usually inhibits reductions in prices that freer competition would otherwise cause. Competition has a bigger impact on the market than privatization. Before privatization, the state must restructure (or corporatize) the entity. Even after doing so, getting an accurate fix on likely revenues after competition is not easy. Cost accounting is crucial to the due-diligence process that investors demand.

Achieving convergence and synergy in business operations is harder than accomplishing technological convergence. Should one regulate the same way for TV over the Internet as over cable? How, or should, one license content over the Internet? Do regulators need to have individual licenses for content, for transmission? Problems of sovereign debt and a newly privatized entity's credit worthiness also crop up. Independent, expert advice can help countries sort through these issues.

Excessive market entry into liberalized value-added services can lead to widespread losses, but this is a process inherent in many new industries where market forces winnow down competitors to the most viable firms. In Bangladesh, for example, 70 Internet service providers (ISPs) compete for just 150,000 subscribers: no business model can survive with an average share of just 2,000 customers, so many of these ISPs will not last. Pakistan has a similar number of ISPs but 10 times as many Internet users, and half of them are still unprofitable.

As with any major change, there are winners and losers in the process. Winners are usually the telecom organizations, the private sector, business users and middle-class consumers; losers include other ministries, those making local calls and less-skilled telecom workers who become unemployed. Individuals who lose out may require compensation—for example, through job retraining. More broadly, how can one get customers to accept tariff rebalancing and the resulting higher local charges? In practice, the increase in competition and the shift from a focus on price margins to call volume and value-added services that accompany such rebalancing often succeeds in driving down or offsetting any temporarily higher local call rates. In the rebalancing, the government's removal of subsidies on fixed-line services should attract more investment into the local loop, and especially to cellular services, which become more competitive on a pricing basis.

There is no conclusive evidence that privatization boosts teledensity. Should countries privatize the incumbent as a single entity or first divide by territory or function and then privatize, which occurred in China with China Telecom? There is no single model for success. Hong Kong, for example, had a private monopoly, and Singapore a state monopoly. Both did well. China has had a state monopoly for centralizing and directing the accumulation of capital. Some think that when China introduces 3G services in 2004, the country will wind up with converged fixed and mobile operators having future 'unified' licenses to provide services by whatever means—fixed, wireless, fixed wireless—that the operator wants.

It should be noted, however, that the Chinese government has recently stepped in to prevent fixed-line operators from providing any more fixed wireless services in urban areas as a means of competing with wireless operators. Fixed wireless represents a 'limited' mobile service that works within a restricted area, usually a large city. The practice has led to cutthroat price wars. It is also occurring in India where mobile telephony is now the cheapest in the world. However, mobile operators in India have much narrower spectrum allocation than similar companies elsewhere. Lower pricing has meant a surge in subscribers—nearly a third of the country's 17 million have joined within the last six months, and this higher usage has clogged the limited spectrum with poor call connections. The Indian government is now releasing more spectrum for use, but recently refused to allow fixed wireless firms to expand into mobile. Nevertheless, it may soon allow unified licensing—to the detriment of existing mobile operators, who will not receive compensation for having paid for wireless spectrum that unified licensees will get for free.

To help with funding the rollout of infrastructure, some countries auction spectrum and choose assignees according to 'beauty contests'—the bidders' characteristics rather than solely on the basis of least-cost bids. However, this approach may be less transparent and more prone to error or interference than open bidding.

Abnormal profits often occur after privatization, due to mandated periods of exclusivity in service provision. Countries probably should not delay the introduction of competition after privatizing, as it can entrench the incumbent in a position of dominating the market and require subsequent intervention to regulate pricing.

Regulators should set price, output and productivity targets for privatization to judge performance, and the regulator needs independence from key ministries, which normally entails having their own source of funding, often from levies on private operators—that is, apart from ministerial budgets.

In practice, incumbents tend to make interconnection difficult. Whether to require the unbundling of the local loop, as in the US and elsewhere, remains a controversial topic. However, some make a false distinction, with no technical basis, for arguing that basic services can remain exempt from competition that would only apply to value-added ones like Internet services. Countries should address the issue of Voice over Internet Protocol (VoIP) telephony early because VoIP bypasses structured tariffs and can compete away the old structure. Many regimes have banned or delayed the introduction of VoIP; others like China have immediately allowed it, with a resulting benefit to consumers and boom in usage.

Governments should charge license fees and royalties to cover only the cost of regulation, not for additional revenues for the state treasury. Since regulators often come from former positions at the incumbent operator, they can be biased in their treatment of market players. Policy makers need to be vigilant that such potential bias does not interfere with free-market competition.

Even without foreign entry, privatization or liberalization, governments should strive to encourage competition across lines of business in state-owned ICT entities. The relatively small countries of Bhutan, Costa Rica and Rwanda have recently boosted the telecom sector without opening their markets to either domestic or foreign competition. Governments there have managed to instil competition across different operating units or regional branches of the same monopoly providers.

Intellectual Property, Legal Issues and Security

Studies have shown that one determinant of the variance in Internet usage and the level of e-commerce across countries, depends on the degree of interpersonal trust prevailing in the society. High-trust countries have more readily adopted online business practices that do not involve personal contact. Similarly, trust in the security of a transaction—freedom from interception, protection of personal data and financial details—is a crucial determinant of whether consumers will shift to online methods of payment for goods and services or use online banking and e-government services.

At the same time, concerns for national security, heightened by the current US government's worldwide fight against terrorism, as well as increases in cyber-crime, have raised the level of intervention that some governments accept in monitoring on-line communications. How should a country's ICT policies balance these two aims when they are in conflict? Can national security and 'state secrets' be pretexts for invasion of privacy or restrictions on universally acknowledged rights of communication and access to information? Requirements for court orders before wire taps or online monitoring, if coupled with the rule of law, can be one way to strike a balance.

Due to problems with extradition treaties among countries, the most talented cyber-criminals tend to hack and commit their cyber-crimes across international borders. Governments should expect, and be prepared to deal with, ICT-based crimes committed internally but emanating from outside their political domains. The Philippines, for example, is now writing a cyber-crime law which is unique in its extension beyond national jurisdiction. The Filipino author of the 'I love you' virus that wreaked havoc on computers worldwide, went unpunished because there had been no law on the books at the time for prosecuting such activities.

The notion of privacy differs among countries in Asia. For example, until recently, the Chinese language did not have a word for 'privacy'[20], so the concept of protecting personal data had little priority, even though the Chinese government strictly monitors and controls Internet use. Due to the absence of protective systems, China's Web users are wary of providing sensitive information over the Internet. For instance, one provincial government began an online taxation programme several years ago, but it attracted few users: presumably the site had inadequate safeguards to protect information and possibly insufficient functionality as well. Other countries like the Philippines explicitly protect consumers with both the right to privacy and the right to free speech.

The concept of privacy on the Internet also differs between the use of computers at home and their use in business or government offices. In the US, over three quarters of companies legally monitor their employees' email, and the same is probably true elsewhere. Rights enjoyed by citizens using their own computers do not extend to those provided by others. Moreover, inexpensive software programmes like *Win-What-Where,* enable ever more intrusive monitoring—for example, keyboard strokes can be monitored remotely from a second computer over the Internet. In addition, most commonly used versions of Wi-Fi have security gaps that enable others to eavesdrop on the wireless signals with special equipment.

[20] Yuan, L. (ed.). *The Contemporary Chinese Dictionary* (Beijing: Foreign Language Teaching and Research Press, 2002).

Despite Trade-Related Aspects of Intellectual Property Rights (TRIPS), Asia's difficulties with piracy of software and intellectual property are still growing. Most countries in the region provide inadequate safeguards against copyright infringement, network security and the abuse of consumer rights. This is a serious issue, since problems in enforcing legislation on the protection of intellectual property can inhibit transfers of technology and the development of innovative domestic businesses.

Like most innovations throughout history, from fire to knives to paper, ICTs can be used for good or ill. Smart identity cards are one example. The small city-state of Brunei instituted a multipurpose smart ID card system. A number of western countries (in Europe, for example) have also done so, and China is planning to begin testing a pilot for nationwide smart IDs as well. Rolling out the system to China's 960 million eligible citizens will take five to six years.[21] Despite the programme's potential Orwellian ability to monitor the populace and the fact that China's internal police force will be in charge of it, such a programme, if implemented properly, could help reduce the misdirection of poverty funds from those previously designated as eligible recipients.

A move from explicit legislation to self-regulation can lower the costs of enforcement—both to government and business. In Pakistan, for instance, the regulator moved from a policy of blocking Internet pornography sites at the country's Internet gateway to a system of self-regulation, by delivering local filtering software like Net Nanny directly to households for installation and use by parents.

As elsewhere, email spam has become more than a nuisance in Asia, costing businesses and consumers millions, if not billions, of dollars in lost productivity. Consumer education or industry self-regulation are both necessary but not sufficient to solve the problem. Apologists for spam say the problem hinges on a definitional question: one person's nuisance email is another's useful direct-marketing information. However, consumer discontent is growing. Singapore's Computer Misuse Act already deals with denial-of-service attacks delivered by spam, but so far there is no explicit legislation to cover unsolicited email. Elsewhere, legislation has passed or is pending in a number of Western countries to make the sending of fraudulent spam a criminal offence. Although there are no technical solutions yet, in the US some are working on creating the email equivalent of caller ID to fight fraudulent spammers. The technical solution is still several years away, but could be effective: any email that does not provide a legitimate return address or ID will be automatically deleted as suspicious.

There used to be a sort of arms race between ever more sophisticated encryption algorithms and ever more powerful computers to crack them. Now, with hackers able to remotely monitor keystrokes over the Internet and thereby intercept passwords, the issue of encryption is changing. Nevertheless, some countries like China still place restrictions on encryption devices so that their security forces can continue to monitor online communications. The country uses a combination of technological and low-tech, labour-intensive means to listen in to online

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[21] Chen, D. W. 'China Readies Super ID Card, a Worry to Some', *The New York Times,* 19 August 2003.

communications and block pornographic or political websites deemed objectionable. Organizations like Amnesty International, estimate that China employs tens of thousands of people solely for this purpose.[22]

The pervasive use of ICTs and the Internet has raised challenges for lawmakers. Many existing laws enacted for the physical world may not be applicable for cyberspace without modification. For example, until recently, a Singaporean would need an auctioneer's license before creating an online portal for auctions similar to that of eBay. Singapore has created an omnibus (umbrella) act to make electronic transactions coverable under existing laws, without having to redraft what is already in statute. It has also amended other legislation like the Evidence Act, to allow electronic documents to be admissible as evidence in a court of law.

To enable cross-border transactions, there must be compatibility between the legal and regulatory regimes across countries. The e-ASEAN initative has developed a framework based on the United Nations Commission on International Tradelaw (UNCITRAL) Model Laws to facilitate the harmonization of e-commerce legislation for electronic transactions and electronic signatures.

The differing legal systems of common law used in former British colonies and civil law used elsewhere in places like China, Japan and Korea have complicated international trade laws. In general, decisions concerning jurisdiction and applicable laws devolve to the transacting parties, who agree on which law applies and where a dispute is to be heard. Hence, there has been no harmonization on jurisdiction of electronic transactions across borders. The WTO and the World Intellectual Property Organization (WIPO) are available for dispute resolution, but the most difficult cases involve consumers who, unlike businesses, do not tend to have their own lawyers and are generally uninformed about laws, particularly those involving international trade. Most do not bother to read websites' terms and conditions.

Before embarking on a new initiative, governments should consult with those most likely to be affected. Sometimes, even businesses forget about this principle and neglect their customers or key channel partners. For e-payment, Visa and Mastercard introduced the secure electronic transaction (SET) protocol, but it required investments in new technology and therefore, proved too expensive for most merchants to comply.

The drafting of cyber laws should occur in consultation with various ministries, due to the wide-ranging impact of such legislation. For example, Internet usage has affected 140 laws in Pakistan. Apparently, Muslim laws of evidence, based on Shar'ia law, require that witnesses be physically present. However, Shar'ia law cannot be amended, so there are potential complications for places trying to fit cyber legislation into their existing law.

Tension exists between requirements for national security and demands for freedom of information, as per Article 19 of the Universal Declaration of Human Rights, which was

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[22] Amnesty International. 'State Control of the Internet in China', November 2002. http://web.amnesty.org/library/index/ENGASA170072002?open&of=ENGCHN.

adopted by the UN General Assembly in 1948. Even when countries have legislation guaranteeing freedom of information, most still retain exceptions to information that may be divulged, particularly when related to national security and personal information. However, two safeguards can prevent such exceptions as 'state secrets' from being too broad and undermining the legislation's intent: the tests of actual harm inflicted and the degree of overriding public interest in the information's disclosure.[23]

Policies on data privacy fall somewhere in the middle of the spectrum from generating public awareness to enacting legislation. Many now advocate self-regulation by industry because separate legislation will tend to increase business costs and may be unnecessary due to existing laws on, for instance, the non-disclosure of banking or income records. Governments should weigh the costs and benefits of enacting new cyber legislation versus amending existing laws, or promoting self-regulation. Reducing litigation and its attendant costs should be a priority. In Pakistan, for example, the government is now computerizing its land records, which had accounted for 84 percent of the country's litigation cases.

Technologies like public-key encryption and firewalls provide a measure of protection against cyber-criminals. However, technological solutions alone cannot completely safeguard information: for example, there may be theft of data from within a company. The cost of enacting security measures with the value of the information to be protected must be balanced.

Governments should institute laws to recognize digital signatures, and make electronic documents admissible as evidence in court. They should also require a subject's consent before processing data from that person, unless the information is already public, and they should provide a certificate authority for third-party services and guarantees.

Since personal data also has a value to marketers and to others who collect it, in future there should be a mechanism whereby citizens have ownership over their personal information, but can gain financially if they decide to release it to others for commercial use.

When drafting cyber laws and regulations on issues like taxation, extraterritorial jurisdiction, settlement of e-payments and resolution of disputes, Asia-Pacific countries have examples of best practices from the US and within the region. Lawmakers should also determine how the UN conventions on human rights should fit into their legal framework when incorporating cyber laws, and place draft laws onto the Internet for public discussion.

Economic Development and Competitiveness in a Globalized Economy

To take advantage of ICT developments, individual country governments must not only put their own internal policies and programmes in order, but also align these

[23] *Global Corruption Report 2003.* Transparency International, November 2002. http://www.globalcorruptionreport.org/download.shtml.

with trends evolving from an increasingly interconnected world. As part of its mission, the United Nations' ICT Task Force tries to help countries do this: to increase efficiency in implementing their ICT plans and bolster developing countries' competitiveness in a globalizing world. From this standpoint, Asia has done better than other developing regions: it continues to attract much of the world's ICT investments for productive export capacity.

Within the global context, policy makers have important decisions to make. Should all Asian countries try to attract manufacturing and build centres for research and development (R&D) as part of their ICT strategies? Or, into what sub-sector in ICT should they pour resources? The collapse of the latest WTO talks at Cancun, Mexico, has prompted a number of bilateral and multilateral trade agreements. Sri Lanka and India will soon form one, as will Thailand and the US. At least several of the participating countries at the Asian Forum are on the verge of acceding to the WTO. How will these changes in their trade status affect their ICT strategies and policies?

Countries' leaders must anticipate change before it occurs and expect that future ICT developments will make possible what today may seem little more than a dream. For example, when India began its outsourcing strategy, it initially lacked any connectivity to the US from its huge ICT outsourcing hubs in Bangalore and Hyderabad. Others have also demonstrated that countries can become part of the global value chain, and through smart applications of ICTs, move from the bottom in textile manufacturing, for instance, to more value-added areas of the supply chain.

Developing countries face unique problems in globalized markets. Their fragile domestic institutions may still rely on protection from policies like currency controls that impede the development of international e-commerce, which by definition, is borderless and involves financial payments across national borders. A lack of credit cards has also constrained the development of e-commerce in other countries of the region. However, even without widespread credit-card usage or electronically integrated banking networks, it may become easier for people in developing Asia to buy securely online. One option would involve an online billing system such as PayPal, which the online auction house eBay recently acquired. The PayPal method of online payment requires only verified email and physical addresses, and a bank account. A second option might entail payment via mobile phone—an idea being tested in Japan and potentially available to any mobile phone subscriber.[24]

ICTs have bolstered trade in the region by, for example, expanding market access and reach to new customers, facilitating logistics and streamlining customs procedures in a number of Asia-Pacific countries. At the same time, ICTs have created new digitized products and services. Growth in trade of ICT goods and services has been higher than growth in total trade, and ICT trade remains high despite an overall global slowdown. International trade across cyberspace is free of tariffs and taxes; it is likely to remain so, as any duties on e-services would be

[24] 'China's Amazon', *The Economist*, 21 August 2003.

difficult to enforce. A WTO-sponsored moratorium on e-commerce customs duties has been in place for over five years.

Whether one classifies electronic transmissions or products shipped electronically as goods or services, can affect the duties that they, in theory, could incur, and whether the General Agreement on Trade and Tariffs (GATT) or General Agreement on Trade in Services (GATS) applies. For now, they are classified as services, fall under GATS and are exempt from duties. Compared with losses in tariff revenues among developed countries, the moratorium has a larger adverse impact on the treasuries of major developing countries like China, India, Malaysia, Pakistan and Thailand, which have higher rates of import tariffs. However, the absolute value of the losses is small.

Other agreements also affect trade in ICTs. Voluntary participation in the Information Technology Agreement, signed in December 1996, obligates signatories to reduce all tariffs on IT products. During the 1990s, the worldwide share of export of ICT products by developing countries doubled to 35 percent, as multinational corporations increasingly shifted their production bases to lower-cost countries.

Countries encourage FDI as a means of transferring knowledge and technology. ICT investments from abroad also have a positive spillover effect on the production sectors of local economies. China presents probably the best case study in successfully attracting FDI and requiring explicit conditions of joint research and training as part of the package. However, a small country like Lao PDR may not have the leverage to make similar demands.

A recent survey by the United Nations Conference on Trade and Development (UNCTAD) looked at the effect of host-country policies in attracting FDI. The study found that investment incentives ranked lower than access to markets (the top priority), the policy environment, production costs, workforce competence and level of education. This confirms similar findings from the past 15 or 20 years, that developing countries frequently give away too much in hopes of getting foreign investment. The process leads to a ‘race to the bottom’ as country competes against country as to which can give the biggest or longest tax holiday. The same process repeats itself within different countries between different regions or even between different countries vying for the jobs that a new production plant or service centre might offer.

China has recently overtaken the US as the world’s largest recipient of FDI. However, one should read investment data with care: there is a fair amount of ‘round-tripping’ of money that goes from China to Hong Kong (and another tax haven, the British Virgin Islands), before returning to China for registration as ‘FDI’—a kind of tax dodge to earn rebates from apparent exports. Similarly, by a strict accounting measure, the tiny country of Luxembourg—not the US—ranked in 2002 as both the world’s leading source and recipient of FDI. Large corporate mergers and acquisitions involving multinational companies with headquarters based in that country (again for tax reasons) resulted in the accounting anomaly.[25]

China's dominance in attracting FDI becomes apparent when comparing its levels with those of the Association of Southeast Asian Nations (ASEAN). Ten years ago, ASEAN received 75 percent of US FDI in East Asia; today much of that goes to China, and ASEAN's share in East Asia has dropped to 10 percent.[26] These trends have forced the region's governments to re-evaluate their strategies. For instance, a mid-size Asian economy like Malaysia, has just a small fraction of the US$2.4 trillion worldwide ICT market: according to 2001 data from industry forecaster IDC, Malaysia accounted for only US$2 billion of the annual total. In an effort to boost that amount, the Malaysian government is now following the export focus of India and Taiwan to create jobs and help Malaysian companies market their exports abroad.

With regard to which comes first—growth or ICT development—some feel that countries must first develop their ICT industries. Developing nations should identify where they have comparative advantage in the production and export of digitized services and focus on these as areas of future economic growth. The Philippines, for example, is following India's lead by focusing on software and business-process outsourcing (BPO). BPO is a high-growth sector but potentially subjects the purveyors of the services to slowdowns in international markets from which the outsourced services derive.

The WTO has built-in inequities that developing countries have had to accept. For example, rules of the GATT do not cover textiles and agriculture. By contrast, advanced countries have been vociferous in their demands concerning TRIPS. Some developing nations have called for greater equity in international trade discussions, whereby developing countries can better protect their infant ICT industries like software and ICT-related services. However, such countries should carefully assess whether protection serves the longer-term interests of industries that must eventually compete globally.

Populous nations such as Viet Nam use ICTs as both a productive sector and enabler for development. With 80 million people, ICT manufacturing is important to create jobs. Viet Nam is emulating the strategy of its large northern neighbour, China, by initially focusing on low-end ICT manufacturing and, more recently, targeting a fledgling software industry with government support. Regardless of the strategy chosen, host governments should include executives from the local operations of multinational ICT investors in the decision-making process.

e-Commerce, particularly in services, makes international trade borderless. Increasingly, vendors can provide health, consultancy and other business services remotely, which

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[25] Sauvant, K. *World Investment Report 2003: FDI Policies for Development—National and International Perspectives* (UNCTAD, Division on Investment, Technology, and Enterprise Development, 2003).

[26] 'ASEAN to form EU-style trade bloc', *CNN Online,* October 8, 2003. http://www.cnn.com/2003/WORLD/asiapcf/southeast/10/07/asean/index.html.

allows countries and individuals to circumvent restrictions on market access related to the entry of persons (needing work visas)—a process that replaces certain modes of supply while boosting the relative importance of cross-border trade. A structural change in the exports of developing countries toward such knowledge-based services will also allow them to benefit from technological innovations. Countries should emulate China and Korea, by adopting strategies for participating in the world's most dynamic and rapidly growing sectors of computer and information services, personal, cultural and recreational services, and financial services, which in developing countries have all grown by 40 to 50 percent per year or more during the past decade.

Conclusion

There is no boilerplate for successful ICT policies and e-strategies. Policy makers in Asian and Pacific countries must identify examples of successes either within their own borders, or in other, similar countries and adapt them as necessary to fit their nation's unique circumstances. Despite this caveat, a few principles are common to most, if not all, successful approaches.

First, be specific in setting goals. Establish a baseline of indicators that characterize the present and the trend leading up to it. Formulate goals and monitor progress toward achieving them.

Second, do not re-invent what has already worked elsewhere. Use the Internet and other ICTs to research and identify best practices from other areas. For example, somewhere in the world, a cyber law already exists and addresses an issue that your country may also face. Work from that as a draft rather than starting from scratch.

Third, prioritize your objectives. Some may be in conflict; others may deserve simultaneous but separate approaches. For instance, resources going into achieving universal access promote societal equity and economic growth in the long run, but may subtract from investments needed to spur earlier, more direct paybacks for the economy.

Fourth, be patient. Policy incentives to attract foreign investment, for example, generally only influence decisions over the medium to long term. Most good policies yield their greatest results over decades, not years, and rarely in months. Analyse the stages through which other countries' successful ICT industries have passed and determine where, if any, opportunities exist for leapfrogging these stages with modern or emerging ICTs.

Fifth, let government drive ICT initiatives—with investments, but most importantly, with conducive policies to encourage private capital and entrepreneurship.

Sixth, engage stakeholders as early as possible with consultative and participatory workshops and seminars with citizens, the private sector, academia and civil society. For the general public, awareness campaigns and educational programmes may be the best tools for appropriate and productive adoption of ICTs.

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Key Questions on ICT Policies and e-Strategies

–Rohan Samarajiva

The following questions were framed for discussion at the Ministers' Roundtable which initiated the Forum. Active interventions by Ministers and Heads of Delegations on the key issues and questions provided a rich collection of ideas that are incorporated in the report of the Forum.

1.0 Research clearly indicates a correlation between ICT development and economic development, but is not conclusive on the direction of causality. Government promotion of investments in ICTs in developing countries assumes that ICTs contribute to economic growth, and that it is not necessary to wait for economic growth to drive consumption of ICTs and ICT-enabled services. How have the Ministers dealt with the inconclusive evidence of ICT causing economic development in promoting ICT investments?

Sustainable ICT development requires that users of ICTs and ICT-enabled services are capable of paying for them. When one introduces ICTs prior to the disposable incomes of potential users reaching a certain level it becomes necessary to provide subsidies in various forms. Unless the use of ICTs and ICT-enabled services increases the disposable incomes of the users quickly, sustainability can become a serious problem. In Sri Lanka, the government has taken a considered decision to promote ICTs and ICT-enabled services under the Sri Lanka Initiative knowing that the targeted user groups cannot pay the economic costs of the provided services. The eSL Initiative is premised on the increase of the disposable incomes of its beneficiaries within the five year life of the Initiative. All programs under eSL are therefore focused on creating employment opportunities for users and facilitating wealth creation opportunities for participating enterprises. This is, however, a risk that the government of Sri Lanka is taking. It would be interesting to share the thinking of Ministers on this subject.

2.0 Critics of major government expenditures on ICTs claim that ICTs will benefit only the already privileged groups in society, not the truly impoverished. How have the Ministers responded to this criticism?

2.1 A subsidiary argument is that ICTs will exacerbate the existing differentials in power among groups in society.

2.2 A different form of the above argument posits the beneficiaries of ICTs as urban dwellers, and the rural dwellers as either the non-beneficiaries or the victims of greater power accumulation in urban centers.

Effective use of ICTs require a range of endowments: the financial wherewithal to pay for connectivity, hardware and services; the educational background to use the services, including English language skills; endowments of capital in various forms to convert the opportunities identified through ICT enabled services into wealth creation. For example, e-commerce cannot benefit an agricultural producer who does not have access to agri-price and market opportunity information through real-time access to the Internet and services thereon. Even if such a producer were to have the required access, the optimal utilization of the opportunities will generally require investments in capacity and organization to engage in e-commerce.

The critics contend that only the currently privileged groups will in fact benefit from ICT promotions in that they are the only ones capable of converting opportunity into benefits. Proponents of the thesis of differential benefits to urban/rural dwellers claim that ICT promotion will deepen the gap between these geographically defined groups. Some will go even further to argue that ICTs will further exacerbate power differentials, such as in the case of mobile phones increasing the negotiating power of shore-based buyers against fishermen. Effective design of ICT promotion efforts must address these concerns in some form. The metaphor of a tide that will raise all boats is, by itself, inadequate. Countries that have relatively higher penetration of ICTs may present evidence of effects across different socio-economic groups. Countries that are in the process of designing ICT promotion programs may wish to share the design elements addressing these concerns and/or discuss how they would meet the above criticisms in the political arena.

3.0 ICTs cut across conventional boundaries, such as those demarcating Ministerial authority. What practical steps have been taken in each of the countries to reduce the resultant frictions and manage ICT projects effectively?

3.1 ICTs cut across operational boundaries between International Government Organizations (IGOs), and even sector/division boundaries within them. This can result in rivalry, duplication, and various forms of unproductive bureaucratic behaviors by different government entities backed by different IGOs or different units of IGOs. How can the leaderships of the IGOs assist the Ministers minimize the negative effects, while ensuring healthy competition of ideas?

ICTs do not correspond to existing organizational definitions, within or outside government. Anything that goes beyond telecommunications infrastructure tends to involve a plethora of other entities. For example, e-government cannot be implemented without the direct participation of the Ministry of Public Administration or equivalent and, in fact, all government organizations. The creation of a legal environment for ICT-enabled services requires the cooperation of the Ministry of Justice or equivalent and pretty much the entire police and judicial machinery. Many countries try to address the overlap problems through the creation of inter-Ministerial committees, which are unfortunately prone to delay and lowest common denominator decision making. Others have tried to back ICT implementation agencies with the authority of the chief executive of the government. Sharing of experiences on how best to manage this problem would be of significant value for the Ministers.

4.0 Research shows that ICT is most efficacious when used in conjunction with other inputs; that it is a necessary but not sufficient condition for the solution or alleviation of problems such as HIV/AIDS that are set out as Millennium Development Goals (MDGs). In relation to each of the MDGs, would the Ministers wish to elaborate on how ICT has been used in conjunction with other inputs?

To be achieved by 2015, the MDGs are:

- halving poverty and hunger;
- achieving universal primary education;
- removing gender disparities;
- reducing under-five mortality by two-thirds and maternal mortality by three-quarters;
- reversing the spread of HIV/AIDS and other diseases;
- ensuring environmental sustainability; and
- halving the proportion of people without access to safe water.

The majority has health and education outcomes as objectives and require the mobilization of several kinds of non-information and communication inputs; The MDG outcomes cannot be achieved solely by ICTs and ICT-enabled services. On the other hand, research shows that the inputs provided through ICTs can multiply the effects of other inputs. Effective mobilization of ICTs in support of MDGs, therefore, requires the coordination of resource inputs, necessitating cooperation among different Ministries and sectors. The sharing of experiences and approaches by the Ministers can be very useful.

5.0 How can gender concerns in ICTs be best addressed? Through quotas and assured representation on policy-making bodies, or through aggressive action to feed the pipeline in the form of efforts to increase participation of women in ICT entrepreneurship, education and training? Is it necessary to ensure adequate gender representation in ICT policy implementation bodies as well?

It may be generally agreed that ICT policies need to be gender-sensitive, especially in the context of economies with significant female participation. Because of the general lack of women in senior policy and industry positions, it is not always easy to ensure female participation in ICT policy making. There can also be gender bias in ICT policy implementation. Given the importance of policy implementation, one may be tempted to select key implementation personnel strictly on the basis of merit, which could perpetuate gender bias. Can the Ministers address these questions based on experience?

6.0 It is well known that the World Wide Web is dominated by content in English, followed at some distance by major European languages and Chinese. The *indigenous languages of most Asian countries are, therefore, under-represented on the Web. The dominance of English has led some to claim that English competence is a pre-requisite of effective ICT use. What actions have the Ministers considered/taken in relation to the language of the Web? Putting resources into improving English education, possibly using ICTs as a tool? Promoting the production of web content in local languages? Promoting browsers and other search tools that would privilege local content?*

6.1 What specific policy actions have been taken or are considered necessary to enable the easy use of indigenous scripts in ICT applications? Are the Asian nations that use Roman script and Arabic numerals at an advantage over those who do not?

Issues of linguistic representation have accompanied the introduction of all new media forms. Identity, which is seen as closely tied to domestic content in local languages, is seen as threatened by foreign content and international languages. Unlike the previous electronic media that for the most part recognized some forms of distance-based distinction (e.g., local TV available with smaller and cheaper antenna than satellite TV), the ease of accessing domestic content is the same as that for foreign content on the Internet. Given the necessity of using various forms of search and retrieval tools such as browsers, the local content in indigenous languages may be even "further away" than international content (e.g., local content in non-standardized script or PDF form does not get picked up by popular browsers). The conventional media policy tools of quotas for domestic content are irrelevant on the Web. It would be of great value to have the views of the Ministers on specific policy actions they have taken to address the language/local content issues.

7.0 ICTs (networking technologies, IT hardware and software) are subject to rapid change and are generally produced in a few centers (that themselves are subject to change) across the world. Examples are the current concentration of Open Source software development workers in the West Coast of the United States, R&D on mobile communication in Finland and the United States, etc. How can countries obtain the best ICTs, without exacerbating their trade imbalances? Is it possible to ignore issues of manufacturing job creation and the promotion of R&D and exports by ICT firms in the formulation and implementation of ICT policies? Even if Ministers wish to ensure greater local participation and production, do their WTO commitments allow them to do so?

State subsidized efforts to promote ICT industry growth through "industrial policy" have not generally been successful, a recent example being Japan's push to become the leader in Fifth Generation computing. Efforts such as Malaysia's Multimedia Super Corridor are less directive and less subsidy driven. Other countries, especially small economies with significant trade dependency, have for the most part conceded the need to import ICTs given their lack of economies of scale and appropriate human resources. While market interventions have worked in manufacturing, the uncertainties that affect the ICT industries made it very difficult for slow-moving governments to effectively intervene in and redirect ICT industries.

The liberal economic paradigm, which underlies the WTO, GATT and GATS, frowns on mercantilist interventions. Have the countries represented at the Forum made the requisite reservations to their GATS commitments to make mercantilist interventions possible? If they are unbound in terms of GATS commitments, are they constrained by bilateral or regional trade agreements? Or do they agree with the liberal economic paradigm?

8.0 *Countrywide deployment of ICT enabled services requires a countrywide broadband or at least a countrywide telecommunications network. How have countries represented at the Forum sought to address this problem: By the government building and operating specialized data networks? By inducing private operators to build and operate specialized networks?*

8.1 *Given the success of market liberalization, including the introduction of competition and privatization of government-owned incumbents, in increasing connectivity, it has been argued that liberalization with the establishment of independent regulation is more than adequate for the provision of communications capacity. The proponents of this view see the re-entry of government into direct supply or the wide use of direct or cross-subsidies to be inimical to the effective operation of market incentives. Have the Ministers had any experience in grappling with liberalization/government provision/subsidy choices in the context of broadband rollout?*

Countries other than the United States and the Philippines have extensive experience with government provision of telecommunications services. Generally speaking, this experience was not a very happy one and a majority of the world's countries have engaged in some form of privatization and introduction of competition to improve sector performance. The question of how to ensure the build-out of broadband capacity has seen the re-emergence of the government versus private provision issue. The government of Andhra Pradesh, well known for its IT promotion activities, has chosen the path of government provision. Sri Lanka has announced its intention to use least-cost subsidy auctions to provide incentives to the private sector to build out broadband capacity in underserved areas. A discussion of the various options, including public-private partnerships at various points in the policy continuum is seen to be of benefit.

9.0 *In light of high costs of providing connectivity and software to low-income users, there has been considerable interest among developing country governments in the potential of low-cost communications equipment operating on unlicensed WiFi bands and in open source software. What are the views of the Ministers on the use of these* *technologies and the policy/regulatory actions that are necessary to enable their use?*

In technological fields, there is always the hope of a radical technology on the horizon that will transform the economics of supply. The current candidates in telecom and IT are WiFi and open source (with perhaps distributed computing as a close contender). The early developments in both fields that were outside the market (community access provided by volunteers in the case of WiFi and "shareware" thinking associated with Richard Stallman in the case of open source) led to hopes that they could be mobilized at very low to no cost for use in developing countries. Recognition that someone must pay for services has tempered this thinking to some extent in recent times. It will be useful to discuss the commercial and non-commercial variants of service-supply models using WiFi and open source.

A related discussion pertains to government actions necessary to enable or promote these "alternative" technologies. For example, full utilization of the potential of WiFi requires governments/regulatory authorities to unregulate the 2.4 GHz and 5.8 GHz bands and to clear them of non-WiFi users. In some countries this requires amendment of legislation. It would be useful to share experiences of government actions in this regard.

10.0 Successful implementation of e-commerce and e-government requires that the users of these services have trust in the systems they use. Prevention of unauthorized intervention in e-commerce and e-government transactions, ensuring that the parties to the transactions are properly authenticated, and providing guarantees that information yielded for one purpose is not used for different purposes are key to building trust. What actions have been taken, or are being considered, by governments represented at the Forum in these three areas? How have the governments balanced the need for trust by users with the imperatives of policing illegal behaviours on the web?

There is considerable research that supports the necessity of creating an environment of trust to ensure optimal use of e-commerce and e-government services. Common sense suggests that sending tax inspectors to pursue persons who have accessed a government tax information website will discourage use and that credit card transactions on the web are likely to be reduced if there is a high probability of leakage of transaction-generated information to third parties. Governments worldwide have taken actions ranging from the enactment of data protection and privacy legislation to the encouraging of private sector self-regulatory initiatives such as Trust-e. These actions have, however, been tempered by the wishes of law enforcement authorities to maintain or enhance their investigative abilities, especially in light of the current concerns about terrorism. Debate and discussion on the appropriate balances to be struck will be most appropriate.

11.0 Should ICT policies and e-strategies include specific reference to implementation?

Implementation is critically important. Without monitoring, enforcement of schedules and deliverables, and evaluation, policies and strategies would remain dead letters. Implementation must be built into all policy and strategy activities in the ICT for development area.

Country Comparisons of National ICT Policies and e-Strategies[27]

–Gopi Pradhan

Country	ICT Developments	ICT Policy	WTO issues	Regulatory Frameworks
Bhutan	- Teledensity 3.1% - Internet since 1999 - Network digitization in progress - Rural connectivity being pursued - Mobile phone introduced - Establishment of Ministry of Information and Communications (2003) - Development of ICT White Paper based on Digital Opportunity Initiative (DOI)	- Ministry of Information and Communications - National ICT Policy - Sector ICT Policies formulated - Bhutan Information Technology Strategy (BITS), 1999 - ICT Master Plan (2001)	- WTO accession under discussion and progress - GATS important component	- Bhutan Telecom Act, 1999 - ICT Act and Media Act to be submitted to National Assembly (2004)
Brunei	- Teledensity almost 100% - Two telecom service providers - Jabatan Telekom Brunei/Telecommunications	- Brunei Information Technology Council—chaired by Minister of Communications	- Member since 1995	- Authority for Info-Communications Technology Industry Order, 2001 (AiTi)

[27] Full reports from 14 countries received during the forum are available at http://www.apdip.net/asian-forum/country.asp

	Department is fixed-line provider (corporatizing to be Telekom Brunei Bhd or Bru/Tel) - DST Communications Sdn Bhd (DST) is GSM provider - 100% digital systems - International connectivity through fibre-optic submarine cabling and satellite earth stations	- National IT Strategic Plan—IT, 2000 - e-government, e-business and e-Brunei (e-society) strategy - Development of Eco-cyber Park to be linked to Asia Pacific Information Infrastructure (APII) and Global Information Network (GIN)		- The Telecommunications Order, 2001 - The Telecommunications Successor Company Order, 2001 - Brunei Info-communication vision
Indonesia	Target by 2005 - 50% villages connected - 250,000 telecentres - 20 million Internet users - 10 million PCs and fixed line telephones	- Ministry of Communication and Information's Strategic Plan - National ICT Vision - High Level ICT Coordinating Team - ICT Policy and Strategy, 2004 - SISFONAS (National Information System) - Five Priorities Programmes	- Member since 1995	- Draft law on Free Access to Public Information - Draft law on Information and Electronic Transaction

Country	ICT Developments	ICT Policy	WTO issues	Regulatory Frameworks
Lao PDR	- Teledensity 1.31% - Mobile 2.02% (2003)—nationwide coverage - GSM, CDMA to start soon - Fibre optic link with Viet Nam and Thailand part of CSC project - Master plan on telecom drafted up to 2020 - High cost of Internet—high import tariff of PCs - e-government project underway	- Science, Technology and Environment Agency - Established National ICT Policy and e-Strategy Task Force with five Working Groups consisting of government, agencies and private sector	- Accession under process with support from ASEAN and US	- Universal Banking service initiative (under process, to be completed by 2005–2006)
Maldives	- Teledensity 10.85% - Information Technology Development Project (ITDP) - Government Network of Maldives (GNM)* - Multipurpose Community Telecentres (MCT) being planned and developed - 30% overall telecom access	- Ministry of Communications, Science and Technology - National ICT Policy in process - National Centre for Information Technology (NCIT), 2003—policy implementation	- ICT services in process of being liberalized - Preparation for gradual implementation of WTO recommendations on liberalization of service sectors	- Telecommunications Authority of Maldives established - Regulatory framework will be in place

	including mobile	- Administrator of GNM - Telecommunications Policy 2001–2005 in place		
Mongolia	- Teledensity 5.4% (2002) - Universal Service Obligation Fund - Network digitization in progress, 90% complete (2003) - Cellular growth significant —1800 users (1996) to 235,000 users (2002) - Seven ISPs - 'Erdemnet' a popular network for education and culture - 'Establishment' of IT training centre under Science & Technology University of Mongolia (2002)	- Ministry of Infrastructure - ICT Development, 2010 adopted by government - Medium Term Strategy and Action Plan in place - ICT Policy and Coordination Department (2003) - Master Plan for rural telecom development, 2020	- WTO member since 1997 - Liberal trade regime - Liberalized ICT sector (including telecom) - Privatization of Mongolia telecom prioritized - Cyber laws will be in place	- Communications Law, 2001 - Communications Regulatory Committee established, six members of the Communications Regulatory Commission (CRC) nominated by PM - Draft IT Law and Laws on Information Security in progress
Nepal	- Email subscription growth ~150% per year (1995–2002) - 22 ISPs	- Ministry of Science and Technology - High Level Commission for Information Technology	- WTO Member since 2004 - Desire to have equal access to markets outside - Submissions to WTO:	- Telecommunication Regulations Act, 1997 - Nepal Telecommu-nication Authority manages and

Country	ICT Developments	ICT Policy	WTO issues	Regulatory Frameworks
	- Teledensity 1.4% (2003), expected to increase to 15% by 2017 - Six VSATs, eight radio paging service provider - ~50% of 3,914 Village Development Commissions (VDCs) have telephones (Feb, 2002) - Fibre optic network planned - 70,000 mobile subscribers (mid-2003)—low due to high cost	- National Communication Policy, 1992 - 15 strategies - National Strategy Paper on ICT (National Planning Commission) - Telecommunications Policy, 1999 - IT Policy, 2000 - BOT emphasized (permitted FDI up to 80% stake) - Currently Telecom policy being revised to suit expansion of ICT applications and industry	1. Schedule on tariff concession 2. Schedule on commitments in services 3. Legislative action plan 4. Action plan on customs valuation, trade-related aspects of IPR - Market expected to be liberalized by 2004	regulates telecom services - Electronic Transaction and Digital Signature Act (ETADSA), 2057 (Nepali year) - Copyright Act, 2059(Nepali year) - No regulations yet on content
Pakistan	- Teledensity 2.87% (2003) - Mobile density 1% (2002) - 1,700 cities have Internet access (2003)	- Pakistan IT Commission - 11 Working Groups under auspices of IT Policy (2000) - e-government considered extremely important	- WTO member since 1995 - Fully-open competition in telecom since 2002 - Telecom Deregulation Policy approved - Supportive of Intellectual Property Rights Laws—have amended Copyright	- Pakistan Telecommu-nications (Re-organization) Act, 1996 Electronic Transactions Ordinance promulgated (2002) - Electronic Crimes Act, 2003 under preparation

			Laws, Patent Ordinance and Trademark Laws - Telecom Deregulation Policy approved (2003)	
Philippines	- Teledensity: mobile 19.36% , - fixed-line 4.17% - Mandatory interconnection and improvement for the provision of local exchange services - Strong contributor to national gross growth - Internet users 1.5 million (Jan–June 2001) to 4.2 million (Jan–June 2003)—2% of population - 'IT21', National IT Plan for twenty-first century, launched in 1998 - GISP—Government Information Systems Plan adopted in 2000	- Commission on ICT - Information Technology and e-Commerce Council (ITECC, 2000) is policy body—represented by public and private sectors and chaired by President - National Information Technology Plan (1994) - Department of ICT (DICT) will be policy-making body after passed by law - National IT Plan (1998) - IT21	- WTO member since 1995 - Telecom industry liberalized - One of the first countries to enact e-commerce legislation - International satellite policy - Partial deregulation of leased lines services - Deregulation of value-added service industry - Commitment to ASEAN in ICT	- Public Telecommunications Policy Law, 1995 (RA 7925) - Electronic Commerce Act of the Philippines (RA8792) - Convergence Law pending - Re-organization of National Telecom Commission (NTC) - Creation of Department of ICT (DICT) - IPR Code, 1998
Samoa	- Teledensity 6.6% - SamoaTel Ltd (100%	- Ministry of Communication and Information	- Accession to WTO under progress	- Postal and Telecommunication

Country	ICT Developments	ICT Policy	WTO issues	Regulatory Frameworks
	government-owned) principal provider of postal and fixed-line telecommunications - Telecom Samoa Cellular Ltd., joint venture of government and Telecom New Zealand Ltd for cellular—license up to 2007 - Three ISPs - 25–50% offices and telecentres, less than 25% homes connected to Internet - Installation of fibre-optics, microwave, wireless local loop technology island-wide - Digital services offered	Technology (MCIT) - Communications Action Plan (1999) - National ICT Steering Committee formed—responsible for developing ICT policies and strategies - Government approved National ICT Policy—2002 - Communication sector undergoing reforms with help of World Bank	- Samoan Communication services identified as non-compliant to WTO (monopoly regime)	Services Act, 1999 - Internet Act, 1997 - World Bank Reform Project to address required regulatory issues
Singapore	- Mobile teledensity—81.7% - Internet penetration—43.5%	Ministry of Information, Communications and Art - National Computerization	- WTO member since 1995 - Full liberalization of telecommunications	- Electronic Transaction Act, 1998 - Evidence Act, amended in

	- Almost 100% broadband in homes, most public and commercial buildings have broadband access - Common application—Singapore ONE - Use of Smart Cards, biometrics and pilot applications - Successful e-government and e-citizen initiatives - Connected Singapore, 2003 - Fixed-line teledensity—45.7%	Plan, 1980—implemented by National Computer Board - National IT Plan 1986 - IT2000 (1992)—vision for Intelligent Island concept - Connected Singapore Master Plan (launched March, 2003) - Objectives of Infocomm 21—new vision of twenty-first century • Infocomm Hub • Business online • e-Government • Citizens online • Talent capital • Pro-business, pro-consumer	market (2000) - Full competition in ICT sector	1995 - Computer Misuse Act, 1993 - Internet Code of Practice, 1997 - Copyright Act, 1987 - Data Protection Code - Media Development Authority—reconstitution of Singapore Broadcasting Authority
Sri Lanka	- Teledensity 8.0% - Three fixed-line operators - Four mobile phone operators - 32 ISPs - Telephone services to 595	- Ministry of Economic Reforms, Science and Technology - National Computer Policy, 1983 - ICT Roadmap through eSL	- WTO member since 1995 - Liberalized international voice telephone - Telecom regulatory commission to promote fair competition	- Telecom Regulatory Commission - ICT Act (No 27), 2003 establishes ICT Agency of Sri Lanka (ICTA—2003) - Science and Technology

Country	ICT Developments	ICT Policy	WTO issues	Regulatory Frameworks
	rural sub-post offices underway	Initiative - Objectives of eSL policy, 2003 • Implementation • Infrastructure & environment • Human resource • e-Government • ICT for development	- Intellectual Property Act No 36 supersedes No 53 of 1979 and conforms to WTO and TRIPS.	Act is parent regulatory instrument under ICTA functions - Evidence Act No 14, 1995 - Computer Crimes Bill - Code of IPR, Act No 52, 1979, amended 1997
Thailand	- Teledensity of 13.1% (Q1, 2003) - Mobile density of ~30% (Q2, 2003) - Average Internet growth ~58.3% per year (1999–2003) - Internet use 26% in urban and 6% in rural areas	- Ministry of ICT established in 2002 - IT2010 Policy (2002)—with timeframe 2001–2010 towards knowledge-based society and economy (KBS/KBE) - National ICT Master Plan 2002–2006 with seven strategies	- WTO member since 1995 - Gradual approach towards liberalization—mainly state-owned - Copyright Act B.E. 2537 - Trade Secrets Act B.E. 2545 - Trademark Act B.E. 2534 - Patent Act B.E. 2535 - Privatization of telecommunication providers to prepare for full liberalization in 2006	- Radiocommunications Act B.E. 2498 (A.D. 1955) - Frequency Allocation Act B.E. 2543 (A.D. 2000) - Telecommunication Business Act B.E. 2544 (A.D. 2001) - Two independent regulatory bodies being formed 1. National Telecommunications Commission 2. National Broadcasting

				Commission - Electronic Transaction Act (April 2002)
Timor-Leste	- BOT (build, operate and transfer) concession awarded to Portugal Telecom International (PTI) by government - Creation of Timor Telecom by PTI - Government preparing network for Internet-based government services and facilities	- Ministry of Transport, Communications and Public Works - Lack of human resources considered most important policy issue in ICT - Lack of infrastructure and facilities	- No process to WTO accession	- Autoridade Reguladora das Comunicações (ARCOM)—responsible for all telecom activity - No other regulatory establishments will be addressed in 2004

Chapter **Two**

ICT Adoption/Diffusion, MDGs and the Pro-Poor Human Development Approach

— Tariq Banuri

Abstract

There is both optimism and scepticism on whether technological development, especially in the areas of information and communication, possesses the ability to help reduce poverty and inequality. While optimists point to the spurt of economic growth associated with the emergence of ICTs, pessimists note the exacerbation of inequality, precisely because of unequal access to the new sources of productivity. The real question is not whether but how technological change affects poverty. This chapter starts with the debate on the benefits of technology to human development. The three generations of technological innovation periods are also described. The chapter focuses on the role of ICTs in the various MDGs to which the international community, in particular developing countries, subscribe. It ends with a discussion of how ICTs in general, can facilitate human development and reduce poverty. Special mention is made of the role of civic entrepreneurship.

ICTs and Human Development

"The new information and communications technologies (ICTs) are among the driving forces of globalization. They are bringing people together, and bringing decision makers unprecedented new tools for development. At the same time, however, there is a real danger that the world's poor will be excluded from the emerging knowledge-based global economy." Kofi Annan

Can technological development, especially in the area of information and communication, help reduce poverty and inequality; and if so, how? There is both optimism and scepticism on this point, with the optimists pointing to the economic growth spurt associated with the emergence of ICTs, and the pessimists noting the exacerbation of inequality precisely because of unequal access to the new sources of productivity. Bill Gates, the founder of Microsoft, put the issue starkly when he asked whether the Internet could do anything for a starving child. Answering the question in the negative, he decided to switch his philanthropic endeavours from the provision of PCs for rural school children in poor countries to support for food production, health, education and poverty eradication.

Briefly, there appear to be three approaches to development, which we refer to using three metaphors: the river, the house and the tree. The metaphor of the river refers to the market, driven inexorably by the power of gravity and the gradient, individual preferences and the invisible hand as it were, and requiring no external force except the removal of obstructions in order to irrigate every area. In this hydrological model, every social goal is derivative from the primary goal of economic growth, which is supposed to drive everything else before it. In practice, however, while the market has been singularly successful in achieving aggregate income growth, it has not been successful in reducing inequality, eradicating poverty or protecting the environment.

A major goal of alternative approaches is to assert the existence of other goals, which do not follow necessarily from the goal of economic growth: poverty eradication; equal opportunity and income; provision of basic human needs; gender equality; and environmental protection. In a ground-breaking paper, the management experts, C. K. Prahalad and Stuart Hart[1] have shown how the corporate world which uses 70 percent of the energy and natural resources of the planet, caters mainly to the top five percent of the income groups in the world. They go on to argue, that while it is possible for the concerns of the bottom 40 percent (the bottom of the pyramid) to be addressed, it requires process innovation rather than product innovation.

An alternative approach to development is policy reform which, like the building of a house, requires a blueprint or plan to which actions can be tailored given the requisite political will. Alternative goals in this perspective require additional policy instruments and clear political support. However, although there is considerable rhetorical support for poverty eradication and other social or environmental goals, the practice often falls short. One possibility is that political will is evolving slowly as the gravity and resilience of the problem are beginning to be recognized. An alternative interpretation is that the very belief in the metaphor of the river—the market—directs energies towards aggregate goals rather than to distributive or egalitarian ones.

The third metaphor is that of the tree which like the river, has its own internal logic of growth, but unlike the river, requires nurturing and rooting in order for its internal logic to be realized. This leads to a very different concept of policy: neither the removal of obstacles (as under the market-led approach) nor the implementation of a pre-conceived plan (as in the case of the policy reform scenario) but the building of capacity for the tree to realize its own potential.

In other words, these three metaphors provide different interpretations of the inherent potential of technology, different interpretations of the failure of the

[1] Prahalad, C. K. and Hart, S. L. *Strategies for the Bottom of the Pyramid: Creating Sustainable Development* (presented at The World Resources Institute's fourth annual Sustainable Enterprise Summit, 19 September 2000. Washington DC, USA), http://www.wri.org/meb/wrisummit/pdfs/hart/ pdf.

otherwise manifestly potent technological changes in reducing poverty, or inequality, and different approaches to policy.

A key problem is that the three approaches are often associated with different 'policy communities'. The economists often tend to favour the market approach, and advocate the use of policy only to remove market obstacles. Technical experts tend to see the world through the eyes of the planner, who deploys policy and resources towards certain ends based on a coherent blueprint or model. Finally, civic entrepreneurs—who may formally be associated with the government or private sector as often as with NGOs—often view the problem in terms of social capital and the capacity for collective action. In the case of ICTs, a major problem has been the lack of linkages among these three policy communities.

Asia's Special Situation

For three distinct reasons, Asia is an extremely interesting case for evaluating both the promise and impact of current trends and measures of human development goals. First, notwithstanding an envious aggregate growth record, the performance in human development has been highly variable, and poverty, lack of access to education and health care services, an imbalanced gender dynamic and a rapidly deteriorating natural environment characterize the socio-economic situation of many countries—as norms rather than anomalies.

Second, and somewhat paradoxically, there is extensive experience with highly successful alternative approaches to poverty eradication, championed by highly charismatic individuals. While these programmes are quite diverse in their approach and orientation, they share a number of common features. The most important is the emphasis on building social capital—that is, the development of knowledge and institutions that engender cooperation, trust and collective action. For example, the basic approach of community development programmes in urban as well as rural areas, is to encourage communities to form local organizations comprising all adult members of the community. These participatory organizations are obliged to hold general body meetings every month in order to make collective decisions on developmental and other matters, save a certain proportion of their incomes and engage in social learning. In return, the support programme helps mobilize financial, technical and managerial resources to support their development efforts.

This brings us to the third interesting feature of recent history, namely, the development of aggressive and coherent national policies and action plans in many countries for the harnessing of ICTs for development. The telecommunications infrastructure in the region has improved vastly over the previous decade; Internet usage has risen dramatically, mainly in the metropolitan areas[2]; cellular phone usage has mushroomed; and educational and skill development programmes have been established.

[2] Wolcott, P. and Goodman, S. E. *The Internet in Turkey and Pakistan: A Comparative Analysis.* (Center for International Security and Cooperation (CISAC), Stanford University, December 2000).

On the face of it, therefore, the ground could not be more ready for the adoption of ICTs for poverty eradication. However, despite the very clear potential for synergy, there has been little progress in bringing ICTs and poverty eradication together. Part of the reason is the very different conceptions of the policy communities that influence the two regimes. The ICT policy community is oriented primarily towards infrastructure enhancement (including expansion of coverage, subject to available resources) and skills training. The pro-poor community, on the other hand, has concerned itself mainly with social mobilization and the building of social capital, often as a means of overcoming barriers produced by the lack of access to technologies and services.

Yet, a little reflection reveals the underlying problem. The action plans have focused mainly on creating conditions in which the private sector can take advantage of the opportunities provided by the enhanced communications infrastructure and skills. However, experience has also taught us that these conditions do not automatically lead towards pro-poor solutions; rather, the fundamental problem is one of adapting the resource, so that it becomes relevant to the needs, strategies, capabilities and concerns of the poor. Just as the meta-knowledge of dwarf varieties had to be incubated in local research stations and worked on by social mobilizers and extension agents in order to become the Green Revolution, so does the meta-knowledge of the ICT revolution needs to be adapted to the local context and needs to produce another wave of social transformation in poor regions.

The Development Experience

Human development refers to an approach to social and economic transformation that places human beings at the centre. The concept has been applied to highlight residual concerns regarding the evolution of the process of economic transformation under capitalism, both in developing and developed countries. Whereas conventional approaches are oriented almost exclusively towards aggregate economic growth, labour productivity, capital accumulation and industrialization, human development seeks to draw attention to the ostensible goal of these developments, namely, the meeting of human needs. In this regard, attention has focused variously on poverty and poverty eradication, inequality in income and opportunity, access to basic needs and social services, environmental concerns (with their consequent impact on human health, productivity, long-term sustainability and ecological integrity) and discrimination and exclusion (especially of women and minority populations).

Critics of the development process have raised the issue in a variety of forms and forums, starting with the expression of concerns about persistent poverty and rising inequality, the inability to meet basic human needs or improve the quality of life, the disempowerment of the poor and vulnerable, the loss of environmental integrity, the threat to cultural autonomy and the legitimization of malgovernance. With each of these critiques has come an alternative formulation of desirable development, including equitable development, real development, sustainable development and human development.

This is not the place to go into an extended discussion of these debates which have been reviewed elsewhere.[3] It is enough to make three points. First, notwithstanding the unprecedented growth in world income and world trade over the last half century, a large part of the global population continues to be excluded from the economic, technological and social benefits of this growth. Since 1950, world income has grown by a factor of five and world trade by a factor of 12. Yet, more than 1.2 billion people continue to live on incomes of less than a dollar per day. This poverty is not only in terms of incomes but also and more importantly, in terms of access to basic services: educational and health services; clean water and sanitation; adequate and reliable energy resources; a clean and healthy environment; protection of life and property; and such essential prerequisites of quality of life such as social capital, credit, technology and human resources.

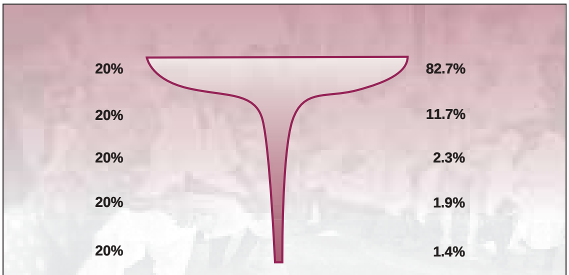

Figure 1 **Haq's Inequality Champagne Glass**

An important indicator of the mismatch between the enviable growth record and the deplorable record on the meeting of human needs, is the astonishing increase in global inequality of income and wealth. In 1989, when the UNDP published its first *Human Development Report* under the leadership of the lae Dr Mahbubul Haq, it drew attention to global inequality in the form of the now famous champagne glass (see Figure 1), which showed that the richest 20 percent of the world population received 83.7 percent of world income—about 60 times the 1.4 percent received by the poorest 20 percent.

- 1950 → 2000
  Over 5x increase in global output
  Nearly 12x increase in world trade
- 1950—Haves 30x over the Have Nots
- 1989—Haves 60x over the Have Nots
- 2000—Haves 80x over the Have Nots

Figure 2 **Globalization & Inequality**

UN figures also show that in 1950, this ratio was only 1:30, while in 2000, it had increased to 1:80 (see Figure 2). Such a dramatic increase in inequality on top of an already highly unequal income distribution would not be acceptable in any functioning polity, no matter how authoritarian or coercive. Indeed, poverty eradication is at the top of the global agenda. In recent years, all of the mainstream economic institutions—including the World Bank, most regional

[3] Banuri, T. 'Modernization and its discontents'. In: Marglis, F. A. and Marglis, S. A., eds. *Dominating Knowledge.* (Oxford: Clarendon Press,1990).
Banuri,T. 'Development and the Politics of Knowledge: A Critical Interpretation of the Social Role of Modernization Theories in the Development of the Third World'. In: Marglis, F. A. and Marglis, S.A., eds. *Dominating Knowledge: Development, Culture and Resistance.* (Clarendon Press, 1990).

development banks, UNDP and even the G8 summit—have described poverty eradication as one of the their central goals, if not the central goal.

Second, the dramatic emergence of ICTs in the 1990s has given rise to both optimism and pessimism, as far as poverty eradication is concerned. On the one hand, it has boosted income and productivity as well as consumer comforts (and discomforts!), and therefore holds the promise of further economic expansion. On the other hand, information has become a resource or an asset like other productive assets (for example, land, capital, energy), and access to this asset is distributed even more unequally than to others—because of the uneven availability and quality of infrastructure, language barriers, barriers of training and capacity, and those of relevance and user-friendliness.

The conventional development framework draws attention precisely to this disadvantage—in addition to the pre-existing disadvantages, namely, lack of access to land, water, education, electricity, mechanical power and organizational skills—and calls for actions to bridge the gap. These actions tend to cluster in two areas: infrastructure expansion and skills provision; to redress inequality in access; and to equip disadvantaged individuals with skills for moving out of poverty. This conventional approach is quite consistent with the overall philosophy of governmental intervention in the area of ICTs which also not coincidentally, focuses on infrastructure expansion and capacity-building. The only problem with this approach, is that it has not worked very well as a means of poverty eradication and achievement of human development goals. The best illustration of this failure, is the experience with electricity—a technology whose evolution and promise bears a striking resemblance to that of ICTs. Even 120 years after the first commercial use of electricity, large populations of the world still lack access to reliable and affordable electricity supplies, notwithstanding the persistent rhetoric of universal coverage, rural electrification and energy security. There is no guarantee that existing infrastructure-driven initiatives would lead to a narrowing of the gap in access to information resources within a reasonable span of time.

The Human Development Approach

There is, however, an alternative approach, which starts not with infrastructure or skill development, but with social capital. Variously described as the pro-poor approach, sustainable livelihoods approach, sustainable human development approach or community development approach, this model views the poor not as the passive and patient recipients of the by-products of a development process that starts elsewhere, but as active agents who need the tools to initiate and sustain an autonomous process of social and economic change. The model is based on the premise that the solution to poverty lies not in charity but in empowering communities to undertake collective action to address and solve their own problems. Accordingly, this approach starts not with a survey of the weaknesses or deficiencies of the poor, but with an assessment of their strengths, assets, coping strategies and adaptive mechanisms. Its purpose is to help build up these strengths and assets in order to enable the poor to become more effective in the pursuit of their objectives.

It needs to be recalled here, that technology in general, and information technology in particular, has been a central element of the strategy of community development programmes. While the idea of cooperative self-help efforts is not new, the impetus that it received in the 1950s and 1960s had much to do with the fact that a productivity-enhancing technological package—namely, the Green Revolution technology—was available to provide a manifest economic incentive to the rural population. Unlike infrastructural programmes that depended on the external infusion of financial resources and whose impact was often short-lived, the technological package had a long-term and continuing positive impact on rural incomes.

It also needs to be stated here, that at a structural level, the Green Revolution was also a form of information technology. It was simply the provision of information to rural farmers—information that they did not have access to otherwise. What the community development programme accomplished in effect was the creation of an effective system of communication (in other words, communication technology), that helped disseminate the benefits of this information technology to a large group of farmers. More importantly, the community development programme coupled this technological package with a programme of social intervention, which led to a more equitable and sustainable impact. As the growth potential of this technology has begun to taper off, there is a need for a new engine of technological change, both to support economic progress and to strengthen the social base of pro-poor programmes.

In other words, the pro-poor approach is relevant to the issue of information technology and the digital divide in at least two ways. First, it constitutes a social infrastructure (a social web, as it were) that can channel access to information technology. Second, ICTs can be viewed as the next wave of productivity-enhancing innovations which have always and everywhere been associated with successful anti-poverty programmes. Community development programmes rest invariably on a technological base, namely, something that enhances the quality of life, improves earning capacity and justifies investment in collective action.

The Orangi Pilot Project (OPP) example shows that where a technological option is not available, it will have to be discovered through painstaking and thorough research. Today, however, a technological breakthrough exists which offers the promise of revolutionizing social and economic conditions through information (a future possibility is biotechnology and the genomic revolution, but we are still some years from its widespread use and application). In other words, proper development of IT solutions can provide grist for the mill of pro-poor community development programmes; in turn, such programmes can help ensure that the benefits of technological development are distributed evenly and are consistent with the goals and objectives of disadvantaged areas. Again, it is desirable that a concerted effort be launched to combine the potentials of pro-poor programmes with information technology development.

This approach suggests that the role of knowledge in eradicating poverty entails more than just skill sets that can enable and facilitate economic activity or access to economic opportunities (such as computer-operating skills). It entails access to information as a means of empowerment including the cognizance of civil, personal and property rights, political participation, and engagement with the media. The harnessing of ICTs to the meeting of human development goals could be undertaken by combining them with community development initiatives. The focus needs to be on collective as well as individual capacity (in that order), while infrastructure provision can often be left to a combination of state provision, community initiative and private sector participation. In simpler terms, this approach pays greater attention to the demand side than the supply side and to access to information, rather than communication. However, this is a matter of relative emphases and choice of entry points, rather than mutually exclusive options.

The Role of Technology

As such, there is sufficient reason to be optimistic about the potential of ICTs for poverty eradication. One rather obvious reason is the role that technological elements have played in virtually every poverty eradication effort.

ICTs and the Digital Divide

"…a reign of scientific intelligence… [leading to] a world divided into a minority ruling in the name of knowledge and an immense ignorant majority…. And then, woe unto the mass of ignorant ones." Mikhail Bakunin

The significance of ICTs is two-fold. On the one hand, ICTs improve the speed, efficiency and effectiveness of decision processes, and on the other hand, assist in the proliferation of knowledge. The rise of ICTs as a component and indeed, as a major contributing factor of globalization is one of the defining features of the contemporary period. Manuel Castells[4] termed the contemporary period the age of the 'informational society', which he believed had succeeded the industrial society. Much of the attention in this regard has focused on the enabling technologies that have helped create this age: telephone; fibre optics; submarine cables; satellite transmission; computer circuits; PCs; wireless; GPS; digital cameras; and most importantly, the Internet; associated with a host of new practices, including e-commerce, cheaper and faster access to information and a variety of multimedia solutions. However, the technology elements of ICTs include not only the material 'hardware' (telephones, computers, satellites), but also the software (applications, GUIs, software code). A leading textbook on economic development defines the role of technology in the following words: "technology encompasses all the skills, knowledge and procedures for making, using and doing useful things. It consists of a series of techniques and involves relationships between hardware (for example, mechanical processes) and software (managerial, marketing techniques)."[5] It is indeed 'a series of techniques for doing useful things'.

The special aspect of information technology is the speed with which it has been absorbed. *The Political and Economic Weekly* of May 1999 noted this fact when it said, "If 50 million is taken as a measure to make a technology ubiquitous, then the

[4] Castells, M. *The Rise of the Network Society,* 2nd ed. (Oxford: Blackwell, 2000).

[5] Meier, G. M. *Leading Issues in Economic Development,* (New York: Oxford University Press, 1995), p. 368.

automobile took some 30-odd years to reach this level and television, 20. The Internet, however, has taken only five, and is well on its way to doubling that number in less than two years more." In other words, not only is the Internet a powerful technology; it is also fast-paced, at least in reaching the already developed areas.

In this regard, the term digital divide has been coined specifically to refer to the widening gulf between the IT haves and the have-nots. The literature classifies different countries as innovators or leaders (mainly OECD member countries), adopters (many of them in Asia, especially the newly industrialized countries and selected regions in India and China), and the excluded or latecomers. This distribution is highly correlated with incomes, although there are exceptions. Current trends suggest that this gap may be widening along all relevant dimensions of access to information technology.

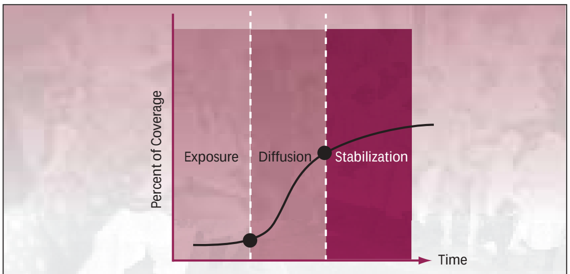

Figure 3 Process of Technological Diffusion

Figure 3 provides a schematic picture of the process of technological diffusion. The literature characterizes this process as a logistic curve with the standard three phases: exposure, diffusion and stabilization. The initial exposure leads to a slow process of adoption, but after a turning point (shown as a red blob in the lower left corner of Figure 3), the pace of adoption speeds up until it reaches a 'mature' level (shown as another red blob towards the upper right of Figure 3), after which it levels off. The 'mature' level may extend to virtually the entire population, although this may only be a subset of the entire population of the globe. In a sense, the problem of poverty is that the process of technological diffusion has stabilized at a level that still excludes almost all of the rural and sub-metropolitan areas of the South.

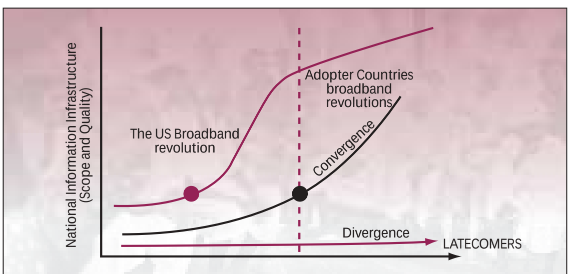

Figure 4 The Promise & Peril of the Internet

If we turn to Figure 4, we see that the turning point in the US broadband revolution arrived very early, and the process may already have reached maturity. The adopter countries followed a few years later and are well on the way to reaching stable levels. However, the excluded countries are still far from a turning point in the adoption process, and may remain so for the foreseeable future. In a way, the aim of the poverty eradication initiatives is to bend the diffusion curve of the excluded countries, so that it begins to converge towards the paths of the more technologically advanced countries.

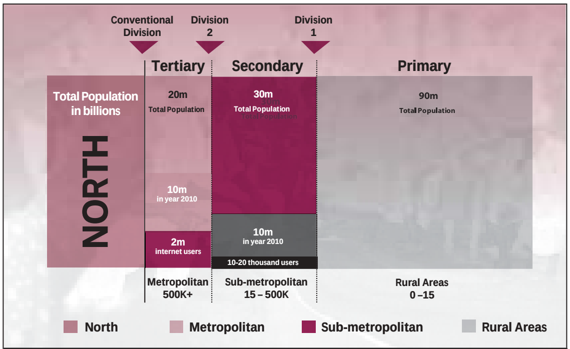

Figure 5 **Digital Divide in Pakistan 2001–2010**

However, there is a deeper dimension to the digital divide, namely, that it is a far more significant attribute of the distribution of productive resources within a country than it is internationally. The essential divide is between rural and urban areas within developing countries. In the latter, there is a secondary divide between those in the metropolitan areas, and the inhabitants of sub-metropolitan towns and cities (see Figure 5). Although the cost of information and communication services in metropolitan areas is high in comparison to local incomes (though not by international standards), the availability and quality of infrastructure, bandwidth, training facilities and a culture of expertise in software and information systems is fairly well developed and can be compared with those in advanced countries. However, the rural and sub-metropolitan areas are another story altogether. Here, the situation is much the same as with energy resources.

The point is that conventional approaches to development cannot resolve this problem. The conventional approach is best described as a hydrological model, the model of a river, in which economic development, technology, finance, productivity, prosperity, social services and consequent improvements in the quality of life, start at a centre (that is, centres of innovation in the North) and then gradually spread out to irrigate other areas, initially the non-metropolitan areas in the North and selected metropolitan regions in the South, gradually and ever so slowly extending to the non-metropolitan areas in the South. There are many problems with this model, but the major one that concerns us here is that it is too slow and unreliable. As mentioned, 100 years after electricity became available in commercial form, rural and sub-metropolitan areas in Asia and Africa still do not get reliable, predictable and affordable forms of energy. The pace of infrastructure expansion is driven by the availability of public resources, and the availability of public resources is determined increasingly by the ability of users to pay for the resultant services. Similarly, the corporate world has structurally been unable to address the needs of the bottom of the pyramid.[6] Thus, neither the government nor the market, has the capacity, in the absence of other actions, to provide for the poor. The result is that areas with low incomes cannot compete with high-income areas for attracting resources or infrastructure, and will have to wait an inordinate amount of time in order to be able to share in the benefits of development.

[6] Prahalad, C. K. and Hart, Stuart L. *Strategies for the Bottom of the Pyramid: Creating Sustainable Development* (presented at The World Resources Institute's fourth annual Sustainable Enterprise Summit, 19 September 2000. Washington DC, USA), http://www.wri.org/meb/ wrisummit/pdfs /hart /pdf.

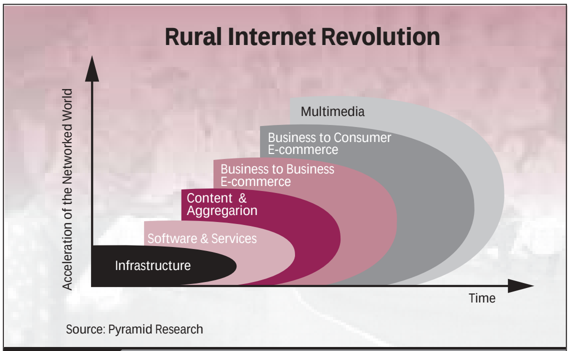

Figure 6 The Path through the Internet Revolution

One difference is that the conventional model of technological diffusion is built around infrastructural provision. On the face of it, this emphasis appears justified. For example, in the Internet revolution the initial expansion was in infrastructure and services, followed by software and services, content and aggregation, B2B e-commerce, B2C e-commerce, and finally multimedia (see Figure 6).

The problem, however, is in applying this model to rural areas of developing countries, where infrastructure cannot expand at a rate faster than the public sector investment programme can accommodate—constrained as it is by the fiscal and payments crises. The result is that the diffusion process will, by and large, exclude the rural areas from their ambit.

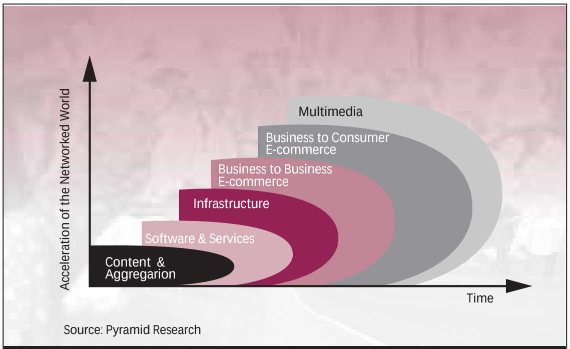

Figure 7 Reconfigured Path: Rural Internet Revolution

The pro-poor model provides an alternative approach towards technological adaptation. This model would start not with the supply side (the infrastructure), but with creating the capacity to demand the resultant services from the given infrastructure (social capital). A simple schematic for the alternative Internet revolution is shown in Figure 7 in which content and aggregation come first, followed by software and services, and then infrastructure (as needed), followed by the remaining elements of the process.

The idea here is rather simple: information technology should not be viewed as a consumer good to be provided through a state subsidy. Rather, it should be viewed as an investment good, a productivity-enhancing intervention, for which the demand depends directly upon its productivity-enhancing impact. If it can be transformed into a productivity-enhancing investment, there would be sufficient demand for it in the rural areas, and the relevant services and infrastructure can be provided by the private sector. However, in order for such demand to be generated, it is critical that there is sufficient content that is of relevance, interest and (economic) value for the rural population. At this moment, such content either does not exist, or if it does exist, it is not in a form that is readily accessible and meaningful for the rural poor. Thus, the impact of ICTs on the poor as consumers, producers or targets of public policy is limited or even negative.[7]

These two interpretations are not meant to be mutually exclusive. Obviously, infrastructure is of extreme importance. However, infrastructure alone is not enough. Just as commercial entrepreneurs are needed to exploit the opportunities created by infrastructure for economic growth, civic entrepreneurs are needed to exploit the opportunities created by infrastructure for poverty eradication. Civic entrepreneurs have the will and the capacity to harness the potential of technological developments in the service of the poor—civic entrepreneurs like Norman Borlaug in the case of the Green Revolution and Akhter Hameed Khan in the case of low-cost sanitation.

In this interpretation, a key assumption is that at any point in time there is sufficient latent demand in rural areas for technological products. Several arguments can be advanced in support of this assumption. Currently, the rural areas in poor countries consume a significant volume of durable and other consumer goods from the 'modern' economy. Ashok Khosla has provided results based on consumer surveys in India, which show a growing consumer demand for a variety of products. More than 70 percent of the rural households in India own transistor radios, bicycles and wrist watches; more than 60 percent own or consume plastic shoes, tooth powder and cooking oils; over 50 percent consume electric fans, sewing machines, motorcycles, kerosene stoves, ghee, leather shoes and tea; over 40 percent own quartz watches, black and white television sets and cassette players; over 30 percent have invested in pressure cookers, electric stoves, toothpaste, bulbs and aerated beverages; and over 20 percent have colour television sets, refrigerators, and gas stoves.

Relevant content

Poor people's information needs are vastly different from those of the existing cohort of Internet users in Pakistan. For example, a website that creates awareness and shares knowledge about basic health issues facing rural populations, in a format palatable to people with limited education levels, is potentially a high-traffic website. Interviews with people who have worked in rural support organizations revealed that basic information, such as how to prepare saline supplements from powder for patients with diarrhoea, is in short supply in some poor communities in Pakistan. Unfortunately, content to this effect, whether Internet-based, or radio or TV-based, is difficult to come across.

Software and solutions

Existing software and solutions (including search engines) are targeted towards the needs of urban and more affluent regions, rather than the needs of poor communities and regions. There is a need to engage universities, the private sector and government agencies to develop appropriate solutions. Besides productivity-enhancing information, targeted initiatives may also help develop software and infrastructural solutions for enhancing the poor's access to social services (health and education),

[7] Buyssolo, M. and O'Connor, D. 'Part One: Technology's Contribution to Poverty Reduction: Technology and Poverty Mapping the Connections'. In: Braga de Macedo, J. and Chino, T., eds. *Technology and Poverty Reduction in Asia and the Pacific,* (Manila: ADB, 2002).

enabling the targeting of anti-poverty programmes, improving the quality of governance and facilitating access to credit, technology and other resources needed for development.

Dissemination and outreach

Currently, there are inadequate mechanisms for dissemination and outreach in rural areas regarding the potential of IT for poverty eradication. However, the existence of pro-poor NGOs in a large number of villages, provides the social infrastructure on which such a dissemination system can be built. In addition, these mechanisms must involve the private sector (through franchising or other mechanisms), educational institutions, radio and television, and others.

Obstacles of language and literacy

Given the low literacy rate as well as the very limited familiarity with English, much of the available content is not accessible to rural populations. In Pakistan, Internet content in Urdu, the national language, is scarce. Websites that do offer Urdu content are slow to load because they contain scanned images of the Urdu script as there is no standard Urdu script for computers. Since 2000, some viable solutions to this problem have emerged, such as the Inpage software. However, the standardization, as well as the deployment of solutions and content, will take time.

Infrastructure and access

The absence of reliable telephone connections, adequate bandwidth and associated services, create an additional obstacle to access to information resources. Governmental subsidy or incentive programmes can help overcome these barriers through alternative technologies and processes (for example ku-band satellite hookups, third-generation wireless Internet, and others). This would be easier if the demand for content and software had developed to the point that the provision of infrastructure is a viable enterprise.

Cost of hardware

While Internet accessibility has expanded, Internet access is contingent also on machines that can dial-in to ISPs. In Pakistan, the cost of a low-end personal computer that fulfils basic functionality, is in the range of Rs 15,000–25,000, which is beyond the means of a large majority of the country's population. More importantly, it is more expensive for the poor to maintain this hardware because of poor quality of utilities and services—such as electricity and repairs.

Information, Communications and Knowledge

At the heart of the division between the conventional and pro-poor approaches is a dissonance in the perception of the role and potential of technology in general, and information and communication technologies in particular. The technology policy community has focused attention primarily, even exclusively, on communications. In contrast, the approach of the pro-poor groups is consistent with a primary emphasis on information and knowledge.

An important distinction is between information technology and information as a factor in the production process. The former refers mainly to the Internet and associated technological processes, which, as is now widely recognized, has direct relevance for economic activity: for example, the Internet economy directly generated revenues of $300 billion in the US economy in 1999. However, the role played by information in the production process is much larger. This can be illustrated by highlighting two issues: first, the value of output today is highly dependent on its 'information content'; and second, the production process has changed because of the emergence of IT.

The inequality is produced not merely by the lack of physical access to the relevant resource (energy or information), but by the inability to use the resource in a manner that justifies the cost and the access. It pertains to the mismatch between cultural, political and economic systems with the direction of technological development. It is this pattern that is being repeated. The unequal access to energy a century ago was indeed, reflected in differential patterns of personal consumption and mobility, but the more profound difference lay in the ability to re-engineer production systems to corner the market for the new resource. In the same manner, the unequal access to ICTs is reflected in personal consumption and forms of communication, but the more profound impact on the prospects of the poor stem from their inability to turn the resource to their use, to re-engineer their production and marketing systems, and to access not only information but also knowledge.

By information, we mean any data gathered in any way—with no inherent qualitative connotations and no underlying assumptions about integrity or reliability. In contrast, knowledge connotes the understanding obtained through one's own or other peoples' studies and observations of reliable information. 'Knowledge therefore, also connotes analysis and deduction while information at best only permits induction'.[8] Since 'knowledge is the sense that people make of information and is infused with the insights, expertise and capacities of those who have it', it plays a critical role in people's ability to process, interpret, evaluate and deploy information in their own context, in pursuit of their own interests.[9]

A single-minded focus on enhancing the access to technology could be useful in some contexts, but we should not be surprised to discover that it has failed to make a dent in the human development agenda. First, the infrastructure will not reach everyone; and second, even if it does, the binding constraint is elsewhere.

First, knowledge is not neutral. Considerable literature in South Asia has looked at the distributional consequences of the Green Revolution, especially the manner in which it skewed the distribution in favour of the larger landlords and against smallholders and tenants.

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[8] Sharma, A. B. *Information and Communications Technologies (ICT): Towards Knowledge Communities for Poverty Alleviation,* (Bangkok: Asian Institute of Technology, 2002).

[9] Lloyd-Laney, M. *Making Knowledge Networks Work for the Poor.* Final Report of ITDG Workshops in Zimbabwe, Sri Lanka and Peru, (ITDG, March 2003).

Second, the neutrality or bias of knowledge provision depends critically on the medium through which it is transferred. Conventional extension systems tended to be biased in favour of larger and more educated farmers. In contrast, community development programmes, which invariably deployed green revolution technology in poverty eradication efforts, tended to favour smallholders, tenants and landless workers. The construction of an appropriate institutional mechanism for the transfer of knowledge is critical in the determination of distributional benefits.

Third, knowledge neither exists nor flows in a vacuum. It requires a supportive institutional structure. In the case of the Green Revolution, this included a sophisticated complex of institutions that undertook research, education, extension, credit provision, input procurement and dissemination, after-sales services and the creation of an overall favourable policy environment. Most of these ingredients are missing in the current situation.

Fourth, the opposite of knowledge is not ignorance. It is not as if farmers or poor people know nothing. They have a system of knowledge that enables them to cope with enormous uncertainties—economic cycles, price variability, pest attacks, weather changes, ecological disasters, policy and governance failures, and even the cycle of developmental windfalls and withdrawals. Additional knowledge needs to be structured so that it strengthens and supports rather than undermines these coping and adaptive strategies.

Fifth, the gradual diffusion of technology reflects both its adaptation to the coping ability and the distillation of components that provide a direct economic benefit.

The Millennium Development Goals (MDGs)

In September 2000, countries of the world gathered for the Millennium Summit under the auspices of the UN to reaffirm their commitment to a series of goals—some long-term, some immediate—for sustainable human development. In particular, persistent concerns about the failure of conventional development to meet human needs led them to adopt a set of eight independent goals to be achieved over the next 15 years. These MDGs serve as useful benchmarks and provide a meaningful framework for assessing progress towards human development in the areas of the most urgent priority for developing nations.

MDG 1: Poverty eradication

The first and in many ways, the core goal, is cutting in half the incidence of poverty, hunger and food insecurity by 2015. The Millennium Summit defined poverty as the proportion of people whose income/consumption is less than one dollar per day. The MDGs recognize that poverty is at the root of human development, and that the other strands of the goals—health, education, gender and environment—are a means to further the objective of eliminating poverty (see Table 1). Since this issue has been discussed above at some length, it will not be repeated here.

Table 1. *A Regional View of MDG 1*

MDG Goal

One—Eradicate extreme poverty and hunger (1995 data)
Goal 1 targets: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day.
Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

	Pakistan	**India**	**Sri Lanka**	**Bangladesh**	**Thailand**
Population below $1 a day (%)	31	44.2	6.6	29.1	—
Poverty gap at $1 a day (%)	6.2	12	1	5.9	—
Percentage share of income or consumption held by poorest 20%	9.5	8.1	8	8.7	—
Prevalence of child malnutrition (% of children under five)	38.2	53.2	32.9	57.4	17.6
Population below minimum level of dietary energy consumption (%)	—	—	—	—	—

Source: World Bank (2002) *World Development Indicators 2002.* (As reported in the World Bank Group's MDG country tables: http://www.developmentgoals.org/Data.htm#CT).

MDG 2: Achieve universal primary education

By 2015, children everywhere, regardless of gender, should be able to complete a full course of primary schooling. The links between ICTs and education have been the source of a growing amount of literature. Since education is a social interaction that requires the communication of information and knowledge, the natural synergies between education and ICTs are obvious.

ICTs increase the effectiveness of the education process through cheaper and better multimedia and interactive tools, enhancing the teaching element of education service delivery and improving its administration (the planning, monitoring and evaluation of education). The impact of ICTs on the substance of education is a matter of intense optimism with an emerging consensus that identifies ICTs as critical instruments in promoting the development of higher cognitive processes.[10]

Although illiteracy and lack of access to education is borne of many factors, poverty—of income and of opportunity—may be the most vital. Similar relationships exist between education and other social factors, particularly gender and demography (young population and the urban-rural divide). On the other hand, the use of ICTs is a capital-intensive paradigm. Financial capital may be among the least important kinds of capital intensity required for ICT use, given that ICT infrastructure is the domain of the growing nexus of the public and private sector profit motive. ICTs require much more than money

[10] Hughes, M. in Byron, I. and Gagliardi, R. *Communities and the Information Society: The Role of Information and Communication Technologies in Education,* (International Bureau of Education, UNESCO, 2001).

Table 2. *A Regional View of MDG 2*

MDG Goal					
Two—Achieve universal primary education (1999 data) Goal 2 target: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.					
	Pakistan	**India**	**Sri Lanka**	**Bangladesh**	**Thailand**
Net primary enrolment ratio (% of relevant age group)	—	—	97	78.4	81.4
Percentage of cohort reaching grade 5 (%)	—	59.7	—	—	97.1
Youth literacy rate (% ages 15–24)	56.2	71.8	96.7	50	98.8

Source: World Bank (2002) World Development Indicators 2002. (As reported in the World Bank Group's MDG country tables: http://www.developmentgoals.org/Data.htm#CT).

for their deployment. They require a critical mass of human capital, and a viable social context for their use. The greatest risk of integrating ICTs into education—whether at the substance or the process level—exists in the possibility of imbalances between the deployment of ICTs and education needs, particularly universal primary education. More specifically, the application of the correct ICTs can yield enormous benefits to universalizing education, whereas the application of irrelevant ICTs stands to weaken the education superstructure.

ICTs can also potentially widen the divide between the educated and the illiterate, since ICT use itself is skewed along the same lines as education. The correlative nature of the digital divide and the education divide, therefore, represents a potentially damaging nexus that, unless mitigated with explicit and meaningful intent, will almost certainly increase the imbalance.

MDG 3: Promote gender equality and empower women

Elimination of gender disparity comprises a number of goals, including bringing about equality in primary and secondary education by 2005 (in terms of enrolment as well as literacy), the share of women employed in the non-agricultural sector, crude economic activity among females and representation in parliament.

This is not to say, however, that gender disparity is a problem of poverty. On the contrary, while the absolute level of health and education outcomes for girls are strongly related to economic conditions, the disparities between females and males are not. According to a recent World Bank report, 'unlike many indicators of standard of living and even many social indicators such as enrolment ratios, gender disparity is not correlated with level of income in South Asia (particularly Pakistan). While the level of female mortality falls with rising incomes around the world, the

Table 3. *A Regional View of MDG 3*

MDG Goal					
Three—Promote gender equality (1995 data) Goal 3 target: Eliminate gender disparity in primary and secondary education, preferably by 2005 and to all levels of education no later than 2015.					
	Pakistan	**India**	**Sri Lanka**	**Bangladesh**	**Thailand**
Ratio of girls to boys in primary and secondary education (%)	—	69.5	99	95.2	—
Ratio of young literate females to males (% ages 15–24)	53.7	77.7	99.5	64.7	99
Share of women employed in the non-agricultural sector (%)	7.5	—	30.7	—	44.2
Proportion of seats held by women in national parliament (%)	—	—	—	—	—

Source: World Bank (2002) World Development Indicators 2002. (As reported in the World Bank Group's MDG country tables: http://www.developmentgoals.org/Data.htm#CT).

ratio between male and female child mortality does not appear to be related to income. Gender disparity is not a problem of poverty'.[11]

Although constrained by a host of social, economic, political and cultural factors, women have benefited from the use of ICTs. The magnitude and scope of those benefits have largely been limited to both very small recipient groups and sub-groups, or to very specific issues and events.

ICTs represent both a challenge and an opportunity for the empowerment of women. The risks are obvious. Given the skewed distribution of rights, education, health and economic opportunity, in the absence of significant and sustained interventions to ensure equal opportunity for women in accessing the new technologies, the increased prominence of ICTs would serve only to further marginalize women. On the other hand, the potential for women's empowerment through ICTs is also tremendous. They can help women overcome perhaps one of the most significant barriers to the achievement of education, knowledge and information, namely, cultural and other restrictions on women's mobility. ICTs can play an important role in eliminating the physical distance between women and information/knowledge, and in overcoming cultural barriers to access to education.[12]

Empirical evidence from pilot projects in Africa (particularly Uganda) suggests that in situations in which an investment has been made in the development of relevant

[11] Filmer D., King, E. M. and Pritchett, L. *Gender Disparity in South Asia: Comparisons Between and Within Countries*, (Washington DC: The World Bank, January 1998).

[12] Commonwealth of Learning, International Development Research Centre, and New Zealand Agency for International Development, *Gender Issues and Barriers to Information and Communications Technologies: Summary Meeting Report,* 24–26 June 2002.

and easy-to-understand content, ICTs have facilitated income generation and the opening up of new economic opportunities for women.[13] Health information portals catering to women's needs are another potentially exciting area of ICT intervention for women's empowerment.

Perhaps, the most significant positive impact of ICTs on women's empowerment, is the enhanced capacity of women's advocacy and support groups to exchange information, coordinate action and undertake concerted advocacy campaigns. Civil society and activist organizations routinely receive dozens of emails on information on emerging areas of concern. The Human Rights Commission of Pakistan has been able to extend its outreach precisely because of email and the Internet. An initiative that was critical in making such interaction possible is the construction of email lists and list archives.

MDGs 4, 5 and 6: Reduce child mortality, maternal mortality, incidence of HIV/AIDS and infectious diseases

This set of goals pertains to health-related indicators. It calls for the under-five mortality rate to be cut by two-thirds between 1990 and 2015—an achievement that will rely on three main indicators: (*a*) under-five mortality, infant mortality and the immunization of one-year olds against measles, as well as the closing of the significant gender gap in child mortality; (*b*) a reduction by three-quarters of the 1990 maternal mortality rate in particular, by ensuring that births are attended by a skilled professional; and (*c*) halting and reversing the incidence of HIV/AIDS—*inter alia* through the expansion of contraceptive use—as well as malaria, TB and infectious diseases.

As a barometer of human and social development, health serves a pivotal role in determining access to life itself, the quality of life afforded to people and the ability of the state and its instruments to deliver health care services. Therefore, three of the eight MDGs are health-related and serve as an indication of the centrality of health to the development paradigm. They are:

- MDG 4: Reduce child mortality
- MDG 5: Improve maternal health
- MDG 6: Combat HIV/AIDS, malaria and other diseases.

A number of factors are correlated with poor health statistics, including poverty, population growth and fertility, and other socio-economic characteristics. A comparative study of Brazil, Ghana, the Ivory Coast, Nepal, Nicaragua, Pakistan, the Philippines, South Africa and Viet Nam, shows childhood survival prospects to be fairly strongly correlated to the level of household income.[14]

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[13] Mijumbi, R. *ICTs as a Tool for Economic Empowerment of Women: Experiences from the Use of a CD ROM by Rural Women in Uganda.* (Expert Group Meeting on ICTs. Division of Women's Advancement (DAWN), United Nations, November 2002).

[14] Wagstaff A. 'Socio-economic inequalities in child mortality: Comparisons across nine developing countries,' *Bulletin of the World Health Organization,* 2000:78:19–29.

Table 4. *A Regional View of MDGs 4–6*

MDG Goal	Pakistan	India	Sri Lanka	Bangladesh	Thailand
Four—Reduce child mortality (1999 data) Goal 4 target: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.					
Under-five mortality rate (per 1,000)	112	—	333	—	—
Infant mortality rate (per 1,000 live births)	85	70	15.9	—	—
Immunization, measles (% of children under 12 months)	54	50	95	71	96
Five—Improve maternal health (1995 data) Goal 5 target: Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio.					
Maternal mortality ratio (modelled estimate, per 100,000 live births)	200	440	60	600	44
Births attended by skilled health staff (% of total)	—	49	95	14	95
Six—Combat HIV/AIDS, malaria and other diseases (1999 data) Goal 6 targets: Halt by 2015, and begin to reverse, the spread of HIV/AIDS, and the incidence of malaria and other major diseases.					
Prevalence of HIV, female (% ages 15–24)	0.0	0.6	0.1	0	2.3
Contraceptive prevalence rate (% of women ages 15–49)	—	51.8	—	53.8	—
Number of children orphaned by HIV/AIDS	7,900	—	600	610	75,000
Incidence of tuberculosis (per 100,000 people)	117	185	59	241	141
Tuberculosis cases detected under DOTS (%)	2	6	76	25	40

Source: World Bank (2002) World Development Indicators 2002. (As reported in the World Bank Group's MDG country tables: http://www.developmentgoals.org/Data.htm#CT).

Social services delivery tends to rest on the coming together of various stakeholders and actors that fulfil various functions, even in the most simplified scenarios. In poverty eradication, for example, the provision of microcredit is a complex process, involving community activists, the credit provider (usually supported by a donor) and the borrower. In education, the dynamics of interactions are also multifarious, with convergence among school administrators, teachers, parents and students. Health service provision involves two parties: the medical practitioner and the patient. Although health care systems are significantly complicated by issues such as access to drugs, surgical instruments, health care planners and administrators, ultimately the provision of service is a transaction between doctor and patient. Moreover, health is an immediate and desperate condition, more so than poverty (which a patient may have known all his or her life) or illiteracy.

The ability of medical practitioners to access and make use of ICTs in a professional capacity, is an obvious indirect benefit to patients. However, civic entrepreneurs in the medical profession have taken initiatives—numerous examples from across the world exist—that leverage ICTs to provide direct health care services. Some of the measures that would facilitate the harnessing of ICTs for health in general and telemedicine in particular, include:

- incorporation of ICTs as tools and as social enablers for medical students, nurses and health care managers;
- elimination of duties and tariffs on diagnostic machines like digital X-ray machines, electric stethoscopes and videoscopes;
- establishment of a public sector body that addresses national health issues through ICTs, and is staffed by members of government, civil society and the private sector;
- incorporation of investments in rural areas as a core function of telecom service providers in the post telecom deregulation era; and
- establishment of a legal and regulatory framework recognizing the validity and privacy issues involved in telemedicine.

The nature of the HIV/AIDS virus is of particular pertinence to ICTs. The spread of HIV/AIDS globally has long been associated with the acute lack of awareness about the disease. More importantly, the use of instruments to inhibit the spread of the disease is largely contingent upon the effective identification of risk factors and sources of the virus, and the deployment of learning mechanisms to aid in the use of measures to combat HIV/AIDS. Information dissemination is critical in the battle against HIV/AIDS. ICTs can therefore, play a central role in combating the disease.

As in the case of education, gender and children's rights, the reconstitution of the ways and means by which society creates, retains and disseminates knowledge is critical to achieving the target of eliminating HIV/AIDS by 2015. ICTs can play a vital role not only in the dissemination of HIV/AIDS-related information but also in the context of access to services and amenities that can help erode taboos, facilitate early identification and provide access to essential health care and drugs.

MDG 7: Ensure environmental sustainability

To 'ensure environmental sustainability' includes specific goalposts, such as cutting in half by 2015, the proportion of people without sustainable access to safe drinking water as well as the more general goals of integrating sustainable development principles into country policies and programmes and reversing the loss of environmental resources. These targets in turn rely on making progress on the following indicators.

Table 5. *A Regional View of MDG 7*

MDG Goal					
Seven—Ensure environmental sustainability (1999 data) Goal 7 targets: Integrate principles of sustainable development into country policies and programmes and reverse loss of environmental resources. Halve, by 2015, the proportion of people without sustainable access to safe drinking water. By 2020, to have achieved a significant improvement in the lives of at least a 100 million slum-dwellers.	**Pakistan**	**India**	**Sri Lanka**	**Bangladesh**	**Thailand**
Forest area (% of total land area)	—	—	—	—	—
Nationally protected areas (% of total land area)	4.8	4.8	13.5	0.8	13.9
GDP per unit of energy use (PPP $ per kg oil equivalent)	4.2	4.7	8.1	10.8	5.3
CO_2 emissions (metric tons per capita)	0.7	1.1	0.4	0.2	3.2
Access to an improved water source (% of population)	—	—	—	—	—
Access to improved sanitation (% of population)	—	—	—	—	—
Access to secure tenure (% of population)	—	—	—	—	—

Source: World Bank (2002) World Development Indicators 2002. (As reported in the World Bank Group's MDG country tables: http://www.developmentgoals.org/Data.htm#CT).

Achieving this goal is contingent on a host of economic, social, cultural and human factors. In many cases, the impact of policy on the environment has been significant with civil society playing a critical role in ensuring the accountability of economic and civic actors on issues that affect the environment. Environment refers not to a single entity or issue but rather to a galaxy of economic and social resources and interactions that shape the physical surroundings of human beings (water, air, soil, natural resources, plant and animal species), and possess a number of possible uses on which human beings are dependent in all of their activities.[15] Its centrality to the development paradigm is rooted in the concept of sustainable development, or 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.[16]

Environmental sustainability represents a broad domain of issues and areas that have varying degrees of severity. An Asian Development Bank study identifies four major environmental problems facing the region, arising from population pressure,

[15] Bretschger, L. and Smulders, S. *Explaining Environmental Kuznets Curves: How Pollution Induces Policy and New Technologies,* No. 2000–95, Center for Economic Research, October 2000.
[16] World Commission on Environment and Development (WCED), *Our Common Future.* (New York: Oxford University Press, 1987).

lack of development and the development process itself.[17] These problems are:

- land degradation and depletion of natural resources;
- unsustainable environments in human settlements due to inadequate shelter, sanitation and water supplies;
- pollution of soil, water and air; and
- consequences of global warming due to excessive discharge of greenhouse gases into the atmosphere.

The argument for leveraging ICTs in pursuing environmental sustainability is the same as that for the other MDGs. ICTs accord information and knowledge with the speed, critical paths and flexibility that other mediums do not. Environmental sustainability, unlike HIV/AIDS, cannot be argued to require only information 'dissemination'. It can also be pursued through functional adjustments and changes with the help of ICTs. A free-access website that tracks industrial emissions, for example, can serve as a self-monitoring tool for private sector businesses, with warning emails to the relevant offices when emissions approach a critical limit as specified, in the case of Pakistan, by the National Environmental Quality Standards (NEQS), or in the case of India and Indonesia under the PROPER programme.

The intervention of technological innovations as they relate to pollution in particular, has been studied in great depth. Pollution-abating technologies themselves can serve the role of 'general purpose technologies' (GPTs)— defined as technologies 'that have the potential to affect a large part of the economy'.[18] As GPTs, pollution-abating or 'clean' technologies are instrumental in ensuring compliance with environment-friendly legislation and regulation, while concurrently sustaining economic growth.[19]

ICTs too are GPTs. The argument for the use of ICTs in development is founded primarily on the greater returns to economic activity which ICTs can generate. As in the case of other technologies, ICTs enhance the net gains arising from transactions by increasing efficiency and improving effectiveness. More importantly, ICTs bridge the gap of asymmetry in information and knowledge. The potential, therefore, of the use of ICTs in environmental sustainability, although largely untapped across the expanse of developed and developing economies, is enormous.

Take the case of energy. In the US, an argument has been made that ICTs have a net positive impact on the environment.[20] Between 1996 and 1998, the US economy grew by eight percent, while energy consumption grew by only one percent. This

[17] Jalal K.F. *Sustainable Development, Environment and Poverty Nexus,* (Office of the Environment, Asian Development Bank, December 1993).

[18] Bresnahan, T. and Trajtenberg, M. 'General Purpose Technologies: Engines of Growth?' *NBER Working Paper Series Paper No. 4148,* (Cambridge, MA: National Bureau of Economic Research, NBER August 1992).

[19] Bretschger and Smulders, op.cit.

[20] Kelly, H. 'Information Technology and the Environment: Choices and Opportunities.' *The Magazine on Information Impacts (iMP),* (Center for Information Strategy and Policy, October 1999). http://www.cisp.org/imp/october99/10_99telly.htm.

decoupling was an environmental godsend because a proportional increase in energy consumption would have resulted in the production of a 100 million tonnes of climate changing gases, or the equivalent of what 70 million cars would produce in a year. Many writers trace the sources of this decoupling to the nature of economic growth, which was driven largely by the growing use of ICTs. This had several implications.

First, the IT industry—software, hardware, knowledge management and content development—is a substantial business sector in itself, characterized by the minimal use of raw materials and a high premium on intellectual or human capital, that is, knowledge. Second, and perhaps more important, ICTs have redefined the way products and services in the economy are designed, produced and operated. The economy grows not so much by adding more resources (including energy resources), but by being increasingly clever about the way these resources are used to meet real human needs. ICTs have reshaped the very notion of productivity, allowing sharp increases in the efficiency with which materials, labour and capital are used.

ICT applications such as e-commerce allow consumers to purchase goods and services from the seat of their desks rather than through the sometimes arduous commute to the marketplace. Telecommuting, an increasing phenomenon although far from universal, allows workers, especially those whose jobs entail mostly desk work, to work from anywhere. The ramifications of telecommuting are immense in the long run through both lower transportation costs and the elimination of multiple points of energy consumption (home, car/bus and office).

These areas represent some of the potential ICTs offer to achieving environmental sustainability. Of course, optimism over the application of ICTs to the environment needs to be tempered by the specific context of Pakistan, particularly in view of the risks that are posed by the socio-economic realities prevalent in the country. Just as ICTs create the potential for significant decreases in solid waste generation, they also create the potential for increased and more complex solid waste generation. ICT hardware such as computers, compact discs and television sets are among the least biodegradable products available. Although they generally have durability, the proliferation of such machinery poses an interesting challenge to environment planners in the country.

The creation and dissemination of content that relates to environmental issues poses a different kind of risk. Given that a digital divide exists in the country, along the same lines as income, education, health and gender divides, it is likely that content will be predisposed to privileged audiences. While environmental awareness and best practices are useful regardless of which segment of society they are directed to, the persistence of the digital divide can lead to increased disparities between the rural poor and the urban elite in terms of environmental sustainability. The accelerated degradation of the immediate environs of the poor, relative to those of the rich, are likely to create a feedback mechanism that reinforces itself, enhancing poverty and health issues through depleted natural resources for the poor. Therefore, the indiscriminate use of ICTs—without a focus on the content, its relevance to the audience and the audience's ability to access it—is likely to increase the divide in environmental awareness and practices, and therefore increase inequality.

MDG Goal 8: Develop a global partnership for development

The final and quite far-reaching goal seeks to foster international systems that are generally more sensitized to and supportive of developing country needs. It calls for developing 'a global partnership for development'. On a larger scale, this includes the promotion of fairer trade and financial rules, and debt relief. On a more human scale, it involves the generation of 'decent and productive work' for youth, better access to essential drugs and bridging the so-called digital divide by bringing ICTs to the poor. Youth unemployment, a key indicator for Goal 8, refers to the share of the labour force between the ages of 15 and 24 who are without work but who are available for and seeking employment.

The number of telephones in use, both fixed-line and mobile, as well as the number of personal computers, can provide an indication of a people's readiness to engage in systems or processes captured here by the term 'global partnerships'. These numbers

Table 6. *A Regional View of MDG 8*

MDG Goal

Eight—Develop a Global Partnership for Development (1999 data)

Goal 8 targets: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system.

Address the special needs of the least developed countries, landlocked countries and small island developing states.

Deal comprehensively with the debt problems of developing countries through national and international measures […].

In cooperation with DCs, develop and implement strategies for decent and productive work for youth.

In cooperation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries.

In cooperation with the private sector, make available the benefits of new technologies, especially ICTs.

	Pakistan	India	Sri Lanka	Bangladesh	Thailand
Youth unemployment rate (% of total labour force ages 15–24)	—	—	28.2	—	7.4
Fixed-line and mobile telephones (per 1,000 people)	24.2	28.4	49.8	4.6	125.9
Personal computers (per 1,000 people)	4.3	3.3	5.6	1	23

Source: World Bank (2002) World Development Indicators 2002 (as reported in the World Bank Group's MDG country tables: http://www.developmentgoals.org/Data.htm#CT).

are rising quickly, although they remain very low in many countries in the region, especially in South Asia. Similarly, the number of personal computers in use is quite low, but rising at a similar rate—from just 1.3 per 1,000 people in 1990 to 4.2 in 2000.[21]

Perhaps, the most compelling case for the use of ICTs in human and social development can be made in the context of this MDG, particularly for countries in which the statistics on poverty, illiteracy, rural access to telecom and freedom of women are still extremely adverse. Here, while ICTs such as mobile telephony can bring faster and cheaper access to economically and socially critical information and knowledge, the vision of an Internet-connected world in which mutual sharing of knowledge, resources and experiences can enrich development throughout the world, is still at a distance.

The Role of Policy

Information and communication technologies and their subset, IT, have emerged as high profile and priority areas in the public policy agenda of most countries in the region since 2000. The last decade has seen a flurry of legislative and regulatory activity to cover ICTs, especially in four distinct domains: laws pertaining to new institutional arrangements (including the establishment of public organizations and oversight bodies); laws intended to facilitate electronic communications; laws on the protection of rights; and laws to guarantee access to information, in which the little change has generally been regressive in character.

However, the focus of governmental efforts is the improvement of the quality of and access to the communications infrastructure (including the relevant skills, capacities and technologies), and the issue of the quality of and access to information *per se* has been somewhat neglected. This is perhaps not surprising for a number of reasons: (*a*) the initiative has generally been housed in the ministries of communications rather than information; (*b*) access to information requires much greater collaboration across governmental ministries than the provision of communications infrastructure; (*c*) information involves many more issues of political sensitivity than communications; (*d*) more generally, communications is more readily translatable into quantifiable goals that bear a reasonable correlation with the intended impact; and (*e*) considerable policy effort was required to restructure the hitherto government-monopolized and inefficiently managed communications infrastructure.

Most of the improvements had begun to take place on a piecemeal basis even in the absence of a coherent policy framework. These changes include selective infrastructure development, expansion of access and development of skills. The result is a sustained enhancement of the coverage as well as the quality of (both land-based and cellular) telephony, reduction in bandwidth prices, increased access to the Internet and its resources and training of IT professionals (especially at lower skill levels). Yet,

[21] ITU, *World Telecommunication Development Report and Database,* (International Telecommunication Union, 2001).

there have been few attempts to establish monitoring mechanisms for assessing performance, data collection arrangements, ensuring cooperation between ministries and agencies and overcoming the ad hoc nature of project and priority development.

Significant transformation in the activities, structures and reach of various entities had begun to take place on a piecemeal basis, even in the absence of a policy framework. In regard to these changes, civil society was and continues to be far ahead of the government. It has displayed greater awareness and more alacritous use of the potential of emerging technologies as well as greater competence in the analysis of problems and identification of solutions. To this day, use of the Internet, intranet, email, electronic data management (for example, personnel and accounting systems), and user-friendly and operational websites is far more ubiquitous in the non-governmental sector. The bulk of the training in ICT-related skills was and is still provided by private sector institutions, albeit now with government support and a modicum of regulation.

However, neither the piecemeal improvements in government-provided infrastructure, nor the equally diverse actions by civil society nor even the latter's awareness and energy is sufficient to impact the problems of poverty and human development.

A critical weakness of the policy is the absence of any explicit reference to MDGs. This derives at least in part from the primary emphasis on communications rather than information, on infrastructure rather than empowerment, on individual rather than collective capacity, and on growth rather than human development.

Impact on Human Development

Government policies in this regard have been motivated mainly by aggregate economic benefits in the shape of overall economic growth, foreign exchange revenue through software exports, enhanced provision of IT products and services to foreign entities, and the growth and development of a base of software and hardware industries. In many countries, the private sector has responded effectively to the opportunities created through external developments as well as policy frameworks. In most countries, private sector activity has preceded government action in providing IT education and training. The dramatic growth of IT education and training represents a significant public sector investment.

There is no evidence of a clear and concerted focus on human development in general and the MDGs in particular. Limiting factors such as lack of content, local languages, rural physical and telecom infrastructure, and overall poverty and illiteracy, also suggest that the economic impact of ICTs have been largely restricted to the urban elite and large businesses. Beyond this, it is difficult to discern significant direct impacts on human development, although a number of impacts can be argued to have occurred indirectly, because of the expanded use of ICTs by government, private sector and civil society entities.

Other things being the same, the reliance on and use of ICT resources is lowest in government. As mentioned, while civil society and private sector organizations routinely use email, Intranet and management systems, government organizations continue to use traditional forms of communications and management. The most visible indicator is the predominant reliance on private email addresses (especially Hotmail and Yahoo) among government officials and students and professors of public sector colleges and universities, in sharp contrast to their counterparts in non-government institutions. A major part of the reason lies in the failure to reform archaic government procedures and regulations which are consistent only with manual forms of communication, and with the failure to provide equivalence to electronic communication in the relevant laws. Examples of this failure include the persistence of an archaic, single-entry accounting system in governmental procedures, lack of infrastructure to protect electronic documents, absence of written procedures and guidelines for handling electronic transactions and delays in the operationalization of the electronics transactions ordinance 2002. As such, the expansion of use of IT in governmental institutions is incumbent upon a veritable re-engineering of governmental procedures. In the absence of such re-engineering, IT-led interventions will remain only on the surface.

The failure to adopt ICTs fully in poverty eradication and human development may have arisen from the following factors:

The public sector, as the driver and enabler of ICT adoption in the economy, has not focused on human and social development. Poverty elimination is not a central theme in the public policy infrastructure for ICTs.

However, the public sector has fulfilled its role admirably in the provision of a telecommunications infrastructure, universal Internet accessibility and a facilitative policy and regulatory framework for ICT adoption in general across sectors—all with the objective of levelling the digital playing field. Not enough time has elapsed for the discernible effects of these initiatives on poverty to be apparent.

Many public sector initiatives like e-government and infrastructure enhancement, have at best been irrelevant for the poor and at worst, failed them miserably. Instead of broadening the access of the poor to social services, e-government has narrowed it, accentuating the digital divide and enhancing the access of the urban elite to public information and services. This creates biases about the potential of ICTs in poverty elimination, particularly in civil society.

Although historically civil society has pioneered the adoption of innovation and technology in development, NGOs and donors have not taken on ICTs, particularly new technologies, with the vigour and commitment that is required—at least initially, to catalyze ICT use in poverty elimination. The knowledge criteria clearly indicate that without initial investments in new technologies, the proliferation of ICTs for poverty alleviation will take longer.

Promote Civic Entrepreneurship

Civil society has often taken the lead in adopting ICTs in the pursuit of development objectives and has pioneered several initiatives for the adoption of ICTs for human development, most of which are funded and supported by international donor agencies. At the very minimum, ICT use can help to converge disparate information resources, and present them in an easy and digestible format.

With the advent of the spectrum of ICTs as they exist today—constantly decreasing costs, constantly increasing functionality and scalability—ICTs represent among the most exciting prospects for poverty eradication. However, little effort seems to have been expended to determine how these technologies could help solve the problems faced by poor communities in urban or rural areas. The problem is not simply providing access to the technology; the problem is adapting knowledge so that it becomes relevant to the needs and concerns of the poor.

In contrast, with the explicit and overt commitment to the facilitation of private sector activity, government policies contain very little reference to NGOs or civil society organizations. The facilitation of ICT adoption by civil society has been incidental, rather than intentional. Community and village-based organizations have neither the resources nor the capacity to engage ICTs in their operations. The larger central organizations however, have both the resources and the incentives—increased organizational efficiency and effectiveness—to invest in the application of ICTs to their work.

If the MDGs are to be pursued with any degree of assurance, it will require creating a framework through which civic entrepreneurs—in government, in business and in civil society—have the resources, opportunities and incentives to harness the potential of ICTs for the poor.

Chapter **Three**

Globalization and WTO: ICT, Trade and Competitiveness

—*Susanne Teltscher*

Abstract

While the spread of ICTs across the globe has been one of the most prominent features of globalization, discussions in the World Trade Organisation (WTO) have been limited to electronic commerce, or e-commerce, and whether to impose customs duties on electronic transmissions sent over the Internet. At the same time, the use of ICTs and the Internet by enterprises has impacted the way global business is carried out, and has created new dynamics in international trade and export competitiveness, in particular in the Asian region.

With respect to the WTO debates, this chapter argues that the fiscal implications of e-commerce could be significant for some Asian countries, but the overall share in government revenue is minor. On the other hand, the ICT sector has played an important role in expanding trade in Asia, both in ICT producing and using sectors. Business process outsourcing, based on the use of ICTs and the Internet, is growing rapidly in many Asian countries, creating new export and employment opportunities. In order to fully grasp the potential of ICTs for trade and export competitiveness, governments need to put in place an environment favourable to the development of ICT-enabled services, such as encouraging the inflow of Foreign Direct Investment (FDI), reducing import duties on ICT products, ensuring a high-quality, cost-effective telecommunications infrastructure, and stepping up efforts to increase domestic ICT skills.

Introduction

It is widely recognized that the spread of ICTs and the Internet contributes significantly to an increasingly globalized and interconnected digital world, creating new economic and social landscapes and fundamentally changing the way enterprises, and economies as a whole, function. While there is general agreement that ICTs affect all sectors of society and the economy, their role as an enabler of economic development, affecting international trade and investment and creating new market opportunities for companies in developing countries, deserves special attention. This is notably demonstrated by the fact that growth in

ICT goods and services trade has been higher than growth in total trade and remains high despite an overall global slowdown.[1]

Furthermore, ICTs enable trade in other sectors by enhancing market access and by broadening the customer base, facilitating customs, transport and logistics. Also, ICTs create new services and goods that can be traded on-line, such as those in the entertainment and cultural industry.

Therefore, policies aimed at creating an enabling environment for the development and deployment of ICTs at the domestic level, need to address issues of trade, investment, industry development and e-business in general. Within the national ICT strategy framework, these policies specifically target the development of the information economy, and are complemented by cross-cutting policies such as those related to the development of the telecommunication infrastructure, the creation of a legal and regulatory framework, or the building of skills for an information society.

This chapter explores recent developments on the international trade-and-ICT agenda and discusses the policy environment that fosters ICT growth and exports in developing countries, particularly in Asia. The issue is examined within the context of the existing multilateral trade negotiations in the WTO. This chapter first looks at the WTO discussion on e-commerce and analyses the potential impact of e-commerce on customs revenues. It then addresses other relevant trade issues, such as trade in ICT goods and services and the electronic delivery of services. It provides an overview of international trade in the ICT producing and using sectors, identifies export sectors that have been particularly dynamic, such as those related to business process outsourcing, and discusses policy measures to enhance the export competitiveness of countries in ICT-related sectors. The chapter concludes by identifying necessary policy actions and linking them to the overall national ICT strategy framework.

The WTO Debate: e-Commerce and Beyond[2]

There are several multilateral trade agreements that are relevant to the deployment and growth of ICT. These include the WTO Agreement on Basic Telecommunication Services (for the telecommunication sector), the moratorium on e-commerce, the Information Technology Agreement (ITA) (for ICT goods), GATS (for ICT services and the electronic delivery of services), as well as the GATT (for digitized products). This section presents the debate on e-commerce, which has captured most of the attention of WTO member States.

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[1] 'Organization for Economic Cooperation & Development', *Measuring the Information Economy*, Paris, 2002.

[2] Much of the discussion presented in this section is based on Teltscher, S., 'Electronic Commerce and Development: Fiscal Implications of Digitized Goods Trading', *World Development,* Vol. 30, No.7 (2002), pp.1137–1158.

The topic of e-commerce was taken up formally in the WTO after the 2nd Ministerial Conference held in Geneva in May 1998. Two major decisions were made: (*a*) to impose a moratorium on customs duties on electronic transmissions; and (*b*) to establish a work programme to examine trade-related issues of e-commerce.

The WTO work programme on e-commerce has been mandated to four subsidiary bodies[3], which have examined the aspects of e-commerce as they relate to the agreements and work programme of the individual bodies. However, the debates came to a halt when they identified a number of cross-cutting issues that needed to be addressed further at a horizontal level. These include: (*a*) the classification of the content of certain electronic transmissions; (*b*) development-related issues; (*c*) fiscal implications of e-commerce; (*d*) the relationship between e-commerce and traditional forms of commerce; and (*e*) the imposition of customs duties on electronic transmissions.

In order to continue the work programme, a number of 'dedicated discussions' on e-commerce were held under the auspices of the General Council[4]. In addition, the Committee on Trade and Development organized two seminars on e-commerce[5], which allowed a discussion of the topics in a more thorough and analytical way.

Classification issue

The classification of 'the content of certain electronic transmissions' has been the most controversial, and hence most debated, issue in the WTO discussions on e-commerce. It has also held up progress in the discussions of the subsidiary bodies, especially in the Council for Trade in Goods.

'Classification' broadly refers to whether electronic transmissions, or products shipped electronically (instead of physically), should be characterized as goods, services, intellectual property or something else. In particular, it concerns the electronic transmission of data which have physical counterparts, such as books, music, film and video material and software. In the past, these so-called digitized products were shipped physically via carrier media such as CDs, diskettes and tapes. They were physically moved across borders, where they were subject to import duties. Today, and increasingly so in the future, they are being sent via datafiles through virtual networks, thereby crossing numerous (sometimes unknown) borders. The data are then downloaded onto a carrier medium, printed or stored on a computer. They can be sent to individuals for direct consumption or to retailers for distribution.

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[3] Council for Trade in Services, Council for Trade in Goods, TRIPS Council, and Committee on Trade and Development.

[4] On 15 June 2001, 6 May 2002, 25 October 2002, 27 February 2003, 17 May 2003, and 11 July 2003.

[5] On 'Government Facilitation of e-Commerce for Development' (14 June 2001) and on 'Revenue Implications of e-commerce' (22 April 2002).

Within the WTO context, there are important political and regulatory implications associated with the electronic delivery of goods and services. Depending on the classification, the trade is subject to different multilateral rules: goods are subject to the GATT, the Agreement on Technical Barriers to Trade, the Agreement on Customs Valuations, or rules of origin; while services would be subject to the GATS. Some digitized products, such as software, fall under the ITA and are thus exempt from tariffs. The underlying differences between agreements and the resulting implications for domestic policies, have been the main factors determining countries favouring specific proposals.

In general, the multilateral rules for services are still far less elaborate than the multilateral rules for trade in goods, providing countries with substantially more leeway for national policy discretion in the services trade. An important difference between the GATT and the GATS relates to general obligations. While the general obligations of the GATT include Most Favoured Nation (MFN), national treatment and a general prohibition of quantitative restrictions, the GATS includes the national treatment principle only in negotiated specific commitments and specific services. A second important difference between the GATS and the GATT is the possibility of imposing quantitative restrictions or quotas. While the GATT (in general) prohibits the use of quotas, they are allowed under the GATS (depending on the market access commitment specified in a country's schedule). Theoretically, this could mean that a country could put (in principle) a limit on, say, the number of books transmitted electronically via the Internet.

So far, the classification issue has not been resolved, although there seems to be an overall tendency towards a GATS classification. The most convincing argument for a GATS approach is the legal certainty it provides for the treatment of digitized products, and the fact that a large majority of activities related to international e-commerce will be in the services sector. The classification of digitized products as services has a number of implications:

- All member states may have to include commitments on the concerned products in their national schedules.
- There may be additional similar products in the future which will have to be taken into account.
- Importers need to compare their current import regulations under GATT with the commitment they will have to make under GATS.
- Exporters need to ensure that market access conditions will not be more restrictive under GATS for the same products.
- Since there are no customs duties on services, there could be a positive trade-creation effect and a negative trade-diversion effect; the same holds for the customs moratorium (see the following).

A critical question that remains is: to what extent are e-commerce-related services covered by an individual country's national schedule? Countries, therefore, need to review their schedules with respect to the supply of electronically delivered services in the context of the new round of services negotiations. In particular, developing countries should identify those services sectors where they have a comparative advantage in the export of electronic services. Examples of services that may be relevant for countries from the Asian region are given later in this chapter.

Customs moratorium and fiscal implications of e-commerce

The customs moratorium was agreed upon by WTO member states at the Geneva Ministerial Conference in May 1998, where ministers 'also declare[d] that members will continue their current practice of not imposing customs duties on electronic transmissions'. The moratorium was renewed at the Doha Ministerial Conference (November 2001).

So far, many countries have expressed support for a (limited) extension of the moratorium. Others would like to make the ban permanent and binding. A number of developing countries are hesitant about an extension (for example, Malaysia, India and Pakistan) and some have expressed concern over the potential fiscal and trade implications of the moratorium. They argue that, if goods that were imported physically in the past and thus were subject to customs duties, are now imported digitally and no customs duties are collected, governments could lose revenue. They also question the overall significance of the moratorium, since no country currently collects import duties on e-deliveries.

Both the classification issue and the customs ban are closely linked to the debate on the potential fiscal implications of e-commerce. If electronic transmissions are defined as services and thus exempted from tariffs, then fiscal losses will occur. However, exactly how large are the potential revenue losses? As a contribution to the debate, the United Nations Conference on Trade and Development (UNCTAD) calculated MFN tariff revenue currently collected from the import of digitized products (that is, printed matter, software, music and other media products, film and video games). The calculations show that the majority of countries that are mostly affected by tariff revenue losses come from the developing world (See Table 1). Given the higher levels of MFN rates they apply to these products, this should not come as a surprise. What is remarkable, however, is the magnitude: despite an import share in digitized products of only 18.5 percent, the absolute tariff revenue (loss) of developing countries would be almost double that of the developed countries, amounting to 64.5 percent of world tariff revenue losses for these products (See Figure 1, p92). This clearly shows that, with respect to potential fiscal losses (in absolute terms), developing countries would be much more impacted by the proposed ban. In Asia, the countries most affected include India, Malaysia, China, Thailand and Pakistan.

On the other hand, if we compare tariff revenue from digitized products to total revenue and revenue from import duties, the percentages are relatively low: for all countries, tariff revenues from these products amount to only 0.14 percent of total government revenue and 1.7 percent of revenue from import duties.[6] Nevertheless, some significant differences exist between countries, with shares ranging from

[6] 'e-Commerce and Development Report 2001' (Geneva: United Nations Conference on Trade and Development). http://r0.unctad.org/ecommerce/docs/edr01_en.htm.

Table 1. *Applied MFN Rates and Tariff Revenue on Imports of Digitized Products, 1999*

Country/ Economy	Average MFN	World MFN	Tariff revenue (US$ 000)	Country/ Economy	Average MFN	World MFN	Tariff revenue (US$ 000)
European Union	1.8	1.5	165,277	Ukraine	8.0	8.7	5,229
India	23.1	27.1	110,503	Uruguay	13.5	8.3	5,120
Mexico	15.6	12.2	104,037	Latvia	7.4	8.1	5,077
Malaysia	7.3	10.5	53,331	Cote d'Ivoire	16.3	13.6	4,370
Brazil	13.3	9.7	43,386	Indonesia	9.4	8.2	4,305
Canada	1.9	0.9	42,776	Turkey	2.6	2.4	4,297
China	8.8	7.5	40,138	Lebanon	14.7	8.4	4,137
Morocco	30.7	30.7	24,159	New Zealand	1.4	1.5	3,981
Argentina	13.6	6.8	22,677	Libya	23.7	14.3	3,173
Israel	5.9	8.0	21,800	Panama	6.8	5.1	3,152
Thailand	11.3	11.8	21,311	Slovenia	5.5	2.8	2,698
Pakistan	38.7	30.2	20,533	Rwanda	45.6	23.4	2,433
Australia	1.5	1.7	19,639	Viet Nam	16.7	17.0	2,371
Czech Republic	4.2	4.7	19,534	Zimbabwe	22.5	18.3	2,349
Korea, Republic of	4.0	3.7	18,529	Ecuador	10.8	4.5	2,209
Russian Federation	12.0	6.9	18,472	Kazakhstan	6.9	9.4	2,124
Venezuela	9.8	7.9	15,726	Guatemala	6.7	5.1	2,120
Poland	5.9	3.1	14,412	Mauritius	9.7	10.2	2,014
Nigeria	11.5	20.6	14,123	Kenya	16.2	9.9	2,004
Hungary	5.2	5.0	13,886	Ghana	12.8	7.8	1,995
Asia (other)	2.7	1.9	12,627	Burkina Faso	29.6	31.5	1,990
United States	0.3	0.2	12,050	Bolivia	8.9	7.1	1,798
Colombia	8.6	8.7	12,023	Iceland	3.9	4.4	1,717
Philippines	7.1	5.1	11,109	Lao PDR	9.3	11.8	1,715
Chile	9.0	9.0	10,817	Congo	16.0	15.7	1,512
Paraguay	11.4	10.9	9,540	El Salvador	5.4	4.1	1,480
Egypt	16.7	10.3	8,856	Trinidad and Tobago	12.0	9.1	1,480
Peru	12.0	12.0	8,811	Cameroon	16.2	9.6	1,476
Saudi Arabia	10.4	8.1	8,574	Sri Lanka	4.6	8.5	1,462
Algeria	15.3	15.9	8,085	Tanzania, United Rep. of	14.9	12.6	1,358
Tunisia	23.8	16.3	6,864	Zambia	16.4	9.5	1,323
Dominican Republic	14.7	15.3	6,695	Iran, Islamic Rep. of	6.0	2.8	1,320
Romania	12.2	6.9	5,537	Papua New Guinea	13.4	15.4	1,311
South Africa	2.6	1.5	5,414	Bangladesh	16.9	5.4	1,297

Table 1. *Continued*

Country/ Economy	Average MFN	World MFN	Tariff revenue (US$ 000)	Country/ Economy	Average MFN	World MFN	Tariff revenue (US$ 000)
Barbados	12.1	12.8	1,284	Dominica	11.8	9.1	144
Gabon	16.2	10.1	1,268	Suriname	11.6	8.5	142
Jordan	19.7	10.7	1,211	Moldova	3.2	2.5	129
Malta	5.3	3.8	1,192	Saint Kitts and Nevis	11.1	10.6	112
Jamaica	9.7	5.1	1,173	Eq. Guinea	16.2	9.1	105
Honduras	7.9	4.7	935	Grenada	11.2	4.7	102
Costa Rica	5.9	2.0	867	Brunei Darussalam	1.3	0.6	84
Belize	12.1	17.5	805	Solomon Islands	27.0	5.4	57
Uganda	7.3	6.3	799	Guyana	12.1	1.5	32
Cuba	8.0	6.3	779	Montserrat	12.2	17.4	28
Oman	5.0	5.0	725	Bhutan	16.5	16.0	27
Saint Vincent	11.2	18.4	675	Sudan	1.5	0.3	12
Nepal	8.8	7.9	603	Bahamas	0.0	0.0	4
Mozambique	19.6	13.4	564	Hong Kong (China)	0.0	0.0	0
Malawi	13.0	4.9	488	Estonia	0.0	0.0	0
Mali	14.2	17.0	476	Japan	0.0	0.0	0
Maldives	17.5	16.9	419	Kyrgyzstan	0.0	0.0	0
Belarus	12.0	5.9	406	Lithuania	0.0	0.0	0
Bahrain	5.2	2.7	361	Singapore	0.0	0.0	0
Norway	0.1	0.0	352	Switzerland	0.0	0.0	0
Seychelles	20.4	14.3	349	Turkmenistan	0.0	0.0	0
Albania	14.7	12.5	326				
Georgia	9.9	11.6	318				
Ethiopia	21.2	8.2	312	**World**	10.7	8.5	1,036,973
Madagascar	3.8	5.3	298				
Chad	16.2	12.0	293	**Developing**			
Antigua, Barbuda	11.1	8.5	290	**countries**	15.3	13.1	689,767
Nicaragua	3.6	2.2	276				
Central African Republic	16.2	9.8	266	**Developed**			
Saint Lucia	10.9	6.6	242	**countries**	3.6	2.9	347,206

Sources: Comtrade, TRAINS.
Excludes intra-EU trade.
Excludes imports which are subject to specific tariffs.
Includes economies in transition.

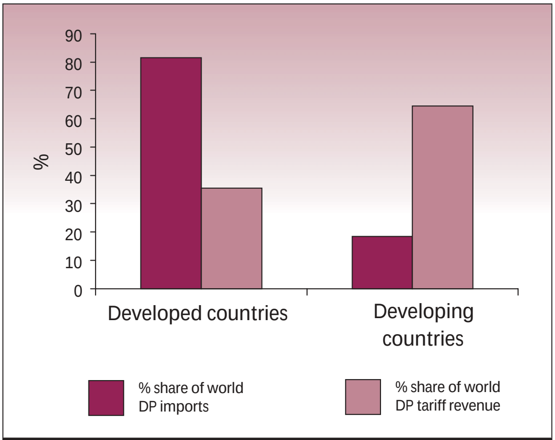

Figure 1 **DP imports and Tariff Revenues**

0–1.1 percent of the total revenue and from 0–20 percent of the revenue from import duties. Generally, customs duties as a source of government revenue play a more important role in developing countries as compared to developed countries. Hence, a reduction in customs revenue as a result of e-commerce would be felt more strongly in developing countries.

In addition to the MFN tariff, most imported goods are subject to domestic taxation, which in the case of services is usually lower, or non-existent. If these goods are imported electronically and exempted from taxes because they are classified as services, then further revenue losses would be felt. UNCTAD calculations show that, compared with tariff rates, rates for additional duties are significantly higher. The combined revenue from both tariff and additional duties would be more than US$8 billion. A large proportion of this is explained by consumption taxes levied on imports in developed countries (US$6.2 billion). If we look at the shares of these duties in government revenue, they now account for 0.5 percent of total government revenue on average, up from 0.1 percent (tariff only). Shares in import revenue have also changed considerably. The combined tariff and customs surcharges (excluding consumption taxes) now amount to 3.6 percent of the total import revenue, up from 1.7 percent (tariff only).

While domestic taxation is not subject to WTO rules, it has been addressed in the WTO in the context of the fiscal implications of e-commerce. However, a clear distinction must be made between revenues resulting from customs duties and those resulting from the collection of sales tax or value added tax (VAT). Not only do they differ in terms of international rules (customs duties are discriminatory while internal taxes are non-discriminatory), but they also take different shares in total government revenue. While revenues from customs duties still take a significant share in the budgets of developing countries, internal taxes are becoming increasingly more important for a country's total revenue collection, and the general trend is to move away from customs duties towards internal taxes. In other words, customs duties are seen as regressive, whereas VAT collection is seen as progressive. In this context, it should be noted that the EU enacted a new directive on collecting VAT on services provided by suppliers outside the EU. The directive, which has been in operation since 1 July 2003, is applied to B2C e-commerce only, as no VAT is collected on B2B transactions.[7]

To conclude the discussion on WTO and e-commerce, it seems that a decision on the moratorium should wait until the classification issue is solved. Should digitized products be classified as services (which seems to be the tendency), the moratorium becomes obsolete, since no customs duties are currently imposed on services (unless this is changed and services become subject to customs duties). At this stage, the extension or suspension of the moratorium has no major economic impact, since no countries impose customs duties on e-commerce (yet). In addition, the technical feasibility of collecting tariffs and taxes on e-commerce remains to be seen.

Services negotiations, on the other hand, are part of the built-in agenda and the Doha agenda, and are already under way in Geneva. With an increasing share of services being traded via the Internet, market access negotiations in services are strongly linked to the debate on e-commerce. A number of developing countries have shown a considerable export potential in the services sectors, including on-line services. Thus, they should identify those sectors of export potential and take them into consideration in their negotiation proposals on services.

Apart from the services trade, trade in ICT goods needs to be considered within the context of the emerging information economy and national ICT policies. In addition to ICT-related services (which fall under the GATS), ICT goods fall under the ITA and the GATT. How the ICT sector impacts on the trade and competitiveness of countries will be further discussed in the following sections.

Trade and Investment in the ICT Producing Sector

The ICT sector plays an important role in advancing the information economy and e-business. It provides essential instruments for e-business, including not only computer hardware and software but also fixed telephones, mobile telephones, telecommunication equipment and wireless transmission equipment. When the business sector starts adopting new ICTs in its operations, it relies heavily on local ICT expertise in order to fully realize all of the efficiency gains that the Internet makes possible at the level of the firm, the industry and the economy as a whole. Therefore, the existence of a local ICT sector contributes significantly to the growing e-business in developing countries.

The ICT sector was the subject of intense negotiations during the Uruguay Round. In December 1996, at the first WTO Ministerial Conference held in Singapore, 29 WTO member states (including 15 European countries) signed the ITA. Its two most important characteristics are:

[7] For further information, see http://europa.eu.int/comm/taxation_customs/taxation/ecommerce/vat_en.htm.

- It was signed as a separate document, and is therefore not a part of the 'Single Undertaking.' For this reason, participation in the ITA is not compulsory for WTO member countries and for countries that are in the process of accession to the WTO.
- It is a tariff-cutting mechanism that obliges its members to cut to zero tariffs on all products covered.

Today, 60 WTO members participate in the ITA. Since the ITA does not cover all products (for example consumer electronic products), proposals have been made to extend its products coverage (referred to as ITA II). However, no agreement has been reached so far and no product has been added to the original list.

Trade in ICT products grew tremendously over the last decade and was worth over US$ 900 billion in 2000 (See Figure 2).[8] In particular, exports of ICT products from developing countries grew at a compound annual growth rate (CAGR) of 23.5 percent over the last decade, while exports from developed countries grew at a CAGR of 10.8 percent. By comparison, total world exports grew by six percent over the same period. As a consequence, the share of developing countries and economies in transition in ICT exports, grew from 15.6 percent of exports in 1990, to 35.5 percent in 2000.

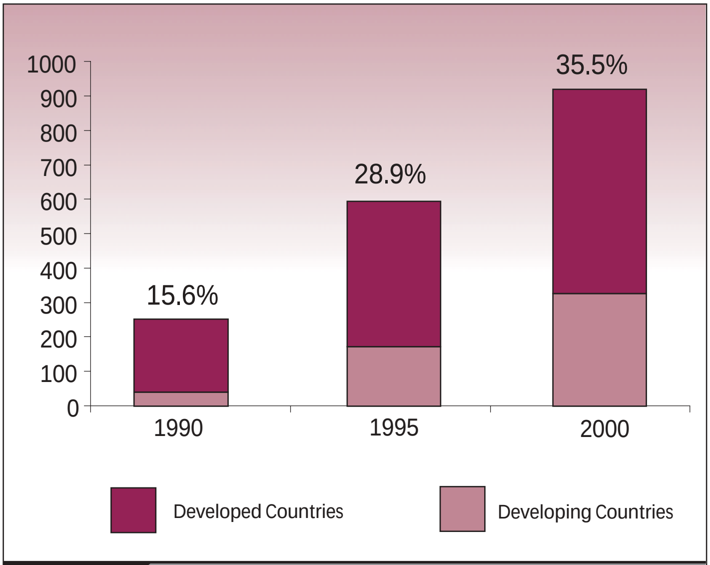

Figure 2 **Total Exports of ICT Products (US$ billions)**

ICT exports represent a higher share in the exports of developing countries, than in those of developed countries. In fact, ICT exports grew from 12 percent of the total exports by developing countries in 1990 to 22 percent of their total exports in 2000, while for developed countries the share was 10 percent in 1990 and 14 percent in

[8] 'e-Commerce and Development Report' (Geneva: UNCTAD, 2002).

2000. This phenomenon was largely a result of strategies of transnational corporations (TNCs) for locating hardware production in emerging markets, as well as efforts by developing countries to develop local ICT production capacities which resulted in important outsourcing of ICT production to those countries.

The level of tariff protection applied to ICT goods is low in developed countries (the main markets for these products), one of the factors that enabled the rapid growth of developing countries' exports of ICT goods. However, tariffs remain relatively high in the developing world, especially in the least developed countries.[9] This prevents companies located in those countries from accessing technology at reasonable costs. In order to enable manufacturers and service providers in developing countries to engage in e-business and to take full advantage of the opportunities offered by the new technologies, the tariffs levied on these products need to be reassessed.

Computer-related services exports from developing countries

Apart from the ICT goods sector, ICT services are increasingly becoming important for trade and information economy development in developing countries. For example, computer-related services were the most dynamic services export sector during the past decade, particularly for developing countries and countries in transition (see next section). Although developing countries still account for a small share in total exports of these services, their shares are growing, and will become even more visible once they start to further disaggregate their services statistics (in some countries, computer-related services are hidden in other categories).

Computer-related services play a key role in the development of knowledge-based services, as they produce high value-added services. Although developed countries dominate the computer industry, some developing countries have been successful in tapping into the computer-related services market, providing software and ICT-enabled services, and showing high export growth rates in these sectors. Besides the role the sector can play in export-led growth, computer software and services also play an important economic role in facilitating growth and development in other, domestic industries that increasingly depend on software as a core component in their design, production and distribution processes.

The role of foreign investment

Much of the growth of the ICT sector in developing countries was based on a heavy inflow of FDI during the 1990s. In order to better understand the role of TNCs in the ICT sector of developing countries, the UNCTAD secretariat undertook a survey of the determinants of investment and use of e-commerce of ICT companies in developing and

[9] The level of protection is highest in the office equipment and components sub-sectors. The reason for this is in part that some products included in that sub-sector are difficult to separate from components of an electrical and even mechanical nature. Thus, these products were not subject to the sweeping tariff-cutting exercise that focused on the ICT sector.

transition economies.[10] The survey also highlights the relationship between ICT TNCs, the local workforce and the local business sector. The results are summarized below.

First, the TNCs that are investing in the ICT sector in developing countries are doing so with a long-term objective. They choose the locations in which they invest for complex, economic and geopolitical factors, rather than short-term advantages. Moreover, respondent companies chose 'greenfield' investment as a preferred expansion method, which is a strategy that reflects an intention to create production capacity and establish a presence in the local markets of developing countries in the long term. In addition, the majority of the workforce employed in the production facilities of the TNCs is skilled local labour, which reflects a long-term commitment.

Second, ICT investment in developing countries has a positive spill-over effect on the local productive sector, which is significantly involved in the production process of the transnationals. The companies also appear to focus on increasing the competencies of their local workforce.

Third, ICT companies engage intensively in e-commerce and equip many of their subsidiaries in developing countries with e-business functionalities. ICT investment, might therefore make an important contribution to increasing e-commerce in those countries, at the same time boosting data traffic on the Internet, fuelling competition and hence potentially bringing about cost reductions in telecommunication services.

In terms of geographic preferences, ICT investment is still concentrated in Asia and SouthEast Asia. It is also important to emphasize that investment for production and research purposes which offers the best opportunities for transfer of technology is heavily concentrated in Asia. This finding is reinforced by the analysis of the factors that directed ICT investment to specific markets, which reveals that policy incentives can alter investment location decisions of transnationals only in the medium to long term. However, this picture could change in the coming years, as the new technologies become more widespread, fuelling the demand for ICT sales and investment in developing countries. A potential role for the policy maker in cooperation with the private sector and all the relevant stakeholders will then be to foster an enabling environment for e-business through the adoption of national e-strategies. The specificities of the e-strategies will differ across countries and regions, but involving the local ICT industry and the local branches of ICT transnationals in their e-strategy design and implementation, is crucial.

Dynamic Services and BPO

While the ICT sector takes on a crucial role in a country's move toward the information economy, the use of ICTs in other sectors of the economy is equally important and is slowly changing the way business is carried out.

ICTs have been particularly influential in the services industries. For example, airline tickets, international financial and insurance products are now sold on line, and

[10] 'e-Commerce and Development Report' (Geneva: UNCTAD, 2002).

customer support, data processing services and consultancy in legal, health, education and software services are provided through the Internet, thus profoundly reshaping many of the existing services industries and creating new services as the technologies develop. The increasing demand for ICT has also generated major growth in the supply of communication services, which are experiencing an expansion in all countries. Through e-commerce, the services industries have enjoyed an increase, particularly in cross-border trade. The digitization of business processes, coupled with the global reach of the Internet, has allowed companies to outsource activities and services to more cost-effective locations and to access new clients in foreign markets.

e-Commerce, particularly in the services sector, makes international trade 'borderless'. As a result, certain services that previously involved the movement of people across borders, with all its limits and restrictions, can now and increasingly so in the future be made available electronically. Examples include health, consultancy and business services. This allows countries to circumvent market access restrictions related to the entry of persons (visa restrictions), thus replacing certain modes of supply and increasing the relative importance of cross-border trade. With falling telecommunication costs, cross-border trade in these services will continue to grow. This, coupled with falling transmission costs, will also encourage the development of new services exports and some that were previously traded physically will move to digital delivery, such as trade in digitized products (see above).

All of these factors have contributed to the growth of services exports, particularly in developing countries. Traditionally, developing country exports have been concentrated in travel and transport services. These services are closely linked to the physical movement of people and goods, and hence merchandise trade. Other, so-called producer services, such as financial, insurance, communication or computer-related services, are more linked to the movement of knowledge and information. Hence, the impact of new technologies and e-commerce are much more profound in these sectors. Therefore, a structural change in developing country exports towards these knowledge-based services will also allow them to benefit from technological innovations.

'Dynamic' export services and 'rising stars'

Statistics on international trade in services show that between 1990 and 2000, developing country services exports grew faster than those of developed countries, especially in services that experienced above-average growth rates on the global market. UNCTAD calculations reveal the following services as having been 'dynamic' (that is, experiencing above-average growth rates) at the global level during the 10 year period (annual growth rates in parentheses):[11]

- Computer-related services (31%)
- Personal, cultural and recreational services (20%)
- Communication services (15%)
- Financial services (10.6%)

[11] Ibid.

- Royalties and license fees (10.4%)
- Construction services (8.8%).

A comparison between developing and developed country growth rates of different types of services exports, reveals that the growth rates in developing countries were higher than the world average in all of the dynamic services, and particularly high in three services: computer and information services (58%); personal, cultural and recreational services (53%); and financial services (41%). It is important to keep in mind, though, that global market shares of developing countries in computer and financial services trade are still very low (less than 3% respectively).

These 'dynamic' export services are, to a large extent, services that can easily be provided electronically (e-services). Computer-related services were the most dynamic export service during this time period, growing at an annual average rate of 31 percent (58% in developing countries) and gaining 23.3 percent market share.

An analysis of export competitiveness (based on market share analysis and revealed comparative advantage) in e-services shows the following:[12]

- Almost all services exports that can be defined as 'dynamic' services can also be defined as e-services (that is, can be delivered electronically).
- Developing countries have experienced the highest growth rates in the export of e-services during the past decade.
- Computer-related services exports from developing countries have been the most dynamic exports during this period.
- Although developed countries have a comparative advantage in the export of most e-services, an increasing number of developing countries are gaining comparative advantage in some e-services.
- A large number of developing countries are gaining world market share (in both relative and absolute terms) in the export of e-services, notably in communications services, financial services and royalty services.
- 'Rising stars' (that is, the most dynamic and competitive exporters) are largely developed and transition economies, and a few developing countries. However, given the high growth rates in a number of developing countries, their share in this category is expected to increase in the near future.
- Among the Asian developing countries, the most competitive are China (all dynamic e-services) and the Republic of Korea (financial and royalty services).[13]

To conclude, the global shares in e-services exports of developing countries are still insignificant and only a handful have a comparative advantage in the export of e-services. However, many developing countries are gaining world market share in the export of, for example, communication services, financial services and royalty services. This, coupled with the high growth rates of e-services exports, is likely to

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[12] Ibid.

[13] India was not included in the analysis because it classifies computer-related services as 'other business services'.

increase the number of developing countries among the 'rising stars'. Although the methods employed in the study do not provide for forecasting, one can safely conclude that developing countries that export dynamic services are less at risk of facing saturation in their export markets in the short- to medium run, compared to export services facing less demand in the world market. It can be further concluded, that given the higher growth rate of services exports in developing countries, the potential impact of e-commerce is much greater than their current share of world trade or the size of their services trade indicates.

The Potential of Outsourcing

Globalization, combined with the growing role of ICT in all business processes, has led to a sharp increase in the outsourcing of services. Business tasks that do not necessarily have to be carried out in-house (for example, because they do not require a constant knowledge of the core activities), are increasingly being outsourced to companies that can provide the same quality service more cost-effectively (increased global competition is forcing companies to produce more cost-effectively in order to maintain their profit margins).

In the late 1980s, outsourcing became common among large businesses located in the US. Originally, they were driven to look for long-term ongoing support to manage their everchanging information technology infrastructure. Large companies, whose core business was not related to ICT, such as manufacturing companies, outsourced their ICT functions in order to focus on their core business and increase process efficiencies.

With advances in network technology and high-speed data networks, as well as increases in bandwidth capacity, remote management services have emerged (that is ICT services that can be performed away from the client's location and computing technology). Companies located in developed countries have rapidly increased the scope of the operations they outsource, from single aspects of ICT to the offloading of entire business functions.

What is now called BPO refers to the outsourcing of business processes and functions in the areas of administration, finance, human resources, distribution logistics, manufacturing services, sales, marketing and customer care, to locations that can provide these services at a lower cost through high-speed data communication links, which guarantee timely delivery of data and services. BPO often involves large-scale data processing (such as that required by banks, insurance companies and airlines) in revenue accounting and payroll processing, for example. As a result of the improved global telecommunications infrastructure, companies can now choose to outsource their business processes to service providers located (almost) anywhere in the world, allowing management to focus on building core business activities and to cut back spending on office facilities and computer systems. While BPO is clearly a cost-driven process, the potential to continuously improve processes as well as service levels is an additional reason for outsourcing.

Projections for the BPO market are extremely high: it is expected to grow from less than US$300 billion (2001) to close to US$1 trillion by 2007.[14] Gartner Inc. predicts that BPO will be a US$300 billion market by 2004, with an annual growth rate (since 1999) of 23 percent. According to Goldman Sachs, by 2005, worldwide BPO will be a US$585 billion market.[15] A survey by Forrester with 57 Global 500 firms shows that more than 50 percent of the companies reported spending more than US$1 million annually on BPO.[16] Forrester predicts that the BPO market in the US will increase annually by 70 percent (between 2001 and 2006). Distribution and logistics take the largest share of the market (29%), followed by human resources (24%) and payment services (16%). Estimates and forecasts by many Internet research firms concur that in the next few years, BPO will continue to grow internationally, becoming one of the fastest-growing e-commerce and e-business services.

Moving functions, such as call centres and customer support centres providing Internet and Web enabled applications to countries with a lower cost base, have emerged as a new business model for enterprises in developed countries. As a consequence, many companies in certain developing countries (mainly India) have flourished by providing, in particular, software application development and management services to clients worldwide. With an English-speaking skilled workforce and salaries up to 80 percent lower than in developed countries, India has managed to capture a large part of the international outsourcing market. The savings linked to low-wage labour has always been a major incentive to outsource to developing countries.

The example of India demonstrates that ICT services can contribute significantly to enhancing export competitiveness. Indian exports of software and ICT services in 2002–2003 reached US$9.5 billion, US$26.3 million more than in 2001–2002.[17] This figure is expected to reach between US$21 billion and US$24 billion by 2008, employing 3.3 million people by 2008. India's ICT services exports have almost doubled in two years and currently account for more than 20 percent of total exports and 10 percent of all foreign exchange. Given the extraordinary growth rates of these e-services exports, the latter figure is expected to reach 30 percent by 2008. Indian software export revenues increased by 30 percent in 2002–2003, while the global market increased only five to 10 percent during the same period.[18]

At the same time, business based on outsourcing is vulnerable to the volatility of foreign markets. As Indian BPO exporters are largely focused on the US. market, a downturn in their main export market could negatively affect their business. For example, in the software sector (which is equally dependent on the US. market), the

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14 UNCTAD, op.cit.

15 UNCTAD, e-Commerce and Development Report 2003, Geneva.

16 www.forrester.com.

17 www.nasscom.org.

18 In fact, the competitiveness of Indian vendors has been so impressive that six states in the US have proposed bills to limit offshore outsourcing for state contracts and decrease the number of visas issued to foreign workers. The legislation has been passed in four states, and starting in 2004–$ the annual quota for such visas will be 65,000 instead of 195,000 (UNCTAD).

Nasdaq crash led to cuts in ICT investment, which directly affected Indian programmers and led to an oversupply of ICT professionals in India. Fortunately, other services were less affected by the recession in the US because they are the indispensable back-office processes of brick-and-mortar companies. By contrast, the slowdown of the US economy has prompted an increasing number of companies to outsource to India to maintain their margins.

BPO service providers are also emerging in countries like Bangladesh, Brazil, Cambodia, China, the Philippines, Romania, Russia, Singapore, Thailand, Venezuela and Viet Nam. These countries are increasingly considered as outsourcing destinations by enterprises in the US, as well as the UK and other European countries, as they offer competitive services on the outsourcing marketplace. Some of these countries may soon be able to compete with Indian BPO providers. Therefore, Indian companies have a great interest in working continuously to develop more sophisticated, specialized and higher value-added BOP services to safeguard their current leadership position in the world market. This will require specialists not only in the ICT and engineering professions but also in areas such as medicine, law, accountancy, statistics and human resource management.

Conclusion and Recommendations for ICT Policy-Making

This chapter demonstrates that a debate on ICT, globalization, trade and competitiveness must consider a variety of aspects, ranging from changes in the ICT producing and using sectors, to policy issues involving market access and border tariffs, investment, domestic support and taxation. Within a national ICT strategy, all of these policies must be closely linked to domestic policies aimed at creating a favourable environment for the development and deployment of ICT.

The chapter also shows that the high growth of some segments of the ICT industry, combined with the recent liberalization of the sector in the context of the WTO ITA, could provide companies from developing countries with important opportunities for exports. The localization of existing software programmes and the customization of ICT systems for the benefit of the local business sector, as well as for transnationals that are present in the country, could also constitute an initial entry strategy for software companies of developing countries, which could then build up their export capacity targeted at regional or global markets.

As the spread of ICT and e-commerce grows, e-services will also grow. BPO will play an increasingly important role for developing countries. In the near future, more and more traditional industries located in developed countries will outsource parts of their services, including in the retail, energy, transportation and manufacturing sectors. This will trigger an increase in international trade in services, as most of these business processes will be outsourced to foreign providers. These human-capital intensive services offer a great potential to developing countries with abundant cheap labour, providing them with increasing opportunities to develop their exports in certain e-services.

While ICT goods are subject to import liberalization, ICT services are not. For developing countries to increase their services exports by taking advantage of the new technologies and e-commerce, open markets in potential importing countries are required. This would require commitments under the GATS on market access (for example, the removal of quantitative restrictions) and national treatment (for example, the removal of discriminatory taxation).

Moreover, in certain ICT services, close interaction with the client is necessary. While some of the client interaction can be carried out remotely, other services require personal interfacing with the client. This could imply employing foreign workers, or temporarily sending local engineers abroad. However, in the case of computer-related services, for example, only between four and seven percent of WTO members have made full commitments on market access for the presence of natural persons.[19] Further liberalization in ICT-related services is therefore urgently needed.

Apart from increasing market access in e-services for exporters from developing countries, policy measures to support exporters of e-services should also focus on a number of domestic obstacles related to technology, payments, infrastructure and standards. Within the national e-strategy framework, a number of policy areas are important for enhancing the capability to compete in the global market of countries and companies, including access to high-quality telecommunications, the availability of human resources, law, finance and payment systems, and tax and investment incentives, to help develop a technology services industry. Finally, tailoring the overall national development strategy to benefit fully from the new ICT-related trade and business opportunities, is crucial to ensure the development of a competitive information economy.

[19] World Trade Organization, Negotiating Proposal on Computer and Related Services. Council for Trade in Services. *Communication from India.* S/CSS/W/141, 22 March 2002.

Chapter Four

The Role and Responsibility of Government in ICT for Development

—Subhash Bhatnagar

Abstract

This chapter is written to serve as a basis for discussing the role of government as an enabler and provider of ICT-based services, while underlining the responsibility that this role places on governments. It presents developments in e-government in Asian countries, discusses the kind of applications that have been developed, the benefits that have been delivered and the reasons why many developing countries in the world have been quick to adopt e-government. Achieving the full potential of e-government requires that many challenges are hurdled. Several factors that are necessary for building effective e-government applications are identified on the basis of an analysis of successes and failures of the e-government applications that have been developed so far.

In the final section, the chapter defines a role for governments in Asia-Pacific that can enable them to exploit the full potential of ICTs. The role encompasses a doer's role, that is, delivering government services electronically, and an enabling role that encourages the private sector to deliver electronic services. This chapter also highlights the responsibility that comes with the commitment of governments to undertake this role. In the final analysis, governments need to develop a clear and coherent vision and strategy, while ensuring that efforts to create an organization able to support and catalyze e-government initiatives is supported by concrete and long-term capacity-building initiatives and policies that will attract private investment in infrastructure and application development. Fundamental criteria include a sincere and clear commitment of governments to undertake reform while understanding and responding to the needs of the people.

Introduction

There are three different perspectives with which developing countries have viewed ICTs. The dominant perspective has been one of promoting the growth of ICTs as one of the key sectors of a country's economy. The ICT sector presents an important opportunity for countries to enhance economic growth and employment, as has been shown by India. The sector can also become a major source of earning foreign exchange, and it offers products and services that can be deployed by other sectors of the economy.

A second perspective that has emerged in the last five years, is the deployment of ICTs for delivering government services. Improvements in the delivery of government services are important for many developing countries as the largest cost of government inefficiency is borne by the poor. Electronic delivery can improve efficiency, reduce delays for citizens, lessen corruption and increase transparency. Applications that focus on the on-line delivery of services to citizens, businesses and different arms of the government, are covered by the broad definition of electronic government. e-Government is about a process of reform in the way government works, shares information and delivers services to external and internal clients. Specifically, e-government harnesses information technologies (such as wide area networks, the Internet and mobile computing) to transform relations with citizens, businesses and other arms of the government. The resulting benefits are: less corruption, increased transparency, greater convenience, revenue growth and cost reduction[1].

The third perspective defines the role of electronic media and communication within a society. Within the ambit of this view, governments have to deal with issues such as, the convergence of different technologies, private control over media and censorship.

This chapter is concerned with the second viewpoint, which is focused on the role of government as an enabler and provider of ICT-based services.

Reasons for the Adoption of e-Government by Developing Countries

It has been noted that e-government initiatives in the Asia-Pacific region are catalyzed by three different scenarios, which take place in varying degrees in different nations. First, e-government has been driven by a vendor/consultant push that stands to benefit from increased investments in hardware and consulting. Second, e-government has been driven by a growing demand for better services from citizens, who now experience vastly improved services from the private sector. Third, e-government has been a top-down, government-driven approach by national leaders, who take charge of national ICT councils and who have identified e-government as a priority service to be rendered.

Some other factors that have contributed to the growing popularity of e-government within developing countries are discussed as follow.

There has been a considerable demonstration effect of the constructive difference that e-government has made in advanced economies in terms of the delivery of

[1] For a comprehensive definition of e-government and examples of cases where these benefits were delivered, see the World Bank website on e-government (http://www1.worldbank.org/publicsector/egov).

services, provision of information and internal administration of the public sector. Many developing countries that have developed a significant capacity in building ICT applications, feel that they are able to take advantage of the new electronic channels that are available for delivering government services.

In the last decade, many countries have gone through a process of economic liberalization and economic growth under the advice from multilateral lending agencies. Many large countries like India and China, have grown 6 to 10 percent over the last decade. Having completed the first phase of economic policy reform, these countries now feel compelled to move to the next phase of reform, that is, governance reform. Since e-government pilots have demonstrated a positive impact on corruption, transparency and quality of service, these countries see e-government as an effective tool for governance reform.

There is significant intra-governmental competition between government departments that are eager to move forward in implementing e-government.

The successes in e-governance are also a source of pride. With some countries that have already demonstrated the best consequence of their experimentation and innovation in this field, there is a sense of competition with developed countries. For example, Brazil launched an electronic voting system and is very proud that it is a better system than that of the US.

Spread of the Internet in the urban areas of many developing countries is starting to create a critical mass not as considerable as in most developed countries, but large enough to enable the government to deliver on-line services. In the large and highly urbanized countries in Latin America or Asia, it has become possible to deliver these services. In some places where e-government has been introduced, it has been shown to work and to have a positive impact on government efficiency and effectiveness.

Variety of Applications and Delivery Models

Applications of e-government can be categorized according to the constituency that is served.

Delivery of services to citizens

Services have been made convenient and easy to access, and delays have been reduced. Rules governing service can be made transparent and consistent across different branches of the same department. Many departments have been able to reduce corruption through e-government.[2]

[2] See OPEN case study in Seoul (http://www1.worldbank.org/publicsector/egov/seoulcs.htm), where corruption has been reduced in the issuance of licenses by municipal corporations by enabling the on-line tracking of application status combined with several other measures. The BHOOMI case in Karnataka, India (http://www1.worldbank.org/publicsector/egov/bhoomi_ cs.htm) also illustrates reduction in corruption in the issuance of certificate of land titles to millions of farmers.

Delivery of services to business and industry

Business and industry are concerned with the costs of setting up a business. A significant component of these costs is the administrative permission and license that must be obtained to establish and operate a business. Electronic delivery can lead to quick turnaround of license applications and lead to an overall reduction in costs.[3] Additionally, rules can be made transparent and consistent across departments. Corruption, which may form a significant part of costs, can be reduced, making the business more competitive.

Increased efficiency of departments/government enterprises

e-Government can lead to lower cost of operations and higher productivity. However, it is interesting to note that there are governments in the region that have been unable to realize the full benefits of leveraging on ICT, as they are unwilling and unable to cut down the number of employees after the introduction of ICT-based services.

Perhaps, the area where cost reduction can be most significant, is in the storage of paper files. Significant reduction in costs can result from a paperless environment.[4] There are one time costs of hardware/software and other operating expenses associated with such applications. The most important advantage is one of greater effectiveness because the administrative burden on decision makers is reduced, releasing time for important issues of policy and decision making.

Often, the data captured by the electronic system enable tighter monitoring of productivity of employees, easy identification of pressure points for delay and corruption, and accumulation of historical data that can be easily mined for policy analysis. The applications of ICTs are not only in direct communications with citizens, but also in vertical and horizontal integration between ministries. This process of efficient transfer and sharing of data and knowledge across agencies and departments in an electronic form enhances greater coherence and efficiency. Countries have used three distinct delivery models.

Departments going on-line

Here, citizens interact with departmental/private operators who access data and information from on-line terminals located in the premises of the department. If adequate care has been taken to re-engineer the back end processes, significant benefits can be delivered in terms of time, costs and number of trips to the department. These tend to result in greater departmental ownership, enabling significant re-engineering of processes. However, it must be noted that in most cases, although each department becomes more efficient, citizens need to visit different departments to avail themselves of different services, because horizontal integration between agencies has not been undertaken, or in some instances, has been initiated on different platforms, using different approaches.

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[3] See the examples of business registration in China (http://www1.worldbank.org/public sector/egov/zhongguancun_cs.htm) where the processing time has been cut significantly.

[4] See the example of SmartGov in Andhra Pradesh Secretariat.

Service centres conveniently located in public places

Multiple services are offered at each location: payment, issue of licenses and certificates. The counters can quickly move traffic from departmental counters to service centres (as in the case of Brazil[5]). Services from municipal, state and federal governments can be offered under one roof. Building the centres, which must deal with several departments, requires significant coordination and perhaps, setting up a separate agency for the project. Counters are manned by public/private agencies. Many countries have outsourced the running of these centres to private operators, who offer other value-added services, like payment of insurance, to augment their income.[6]

Self-service through a portal

The portals are designed to offer a variety of services and the interface makes it convenient for citizens to access them (using a life cycle approach, as in the UK and Singapore[7]). Complete back-end computerization is required and there is usually a 'middle ware', which directs requests for access to information from different departmental databases/websites. Integration at the back-end is needed for data sharing. There should be policies governing data definitions, structure of data and layered architecture of individual departmental applications. Self-service delivery presumes high Internet penetration and the willingness and ability of citizens to use these portals. This in turn, requires security and mutual trust (which grows with each successful outcome). Many countries have experienced a gradual buildup of usage. Canada had 11 percent use of the portal in 2002, even though 60 percent of its citizens had access to the Internet. Adoption rate has to be driven through training and other incentives. Also, building a portal requires strong centralized leadership for extensive coordination. Even then, the goal of a networked government, where a particular service requires approvals from many different departments, is difficult to achieve.

Some Examples of Successful Projects from Different Countries

In many developing countries, many government departments publish information on websites. By and large, these sites are poorly designed, not kept updated, and do not own responsibility for the quality of information.

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5 For a detailed description of experiences with service centre locations in Bahia and Sao Paulo in Brazil, see http://www1.worldbank.org/publicsector/egov/bahiaSAC.htm and http://www1.worldbank.org/publicsector/egov/poupatempo.htm.

6 For a detailed description of private operators running service centres in Andhra Pradesh, see the description of e-seva centres at 14 locations in Hyderabad, India. See http://www.apit.com/eseva.html.

7 The UK government on-line portal is organized so that a citizen can access services in multiple ways: issues beginning with before and after the birth of a child, nursery education, lone parents, just for dads, adopting and fostering, etc. In Singapore, services and information are categorized into 15 e-towns that cater to various essential touch-points in life: Business, Defense, Education, Elections, Employment, Family, Health, Housing, Library, Recreation, Safety and Security, Sports, Transport and Travel. For details, see http://www.ukonline.gov.uk and http://www.ecitizen.gov.sg.

Initially targeted at attracting foreign investments, many websites now focus on delivering information and services to citizens and businesses as Internet penetration grows in urban areas. A significant number of developing countries from Asia and Latin America have implemented transaction-oriented e-government applications on a pilot basis. A few of these pilots in Chile, India, Brazil and South Korea have been replicated on a wider scale. Table 1 below analyses documented case studies of e-government applications from different developing countries. The table lists the countries where such applications have been developed and identifies a few benefits that have been realized. These applications represent *the low hanging fruit*, applications that deliver significant benefit but are not difficult to implement.

Table 1. *Examples of Successful e-Government Applications*

Application	**Examples**	**Social and Economic Impact**
1. Delivering Citizen Services		
Payment of property taxes, issuance of land titles	Computer Aided Registration of Deeds in Andhra Pradesh Karnataka and Maharashtra, BHOOMI in Karnataka	Transparency, faster processing for citizens, reduced corruption, increased productivity for offices
Income tax on-line	Singapore, Brazil, Jordan, Chile and Mexico	Convenient, quicker refunds, better compliance, cost savings
Issuance of driving license, motor registration, passport, birth certificate, social security and collection of fines	Citizen Service Center (mobile and in shopping malls) Bahia and Brazil, Fully Automated System for Transport (FAST) in Hyderabad, Gujarat and Karnataka	Cuts delays, several services under one roof, reduced corruption, reduction of intermediaries
On-line issuance/payment of electricity, phone, and water bills, many and fines	e-Seva in Hyderabad, Fast, Reliable, Instant, Efficient Network for Disbursement of Services (FRIENDS) in Kerala	Convenient locations, quicker processing time, customer does tasks in one visit
2. Delivery of Services to Business and Industry		
e-Procurement	Mexico, Philippines, Bulgaria, Brazil and Chile	Reduces advertisement costs, lower costs due to better prices, transparency
New business registration	Jordan, Jamaica and China	Cuts down duration and number of visits, convenience in filing tax returns/quicker refunds
Tax collection (sales tax, VAT, and corporate income tax)	Gujarat check post, Cameroon, Chile Singapore and Mauritius	Cuts down time and number of visits, convenience on filing tax returns/quicker refunds, increase in revenue collection for government

Table 1. *Continued*

Application	Examples	Social and Economic Impact
Customs on-line	A total of 70 countries such as India, Jamaica Philippines, Tunisia and Mauritius	Quicker clearance, less corruption
Trade facilitation	Dubai, Yemen , Tunisia Mauritius and Singapore	Quick turnaround of ships in ports
Municipal services	OPEN Seoul, municipalities in India, and Latin American countries	Quick permissions and issuance of licenses, access and permissions
3. Internal Efficiency: email and Electronic Work Flow in Government		
Use of email and video conferencing	Many government offices	Usage is low, faster communication, less travel
Document management and work flow for paperless operations	SmartGov in AP	Speedy file disposal, traceability of actions, greater accountability
4. Empowering Citizens through Access to Information		
Publishing budgets at the central and municipal level	Argentina, India and Turkey	Greater transparency
Publishing project expenditure, executing agency	Panchayat websites in Karnataka	Transparency and lower corruption
Services through rural kiosks, market information, application forms, complaints , e-commerce	1000 kiosks in a dozen pilots in India, pilots in Latin America and Africa	Saves travel time, reduces corruption Better negotiating power, increased accountability, and access to markets

On the whole, the utilization of the Web by governments to promote two-way interaction with citizens has been weak. Often, websites merely provide static information that was earlier presented in printed brochures. Information on specific issues of interest to the public, such as reports, surveys on performance, allocation of budgets, award of contracts and expenditure on maintenance of public infrastructure, are not carried. There is also hardly any use of websites for conducting opinion polls, submission of ideas and seeking feedback on government department agendas. Few pilots that have attempted to promote such interaction have not succeeded for a variety of reasons. Some of the reasons are citizens' apathy, illiteracy, lack of access to the Internet, lack of interest by the media and absence of intermediaries that can analyse the information published on government websites and promote discussions in citizen's forums. It has also been argued that direct email access to government agencies leads to a deluge of unwarranted emails from organized lobby groups, rather than emails from constituents. These email overloads clog up office systems and cause them to be less efficient.

Although such problems may be encountered particularly during the initial phase of such experiments, alternative modalities to enhance interaction between governments and citizens need to be expanded. Governments need to invest in electronic delivery of services to reflect the aims of increasing administrative efficiency, greater transparency through information access and dissemination, and empowerment by enhancing interaction with citizens.

How to Build Successful e-Government Applications

Process re-engineering is required. Existing methods and procedures need to be mapped. Often, different branches of the same department do not use the same procedures as local context and conditions result in variations being introduced over time. Often, tasks are carried out in a mechanical fashion, because the original purpose for carrying them out has been lost or forgotten. An important aspect of initiating e-government is to document the existing procedures, and then to simplify them so that tasks can be completed in as few steps as possible without compromising the basic purposes and function. This entire process of simplification of documents and workflow, points of approval and audit, is called re-engineering. Most of the e-government applications that have been successful in reducing total processing time and curtailing costs have done through a substantial re-engineering of their processes. Such re-engineering must precede any exercise in automation.

The end result of re-engineering may be the modification of processes such that there are fewer steps and fewer people required to perform the tasks. This means that the way civil servants work may need to be modified. The introduction of technology may mean changes in the way work is done, which could generate considerable resistance from the lower levels of civil servants. A challenge in implementing e-government is to overcome this resistance through education and training. 'Change management' has to be strategically planned and implemented, as e-government projects have to consciously strive to provide benefits to civil servants at this level, as they are the ones who perceive the loss of power and authority over citizens when the electronic delivery of services is introduced. Due to automation of tasks, the workflow is regulated and civil servants often lose the flexibility to deal with applications in any sequence other than the one dictated by the computerized workflow. This takes away the power of patronage and inability to expedite work. Work delays are noticed easily because both the public and supervisors now have the capacity to track information as it moves from workstation to workstation. Indirectly, the principles of governance and transparency will dictate the process of services provided to the public. The design and structure of ICT-based services and processes will ultimately determine the success of building trust and confidence among the public.

Successful implementation of projects requires that there is a clear focus on the goal of the application. The intended beneficiaries of the application are identified and benefits that will accrue to the stakeholders are concretized. In fact, specific benefits like reduction in time or number of trips to an office, need to be targeted and made public. It is only then that the process of re-engineering can work towards its ultimate goal.

Strong project management skills are needed. Project managers need to identify goals and benefits in concrete terms. The task is often vast and not manageable within the resources that are available internally to a government department. The adoption of established standards and protocols can minimize customization. If off-the-shelf software is available, then it should be used instead of developing similar software.[8] Systems analysis, which provides the necessary cues for re-engineering, should be done internally. Design, software development, data preparation, training, and the like, can be easily outsourced.

Training expenses should be provided for. Successful projects typically spend about 10 percent of the budget on training.[9] Awareness of the benefits of e-government has to be created among senior civil servants and political executives. Similarly, training is required for project leaders who need to define project deliverables, deal (negotiate) with consultants and vendors, and manage an outsourced development process. Clerical staff needs to be trained on specific applications. Supervisors and managers need to be trained on using information. Finally, citizens need to be made aware of on-line services and how to transact business on portals.

Partnership with the private sector can be useful, as the private sector has significant experience in developing ICT applications. Several types of partnership arrangements can be used. For smaller countries, it may be possible to find a single partner for the entire effort (not just a specific project) of developing a strategy, producing guidelines for design, re-engineering processes, developing software, helping in procurement and providing training. Otherwise, multiple partners may be used for different tasks. The choice of partners can vary from multinational management consultants to ICT vendors to local companies. The task for partners can be defined in many ways. Partners may be asked to build; or to build and operate; or to build, operate and transfer. Whatever the partnering arrangement, it must lead to building of local capacity. If private sector partners are involved, contracts should be drawn up in a way that is fair and equitable for both the government and the private sector.

Electronic government does not mean that all of the steps in the delivery of a service should be handled electronically. Significant benefits can be derived by handling just a few of the critical components electronically. For example, in Chile, the e-procurement system announces government requirements on a website, but manually handles the bids. Registered suppliers for the required product/service are sent an email to broaden the choice of suppliers. Once the bids have been processed manually, the results are announced electronically on a website. Significant costs have been saved in Chile because of expanded supplier choice and the fact that the whole process of the selection of suppliers is more transparent,

[8] For example, many countries have implemented software called ASYCUDA, which was developed by UNCTAD for implementing on-line customs clearance. See http://www.asycuda.org/default.asp.

[9] The case study on CARDS on the World Bank website provides details of expenditures on various facets of implementation. See http://www1.worldbank.otg/publicsector/egov/cardcs.htm.

even if the core process of bidding continues to be manual.[10] There are many such examples, where some components of an electronic service delivery continue to be handled manually.[11] In all of these examples, significant benefits have been delivered to the users in terms of reduced time and less corruption.

e-Government Readiness: Role of Governments

There are several dimensions to readiness for e-government. One aspect of readiness is the maturity of technical infrastructure and back-office use in various departments. For example, use of email across government departments is indicative of readiness. Readiness also depends on the attitudinal make-up of the civil service. Willingness to re-engineer, share more information and treat the citizen as a customer, indicates high readiness. Attitudinal changes are difficult to bring about, unless there is a champion at the political level and strong leadership within the department. Departmental champions need to be identified and coordination committees created at departmental levels. A final aspect of readiness is an aware and demanding citizenry, which understands its rights and is willing to express them and to fight for them in case of laxity and inefficiency. By publishing performance data and citizen charters, e-government can be instrumental in promoting citizen awareness and participation.

Delivering e-government services requires either a high penetration of Internet services in homes, or the presence of a large number of public kiosks. It is important to note that for handling e-payment and for building trust between citizens and government for transactions over long distances, an enabling legal framework must be in place.

The role that governments have to play in enhancing readiness for electronic delivery of services encompasses a doer's role that is, delivering government services electronically as well as an enabling role that encourages the private sector to deliver electronic services. Governments need to develop a vision and strategy, create an organization to support and catalyze e-government, build human capacity and enact policies that will attract private investment in infrastructure and application development.

Developing a vision and strategy

Governments must choose application areas where electronic service delivery will be promoted. Governments often identify services where citizen contact is large or very frequent. Departments that are known to be corrupt are also high priority. The choice of applications is linked with the overall political objective of the

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[10] For more details on the Chilean e-procurement system and the site operated by a private sector company, please see http://www1.worldbank.org/publicsector/egov/eprocurement _chile.htm.

[11] For most of the applications documented by the World Bank website, payment is made in the traditional manner. For example, radio frequency auction in Canada and the US is done on-line in a multi-stage process, but the final payment by the successful bidder still comes in as a cheque See http://www1.worldbank.org/publicsector/egov.

government whether it is to attract investment, tackle corruption effectively, or increase revenues from tax collection. Trial through a few quick strike projects is important, as the benefits need to be demonstrated to citizens and civil servants. Such pilots also help in understanding the key step of re-engineering processes and managing change in a local context.

e-Government can be built in stages after the big picture is in place. First, on-line service delivery is provided within a set of chosen departments. Later, many of these services are delivered on-line, under one roof, at conveniently located centres. Then, all of the services are web-enabled and offered through a single portal. An assessment of the networking infrastructure and Internet penetration is necessary to determine the kind of delivery models that are viable. Building e-government through these stages requires a great deal of coordination among departments. Ministerial level coordination committees need to be formed. Managing expectations and maintaining credibility is important.

No government is completely ready on all of the above dimensions. Some governments therefore hesitate to make a beginning. The experience of some countries like Mauritius and Jordan suggests that organization and coordination can be overemphasized at the expense of action in implementation.[12] This lack of balance between planning and action can result in demoralization among the champions.

Departmental ownership of e-government is vital, because no external agency can drive the kind of change that is needed in implementing e-government. However, if the implementation of e-government is left entirely to a department, then resources get wasted and data sharing may be hampered. This would make it difficult to deliver services where a large amount of documents and data must be shared across departments (such as licensing). Also, a department may not have the capacity to use the correct method and latest design techniques in developing the application. e-Government efforts should therefore be supported by a central agency, which can provide the necessary guidance in the use of correct methodology. For countries where a central support agency needs to be created, the role, mandate and size of the central support agency needs to be defined. Its appropriate home has to be established. Some of the tasks to be performed by a central agency are: assessing and enhancing preparedness; developing a strategy or implementation plan; building shared infrastructure; finding resources for re-engineering, application development and change management; developing guidelines, standards and best practices; developing public private partnership; identifying departmental champions; monitoring progress and impact; and overseeing a few quick strike projects.

One of the important steps in preparation for e-government is capacity-building within the government to manage the implementation of projects. States like

[12] This observation is based on e-government mission work carried out in these countries by the author on behalf of the World Bank and the Commonwealth Secretariat.

Andhra Pradesh in India, which is considered a pioneer in the implementation of e-government, have invested heavily in the training of chief information officers. Andhra Pradesh has trained nearly 100 handpicked officers at the middle and senior levels in 3–4 month intensive residential programes. These trainees are expected to take leadership positions for implementing e-government across the 70 departments of the state. The training provided an exposure to technology so that the trainees can comfortably deal with private sector partners in procuring various products and services. Analysis and design of systems, management of projects, re-engineering of administrative processes and management of change, are the other important topics covered in these training programmes.

Governments also need to create an incentive system for departments to take the lead in implementing electronic service delivery. Policies that enable departments to charge a user fee when the quality of delivery is significantly upgraded, need to be defined. Allowing the departments to retain the user fee and make investments to build new delivery systems, can serve as a strong incentive for e-government applications.

Systematic evaluation studies need to be conducted to measure benefits during and after implementation. So far, the benefits of e-government have been largely anecdotal. Evaluation studies should be carried out by independent agencies. Stakeholders must indicate the benefits that have been delivered and problems that continue to be faced. Serious evaluations can provide feedback for a national strategy, as well as design and implementation of individual projects. Some of the projects that were deemed to be successful (and awarded prizes by international organizations) have started faltering. A World Bank-sponsored evaluation of four projects in India indicates that two projects are moving towards failure.[13] Long-term sustainability can be ensured if the innovation is championed not just by one individual administrator but by the entire department.

e-Government can advance the agenda on governance and fiscal reform, transparency, anti-corruption, empowerment and poverty reduction. The potential has been recognized, but implementation is difficult. Pioneers in several countries have shown that gains can be real and projects can be implemented successfully. The challenge is to promote its widespread use.

[13] See the evaluation reports at http://www1.worldbank.org/publicsector/bnpp/gksp1.htm.

Chapter Five

Privatization and Regulatory Issues

—*John Ure*

Abstract

The reasons, aims and results of policy-making often do not equate with one another. Reasons reflect current economic and political priorities of the state; aims reflect outcomes that are often idealized for current political consumption; while results reflect the harsh realities of the times. This is just as true for policies of privatization as for any other. The first part of this chapter briefly looks at the various meanings of the term 'privatization'. The reasons, aims and preparatory steps for privatization are also discussed. This chapter then focuses on some of the key issues in designing the privatization process, results and outcomes, draws lessons and provides some regulatory perspectives.

Privatization

The term 'privatization' can have several different meanings.[1] Strictly defined, it refers to the 100 percent transfer of ownership through the sale of a state-owned enterprise (SOE) to private sector equity holders by means of a share issue privatization (SIP). However, as cases in post-communist Russia illustrate, sometimes the transfer of ownership can be a private transaction and the issue of transparency then becomes especially important. Since telecommunications is usually regarded as being of strategic importance to national economic

[1] The International Finance Corporation (IFC, 1995) states: 'A generous stance would admit any transfer of ownership or control from public to private sector. A more exacting definition would require that the transfer be enough to give the private operators substantive independent power'. The IFC lists numerous techniques of ownership transfer, including public offer, closed subscription, joint venture, liquidation, concessions, auctions, voucher or certificate-based transfers, employee or management buyouts, and combinations of these. Megginson and Netter (2001) provide a similar review, adding that in the USA, state outsourcing is also sometimes termed 'privatization'. See Megginson, W. and Jeffry M. N., 'From State To Market: A Survey of Empirical Studies On Privatization', *Journal of Economic Literature,* June 2001; prepublication AEA paper url: http://papers.ssrn.com/sol3/delivery.cfm/SSRN_ID262311_code010326560. pdf?abstractid=262311.

development and requiring experienced management, or because of limitations in local capital markets, the majority shares may be sold to an overseas company with telecommunications experience. For example, in 1990, New Zealand Telecom was auctioned to Bell Atlantic (USA) and Ameritech (USA) for NZ$4.25 billion. On the other hand, local politics may rule out such an acquisition, especially in countries where nationalist sentiment is overwhelming. The Constitution of the country may actually forbid the foreign ownership of national assets, as is the case in Indonesia, the Philippines and Thailand.

Another consideration is national security, as telecommunication networks may carry highly sensitive government or industrial traffic.[2] The perception or suspicion that foreign SOEs or private companies closely identified with particular states are security risks may be genuine, or it may be a politically convenient way to object to the transfer of ownership.[3] A heavy SOE debt burden is a further consideration that may hinder outright privatization. Buyers will be reluctant to take it on, and the debt either has to be rescheduled over a sufficiently long period at low interest rates, or assumed by government. For example, in the case of telecommunications privatization, governments in Argentina, Venezuela and Ghana assumed responsibility for debts of US$930 million, US$471 million and US$6.3 million respectively.

Private Capital

Loosely used, privatization is a reference to the increasing penetration of telecommunication service markets by private capital, as a result of market liberalization.[4] (See Appendix for a review of current levels of capitalization of the major telecom companies in Asia). This can arise in numerous ways as shown by the mechanisms for privatization listed below.

Employee and Management Buyouts

These are not usually practical for large undertakings of strategic importance, such as telecommunication enterprises. However, employee share-ownership schemes can be part of a negotiated stakeholder agreement to win the backing of labour

[2] Privately-owned Hutchison, the Hong Kong telecommunications company, was denied permission to buy a stake in Global Crossing because of concerns in the US of its close links with China, but partially state-owned Singapore Telecom was given the go-ahead. On the other hand, SingTel was rebuffed in its efforts to buy Hongkong Telecom and buy into Time Telekom in Malaysia, while its efforts to purchase Optus from Cable & Wireless in Australia faced a similar uphill battle before clearance was finally given.

[3] Problems do not end even when formal privatization has been completed, as the cases of Korea Telecom and NTT in Japan illustrate. In 2002, the USA, EU and Canada objected within the WTO to the exemption of KT and NTT from their respective Government Procurement Agreements (GPAs) on suspicion of continuing government influence over their decision-making (*The Korea Herald*, 11 October 2002).

[4] For a discussion of privatization in Asia from this wider perspective, see Ure, J. and Vivorakij, A. ‘Privatization of Telecommunications: The Asian Experience’ in Ryan, D. ed. *Telecommunications: Privatization and Competition, Philadelphia* (Temple University Press, 1997), pp.1–20. Pre-publication url: http://www.trp.hku.hk/publications/private1.pdf.

unions, and management share-ownership and stock options can become part of an incentive scheme designed to drive growth.

Auctions

Auctions have been used to sell state-owned telecommunications enterprises (SOTE) to domestic and foreign bidders where the state wants to raise large stakes and ensure, through vetting and pre-selection, that the bidders are competent investors with telecommunications management skills.

Voucher and Certificate-Based Transfers

Voucher and certificate-based transfers have been used in Eastern Europe to allocate shares to local citizens, but the procedures can be dangerously lacking in transparency.

The Concession Method

This method was used in 1981, when the ex-Portuguese colony of Macau awarded a 20-year Build-Operate-Transfer (BOT) contract to Companhia de Telecommunications (CTM), a joint venture between the Government of Macau, CPRM of Portugal and led by the Cable & Wireless Company. Under this arrangement, remaining asset values were transferred to the Macau government only at the end of the concession period. After negotiations in the mid-1990s, the franchise was extended for a further 10 years, but the cellular and Internet markets were opened to competition. By contrast, in 1992, Thailand used the Build-Transfer-Operate (BTO) model to grant two revenue-sharing concessions.[5] Now that both the Communications Authority of Thailand (CAT) and the Telephone Organization of Thailand (TOT) are scheduled for SIP privatization, these schemes are being reconsidered because the JV partners are concerned that through revenue-sharing, they will be subsidizing a direct competitor.

Liquidation

The most spectacular recent cases of liquidation have arisen in the private sector in the US where companies like Worldcom, Global Crossing, 360 Networks and others have either sought protection under Chapter 11 of the US Bankruptcy Law, which offers temporary relief from liquidation under the bankruptcy laws, or have passed into receivership.

Joint Ventures

Joint ventures (JVs) between foreign-owned telecommunications companies and local SOTEs became popular in Asia in the 1990s, but most have collapsed since then. PT Telekom in Indonesia experimented with the KOS joint venture scheme under which the foreign partner in each province was required to employ PT

[5] BTOs were awarded to Telecom Asia, a joint venture between Charoen Pokphand and Nynex of the US, and TT&T, a joint venture between two Thai companies, Loxley and Jasmine. The Thai Constitution prohibits the private ownership of national infrastructure. The revenue-sharing arrangements of these schemes is now being questioned by the BTO partners who fear they will end up both paying and competing with their newly privatized partners.

Telekom staff, but the Asian economic crisis undermined the commercial viability of these schemes. PT Telekom has since adopted the more conventional road to privatization.

Near Joint Ventures

In 1988, Vietnam adopted something less than a joint venture, when a Business Cooperation Contract (BCC) arrangement was started with Telstra based on payments from revenues. Mobile operator China Unicom experimented with China-China-Foreign (CCF or 'Zhong-Zhong-Wai' in Chinese) partnerships in the mid-1990s. Operating revenues were shared with the local China partner, who in turn, shared revenues with a foreign partner in exchange for management, technology and network consultancy services. When the state council upheld the directive of the Ministry of Posts and Telecommunications, that installation fees must be excluded from revenue-sharing agreements and instead be ploughed back into network investment, the foreign partners no longer found these CCFs to be commercially viable.[6]

Public Offer and Closed Subscriptions

IPOs and private placements are the most frequently used mechanisms for the privatization of SOTEs, partly because the state is looking for a windfall income, but also because of the sheer size of the holdings and the strategic importance of the sector. Often, the state will retain part or the majority of shares, releasing them in tranches according to the market price and the ability of the market to absorb them.

Outsourcing

From 1989, Indonesia experimented with the Pola Bagi Hasil (PBH) model that allowed domestic private capital to share revenue as building contractors and consultants to PT Telekom. This arrangement was known as the Build-Transfer (BT) model, an early form of outsourcing.

Reasons, Aims and Preparation for Privatization

Reasons

What are the economic and political reasons for and priorities in telecommunications privatization? Very often, the economic reason is to plug a gap in state finances by 'selling off the family silver'.[7] However, there are other reasons, as follows:

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[6] The dispute illustrates a wider issue: that various forms and degrees of involvement of 'outside capital', which could be domestic or foreign investment, run up against objections from different interest groups and stakeholders within the telecommunications establishment, sometimes from the incumbent operator, sometimes from the regulator, sometimes from policy makers and politicians.

[7] As Sir Harold Macmillan, British Prime Minister in the early 1970s, called Mrs Margaret Thatcher's wholesale programme of privatizations in the 1980s.

Economic Reasons

- Improve state finances – one of the factors at work in Malaysia in the early 1980s and in India in the 2000s.[8]
- Cut state subsidies and the costs of administration by making the PTT[9] service more commercial—China has undergone significant cost restructuring since the state divested its share holdings in China Telecommunications.
- Promote the local capital market—a goal of both the Malaysian and Singaporean governments when Telekom Malaysia and SingTel were privatized.
- Meet trade and investment commitments—all signatories to the WTO Basic Agreement on Telecommunications have accepted certain obligations.
- Promote economic growth in a key industrial sector—an emphasis on technological development was high on the agenda in Malaysia's Vision 2020.

The political reason may be public protest at the poor level and high cost of service provision. Again, here is a short list.

Political Reasons

- Protests from residents or business user groups—the Hong Kong Telecom Users' Group (HKTUG) was an important lobby on government to end the monopoly of Hongkong Telecom and open the market.
- Pressure from trading partners and world and regional trade organizations—both Japan and South Korea came under sustained pressure from the US during the 1990s to open their telecommunication markets.
- Pressure from local private business groups who want to enter the market—this is almost universally the case where there are profits to be made.
- Promote important domestic constituencies—radio spectrum has been reserved in the US for minority groups; Malaysia's 'Bumiputeras' policy was designed to promote commercial participation by the indigenous population.
- Free market ideology—a strong factor in Mrs Thatcher's Britain and President Reagan's US ('Reaganomics') in the 1980s.

There are significant counter-pressures, notably from consumer groups who fear that tariff rebalancing and the end of subsidies will push up local tariffs, from labour unions who fear job losses, and from Leftwing or nationalist political parties, who fear a loss of public control over the social obligations of telecom companies, the

[8] Jabatan Telekom Malaysia (JTM) had M$4.6 billion long-term debt by 1986 and total capital expenditure of M$5.5 billion against a revenue of M$5 billion. See Mansor, R. 'Liberalization/Privatization of Telecommunications: Telekom Malaysia's Experience' in Brody, A., Newstead, A. and White, P. eds., *Telecommunications Management and Policy: Australian International Perspectives* (Victoria, Australia: Monash University, Graduate School of Management, 1992).

[9] PTT stands for Posts, Telegraph and Telephone, indicating the genealogy of the sector.

loss of national sovereignty and the loss of national industry standards setting. These pressures can easily delay the process of privatization, and will almost certainly require negotiation and compromise.

Aims

The aims of privatization usually stress improved performance and output or 'productivity', cost accounting and cost cutting or 'efficiency', more professional management, improved corporate governance and less corruption, greater transparency in decision-making and strategic focus, wider access to capital, more focus on innovation and on customer relations management, and so forth. Although these aims are presented as win-win, there are stakeholders who stand to lose out. Where stakeholders are also political constituents, it may be politically wise as well as socially desirable, to put in place compensatory mechanisms if the market does not already do this. For example, tariff rebalancing raises local prices and brings down long-distance prices, and while some residential users will gain more than they lose, others will definitively lose. For low-income losers, such as the elderly or low-user groups, special tariffs or rebates or other welfare programmes can be used. The following is a list of potential winners and losers among stakeholders.

State Sector

Winners will be the ministries most closely associated with ICTs, who have wider policy mandates to promote the information infrastructure, e-commerce and the information society; and the regulators who have to ensure transparency and competition. The losers will include those ministries who lose either financial or policy responsibilities to the ICT ministries; as well as the Director-General Departments of the old Ministry of PTT who lose their regulatory role.

Private Sector

Winners will include private investors of capital, including foreign investors if the sector is opened; equipment suppliers and vendors who were previously excluded from supplier contracts; and potential new entrants if the market is also liberalized. Losers will be suppliers who previously enjoyed exclusive contracts with the incumbent.

Consumers

Winners are business users who can expect heavier volume discounts, more choice of operators if there is competition, better quality of service and service level agreements (SLAs), lower long-distance and international prices as well as residential users who can expect better customer service and choice if there is effective competition and shorter waiting lists for telephones. Losers will be residential customers who are faced with higher local tariffs in the event of rate rebalancing, but only if they do not save equal amounts on lower long-distance and international call charges as well as residents in underserved areas if there is no universal service obligation.

Workers

Winners will be staff who have high-tech or professional skills adaptable to the requirements of a modern computer-driven telecoms business, workers in demand from new entrants where there is competition and younger workers. Losers will be less skilled workers or workers whose skills are technologically redundant, and older workers.

Preparation for Privatization

Privatization can mean much less than the complete transfer of ownership from the state. In the case of a very large state monopoly, the privatization of national carriers often proceeds in stages. One reason may be the desire of the government to retain ultimate control, either because telecommunications is regarded as too important a national asset or, as is frequently the case, it is regarded as an important contributor to the national budget.[10] The latter has been especially significant for foreign exchange earnings on international traffic during the era when the international accounting and settlement rates regime was dominant. Today, with various mechanisms for the by-pass of these arrangements,[11] the revenue from international call services has fallen dramatically, a fact compounded by the huge overhang of excessive international submarine cable capacity that was built in anticipation of Internet traffic from the dot.com boom. This makes the foreign exchange argument less compelling than in the past.[12]

Even where the state is reduced to a minority stakeholder, it can retain a 'golden share' that gives it a veto on the board of directors, as happened in the early days of British Telecom (BT) and Telecom New Zealand. These safeguards were eventually replaced by rights of veto by the government over the sale of assets, and as the markets liberalized and opened to competitive new entry, the need for safeguards diminished.[13] The usual transitional step towards privatization and

[10] For example, in the 1990s in Indonesia and Taiwan, as much as 60 percent of annual telecoms revenue went to the treasury during periods of fiscal tightening. See Ure, J. and Vivorakij, A. 'Privatization of Telecommunications: The Asian Experience' in Ryan, D. ed. *Telecommunications: Privatization and Competition, Philadelphia* (Temple University Press, 1997), pp.1–20. Pre-publication url: http://www.trp.hku.hk/publications/private1.pdf.

[11] By-pass can be achieved in various ways. Where it is policy, as in the US, the UK, Hong Kong and Australia, international simple resale (ISR) is the most effective means. This allows new entrants to lease international circuits from the incumbent and resell at competitive prices. Other forms of by-pass may not all be legal, but are very difficult to police, such as callback services. (VoIP) and refile, which involves calls being least-cost routed to arbitrage different settlement rate arrangements between countries, but without informing the terminating network of what is going on. Arguments rage between incumbents who see this as outright deception and new entrants who see it as a market mechanism, but today it has become standard practice worldwide.

[12] Just opening the international market to competition is sufficient to see prices fall dramatically. Following the privatization of India's international monopolist Videsh Sanchar Nigam Ltd (VSNL) in February 2003, and the opening of the market to competition in April, VSNL's overseas call charges have fallen in the region of 50 percent.

[13] Until the end of Hong Kong Telecom International's private monopoly, the Hong Kong Government reserved a right of veto over the transfer of ownership.

market opening of the core basic fixed voice services sector is corporatization. It takes the finances of the SOE off the books of the national treasury and allows the new corporate entity to raise its own capital in the debt market. This can have the added advantage of imposing some degree of financial discipline on the SOE, a stepping stone towards the separate identification of costs and services for the planning of an efficient internal allocation of resources, and for a rational approach to funding uneconomic lines of business where these are seen to be socially desirable.

A further reason for a 'stages' approach to privatization is that the SOE may simply be too large for the local capital market to absorb, and if the government wishes equity to be owned locally, or wishes to use the public listing as a means to build up the capacity of the local financial market, a staged approach is required. A good example is the partial privatization of SingTel, where local financial market capacity-building was a stated objective of government.[14]

Another complicating factor is employment. Traditionally, telecommunication companies have employed large workforces, from the highly skilled whose skills were tied closely to old analogue technologies, to semi-skilled installation, repair and maintenance workers, to an army of construction workers employed to dig trenches and lay wires and cables, especially in the customer access network or local loop. This was essentially an engineering utility business. Changes in technologies, in modes of access (for example, wireless and cable TV) and in market structure, have transformed the operating environment.

Under these circumstances, labour union resistance to corporatization and privatization is to be expected, unless transitional measures are put in place to compensate the losers.[15] Often, these are the most difficult issues of all to handle, and in all major privatizations, delays are due to the tough negotiations involved. Issues to be considered include the status of employees after a transfer of ownership, who is responsible for legacy commitments, including pension rights, pay scales, promotion and seniority, allowances covering health insurance and housing benefits, early retirement schemes and retraining schemes. One way by which these issues are finessed is through the setting up of related companies that employ the surplus workers and who contract outsourcing from the main company.[16] This removes some of the financial liabilities from the privatized company, but really only shifts them to other items on the balance sheet.

[14] Hukill, M. 'The Privatization and Regulation of Singapore Telecom,' *Telecom Journal,* Vol. 6, No. 3 (July 1994), pp. 26–30.

[15] Labour union opposition to privatization is almost universal, but a clear distinction needs to be drawn between ideological (political) opposition and industrial (that is, economic) opposition. The former can only be resolved through elections, the latter by negotiation.

[16] In Asia, this approach was first adopted by NTT in Japan following corporatization in 1985 and the beginnings of privatization in 1986. Even so, by 1990 NTT had cut back its 1984 workforce of 310,000 by 50,000. For an excellent detailed analysis of a privatization in practice, see Takano, Y. 'Nippon Telegraph and Telephone Privatization Study: Experience of Japan and Lessons for Developing Countries', *World Bank Discussion Paper 179* (Washington DC: World Bank, 1992).

Nevertheless, if the market as a whole grows as a consequence of liberalization and if these related companies can operate flexibly, they can end up outsourcing for new entrants as well (for example, trenching work or repair and maintenance work). Keeping these overheads off-the-books can work for new entrants as well as for incumbents.

Due to these wider issues, the role of policy and regulation surrounding the privatization process is of crucial importance, especially if the process is not to be endlessly delayed pending the resolution of interminable disputes.[17] For example, at one end of the spectrum of possible solutions, government could decide to take back into public ownership the companies spun-off from the incumbent to protect the rights of the otherwise redundant workers, on the grounds that such a step removes an immediate hurdle to privatization and the costs to the national budget are far less than the gains from the privatization sale and the subsequent flow of profits tax revenues from the newly-privatized enterprise. Such a move could have a 'sunset' provision, to limit the budgetary liability to workers over a certain age. Alternatively, the government could agree on a subsidy to these spin-offs, again with a 'sunset' provision, or it could encourage new entrants to outsource to them. However, any such arrangement would have to be seen to be market neutral so as not to give the new entrants an advantage over the incumbent or vice-versa.

In addition to the scheduling and timetable of privatization and the resolution of employment issues, preparation for privatization involves the introduction of cost accounting to reveal the real costs and revenues, assets and liabilities of the enterprise, and provides a clear view of the future structure and governance of the company, the market environment that will follow from privatization and the regulatory regime that will be put in place. The importance of these factors becomes evident when the results of studies of the privatization process are reviewed below.

Issues and Results of the Privatization Process

In the Asia-Pacific region, the privatization of SOTEs began in Japan in the 1980s, and gathered pace during the 1990s. Time-series data is therefore, quite short for an exhaustive econometric study, but sufficient to at least identify the key issues that arise and to draw some useful lessons from the experience.

Key Issues

The following are the key issues arising from the experience of the past two decades.

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[17] The timing of an IPO can be critical. Following the dot.com market crash, many IPOs were either put on hold or the price offers substantially lowered. For example, in late 2002, China Telecom was forced to reduce its average offer price by nearly 10 percent, while in Taiwan the government's attempts at further divestment in Chunghwa Telecom, were again postponed.

Tariff Rebalancing

A delay in rebalancing local and long-distance telephone charges will seriously skew the economics of market entry as new entrants are attracted to the higher-tariff international and domestic long-distance markets, leaving the local loop non-competitive and without new investment. A universal service fund (USF), into which new entrants contribute according to their share of long-distance traffic revenues would be one way, albeit a heavy-handed way, to ensure some investment in the customer access network. However, it would also be unsatisfactory since a USF is designed to meet uneconomic social obligations, while unbalanced tariffs subsidize what should be profitable markets.

Job Loss

A fall in employment would seem to be almost inevitable in the incumbent, although new entrants will create jobs. Spinning off subsidiary companies to take up the excess labour and then outsourcing certain tasks to them, such as ducting and maintenance work or security work, is one possibility. Pacific Century Cyberworks–Hong Kong Telecom (PCCW-HKT) used this in Hong Kong and NTT did the same in Japan. PT Telekom in Indonesia required its joint venture partners in the 1990s to employ its surplus staff. Otherwise, telecom companies, which are given a commercial status as separate corporate entities, have to negotiate redundancy packages, pension-right guarantees and so on, and this requires cost restructuring. The new China Telecom (CT) and China Netcom Corporation (CNC) have carried on this exercise since 2002, having to show on their books for the first time the true cost of staff benefits, costs that have to be covered by their operating revenues.

Social Obligations

The old PTT monopoly SOTE model failed to meet universal service obligations. The cross-subsidy model seemed to have a future as long as there was: (*a*) a steady expansion of the basic network generating revenue from installation charges, monthly access charges and usage charges; and (*b*) there were profitable and growing long-distance and international markets. High installation and access charges had rationing as their economic logic. A small network is easily congested, which reduces the value of being on it, but as network capacity expands, it makes better economic logic to reduce access charges and push up usage charges. As countries begin to move from low-income to middle-income and networks expand, this is what tends to happen. However, as telephone networks become digital, the scope of the services available increases and the means of by-pass of official tariff structures appear. The new middle and business classes have an incentive to lower their costs and to look for specialist providers, such as mobile operators, callback and value-added service providers (VAS), and Internet Service Providers (ISPs) who can cater to their specific needs and are able to offer cheaper ways to make long-distance calls. Examples are the use of short message services (SMS), instant messaging services (IMS), VoIP, and least-cost routing. Under these pressures, the old cross-subsidy model begins to break down. A new model is required, and the most popular one is setting up a USF into which all new entrants make a contribution. An alternative is to auction off the universal service obligation to a new entrant, as

Chile has done, or to require new entrants to invest in rural as well as urban areas, as in the Philippines.[18]

National Sovereignty

The sovereignty issue turns into a problem when it becomes an atavistic holding on to the idea that telecommunications as infrastructure is a national asset that must not fall into foreign ownership. The reasons given range from national security issues or political reasons masquerading as security issues, to the view that an economy must develop its own national standards and technologies. The national asset issue overlooks the reality that: (*a*) the national asset can grow far more quickly if it is open to direct investment from beyond the state, whether to domestic or foreign capital; (*b*) diversity of networks reduces national vulnerability to a single network failure and offers far more choice; and (*c*) choice is a good way to attract foreign investment in other sectors of the economy. The national security argument may be less easily disposed of, but is probably exaggerated and misused if it is used to exclude all outside private investment in any network**.** The national standards argument really only applies to super powerful national economies, or blocs of economies such as the US, the EU, Japan and China. Each is tempted to use the scale of the local market to develop its own industry standards. The coherence of such a policy is challenged by privatization when coupled with competition, because in a free market, each company will make its own choice of standards and technologies using commercial criteria. However, privatization alone does not prejudice such a strategy.

Results

Econometric Evidence: Outcomes of Divestment

The outcome of telecoms privatization is rather like cooking a dinner: it cannot be better than the quality of the ingredients that go into it, but it can be worse. It also depends a lot on the recipe and how well the kitchen is arranged. The recipe in this case is the design of the privatization process while the kitchen arrangement is the environment in which it takes place. For example, is the SOTE to be privatized as one entity, or is the divestiture to split the company into different lines of business, or different geographical areas, in other words, structural separation or, is there to be separations accounting between different lines of business to prevent hidden cross-subsidies and predatory pricing? Is the environment to be a period of exclusivity, or a duopoly, limited entry or a fully open market? Will there be an independent regulator, dominance regulation, a competition law, unbundling of the local loop, interconnection to be mandated and so on? Will the licensing regime be technology neutral?

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[18] For a discussion of methods to tackle the problem of universal access, see Development Gateway at http://www.developmentgateway.org/node/133831/sdm/docview?docid=441647, including Wellenius, B. 'Sustainable Telecenters' Public Policy for the Private Sector', Paper # 251 (World Bank Rapid Response Unit, Knowledge Services for Developing Countries, 2003), p.3 at http://rru.worldbank.org/viewpoint/HTMLNotes/251/251Welle-121302.pdf.

Studies of privatization abound in the literature. For the purposes of this chapter, they can be classified into two broad categories. First, econometric studies that attempt to identify the *outcomes of privatization*, successes and failures, and the factors that influence these outcomes. Second, research papers that identify the *process of privatization* in each country, the events leading up to it, the conditions surrounding it, the important environmental factors such as regulation, the state of supply and demand, the status of property rights and their enforcement, and so forth. As the econometric evidence relates directly to outcomes, a sample is summarized below to review results. The findings of a selection of non-econometric studies are used later in this chapter to consider lessons and guidelines.

Some econometric studies use firm-level data and measure individual regulatory factors; others aggregate and compare cross-country outcomes.[19] The following is a brief summary of the most relevant findings.

General Studies

These look at the results of privatization across different industries. For example, Shirley and Walsh (2000) reviewed 52 studies of privatization, for the World Bank, 32 of which found significant improvements in performance of private and privatized companies, 15 found no significant differences and five found superior performances in publicly-owned companies.[20] Boubakri and Cosset examine the post-issue stock price performance of 120 privatization issues in developing countries and find statistically significant abnormal returns over a period of three years after the IPO.[21] Of course, one way to achieve abnormal returns and to maximize the revenue raised by an IPO, is to grant a long period of exclusivity following privatization. Wallsten studied telephone privatizations and finds that periods of exclusivity can double a firm's sale price, 'but at the cost of substantially reducing investment: exclusivity periods are associated with up to 40 percent reduction in growth in the number of telephone mainlines' (p.16).[22] A theme

[19] 'Ideally, the study of the effects of privatization and competition should be based on firm-level data. But such data are hard to come by . . . The telecommunications sector offers a convenient setting since the industry tends to be dominated by a very small number of players in any given country. As a result, the distinction between country-level and firm-level data in telecommunications industry is not as significant as in many other industries.' See Xu, L. C. *The Impact of Privatization and Competition in the Telecommunications Sector around the World* (Washington D.C.: World Bank, 2002).

[20] Shirley, M. and Walsh, P. *Public versus Private Ownership: The Current State of Debate* (Development Research Group, World Bank, 2000). URL: http://econ.worldbank.org/files/1175–wps 2420.pdf.

[21] Boubakri, N. and Cosset, J.E. 'The Aftermarket Performance of Privatization Offering in Developing Countries' (Working Paper, Montreal: Ecole des HEC, 2000). URL: http://www.crefa.ecu.ulaval.ca/cunier/0016.pdf. In standard economic theory, normal profit equates to the competitive return on capital (the long run rate of return) plus any risk premium the market imputes for innovation. Above that, the rate of return is considered abnormal and in competitive markets, will be temporary. In cases where privatizations are accompanied by periods of exclusivity, abnormal profits could be expected.

[22] Wallsten, S.'Telecommunications Privatization in Developing Countries', *The Real Effects of Exclusivity Periods* (Working Paper and AEI Bookings joint center for Regulatory Studies,2000; 2003). URL: http://aeibookings.org/admin/pdffiles/phpq5.pdf.

common to many of these studies is the relative importance of privatization versus competition. Some researchers predict that in a competitive environment, there would be little to choose between publicly and privately owned companies. Others suggest that other things being equal, privatization always improves performance, while yet others stress the complementarities between privatization and competition. There is no overriding evidence to suggest that any one of these statements is beyond dispute.

Productivity, Output and Employment

Xu (2002) uses country-level panel data from 1981–1998 and finds that privatization did result in a significant shedding of labour, output growth and network expansion, and improvements to both labour and total factor productivity.[23] However, the effects of privatization and competition were complementary, accounting for around 50 percent of the growth, with competition having the greater impact on labour and total factor productivity. The effects on employment of privatization and competition tend to cancel each other out, so, 'it is not surprising that telecommunications employment was stagnant over the past two decades even as output in this sector demonstrated robust growth.'[24] (p.25). In another study, Bortolotti et al.[25] examine the records of 31 national telecommunications carriers from 14 industrialized and 11 non-industrialized economies that have been fully or partially divested by IPOs between October 1981 and November 1998, and find that employment fell, but not dramatically, from 67,000 to 63,000.

Prices

Prices are notoriously difficult to compare across economies. As Boylaud and Nicoletti point out, price discounts across OECD countries can reach up to 25 percent.[26] Price wars are common when competition for market share is intense. Without strong regulation, predatory pricing by incumbents, including hidden discounts and discriminatory pricing, are open options for post-privatization and liberalization. Privatization and liberalization also imply tariff rebalancing. Another difficulty is knowing how to appropriately weigh the resulting price sets or baskets of services to compare with pre-privatization and liberalization. Doove et al.[27]

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[23] Total factor productivity picks up productivity gains that cannot be easily attributed to increases in the productivity of labour or capital usage alone. This residual productivity is attributed to the combined effects rather than to other factors.

[24] Xu, L. C. *The Impact of Privatization and Competition in the Telecommunications Sector around the World* (Washington D.C.: World Bank, 2002).

[25] Bortolotti, B., D'Souza, J., Fautiui, M., and Muggiason, W.L. 'Privatization and the Sources of Performance Improvement in the Global Telecommunication Industry'. *Telecommunications Policy,* u 26.n.5/6 (2002) pp. 243–268.

[26] Boyland, O. and Nicoletti, G. 'Regulation Market Structure and Performance in Telecommunications.' *Economics Department Working Papers,* No. 237 (OECD, Paris, 2000). URL: http://www.oecd.org/dataoecd/13/26/188438.pdf.

[27] Doove, S., et al. 'Price Effects of Regulation: International Air Passengers Transport, Telecommunications and Electricity Supply', Staff Research Paper (Productivity Commission, Commonweath of Australia). URL: http://www.pc.gov.au/research/staffres/peor/poer.pdf.

include price effects in their study that applies the methodology and OECD data of Boylaud and Nicoletti (2000), to an additional 23 non-OECD economies, but conclude on an uncertain note. While higher levels of regulatory intervention in non-OECD countries seem to be related to higher telecommunications prices, the same does not always hold in OECD countries—the Scandinavian countries being the case in point—which may well reflect upon not just the quantity but also the quality of regulation in non-OECD countries.

Investment

Bortolotti et al. (2002) find no significant effects of privatization on investment levels one way or the other, but they do find some evidence to suggest 'regulation may strongly affect the strategic investment decision of firms' in a negative direction where a more competitive environment may crowd out investment by the incumbents, as they will have to share some of the benefits from these investments with their competitors' (p. 264). Unbundling the local loop could fall into this category. They also see problems of attribution when they find that sales of fixed lines and profitability generally increase following privatization. Prices tend to be restrained either by competitive entry or by regulation, especially in cases where an independent regulator has been established and introduces incentive regulation,[28] so this implies that profits rise because of sale volumes rather than price hikes. However, they also find that 'output per worker increases more after privatization for telecom employees in economically advanced countries than it does for telecom workers in less developed nations' (p.258).[29]

Competition and Regulation

Privatization is probably less important than competition in achieving increases in output, labour productivity, profitability and price restraint. According to Boylaud and Nicoletti (2000), in their study of 24 OECD countries between 1991–1997, 'no clear evidence could be found concerning the effects on performance of the ownership structure of the industry', but the 'prospect of competition (as proxied by the number of years remaining before liberalization) generally has a strong positive effect on the productivity and the quality of services and a strong negative effect

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[28] Incentive regulation refers to the price-cap model whereby price rises are capped at the level of increase of the retail or consumer price index minus X, where the regulator determines X. Firms are therefore, encouraged to lower their unit costs by more than X to boost profits.

[29] In a thought-provoking paper, Roller and Waverman (2001) seem to show that the contribution investments in telecom networks make to the GDP is greater the level of development of the economy, which raises questions over the efficiency of resource allocations to telecoms in developing countries. One research paper does not prove the case; bottom-up case studies of the economic benefits of telecoms often give circumstantial evidence to the contrary; and as Duwadi (2003) points out, new technologies can still offer cost-effective ways for developing countries to achieve universal service. However, it is plausible that so-called 'network effects' are greater in more developed economies. See Roller, L. and Waverman, L., 'Telecommunications Infrastructure and Economic Development: A Simultaneous Approach', *American Economic Review* (September 2001), pp. 909–923; and Duwadi, K. 'Telecommunications Investment, Economic Growth and Universal Service in a Global Economy,' (Washington D.C., International Bureau, Federal Communications Commission, 2003); available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-233246A1.pdf.

on prices' (p.7). The period 1980s–2000 has seen exponential growth in telecommunications demand, for both fixed and mobile connections, and privatization may be responsible for making the supply side more responsive, but equally so, the effects of de-regulation and liberalization lead to greater competition.[30]

Regulation

Clearly, regulation affects market behaviour as well as market structure, although Doove et al. (2001) find separating out the effects 'virtually impossible' (p.44). Examples of regulation affecting behaviour are incentive 'price capping' which encourages output and efficiency; monopoly rent 'profits capping' which, if the rate base is capital investment as opposed to shareholder funds, can lead to the inefficiency of 'gold plating'[31]; heavy-handed dominance regulation which, if it is prolonged, will reduce the incumbent's motive to innovate; and light-handed 'threshold' regulation which encourages market-led development till a case for regulatory intervention becomes clear-cut. In a post-privatization period, the regulatory environment by default has to be important.[32] The market structure is influenced by regulation even though the market remains influenced by other factors, such as size of the market, ease of entry, availability of technology and capital and staff.

Lessons and Useful Guidelines

There is a large body of non-econometric studies and accounts of the privatization process from bodies such as the World Bank, IFC, OECD and the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), from governments, and from academic papers and consultant reports. One of the best and earliest accounts of an actual privatization process is of NTT in Japan by Takano (1992) for the World Bank. Key points arising from some of these studies are listed below. Four perspectives that can provide useful insights into the policy-making and regulatory process then follow.

Lessons and Guidelines

Privatization is an intensely political process, and regulation an intensely commercial one, so they are controversial. There is a better chance of achieving

[30] The standard method used in studies is to examine the three years, pre-privatization and the three years, post-privatization because panel data that is - data across countries - beyond three years is often not available. However, realistically this is too short a timeframe in which to analyse factors such as economic growth and the effects of competition policy.

[31] If the rate base is capital expenditure, regulated companies have an incentive to boost their capital expenditure beyond commercial justification. A rate base of shareholder funds removes this incentive.

[32] In his study of 30 African and Latin American countries between 1984–1997, Wallsten (1999) finds: 'Privatization by itself does not appear to generate many benefits, and is negatively related with main line penetration. Privatization combined with a separate regulator, however, is correlated with increased connection capacity and payphones per capita' (p.15). See Wallsten, S. 'An Empirical Analysis of Competition, Privatization, and Regulation in Africa and Latin America' (Working Paper, Stanford University and The World Bank, 1999); available at http://econ.worldbank.org/docs/553.pdf.

productive, equitable and efficient outcomes if the lessons of previous reforms are understood.

Clear Aims

Perhaps the key lesson is the need to be absolutely clear as to the aims and objectives of privatization; for example, whether it is primarily a fund-raising exercise, or a restructuring one, or a prelude to full-blown market opening. Especially important is that 'a country must publicly clarify the decisions on corporate structure, together with how competition should be effectuated, by the time of privatization.'[33] Once SOTE is privatized, it is very difficult to restructure.

Commitment and Leadership

There are so many vested interests and lobbies, that the person responsible for the privatization process needs to be vested with the highest level of authority to be able to override special interest groups. Ideally, the person should be appointed directly by the head of state, the head of government or a very senior minister, and with a background that draws widespread respect and support from the community.

Corporate Structure, Governance and Reforms

Arranging the corporate structure prior to privatization is important, because it becomes a much more difficult task afterwards. This is especially true of geographical or market or line-of-business separations, because capital markets will shy away from uncertainty. Adopting cost accounting procedures and mechanisms is also best done ahead of privatization, although this process may have to be carried over into the post-privatization period. The discovery of the real costs of doing business is also part of the due diligence process prior to an IPO. At the very least, asset overheads, indebtedness and depreciation schedules have to be sorted out, especially where telecoms are being separated from posts, or structural separations are involved. Without cost accounting, tariff rebalancing also becomes impossible. All this needs to be done in an accountable and transparent manner if the cost of capital is to be kept low and credit worthiness ratings kept high.

Privatization Targets

Besides raising funds for the national treasury, there is little point in privatization unless objectives are set that cannot be just as easily met by the SOTE. These should include growth targets; for example, mainlines per capita, universal service targets, productivity and price targets, and quality of service targets. Potential investors will also look for revenue, average revenue per user and profit forecasts. It should be made clear how far these targets are dependent on the level of effective competition and the nature of the regulation.

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[33] Takano, Y. 'Nippon Telegraph and Telephone Privatization Study: Experience of Japan and Lessons for Developing Countries', *World Bank Discussion Paper 179* (Washington DC: World Bank, 1992).

Government, Management and Labour Relations

The roles and expectations of government, management and employees need to be negotiated to mutual benefit. This is easier said than done, but there are ways to minimize the impact of job loss. The state can absorb some of the costs of pension commitments and early retirement compensation, if necessary, from the proceeds of the IPO. Satellite companies can be formed to employ staff and work can be outsourced to these companies. Retraining and redeployment programmes can be funded. Labour unions can be given consultation and negotiating right guarantees, and so forth. Management remuneration is also an issue that needs to be addressed. Should it be left to market forces, or should government continue to exert influence?

Regulatory Structure

Is the regulator's office to be in any sense an independent and self-funding body? To be independent of the industry means not subject to 'capture' by the incumbent or the new entrants. To be independent of government simply means to be free to carry out government policy without undue interference from ministers and with sufficient resources to hire independent consultants and experts. The WTO BAT Reference Paper requires regulatory transparency and open-handedness; without these in place, regulatory risk will become a deterrent to private capital investment and innovation, and this in turn will subvert the aims of privatization.

Tariff Rebalancing

Economically important but politically difficult, tariff rebalancing needs a step-by-step approach, during which time the skewing effects will send competition into the business as well as long-distance markets. The transition period is best telegraphed in advance, so that investment decisions can be planned.

Interconnection

Unbundling the local loop (ULL) is the most contentious issue post-privatization and liberalization, with economic arguments for and against it. There are opportunities for the regulator to negotiate trade-offs with the privatized incumbent, such as periods of exemption in exchange for commitments to invest in the customer access network, or sunset periods for the phasing out of ULL after the new entrants have had time to build a customer base. Mandating core network interconnection is the second most contentious issue, but is essential to providing efficient network economics that underpin competitive entry. The devil is in the detail and the implementation. Cost accounting is absolutely necessary to arrive at sensible cost-based fees, and the regulator needs resources to be able to get hold of this information. Interim measures such as revenue-sharing, 'sender-keeps-all' and a fixed fee may be necessary before the true costs of interconnection are known. The regulator has to achieve a 'level playing field' with powers to intervene if and when private negotiations fail.

Competition

Competition is more effective than privatization on its own in bringing about improvements. The usual progression is from customer premises equipment (CPE) to value-added services, including mobile cellular telephony, to limited entry in the fixed wireline market, to full-blown competition. However, the rapid pace of technological advance limits the relevance of earlier models of liberalization, especially the advent of technologies enabling services such as VoIP, using existing circuit switched networks, and IP Telephony over Next Generation Networks (NGNs) using IP routing algorithms. Apart from deciding how much competition to allow and when to allow it, there is also the choice of having sector-specific competition law focused on telecommunications or introducing a general Competition Law to cover all industries.

Convergence

Convergence has a technological aspect and a business synergy aspect to it.[34] Digital technology opens the road to convergence at the level of the switch and the transmission path, or multiplexing, and the latest consumer electronic access devices are paving the way for convergence at the level of the CPE. Mobile phones can display video clips, and home entertainment centres can mix TV with the Internet, download music videos and play games. More difficult to achieve have been business synergies, as the failure of the Time Warner-AOL merger illustrates, but slowly and surely, telecom companies are moving into multicasting, cable TV networks into telephony and broadband Internet, and soon broadcast TV stations will be multiplexing content over digital terrestrial transmission (DTT) networks. A privatization process must address the question of what competitive, regulatory and licensing environment is to follow privatization, in light of convergence.

Licensing

Convergence issues raise important questions about licensing services that can be offered across a variety of competing platforms. Some regulators distinguish between transmission and content in their licensing regimes, and while this makes sense in terms of recognizing that there are many different ways to transmit the same digital content, can it ever hope to treat all transmission modes equally? For example, is content delivered over the Internet and the same content delivered over a cable TV or telephone network licensed in the same way? Another issue is whether licences should be company specific or line-of-business specific; geographically specific, general licences or class licences. Further, should restrictions on operational and commercial activities be written into individual licences, or into the legislation under which they are issued, or be part of general Competition Law? Details such as these will affect the post-privatization and post-liberalization environment.

The IPO

Preparing and launching an IPO in light of all the above, is an exercise of considerable and growing complexity. Outside independent expert financial advice

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[34] For a brief discussion of convergence from a regulatory perspective, see Ure, J. *'Regulation and Poverty Reduction'*, UNESCAP Experts Group Meeting, Bangkok, Thailand, 27–28 November, 2003 at http://www.unescap.org/rural/ICTEGMNov2003/HongKong_John%Ure.doc .

is almost a necessity. Flexibility is required to get the following right: timing of the IPO, number of tranches of shares to issue, price, ratio of placements to public offering, whether to use an auction method, the capacity of the local capital market to absorb the stock, and the like.

Restrictions

Governments may be under many pressures to restrict who can buy shares and who can exercise control over the privatized enterprise. Where governments retain a substantial share holding, there is a danger that the privatized company will be serving two masters: the government and private shareholders. Collusion between the two would be at the expense of effective competition and the consumer, so it is important to consider alternative ways to influence the economic and social behaviour of the privatized company to achieve government objectives. Incentive regulation is one path. Restrictions on foreign investment also come at a cost, and generally if governments wish to keep ownership and control in local hands, the use of the golden share through which the government can exercise a veto, is a less intrusive weapon than direct involvement at the Board of Directors level.

Debt

Poor credit ratings of privatized companies in less developed economies may close off the capital markets to them, and sovereign debt problems may restrict the ability of the government to assist. Bilateral and multilateral agreements with the World Bank and the IFC, other governments or the IMF and a consortium of private banks are avenues to be explored. Telecommunications ought to be a profitable business as well as a welfare enhancing one, and in most cases, good management and a well-designed regime of incentive regulation should attract support.

Four Perspectives on Reform

Good reform is not simply a process of learning from previous experience, but also a process of being able to analyse the particulars of current circumstances. No two environments or their histories are ever exactly the same, so what works well under one set of circumstances may not work so well under another. For this reason, having a conceptual framework within which to think through the issues is invaluable. The following four perspectives provide different insights, all of which can be helpful.

Reformist Approach

The World Bank, International Telecommunication Union (ITU), OECD, Asia Pacific Telecommunity (APT), Asia Pacific Economic Cooperation (APEC), Pacific Economic Cooperation Council (PECC) and many similar international and regional organizations focus on the practicalities of reform, ways to do it and global best practices. For example, the importance of getting the price structure right, bringing prices more line with costs, and a timetable for tariff rebalancing are stressed by Wellenius et al. (1993).[35] Are these the right priorities? Raising local tariffs and

[35] Wellenius, B. *Telecommunications: World Bank Experience and Strategy* (Washington D.C., World Bank, 1993).

lowering IDD and trunk call charges (tariff rebalancing) may seem counter-intuitive to the aims of making telephony affordable to all, yet the process is inevitable if IDD and long-distance tariffs are being by-passed and if more investment is to be encouraged in customer access networks by new entrants. Rather than opposing the inevitable, good regulation has to look for ways to differentiate between the poor and the better off to promote universal access.

Institutionalist Approach

Petrazzini (1995)[36] offers the most focused analysis on reform and privatization cases in less developed countries (LDCs), arguing that they are more likely to succeed where the relative autonomy of the state insulates it from outside pressure groups and power is highly concentrated within, and more likely to fail where relative autonomy is weak and power widely dispersed. Is this an argument for limited consultation, and will lengthy consultation inevitably delay sector reform? Ure[37] has elsewhere argued that Petrazzini's emphasis upon power is perhaps, too much at the expense of the role of a commitment to development by the state. Both may be necessary, but neither is sufficient.

Neo-Institutionalist Approach

Singh (1999)[38] gives pride of place to stakeholder interests and the role of incentives and property rights in the marketplace as a tool to explain the success or failure of privatization and reform. Noam, in *Noam et al,*[39] suggests that special interest groups emerge as network development progresses from (*a*) underdevelopment to (*b*) high revenue growth concentrated on urban areas, to (*c*) cross-subsidization of universal service to high cost areas. These special interest groups are people living in urban areas opposed to paying more than the incremental cost of a city telecommunications network. They lobby to have the right to use low cost networks catering for their specific business or residential needs. This has clear implications for funding universal access if middle class consumers vote against the cross-subsidization of services, and places pressure on regulators to come up with alternative approaches.

Transaction Theory Insights

This approach distinguishes between information-rich and information-simple transactions. Transactions that involve long-term assets and relationships, and ongoing coordination between transactors who are information-rich are best done

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[36] Petrazzini, B. *The Political Economy of Telecommunications Reform in Developing Countries:Privatization and Liberalization in Perspective* (Praeger,Westport, Connecticut and London, 1995).

[37] Ure, J. 'Corporatization and Privatization of Telecommunications in ASEAN Countries', *Pacific Telecommunications Review,* 1993 Vol. 15,No. 1, pp 3–13.

[38] Singh, J.P. *Leapfrogging Development? The Political Economy of Telecommunications Restructuring* (State University of New York Press, 1999).

[39] Noam, E. and Komatsuzaki, S., and Conn, D., *Telecommunications in the Pacific Basin: An Evolutionary Approach* (New York and Oxford, Oxford University Press, 1994). Noam elaborates the implications for USO reform in 'Beyond Liberalization III: Reforming Universal Service', *Telecommunications Policy,* Vol. 18, No. 9 (1994), pp. 687-704.

within the firm. Those that do not have these characteristics and have only simple information requirements are well suited for transactions between firms. The implication is that information-simple markets are more easily opened to competitive entry than information-rich markets. Faulhaber[40] argues that the liberalization and deregulation of CPE was an early success because no long-term relationships were involved and the information requirements of the transactions were simple: basically, 'where do you want the phone and when do you want the phone?' In the US experience, the opening of the long-distance market was not very successful because the switch architecture of the old Bell system integrated many functions of both local and long-distance while the complexity of the engineering, subscriber database and the billing system information required was immense. Also, long-term customer relationships and interaction are important, so the regulatory costs of implementing interconnection, unbundling of network elements and so forth are very high. Is this a useful framework for designing and thinking about the costs and benefits of different approaches to structural reform and the opening of markets?

Conclusion

The term 'privatization' has a variety of meanings, but they all involve a degree of entry of private capital and entrepreneurship into the telecommunications business. The main constraint for developed economies is the underdevelopment of local capital markets, unless they are willing to see foreign capital enter on a grand scale. There can be many advantages for the latter, but local political considerations and priorities may dictate otherwise, in which case the costs of foregoing foreign capital need to be offset, and therefore to some extent, justified, by local reforms. As UNESCAP (2002)[41] puts it:

> Where countries are not yet at a stage where it is politically or economically feasible to embark on a privatization programme, then privatizing management, asset leasing, franchising and management contracts can lead to important economic benefits without having to change ownership. (Section V)

Privatization can go through various stages and take many forms, but there are just as many interest groups to lobby for and against. The principal stakeholders on the supply side are government and the employees, where government can be motivated by different considerations such as raising funds from an IPO, or promoting structural reform and investment in telecommunications, and employees by safeguarding jobs, salary structures, pension rights and other fringe benefits. Clearly, many policy trade-offs are involved if the process is to be

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[40] Faulhaber, G., 'Policy-Induced Competition: The Telecommunications Experiments' (Working Paper, 2001) at http://rider.wharton.upenn.edu/~faulhabe/Policy-Induced%20Competition.pdf (Information, Economics and Policy, 2003).

[41] 'Privatization: A Panacea or A Palliative Development' (UNESCAP, 2002). URL: http://www.unescap.org/drpad/publication/toc/dp22con.htm.

successful and these need to be clearly identified and made public, before privatization is carried out. Restructuring after the event leads to uncertainty and capital flight.

The evidence on privatization is not conclusive one way or the other, and therefore generalizations are difficult. However, in their general literature review, Megginson and Netter[42] conclude:

> Research now supports the proposition that privately-owned firms are more efficient and more profitable than otherwise-comparable state-owned firms. There is limited empirical evidence, especially from China, that suggests that non-privatizing reform measures, such as price deregulation, market liberalization and increased use of incentives, can improve the efficiency of SOEs, but it also seems likely that these reforms would be even more effective if coupled with privatization. (p.46)

Efficiency is a dangerous word, because it can mask all kinds of bad things, such as declining quality, standards of health and safety, and choice, which do not get measured in econometrics. Studies do tend to show that output (fixed lines per capita) rises along with profitability, but evidence on prices is rather lacking and complicated by tariff rebalancing where it takes place and which is associated with efficiency. So overall, as Megginson and Netter (2001) also conclude, 'there is little empirical evidence on how privatization affects consumers' (p.47). Most studies find that employment falls in the incumbent firm as a result of privatization, although there is no consensus whether this is by a large amount or small amount. Where competition is robust, jobs tend to be created and the market grows, the one tendency cancelling out the other. There is evidence that where a strong independent regulator is established, these effects are greater. Market growth also implies capital investment, and this in turn results in rising labour productivity, which some studies find stronger in developed than developing economies.

These results also mean the effects of privatization are either complemented or overwhelmed by the effects of market structure (competition) and/or regulation. Separating out the effects is difficult, but the evidence suggests that competition is the more significant element in driving telecommunications investment and output than privatization. It also suggests that privatization without strong regulatory support is less effective.

Non-econometric research has turned up important lessons as to the process of privatization or divestiture. The nature of the state and its relation to civil society,

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[42] Megginson, W. and Jeffry M. N., 'From State To Market: A Survey of Empirical Studies On Privatization', *Journal of Economic Literature,* June 2001; prepublication AEA paper url: http://papers.ssrn.com/sol3/delivery.cfm/SSRN_ID262311_code010326560.pdf?abstractid=262311.

and how open it is to manipulation by interest groups, has important consequences for the success or failure of the reform process. The three key issues that need addressing when planning to privatize are: (*a*) price regulation and how prices are to be governed; (*b*) network growth targets, including universal service targets and how to pay for them; and (*c*) quality of service targets and how to measure consumer benefits.

The lessons from new institutional economics suggest that incentives, including property rights issues, need to go into the design of reforms, and transactions cost theory raises useful guidelines for working out the costs and benefits of different designs of policy reform, to see just what it takes and costs to create successful reform.

APPENDIX - Capitalization of Major Private Telecom Companies in Asia 10/2/2003

Company	Currency	Local price	Market Cap (US$ bn)	Date of IPO	Weight in local Index	Index
Cellular carriers						
Pan Asia						
SmarTone	HK$	11.95	0.9	31/10/96	—	—
SUNDAY	HK$	0.37	0.1	16/3/00	—	—
CMHK	HK$	20.80	52.4	23/10/97	11.695%	Hang Seng Index
Unicom	HK$	6.65	10.7	22/6/00	2.375%	Hang Seng Index
SK Telecom	Won	186,000	13.3	7/11/89	5.240%	Korea Composite
KT Freetel	Won	21,750	3.5	7/12/99	10.474%	KOSDAQ Composite
LGT	Won	3,810	0.9	20/9/00	2.662%	KOSDAQ Composite
MobileOne	S$	1.42	0.9	4/12/02	0.816%	STI Index
TAC	US$	1.48	0.7	13/10/95	0.278%	STI Index
AIS	Bt	57.0	4.2	5/8/93	—	—
Digi	RM	3.72	0.7	18/12/97	0.787%	Kuala Lumpur Composite
Maxis	RM	6.45	4.2	8/7/02	4.511%	Kuala Lumpur Composite
PT Indosat	Rp	9,600	1.2	19/10/94	2.815%	Jakarta Composite
TCC	NT$	27.00	3.6	19/9/00	1.065%	Taiwan Weighted
Far EasTone	NT$	22.30	1.5	10/12/01	—	—
Globe Telecom	P	700	1.9	2/1/90	11.620%	Philippines Composite
Japan						
NTT DoCoMo	Yen	279,000	126.2	22/10/98	0.114%	Nikkei 225 Index
Integrated carriers						
Pan Asia						
PCCW	HK$	5.25	3.6	18/10/94	0.801%	Hang Seng Index
China Telecom	HK$	2.05	19.9	15/11/02	—	—
SingTel	S$	1.68	17.4	1/11/93	8.333%	STI Index
Telstra	A$	4.83	42.5	14/11/97	4.518%	All Ordinary Index
Telecom NZ	NZ$	5.10	5.8	18/7/91	22.0%	NZ Top 40 Index
Korea Telecom	Won	47,350	12.0	23/12/98	4.713%	Korea Composite
CHT	NT$	47.90	13.7	27/10/00	3.938%	Taiwan Weighted
PLDT	P	670	2.1	2/1/90	12.764%	Philippines Composite
PT Telkom	Rp	6,450	7.8	14/11/95	18.229%	Jakarta Composite
Telekom Malaysia	RM	7.45	6.2	7/11/90	6.782%	Kuala Lumpur Composite
Telecom Asia	Bt	6.45	0.5	22/12/93	—	—
Japan						
NTT	Yen	516,000	74.1	8/1/88	0.212%	Nikkei 225 Index
KDDI	Yen	598,000	22.9	1/10/93	2.404%	Nikkei 225 Index
Japan Telecom	Yen	353,000	10.2	6/9/94	0.366%	TOPIX Index

Source: Bloomberg, CSFB estimates.

Chapter **Six**

Infrastructure and Universal Access: Goals, Strategies and Models

—Virgilio L. Peña

Abstract

The emerging global and national information and communications technology services sector has been characterized by rapid technological change, industry restructuring, market expansion, privatization, widespread competition and significant cost reductions. Such changes have profound implications for developing countries, as they seek to expand and develop their ICT sector to make it globally competitive and, at the same time, make it 'a public policy to spread telecommunications to most members of society, and to make available, directly or indirectly, the funds necessary.' [1]

Given this emerging environment, the role of government in achieving the goal of universal service is being debated. There is the dilemma of pursuing the policy of privatization on the one hand, and the reluctance of the private sector to provide the necessary applications and services in unserved and underserved communities because of lack of commercial viability, on the other.

A number of community e-centers or multi-purpose community telecentre models have been adopted by several countries. In the Philippines, the Community e-Center Program (CECP) is being adopted as a way of achieving the goal of universal access. It intends to coordinate similar and related initiatives to align with a single blueprint of CECP implementation strategies. Moreover, CECP focuses on content development, rather than overemphasizing broadband deployment alone.

Content can drive utilization of broadband, as well as the need for complementary capacity-building efforts to educate end users.

[1] Noam, E. M. 'Reforming Universal Service: A Prerequisite to Competition and Interconnection' in Eli M. Noam and A.J.Wolfson, eds., *Globalization and Localism in Telecommunications.* (Elsevier Science B.V. 1997, p.113).

In many cases, sustainability, business/commercial mechanisms, content provision and local participation are primary considerations in these models. A number of technologies that are more suitable to remote communities are being utilized in some 'successful' models.

Introduction

Traditionally, the goal of spreading telecommunications was referred to as *universal service*. Hadden[2], for example, states that, 'Universal service is the name given to the level of telecommunications service that public policy regards as so essential it must be made available to everyone at reasonable cost.' Universal service is supposed to respond to the global concern of 'narrowing the telecommunications gap'[3] and recently, 'bridging the digital divide'.

In many cases, the terms 'universal access' and 'universal service' are used interchangeably. Hank Intven, et al. of the *Telecommunications Regulation Handbook*,[4] describe the concepts as follows:

Universal service policies generally focus on promoting or maintaining the 'universal' availability of connections by individual households to public telecommunications networks. The objective of connecting all, or most, households to public telecommunications networks is generally referred to as the Universal Service Obligation (USO). According to the International Telecommunication Union (ITU)[5], the goal of universal service is appropriate for developed countries only, since the concern is with 'the few without a telephone rather than the majority of the population, which already have one'. However, it is not economically feasible in most developing countries, where universal access is a more practical objective.

Universal access generally refers to a situation where every person has a reasonable means of access to a publicly available telephone. Universal access may be provided through pay telephones, community telephone centres, teleboutiques, community Internet access terminals and similar means.

The definition of universal access is very much country-specific and correspondingly, universal access policies ought to be flexible in meeting specific universal access needs. Definitions also vary and the focus usually depends on the level of development of a particular country. For example, universal access needs in

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2 Hadden, S. G. 'Universal Service: Policy Options for the Future' in Noam, E. M. and Wolfson, A.J., eds. *Globalism and Localism in Telecommunications* (Elsevier Science B.V, 1997, p.129)

3 Independent Commission for Worldwide Telecommunications Development. *The Missing Link: Report of the Maitland Commission.* (Geneva: ITU, 1984).

4 The preparation of the *Telecommunication Regulation Handbook* (Nov 2000) was funded by the infoDev Program of the World Bank, with additional funding from McCarthy Tetrault. Hank Intven, Jeremy Oliver Edgardo Sepulveda, *Telecommunication Regulation Handbook,* (Washington: World Bank, USA, 2000).

5 International Telecommunication Union. *1998 World Telecommunication Development Report* (Geneva: ITU, 1998).

Table 1. Universal Service Targets in Selected OECD Countries	
Australia	Standard telephone services, including voice telephony and, if voice telephony is not practicable due to a disability, another form of communication equipment to voice telephony (for example, a teletypewriter); payphones; prescribed carriage services.
Canada	Individual line local service with touch-tone dialing provided by a digital switch with the capability to connect via low speed data transmission to the Internet at local rates; enhanced calling features, including access to emergency services. Voice Message Relay service and privacy protection features; access to operator and directory assistance services; access to the long-distance network; a copy of a current local telephone directory.
US	Voice-grade access to the Public Switched Telephone Network (PSTN), with the ability to place and receive calls; Dual Tone Multi-frequency (touch-tone) signalling or its functional equivalent; single party service access to emergency services; access to operator services; access to directory services; access to long-distance services.
Norway	Public voice telephony; operator assistance; emergency and directory inquiry services; public payphones.
Spain	Basic telephone service, including local, national and international access; free directory services; public phones; special services for disabled people.
UK	Connection to the fixed network able to support voice telephony and with speed data and fax transmission (and the option of a more restricted service package at a lower cost); public telephones; free access to emergency services; itemized billing; selective call barring; access to operator assistance and directory assistance.

high-income economies focus on the needs of the elderly, the information infrastructure, availability of choice and quality of service. Examples of universal targets in selected developed countries are shown in Table 1.

On the other hand, universal access objectives of developing and transitional economies generally focus on network coverage, payphones, affordability and education of users. Examples of these are shown in Table 2.

Recently, focus has shifted to access to ICTs, to ensure the fundamental right to receive and impart information and ideas through any media as enshrined in Article 19 of the United Nations Universal Declaration of Human Rights. The

Table 2. Universal Access Targets of Select Developing and Transitional Economies	
Costa Rica	Within 1 km of both public and private access.
Iran	Telephone facilities to all villages of more than a 100 people.
Kenya	A phone within walking distance.
Mozambique	A public telephone within a distance of less than 5 km. At least one public telephone in each of the 144 district centres.
Zambia	Telephone booths in public places (schools, clinics, etc.) countrywide.
Philippines	The availability in all urban and rural areas of a minimum set of telecommunications services, which are reliable and affordable.

declaration of principles for the World Summit on Information Society (WSIS), 2003, recognizes that 'knowledge, information and communication are at the core of human progress, endeavour and well-being and that, although the dramatic increase in the volume, speed and ubiquity of information flows, which has been made possible through new information and communication technologies, have already brought about profound changes in people's lives, and are creating enormous new opportunities, they have yet to benefit the vast majority of the peoples of the world.'

The declaration further promotes, among others, the principles of 'inclusion and universal, ubiquitous and affordable access to ICT'. Countries with less developed infrastructure will encounter very serious difficulties in living up to these principles, because of the various dimensions associated with this goal.

There appears to be an emerging consensus that the digital divide is not just about access to technology, but has a socio-economic component. There are many dimensions to the digital divide. It exists between nations and within nations. It exists between rich and poor, young and old, urban and rural. There is a financial divide, a knowledge divide and a divide of confidence. The divide is also reflected in the concentration of information resources in a small group of developed countries the imbalance of information technology assets among nations.[6]

The 2002 World Telecommunication Development Conference identified the following important factors in bridging the digital divide:

Awareness — The state and individuals should be fully aware of the importance of digital technologies and their applications.

Accessibility — Infrastructure should be expanded and improved in order to provide the necessary connectivity for the effective use of ICTs.

Affordability — Means should be found to provide low-cost services to users, low-cost equipment and training on the effective use of ICTs for national and individual development.

These need to be expanded by another 'A' if we are to succeed in this objective— APPLICATIONS. Both government and the private sector should focus on developing applications. Too often, there is greater emphasis on building networks and deploying broadband at the expense of developing content, more specifically, national language content.

[6] *Final Report of the ITU World Telecommunication Development Conference,* Istanbul, Turkey, March 2002, p. 4. http://www.itu.int/itudoc/itu-d/wtdc/wtdc02.html.

Table 3. *ICT Indicators in Select Asian Countries*

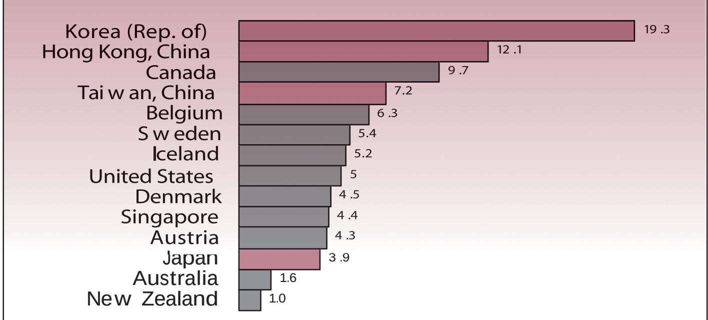
Categories/Countries	IDN	LAO	MAL	MMR	FHL	SGP	THA	ENGLISH	INDIA	PAKISTAN	S.KOREA
TELEPHONE SUBSCRIBERS per 100 pop.	9.1	2.1	51.2	0.6	22.0	125.5	22.2	1.3	5.2	2.9	116.8
CELLULAR MOBILES SUBSCRIBERS per 100 pop.	5.50	1.00	34.88	0.03	17.77	79.14	26.04	0.81	1.22	0.56	67.95
INFORMATION TECHNOLOGY											
– Internet Hosts per 100 inhabitants	2.2	0.3	31.1	—	3.9	479.18	11.8	—	0.81	0.78	148.47
– Internet Users per 100 inhabitants	191.2	27.1	2,731.1	2.1	255.7	5,396.6	775.6	15.3	159.1	34.5	5,518.9
– Estimated PCs per 100 inhabitants	1.1	0.3	12.6	0.11	2.17	50.83	2.78	0.34	0.58	0.41	55.58
INT'L INTERNET BANDWIDTH **Mbps** (As of 2001)	313.0	2.0	733.0	2.0	237.0	2,369.0	642.0	40.0	1,475.0	225.0	5,432.0

Source: ITU (http://www.oaseeconnect.gov.ny)

The Asian ICT Environment

Table 3 provides a snapshot of the ICT environment in Asian countries. As expected, a wide disparity exists within Asia and between developed and developing countries.

The Asia-Pacific region emerged as the largest telecommunications market in the world in 2001, according to an ITU report released during TELECOM ASIA 2002. The region is a leader in advanced Internet technologies such as broadband access and mobile data (see Figure 1).



Source: International Telecommunication Union, 2002, *Asia-Pacific Telecommunications Indicators 2002,* Geneva, ITU. http://www.itu.int/itudoc/gs/promo/bdt/81892.pdf

Figure 1 **Top 12 economies by broadband penetration (June 2002)**

The region is experiencing an explosion of international Internet bandwidth. The capacity of Internet links connecting Asia-Pacific to the world have grown more than eight-fold over the last two years, from eight to 65 gigabits by the end of 2001. International Internet capacity in the region now far exceeds conventional telephone capacity (see Figure 2).[7]

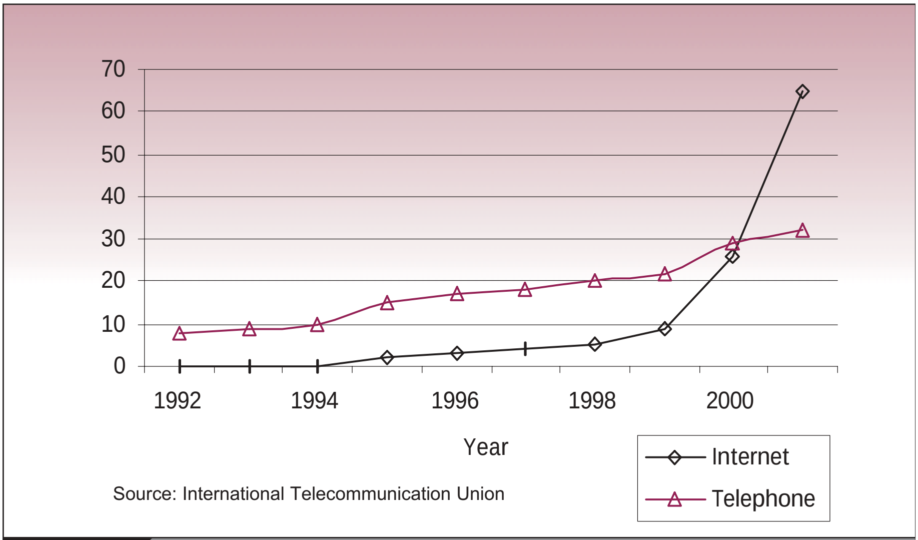


Figure 2 **Asia-Pacific International Communications Capacity (Gbit/s)**

While the region is experiencing the bandwidth boom, not all countries have participated in and benefited from it. The ITU identifies two such groups of countries with unfavourable geographic locations: land-locked Asian countries and Pacific island nations lying too far away from main submarine cable routes. These groups of countries do not get the full benefits from undersea cables.

The ITU further explains that these nations find themselves in a situation where they rely on lower quality and high-cost satellite connections. In most cases, they do not have the economies of scale and therefore do not have the resources, to buy large amounts and thus pay higher prices. For example, countries in South-East Asia are paying between six and seven times more than what Japan pays for international Internet bandwidth.

Technologies and Other Unconventional Access Methods and Applications

Access barriers have been largely due to poor telecommunications infrastructure, in places that still predominantly use the traditional analogue copper cable.

[7] East Asia APEC Economies include China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Chinese Taipei, Thailand and Viet Nam.

Wireless technologies are increasingly being utilized in developing countries to improve access. With wireless technologies, rolling out the infrastructures is quicker and, more often than not, more cost effective.

Satellite, as cited earlier, has been utilized by land-locked and small island nations. It is recognized as an appropriate technology for broadband service in remote locations, as shown in Figure 3.

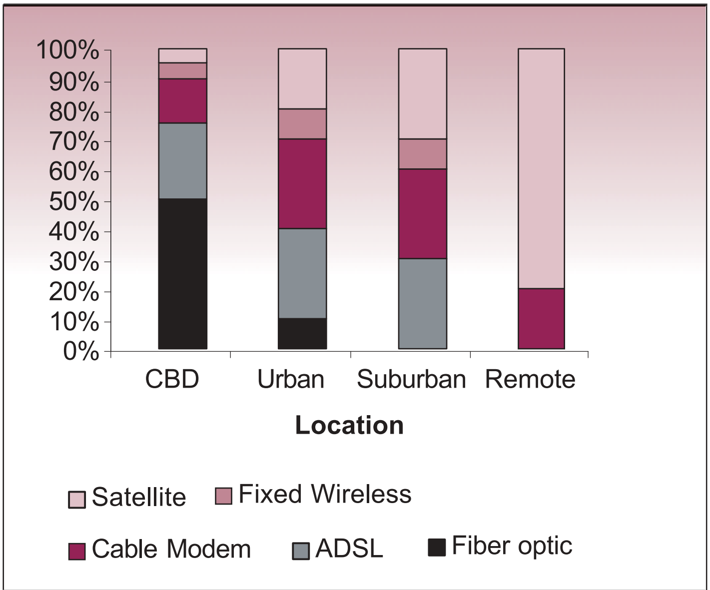


Figure 3 **Current Broadband Service by Location**[8]

On the other hand, some unconventional access methods have proven to be successful particularly to meet the requirements of small and medium enterprises (SMEs). Companies, community groups and individuals are now recognizing the need and the potential for using the short messaging service (SMS) of cellular phones for communicating with customers, members and associates.

We have already seen that mobile phone usage in many, if not all, countries is growing rapidly and has certainly reached 'critical mass'. People carry their mobile phones with them all the time, making it an ideal means of reliable communication. A report from the APEC Telecommunications and Information Working Group (TEL) on 'EC Strategies for Rural SMEs in APEC', presented the results of case studies in the Philippines and Indonesia, showcasing the 'importance of community Internet access in rural areas'. The report presented the following applications,[9] among

[8] Presentation by Dr. Phinainitisart, Shin Satellite Public Co., Ltd., at the Industry Forum held in conjunction with the 3rd ASEAN TELMIN Meeting in Singapore, September 2003.

[9] Examples were taken from the APEC TEL Working Group Report on EC Strategies for Rural SMEs in APEC, presented at APEC TEL 28 in Taipei on 4–10 October 2003.

others, that highlight the many opportunities for creative people who utilize SMS for specific business requirements.

Booking hotel rooms in the Philippines

A beach resort recently opened in the southern island of the Philippines, 880 km south of Manila. Business during a prime vacation week was quite brisk, even though the place had no reservation office, no website and no fixed-line phone or Internet access. The owners had only a poorly printed brochure listing two mobile phone numbers. "Practically all our guests this week made reservations through these numbers, and most of them didn't call—they just texted us," the owner said. "Our customers save a lot of money."

Text2teach in the Philippines

text2teach, a service introduced in the Philippines, is a global programme developed jointly by Nokia, the International Youth Foundation (IYF), Pearson and the United Nations Development Programme (UNDP). The four organizations combined their expertise in technology, training, content and processes, to create an impact on the learning of young people by enabling teachers to use mobile phones supplied by Nokia, to request more than 80 full-length videos provided by Pearson. Each of the videos introduces and illustrates a key component of the Philippine science curriculum. Upon texting, the requested video will be sent via satellite to a digital recorder connected to a television in the teacher's classroom. The interactive demonstration of science concepts and ideas is expected to benefit both teachers and students.

Malaysian news by SMS

On-line newspaper *Malaysiakini* launched pay-per-view access to its news content by SMS. To subscribe, readers must send an SMS with the word 'Mkini' to the telephone short code 32300. *Malaysiakini* will send a return SMS with a special log in code. Once this code is entered into the SMS log in box on the website, the content can be accessed for the next 24 hours.

Livestock and harvest prices

Australian-based agricultural agency Elders say that growers and sales representatives have replaced fax with SMS to receive up-to-date information about prices, which is vital in an industry where price changes occur quickly. They are also examining the use of SMS for insurance quotes and livestock prices. Email has also become an important means of reaching growers.

Bureau trial of SMS to warn of severe weather

The Australian Bureau of Meteorology is carrying out a trial in four cities using SMS to deliver an alert directly to the mobile phones of members of the public when severe weather is forecast. The trial has already attracted over 2,500 subscribers, each requesting, on average, six specific services. The SMS provides an alert that a warning has been issued and refers the recipient to the Bureau website or a 1–300 telephone number for full details of the warning.

Community e-Centres, Multi-purpose Community Centres and Other Similar Schemes: Best Practices and Models

A telephone in every home should be a key goal in any country's telecommunications policy, but a telephone within walking distance is a worthy interim step.

This is why telecentres appear as important elements within the communications infrastructure of a number of countries around the world.[10] Telecentres are also known as community e-centres, community access centres, telecottages, Internet shops, Internet cafés, cyber-cafés and other names depending on their size and functionality.

Community e-centres are facilities where the public can access a variety of information and communication services and technologies. They range in size, from a one-person micro-business, to middle-size enterprises or cooperatives employing 10 or more people. The concept is flexible and can be adopted to a wide range of local needs and circumstances; it can evolve from one form to another in response to changes in business practice, technology and the economy.[11]

More than just providing 'shared premises' where the public can access ICT services,[12] community e-centres play a major role in 'developing human capital, and encouraging social and economic development[13]' especially in underserved and unserved areas. Bastidas-Buch, Montero and Proenza have identified seven types of community e-centres based on management style: commercial, franchise, university, school, NGO-sponsored, municipal and multipurpose.[14]

The **commercial e-centre** (a.k.a. cyber-café), mainly offering Internet access, has the highest potential for replication and sustainability. However, the mechanisms for the **franchise model** have yet to be defined. The **NGO-run community e-centre** has the highest potential of targeting the poor populations. It tends to have specialized content and services as determined by the location and promoting institution. The **university-based e-centre** provides access to ICTs mainly for students, but is open to the public as well. Similarly, the public is allowed to access ICTs in **school e-centres** but only after class hours. Theoretically, **municipal and multipurpose community e-centres** offer a wide range of private and government services. Municipal e-centres are primarily run

[10] Kruger, P. *The Role of Telecenters,* World Telecommunication Development: The Digital Opportunity, International Systems and Communications Limited, 2002.

[11] Framework for DOTC Community e-Center Program, p. 3. http://www.dotcmain.gov.ph/

[12] Colle, R. D. and Román, R. quoted in Dymond, A. C. and Oestmann, S. 'Telecentres—Experiences, Lessons and Trends', 'Telecentres: Case studies and Key Issues', Larchem, C. and Walker, D., eds. *The Commonwealth of Learning,* 2001. http://ww.col.org/telecentres/chapter%2001.pdf.

[13] Dymond, A. C. and Oestmann, S. See 12 above.

[14] Bastidas-Buch is a telecommunications engineer working for the International Telecommunications Union. Montero works as Systems Specialist for the Inter-American Development Bank. Proenza is an Economist with the UN Food and Agriculture Organization.

by local governments, some in partnership with private entities. Multipurpose e-centres, on the other hand, may be run either by the state government or an administrative board.

In addition to these seven types, this chapter proposes two more types, namely, community and cooperative telecentres. The **community e-centre** focuses on services uniquely required by the community, while the **cooperative telecentre** is funded and managed by a cooperative.

Among the most successful models established are:

- Peru's *cabinas publicas*
- Paraguay's AMIC@S
- Chile's El Encuentro
- Philippines B2B Price Now[15]

Peru's *cabinas publicas* fall under the commercial e-centre category, as they are privately-owned and managed, and are more popularly known as Internet cafés. The first *cabinas* were set-up by the academic and scientific community, *Red Cientifica Peruana* (RCP). The success of the *cabinas* resulted from the aggressive awareness campaign led by the RCP, the increase in the number of young people capable of operating and managing ICT, and Peru's telecommunications policies that embrace the concepts of market liberalization and competition. Both human resource and market conditions created the demand and infostructure that brought about the widespread use of ICTs and ICT-enabled services.

Paraguay's AMIC@S (*Aulas Municipales de Información, Comunicación y Aprendizaje*) are basically municipal community e-centres established in both cosmopolitan and poor communities, to serve as media for cyberconferences between the mayor and the public, computer training centres, instruments for virtual trips, and/or venues for accessing other ICT services that communities demand. The AMIC@S were put up and are maintained through finances provided by the United States Agency for International Development (USAID) and the local government. A central technical unit has been put up to set the guidelines for the operation of all AMIC@S, while individual management committees have been formed to supervise each.

Chile's *El Encuentro* is an example of an NGO-run community e-centre. *El Encuentro* was conceptualized by an influential individual who sought hardware and software donations from private businesses. The finances of the *El Encuentro* are managed by a Board of Directors, which consists of influential people who solicit funds for the community e-centre.

Philippines B2B Price Now is basically a cooperative type of telecentre. It is focused

[15] In the APEC TEL Working Group Report on EC strategies for Rural SMEs in APEC, B2B Price Now was used as a benchmark example of what can be achieved in the rural sector; it serves as a model for others to adopt and adapt for local use.

on meeting the needs of very small agricultural concerns across the Philippines. India's Warnana 'Wired Village' project in the state of Maharashtra, is implemented by a local cooperative that utilizes ICTs to streamline the operations associated with sugarcane growing and harvesting. The project benefits small farmers, both in terms of transparency and time saved on administrative work.

The setting or location where the community e-centre is to be set up must be the primary determining factor in identifying the appropriate type of e-centre that is established, as an entirely commercial model may be set up in some areas, while it may not be an effective mechanism in very low-income communities. For the latter, certain types or levels of private sector incentives and/or government subsidies may be necessary to make community e-centres successful. Nonetheless, the aforementioned cases exemplify that community e-centres:

- can also be established in low-income communities, aside from cosmopolitan areas;
- have adopted various type/s of business models to ensure their self-sustainability; and
- are run by individual/s who are accountable for their operations, management and sustainability.

The above models illustrate that real success lies in networking with the population by:

- maximizing technologies and integrating systems and ICT-based resources;
- implementing socially-oriented activities, such as awareness campaigns and ICT training;
- developing technologies and content based on defined priorities that are, in turn, defined by the needs/demands of the immediate user community; and
- involving the local community in all phases of the project.

The Community e-Centre Programme: The Philippine Model

Definition

A Community e-Centre (CeC) is an outlet for providing the general public with affordable access to a variety of services using ICTs, such as telephones, the Internet, email, fax, telex/telegram, computer training, distance learning, on-line services and other kinds of services/information relevant to the community.

The outlets will be located in strategic areas accessible to the community, such as the municipal hall, the post office, the *barangay* hall, or any similar area where most of the local folks congregate almost daily.

Variations of this concept of a 'one-stop provider of ICT services' are telecentres, information and reading centres, community access centres, telecottages, and Internet cafés, among others.

Services

Depending on the size of the community, the services offered in a CeC will range from the basic voice, date and business centre services, to government and commercial services:

- voice services (national and international phone calls);
- data services (Internet, email, texting);
- business centre services (fax, telex, telegram, photocopying, scanning, printing);
- computer training services (basic training, distance learning);
- local government unit (LGU) services (*barangay* clearances, complaints, residence certificates, real estate taxes, business permits and licenses);
- national government services (birth certificates, social security, taxpayer identification number, passport, etc.);
- special overseas filipino workers, services (VoIP, email with Webcam, job search/placements);
- community-based services (agricultural prices, local content development, local tourism) and
- commercial services (e-procurement, payment and collections, remittance processing).

While set-up and operational costs of a CeC will be fairly predictable, the major critical success factor for its sustainability will be the revenues coming from various compelling applications for the local community.

Need for Community e-Centres

Citizens residing in smaller communities do not have access to basic services and would need to travel long distances for them (for example, long-distance telephone services, Internet access, e-learning). To make matters worse, existing telecom companies are not interested in developing access to smaller communities (*barangays*, towns, municipalities) and predictably, tend to concentrate on the more lucrative (urban) areas. Thus, telephone density and PC penetration in the smaller communities are still low, with a correspondingly low affordability level of consumers.

However, there is no need for citizens in rural areas to be disadvantaged in terms of timely information and basic phone and data services because of poor telecommunication facilities.

Objectives

The CeC aims to:

- increase ICT participation in remote communities;
- prepare access points for delivery of e-government services (national and local) to smaller communities that do not have access at all;
- augment the existing government effort on solving the 'last-mile problem', with private sector and local community participation;

- improve bandwidth affordability in remote areas through special incentives (for example, pricing, subsidies, low-interest loans); and
- provide affordable access to voice and data services to unserved and underserved areas.

Benefits

The following benefits are expected from CeCs:

- decrease digital divide issues by increasing universal access to the Internet;
- decrease the cost for delivery of government services to areas not covered by the various agencies; and
- directly contribute to income generation, intellectual development and poverty alleviation in the rural areas (for examples provide job opportunities, better agricultural prices and, training for ICT-enabled services).

Other benefits include:

- providing access to basic telecommunication services;
- providing access to job opportunities to the more than four million unemployed Filipinos, mostly in the agricultural areas;
- increasing farmers' ability to monitor and obtain better prices on agricultural products;
- facilitation of market opportunities and delivery of goods and services;
- providing cheaper means of communication for families of overseas workers and faster remittances of money;
- providing access to markets such as agriculture/SMEs;
- skills training for potential workforce to address the rapidly growing ICT-enabled services global market, ranging from low-entry level skills (for example, data-entry, medical transcription) to high-end skills (for example, customer contact centres, accounting, legal services, human resource process outsourcing);
- opportunity for government agencies (national and local) to offer more responsive services to half the population;
- opportunity for communities to participate in identifying/providing meaningful and accurate content;
- opportunity for growth at the *barangay* level;
- providing a vital link to a host of information, with content coming from communities;
- promoting tourism;
- opportunities for SMEs to provide peripheral products and services;
- providing just-in-time communications;
- providing research facilities for students;
- providing e-health services; and
- rural vocational training.

Major Stakeholders

While there are numerous groups of people who have a stake in the success of CeCs, it is important to recognize the major groups whose participation must be solicited to ensure a more successful implementation. These groups are:

1. Filipino citizens in areas who have no access to a phone and means to get information or be informed:
   - families of Overseas Filipino Workers (OFWs); and
   - students with no access to the Internet for research.
2. SMEs that have no access to important information and want to reach other markets beyond their area:
   - local entrepreneurs ; and
   - cooperatives.
3. Government agencies (local and national) that want to extend their services to more citizens:
   - local government (for example, governors, mayors, congressmen, *barangays*); and
   - national government (for example, the National Statistics Office, Social Securities Service, Government Service Insurance System, Bureau of Internal Revenue, Department of Foreign Affairs, Philippine Overseas Employment Agency, PhilHealth, Pag-Ibig Home Development Mutual Fund).
4. Commercial establishments that want to offer their existing products/services to remote areas:
   - financial institutions (for example, for remittance processing, telegraphic transfer);
   - payment and collection (for example, *Bayad* Center); and
   - buying/selling marketplaces (for example, b2bpricenow.com, e-procurement).
5. Local resorts, travel agencies and tourists.
6. NGOs (for example, NGOs handling returning rebels, housewives, the poorest of the poor)
7. Application and content providers:
   - local, regional, national content providers; and
   - application providers (for example barangay.net).
8. Other stakeholders that will be interested in the success of CeCs are:
   - hardware and software vendors;
   - ISPs;
   - education and training institutions; and
   - telecommunication companies.

Previous efforts

There have been attempts in the past to offer services to remote areas, however, these were focused only on providing voice services, such as the *Telepono sa Barangay* (TSB) and the Public Calling Offices (PCOs) offered by Telecommunication Office (TelOf) of the government and other private telcos.

Access to the Internet is currently being offered by local Internet cafés, which are mostly concentrated in the larger cities and municipalities where voice and data services are more prevalent. Similar initiatives, though on a very small scale basis (and not on a nationwide scale) have been done with funding from various NGOs and foreign funding agencies (like the Municipal Community Telecenters of DOST-PCHRD in Lanao). All existing initiatives have been observed to be highly subsidized and not sustainable models, with no compelling Internet applications for the community.

Vision for CeCs

The vision for CeCs is to ensure that the capability of digital technologies impact the quality of life of each Filipino, rich or poor, by providing access to basic ICT services, regardless of distance.

This vision supports the overall Vision of the Philippine Information Technology & e-Commerce Council (ITECC), of 'an e-enabled society where empowered citizens have access to technologies that will provide quality education, efficient government service, greater source of livelihood, and a better way of life.' It is similarly supported by the Information Infrastructure Committee's Vision to 'provide affordable Internet access to all segments of the population.'

The strategies to achieve this vision are:

- to solicit the support of key stakeholders in working together to expand ICT participation to remote communities;
- to augment existing government efforts in solving the 'last-mile problem' with private sector and local community participation; and
- to improve bandwidth affordability in remote areas through special incentives (for example, pricing, subsidies, low-interest loans).

The recommended business models to deploy the programme have sustainability as the common feature. Various funding sources can be tapped to initially fund the CeCs, but financial sustainability should come from regular monthly revenues from its various service offerings. The CeCs will need to continually build compelling and relevant applications to attract the various community groups to go to the CeCs on a regular basis.

Three business models are enumerated below. Each shows the potential sources of funding as well as the potential sources of regular revenue streams.

1. Entrepreneur-led

Variants: SME-led, cooperative-led, ICT school-led, Telco PCO-led Source of funding: Business loans, Capital Monthly revenue sources:

- voice services (local/national/international calls, texting, phone cards);
- data services (Internet access, email accounts, PC rental);
- business centre services (domestic/international fax, telex, telegram, photocopying, scanning, typing/printing);
- audio-visual services (business forms design/printing, audio-visual editing, website development, hosting of SME websites);

- training services (computer literacy training, office systems software, basic Internet access training, distance education, e-learning modules, ICT-enabled services training);
- community-based services (agricultural price monitoring and trading, local content development and data-entry, local tourism-tour packages/ booking);
- special OFW services (VoIP, email service plus webcam, job search and placement, PC to SMS services);
- commercial services (money remittance services, payment and collection services, eprocurement services);
- e-LGU services (*barangay* clearances, residence tax certificates or *cedulas*, real estate tax payments, business permits and licenses, *barangay* complaints); and
- national government services (on-line services from national government agencies, such as birth certificates from the National Statistics Office, government loans, passport renewal and overseas application tracking).

2 LGU-led

Variants: Town mayor-led, provincial governor-led, public school superintendent-led source of funding: regular LGU funds, politician's pork-barrel fund;

- monthly revenue sources (in addition to those enumerated in Entreprenuer-led); e-LGU services (*barangay* clearances, *cedulas*, real estate tax payments, business permits and licenses, *barangay* complaints); and
- national government services.

3 NGO-led

Variants: Corporate foundation-led (for example, Adopt a CeC project), funding agency-led, civic organization-led (for example, Rotary) source of funding: grants, donations and similar sources. Monthly revenue sources (same as both models enumerated earlier).

Choice of Technology

With a geography like that of the Philippines, where the population is widely dispersed, the more appropriate technology to provide access to isolated islands would be wireless and satellite communications (see Figure 3). This is one of the major hindrances in providing broader access. Whereas the urban communities and the central business districts benefit from high speed and lower cost access through fiber optic wirelines, the only technology suitable for remote communities are the most expensive. This is the challenge that must be faced by developing economies in addressing the digital divide.

With wireless appearing to be the answer to providing access to remote communities, various developments need to be considered:

Wireless Local Loops (WLL) — This will allow communities to be linked locally to each other in a local network and enable CeCs in various locations to share broadband connectivity to the Internet.

Mobile telephones — Applications can be developed using SMS to allow mobile phones access to content or to transact business. In the Philippines, the growth of cellphone penetration has been phenomenal. A recent survey shows that more than 30 percent of the total population has access to a cellular phone. At last count, there are 18 million subscribers sending an average of 10 SMS messages per day.

Wi-Fi, 3G, and GPRS — These technologies need to be considered when more and more applications and content are developed, as they require broadband for access through hand held and other wireless devices.

It is important to have a close collaboration between government and the private sector to accelerate the country's ability to deploy CeCs. Current efforts focus on establishing CeCs first in communities with already existing infrastructure. Although the private sector has essentially taken over telecommunications facilities in the country, government continues to manage and operate facilities in unserved areas.

One of the other components of the total cost of access to technology, is software. Open source software has been adapted by many as a strategy for reducing this cost. However, thought must be given to issues such as security, compatibility and additional cost of services before a definitive policy on standardizing on open source can be formulated.

Conclusions

A majority of the people in the world remain untouched by the explosive developments in ICTs and their applications, and the resulting emergence of a global 'information society'.

The Asia-Pacific region, which is home to 62 percent of the world's population, is making progress in utilizing ICTs for the benefit of humanity, leads the world in several areas, such as broadband deployment, growth in mobile services, production of high quality software and the manufacture of cost effective equipment.[16]

However, the infrastructure development within the Asia-Pacific region is uneven. Universal access goals vary and the strategies adopted to achieve these goals are unique for each country.

One common general strategy for universal access is the CeC. Several models are now in place, ranging from a simple public calling office to a multi-purpose kiosk.

Whatever model is used, sustainability, community involvement, content and applications are recognized as crucial components.

[16] Message of ITU Secretary General Yoshio Utsumi to the Third Meeting on Asia-Pacific Initiatives for Information Society (Bangalore, India, 21–25 July 2003).

Chapter Seven

Capacity-Building and Employment Generation

—*Phet Sayo*

Abstract

This chapter examines capacity-building and employment generation in the context of ICT adoption in the Asia-Pacific region. The goals of ICT adoption among Asia-Pacific countries differ, with some nations focusing on deploying computers for every student in the classroom, while other countries are concerned with acquiring the means and know-how for basic infrastructure development. In spite of the diversity of economies, national goals and objectives, some general trends can be charted. This chapter provides an overview of these trends and argues that human resource development should remain the common denominator for capacity-building agendas. The paper also advocates a focus on small, medium and micro enterprises (SMMEs), as the chief target for employment generation opportunities.

Introduction

Capacity-building, in its broadest sense, covers the entire scope of sustainable human development and encompasses an organization's (or individual's) core skills and capabilities to achieve development goals.[1] It can be argued that all development initiatives are about building capacities—whether at the community, national or regional level—without which interventions in any field would be ineffective or short-lived.

Capacity-building is often equated with human capital formation. According to the OECD and UNESCO[2],

> There is now robust evidence that human capital is a key determinant of economic growth and emerging evidence indicates that it is also associated with a wide range of non-economic benefits such as better health and

[1] Harris, R. *Information and Communication Technologies for Poverty Alleviation,* UNDP-APDIP e-Primers for the Information Economy, Society and Polity. (Kuala Lumpur: UNDP-APDIP, 2004).
[2] 'Financing Education—Investments and Returns, 2002', OECD and UNESCO, 2002.

well-being. Investment in human capital, and by implication in education, has thus moved to centre stage in strategies to promote economic prosperity, fuller employment and social cohesion. As a result, education is increasingly considered an investment in the collective future of societies and nations, rather than simply in the future success of individuals.

Education today has gone beyond simply providing literacy and numeracy skills to include e-literacy training, or training in the use of ICTs. In the Information Age, ICTs are seen as indispensable to the achievement of socio-economic development. The dynamic, constantly and rapidly changing power of ICTs facilitates interconnectivity and the production and sharing of information, empowering individuals and social networks, and increasing modes of productivity. However, it is also this nature of ICTs that requires society to make rapid and complex changes, to make the transition from introduction to adoption, to the utilization of ICTs. If a country is to successfully make this transition, it must prioritize human resource development. In laying the appropriate foundation and providing long-term knowledge capital for a nation, human resource development serves as the primary means of supporting and adopting national ICT agendas and programmes. Human resource development, through formal and informal education and training, and general sensitization to ICTs, is paramount for any long-term strategic development of ICTs within a country.

There are four broad rationales for integrating ICTs in education and training, namely, the social, vocational, pedagogical and catalytic.[3] The social rationale relates to the pervasive use of ICTs in everyday life. The introduction of ICTs in the classroom not only familiarizes but also develops the skill of young students in the use of ICTs as commonplace tools. The vocational rationale refers to the ICT-based employment opportunities and skills required for the job market. These include programming or networking skills, and related knowledge that enhances productivity, such as word processing and desktop publishing skills. The pedagogical rationale encompasses the positive impact on teaching and learning effectiveness of the integration of ICTs in the curriculum. Finally, the catalytic rationale refers to the fact that ICTs can improve the overall efficiency of the delivery of education, not only in the schools but also in educational management institutions, at the national state/provincial and community levels. ICTs are catalysts for institutional reforms, brought about by renovations in infrastructure, delivery, administration and management. The formulation of ICT policies in education provides decision makers with an opportunity to revisit and re-evaluate traditional instructional and institutional paradigms.

Human Resource Development Trends in the Asia-Pacific

According to UNESCO's analysis of current ICT in education developments in the Asia-Pacific, countries in the region can be categorized as 'those which are already integrating the use of ICT into the education systems; those which are starting to

[3] Byron and Gagliarki, R. 'Communities and the Information Society: The Role of Information and Communication Technologies in Education'. Acacia Initiative, IDRC, 2002.

apply and test various strategies; and those which have just begun and are more concerned with ICT infrastructure and connectivity installation. Needless to say, there are countries especially in the Pacific which have not started at all'.[4]

For developed nations, the emphasis is on keeping up to date on ICT developments, and maintaining comparative advantage in the information society. For lesser developed countries, integrating ICTs in capacity-building means creating further opportunities for new comparative advantages. For the least developed countries, the imperative is basic e-literacy and skill sets in support of domestic markets and overall socio-economic goals.

At the higher end, countries like Japan focus on high standards in the provision of ICT hardware in the classroom and training of school teachers. The 'Basic Plan for Science and Technology', developed and implemented by the Japanese government, aims to establish Japan as a nation driven by creativity in science and technology. In practice, this translates to providing one computer for every two students at the primary level, and one computer per student at the secondary level in the public school system. Whereas in the past, the focus was greater on higher levels of education, the Japanese government has recognized the overall need for 'bringing rapid and extensive changes in diverse spheres such as [the] economy, industry, education, and recreation', through research and development in ICTs. This is the social rationale for adopting ICTs in education, and one that targets long-term competitiveness.

In Bangladesh, the focus of capacity-building is on socio-economic development. Provision of nationwide infrastructure under a national ICT policy, spearheaded by a National ICT task force chaired by the prime minister, is planned to facilitate e-learning as well as good governance and e-commerce. The human resource development focus of the national policy is to develop ICT professionals and engineers to meet the 'demand for skilled ICT workers [that] is growing world-wide', particularly for the 'global software and ICT-enabled services market'.

In China, the government has increased the expenditure in ICTs for all levels of education, with emphasis on the tertiary levels and on distance education, while efforts are being made to restructure the educational system to strengthen links between education, the economy and society. The targets include 6,000 distance education centres in Western China by 2003; 90 percent connectivity to the Internet in primary and secondary schools by 2010; and the promotion of educational networks, such as the China Education and Research Network.

In Lao PDR, the catalytic rationale for ICTs in education is applied. Under the 'Information Technology Master Plan in Education Management', the Ministry of Education plans to achieve the following main objectives: (*a*) establish

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[4] Villanueva, C. 'ICT use in Asia and the Pacific—An Overview'; available from http://www.unesco.org/bangkok/education/ict/ict_enabling/ict_use_overview/ict_use_in_education.htm, accessed on 18 December 2003.

infrastructure spanning the provinces, primarily for administrative and management purposes; (*b*) provide connectivity for the National University and links with the ministry; and (*c*) curriculum development for tertiary education.

Similarly, in Samoa, the focus under the 'ICT Master Plan of Samoa' and the Department of Education's 2003 'Corporate Plan', is on the catalytic rationale. With the application of ICTs, in particular through networking the ministry infrastructure, the government seeks to make the Ministry of Education more effective and efficient. The long-term goal is to connect schools to the network as well. A study has been conducted to assess the possibility of ICT integration in the classroom.

In India, the emphasis is on reforming the curriculum with a focus on the integration of computers across the board. Under the National Curriculum Framework for School Education (2000), formulated by the National Council for Educational Research and Training (NCERT), the government has endorsed a pedagogic shift towards inter-disciplinary and cross-disciplinary thinking and learning enabled by ICTs. This includes the production and delivery of presentations for non-ICT related subjects and the promotion of research and development of multimedia-rich content. The focus is less on the technologies themselves, than on technologies as tools for enriching the teaching and learning process.

Although the benefits of integrating ICTs in education are widely recognized, as the foregoing examples suggest, it poses a number of challenges to developing nations, including costs and sources of funding, choices for curriculum development and pedagogy shifts, instructor competencies, local content and outreach to rural and remote areas. These are briefly outlined below.

Costs and funding

These are issues for both developed and developing countries, with regard to the provision of hardware and software, long-term maintenance and constant upgrades of ICTs in the classroom and administrative institutions. Even in developed countries, educational administrators and managers look towards private sector contributions for equipping their classrooms with the latest, state-of-the-art facilities. In developing countries, financial constraints are no doubt more significant. In some cases, there is no basic telecommunications infrastructure, much less infrastructure for the classrooms.

Although the price of personal computers and peripherals is constantly declining, alternatives such as Free and Open Source Software (FOSS) can greatly reduce the cost of software procurement for infrastructure and instructional use, and innovative networking hardware technologies such as wireless (Wi-Fi) can expand infrastructure at reduced investments. For developing countries, the costs of providing the necessary hardware and software in a meaningful manner on a national scale remain prohibitive. Beyond hardware and software, there are immediate and long-term investments in retraining teachers to equip them with the necessary knowledge to integrate ICTs into the curriculum. A cost-effective model for tackling this is the 'training the trainers' approach, which leverages the multiplier effect for the broadest reach.

Unfortunately, there is no way forward without heavy national expenditure in ICTs in education. However, with clear strategies and policies in place, along with assessment and monitoring mechanisms, efficient and effective resource allocations can greatly reduce the burden and provide a clear roadmap for donor agencies, civil society organizations and the private sector to contribute. At the minimum and in the long run, the most prudent resource allocations are in the provision of ICTs for general education systems and government agencies - covering all four main rationales for adopting ICTs in education.

Curriculum development

ICTs are unique in that they are both the tools for enhancing education, and are themselves the subject of education. It is necessary to examine both cases, and set priorities according to national agendas.

For developing countries positioning for global competitiveness in ICTs, the priority lies in ICTs as subject matter, and in reforming higher levels of education (tertiary and vocational training) to meet international standards. Less developed countries may be less concerned with global competitiveness, or are not yet in a position to adopt such strategies, and therefore, are more concerned with domestic markets and infrastructure needs. In countries like Indonesia and Viet Nam, ICTs are not integrated into the general curriculum (primary and secondary levels), but offered under extra-curricular activities. On the other hand, countries such as India and Pakistan place great emphasis on training skilled and semi-skilled ICT workers for domestic and international markets, and the focus is on programming, software development and hardware networking as areas of study.

Private institutions and small and medium-sized learning institutions specializing in ICT skills are becoming an industry throughout Asia, due mainly to the lack of public provision. At the lower end, these institutions offer courses on basic office skills, word processing, spreadsheets, and using the Internet. At the higher end, learning centres offer certified and uncertified courses on networking, programming languages, web-based development, and the like. While the proliferation of these institutions and learning centres may have a positive effect on the general level of capacity, it is necessary for governments to put in place mechanisms for certification, to ensure that the quality of instruction, and therefore the quality of knowledge workers, meets national, if not international, standards. For example, the Bangladesh government, under its national ICT policy, has recognized the need to develop and implement a national certification and accreditation system.

Development and shifts in pedagogy

For developing countries, the main goal for ICTs in education is basic computer and Internet literacy for the masses. The emphasis is equal provision for both urban and rural areas.

The first argument against basic computer literacy is that basic literacy itself is the main challenge. Why should investments be made on ICTs in education when basic education needs are hardly being met? The counter-argument is that basic literacy and basic e-literacy should not be seen as opposing, but integrated. ICTs are tools that can supplement basic literacy and numeracy by providing multimedia and interactive dimensions to the learning process.

More significantly, ICTs are being used to promote the development of higher cognitive processes. In the classroom, this translates not only to the provision of hardware and software, but also to a change in the mode of instruction—from transmitting information and knowledge to facilitating critical thinking, autonomous learning and collaborative learning, using multimedia learning materials.

Competencies

Without knowledgeable instructors and teachers, plans for implementing ICTs in education will not move forward and achieve the desired results. Concurrently, given the rapid production of knowledge, pedagogies need to shift towards the promotion of 'life-long learning'. Like their students, teachers and instructors need to be skilled in the use of ICTs, and be able to keep pace with the dynamic nature and developments of ICTs. Policies and strategies at the national, state/provincial and district levels should have provision for retraining the teachers, through up-to-date and frequent service training sessions.

Of course, the dilemma for developing countries is that they lack the technical expertise in the first place. In 'training the trainers'—teachers as well as technicians—developing countries may look to international organizations, bilateral partners and neighbouring countries for assistance, provided there are clear programmes for training and retraining.

Local content for learning

In general, the adoption of ICTs in the Asian context means the adoption of content that is predominantly in English, unless the development of local content is pursued.

A process of appropriation—linguistic and socio-cultural—is required, as the new media have been developed predominantly in the western languages and according to western teaching-learning processes. Most educational software for instruction or administration as well as Web-based content (more than 80 percent) is in English and is culturally biased. On the one hand, integrating ICTs in education requires changes in pedagogy; on the other hand, there is a need to ensure that values and traditional means (not only in terms of language) of transmitting information and knowledge, such as oral traditions of teaching, are retained.

It is imperative to address the local language and content issues at the national level, with national governments taking the lead in resolving fundamental issues of script standardization to foster the local development of supportive software, and educational content development using new technologies.

FOSS represents a valuable opportunity for local content development. The nature of FOSS, which allows for modification, recompilation and open distribution, makes possible the localization of entire software packages and operating systems. Moreover, FOSS itself can be used as a subject for training in software development and networking.

Reaching rural and remote areas

According to the United Nations Population Division, in 2000, 74 percent of the population in the least developed countries lived in rural areas. It is projected that this figure will decrease by only less than three percent by 2005. In less developed regions, almost 60 percent of the population resides in the rural areas. In Asia, the rural population is over 60 percent of the total, and in some countries as much as over 80 percent of the population.

In this context, the most successful mode of introducing ICTs in low-income countries and remote communities, has been through community-based centres (also known as telecentres). These centres provide an array of services that can be classified broadly into information services and capacity-building services. Information services include information on health, social and economic programmes and government, to empower remote communities with the necessary information for a better livelihood. Capacity-building encompasses training in ICT literacy (training in word processing, spreadsheet functions, email and Internet information retrieval) and raising the awareness of the benefits of using ICTs and the Internet. Although some of these initiatives begin with the objective of providing employment opportunities for the users, the verdict on the outcomes is not conclusive. Arguably, the value of these community-based centres lies in the provision of general computer training aimed at social capital development and networking, and increased productivity.

Appropriate ICTs can facilitate distance education on several levels and provide access to information and knowledge to remote areas. On one level, with the Internet, users have access to a wealth of specialized and general information from institutions and organizations outside of their own locale, from anywhere in the world. More sophisticated configurations can allow for video-conferencing to promote distance education and allow teachers and students to dialogue with peers to enrich the education process. Where traditional fixed-line infrastructure is difficult to put in place, telecentres and community-based stations for connectivity have successfully experimented with and implemented wireless solutions. Such is the case in Chennai, India, where corDECT wireless trails provide connectivity for both voice and data transmissions.

At the local level, networked ICTs can facilitate both centralized and decentralized education systems, where the centralized system is organized by national or higher levels or authorities, to support teachers with tools, access and curricula, and the decentralized system consists of inter-school and inter-community networking, enabling collaborative support and sharing.

Towards a More Holistic Approach to Capacity-Building

Aligning ICT in education policies with national ICT agendas, whether for fostering and strengthening industry or for broader socio-economic development, requires reinstating human capacity development as a dynamic component of a multidimensional and multisectoral development framework.

Given the diverse economies in the Asia-Pacific region, and therefore, varying requirements and approaches, strategies for transiting to information economies differ from country to country. Some countries are leading in innovation and creating better opportunities, while others are at the stage of ICT introduction and adoption. While it may be realistic for some to think of 'digital opportunities', it would be a mistake to believe these opportunities are at present uniformly available to all. There may be opportunities for technological leapfrogging, but there may be no immediate leapfrogging to opportunities with the introduction of technology alone. To minimize the risk of marginalization and exclusion from global activities, developing countries must develop greater capacities for information access and processing.

Developing countries need to examine the nature of ICTs and the broad implications of adoption against a wide spectrum of national needs and strategies, as well as domestic implementation capabilities. Governments also need to undertake impact assessment studies, to fully ascertain specific implications for modes of education (formal and informal), labour markets (domestic and international), desired knowledge workforce (skilled and semi-skilled professionals), and national expenditures and budget allocations for education. Governments must view investments in ICT for capacity-building as long-term investments, requiring resource allocations for infrastructure, hardware, software and training. Justifications for heavy investment in building human capacity must be based on clear and dynamic strategies that support overall development priorities in recognition of the principle that capacity is a means to achieving national objectives and goals, for which the conditions and pre-requisites have to be defined.

At the minimum, as previously mentioned, the common denominator ought to be human resource development for the masses, with basic e-literacy as a target. The guiding principle behind this aim should be education for all, regardless of income status, gender and geographic location. Policies should champion the principle that capacity-building opportunities are inclusive of all members of society with special focus on the disadvantaged and marginalized segments.

Often, it is non-government entities in developing countries, such as NGOs, donor agencies, grass-roots initiatives and private organizations that introduce ICTs into decentralized education systems. Although these contributions may not be on a mass scale, they represent best practices from which governments can draw for effective, larger-scale programmes for the introduction of ICTs into communities and schools.

Even in state-planned economies, the private sector is often the telecommunications provider and is thus the key to providing the infrastructure for educational initiatives. Through such mechanisms as Universal Service Programmes, a balance between private, commercial interests and the public interest can be achieved to benefit all and ensure successful implementation. For the private sector, namely, the telecommunications providers, an increase in ICT capacities for the public is equivalent to more dependents on new ICTs, resulting in greater demand for telecommunications services.

International organizations and donor agencies play a key role in policy development and can provide assistance in the formulation of ICT and ICT capacity-building policies. Specifically, organizations such as UNESCO assist national governments directly with ICT in education 'master plans'. However, international organizations have a responsibility, given the need for a holistic approach to the adoption of ICTs, to coordinate their efforts with government agencies and other international organizations, to ensure that policies in education are aligned with, supportive of and complementary to broader national policies and goals.

Employment Generation

India, in particular, Bangalore, is often cited as an example of how the potential of ICTs as a catalyst of economic growth can be harnessed. With its software exports of over six billion US dollars, a rapidly expanding outsourcing sector and a large call centre industry, it is difficult to overlook.

Some general facts and figures paint a clearer picture of the tremendous growth in the software industry in India:[5] Two hundred Fortune 500 companies outsource to India; over 400,000 skilled workers are employed in the software industry; 30 percent of Silicon Valley start-ups are started /headed by people of Indian origin, who often return to India with capital and expertise; venture capital infusion has rapidly grown from USD15 million in 1996, to USD450 million in 2000, with a projected total of USD10 billion by 2008.

[5] Mohnot, N. 'The India Software Success Story', SEPG Asia-Pacific, QAI India Limited, PowerPoint presentation, 2002.

The strategy pursued by India and those who would follow in its wake, is the establishment of ICT clusters. In the Asia-Pacific region, ICT clusters come under various nomenclatures, but are often called software/hardware parks or incubators. While the names vary, there are objectives in common, namely:

- fostering synergies and the collective for the production, and ultimately the export, of ICTs (software and/or hardware);
- establishing centralized, state-of-the-art physical and virtual facilities to attract direct foreign investments from transnational corporations; and
- establishing centralized, state-of-the-art physical and virtual facilities to encourage, promote and nurture or 'incubate' domestic enterprises and entrepreneurial efforts.

In Malaysia, the Multimedia Super Corridor (MSC) was conceived and launched in 1996 as an initiative to encourage national and international investment in ICT. With the MSC and complementary initiatives, the government saw an opportunity for positioning Malaysia as a competitive economy with the hope that growth in the ICT sector would generate a spill-over effect to the rest of the economy. The Malaysian government offers MSC-status, which provides incentives for national and foreign investment in Malaysia. As of 2003, over 973 entities have MSC-status: 934 companies, 33 institutes of higher learning, and nine incubator companies.[6] In 2002, total sales generated was around RM 4 billion, which is an increase of RM 520 million from the preceding year. Malaysia anticipates total sales to reach RM 7.9 billion by 2004.

The common factor underlying the success of these ICT clusters are the pools of technical and professional/business human capital, backed by the political vision and will to create the necessary enabling environments at the highest levels of government. India has one of the largest pools of technical manpower in the world and a strong National Association of Software and Service Companies of India (NASSCOM) and Ministry of Information Technology. On the other hand, Malaysia's aspirations are guided by its Vision 2020, coupled with a National IT Agenda, and directed by the National IT Council, with inter-ministerial support.

It is interesting to note that both nations have placed great importance on the social rationale for ICTs in education, as both recognize the need to maintain not only a specialized workforce for ICT-based industries, but also a general knowledge-based workforce. India aims to integrate ICTs across the curriculum, while Malaysia is shifting its focus to the maths and sciences with 'smart school' initiatives at the primary and secondary levels of education.

The overarching goal of the ICT clusters in India and Malaysia is global positioning, towards long-term income and employment generation. However, while the potential economic benefits are clear, indirect and overall benefits to society are

[6] Multimedia Super Corridor official website, "MSC Status Update", Multimedia Development Corporation; available from http://www.msc.com.my, accessed on 20 January 2004.

less so. The argument is that ICT clusters are a visible, high profile and symbolic catalyst for ICT adoption, as they raise the general public's awareness of ICTs and thus have a trickle-down effect for the rest of the nation. However, notwithstanding the positive economic impacts of the hubs in Bangalore and Kuala Lumpur, ICT diffusion and adoption in both India and Malaysia, as well as employment and income generation from ICTs, are far from commonplace in the rural and remote areas, where the majority of the poor reside.

As the ASEAN countries, such as Thailand, Viet Nam and Indonesia, follow suit with their own software and hardware parks/camps, it is crucial to examine each nation's comparative advantages and the preconditions necessary for sustainable economic development through ICT clusters. External factors that are unique to India and that have contributed to its success, such as its diaspora of skilled labour, literacy in English, and perhaps mere timing, are not replicable. Nations need to rely on factors within their control. Human resource development policies and targets must necessarily align with strategic capital investments. While international markets are attractive, burgeoning domestic markets may prove to be the long-term, sustaining and sustainable source of employment and income.

Technopoles, software/hardware parks and incubators, are not within the horizon for all developing countries. Nor have they produced widespread socio-economic benefits. In the Asia-Pacific context, the greatest contribution to national economies, whether we are examining domestic or international markets, are SMMEs.

The Role of SMMEs

The only way to reduce poverty in a sustainable way is to promote economic growth, through wealth and employment creation. In developing countries, SMEs are the major source of income, a breeding ground for entrepreneurs and a provider of employment.

According to the Asia-Pacific Economic Cooperation's (APEC) 1999 report on the 'SME Electronic Commerce Study', there are 40 million or more SMEs[7] that together:

- comprise over 95 percent of all enterprises;
- employ up to 84 percent of the workforce;
- contribute between 30 percent and 60 percent of the GDP; and
- account for about 35 percent of all exports from the region.

While the definition of SMEs varies from country to country, and from publication to publication, the common parameters for defining SMEs are: (*a*) size, as in the number of employees under an SME; (*b*) capital investment; (*c*) assets; and (*d*) revenue generation.

[7] APEC defines SMEs as enterprises employing up to 500 workers.

Asia-Pacific countries stand to benefit greatly from the development of SMMEs. Micro-enterprises are included in the same category as SMEs, as the challenges and developments for the rapid deployment and adoption of ICTs within micro-enterprises are to a large extent similar to those for SMEs. 'A productive SMME sector across the Asia-Pacific region can form the foundation upon which national and regional socio-economic development goals can be attained and ICT can be utilized to benefit the wider community'.[8]

The Internet and declining costs for technologies and communications infrastructure allow SMMEs to conduct transactions and engage in more efficient modes of business that were once affordable only to large-scale enterprises. Low-cost ICTs allow SMMEs to

- reduce transaction costs, facilitating a wider range of business opportunities and allowing operations at minimal costs and lower overheads;
- efficiently and effectively manage their knowledge base for increased productivity;
- move from economies of scale towards an economy based on profits arising from the speed of innovation and the ability to attract and retain customers;
- develop internal networks and external network linkages with enterprise partners for increased efficiencies and business opportunities; and
- engage in e-commerce through the Internet, regardless of size, location, financial resources and market share/purchase power.

However, while the adoption of ICTs can greatly increase productivity and competitiveness, SMMEs run the risk of being unable to keep up with the efficiencies internationally and the changes in modes and patterns of business brought on by the use of the new technologies. Although costs are falling, investments remain prohibitive for enterprises at the lower end of the spectrum. These costs include investments in hardware, software and, most importantly, training and human resources capacities.

SMMEs need encouragement, as investing in ICTs requires taking risks. Building the awareness of SMMEs of the benefits of ICTs, is a first step in promoting appropriate choices in ICT adoption for business.

Moreover, SMMEs should not be left out of national ICT policies. There is a need to foster an ICT enabling framework for SMMEs. First, an assessment of the needs of SMMEs must be undertaken to examine the regulatory and institutional environments required to foster the adoption of ICTs in SMMEs. Such considerations may result in:

1. the integration of the financial sector in ICT policies and e-strategies to

8 Harris, G.L. SME Resource Paper, UNDP–APDIP, Kuala Lumpur, 2003.

create an enabling environment for e-business to support SMME transactions and activities;
2. incentives and tax breaks for hardware and software procurement for SMMEs;
3. new legal and regulatory frameworks in areas such as digital signatures and cyber-crimes, to foster trust and confidence for business to business and business to consumer relations; and
4. the promotion of FOSS adoption at the national level through procurement and deployment for infrastructure and services by government. FOSS is a viable alternative to expensive and non-localized proprietary software. SMMEs may be encouraged to deploy FOSS for infrastructure and operations, and service interface between business partners and customers.

National policies must take into account the challenges and public and private sector deficiencies faced by SMMEs. Even if investments are made by SMMEs, the main constraint generally in the Asia-Pacific region is the lack of national communication infrastructures and prohibitive costs of access to ICTs.

Equally important, the government, through policy, should make clear the linkages between enterprise development and human resource development by developing a knowledge-based workforce in support of the needs of enterprise for adopting, maintaining and innovating with ICTs.

In formal education, this translates to developing general ICT literacy at the primary and secondary levels, and specialized ICT knowledge and skills at the tertiary levels. In informal education, national programmes may be put in place to subsidize vocational training that facilitates the creation of sustainable SMMEs.

In the more developed countries, policies may facilitate e-business and e-commerce through standardization of practices and the development of legal frameworks, in addition to the development of software parks, ICT hubs, and incubators. However, for the lesser developed countries, these are not realistic aspirations—at least not yet. Indeed, in the lesser developed countries, development of SMMEs or, more accurately, micro-enterprises in rural communities and urban areas, should be the priorities. Governments can put in place policies and programmes to encourage and support community-based grass roots SMMEs.

Also, in the lesser developed countries of the Asia-Pacific, telecentres are useful in providing ICT-enabled services for SMMEs, especially micro-enterprises. The India Shop[9] in Chennai, South India is an example of grass-roots employment and income generation. An initiative of the Foundation of Occupational Development (FOOD India), the India Shop is an e-commerce site driven by e-marketers who are

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[9] Chin, S. Y. 'e-Marketers of South India', IDRC, 2002; Internet; available from http://www.indiatogether.org/economy/trade/articles/emktsi.htm, accessed on 14 December 2003.

trained in multimedia skills to promote the sale of local handicrafts, such as *saris*. With a focus on young people, the India Shop has trained and employed 100 people aged 22 to 30; of these, 40 percent are women. The India Shop offers 1,800 products by over 40 artisans, generating an average of USD3,200 a month from sales, mostly outside India.

In Cambodia, disabled Cambodians are trained to provide outsourced data services, such as the digitization of data for international and local clients. Digital Divide Data (DDD), a non-profit NGO established in July 2001, offers vocational opportunities and employment for disadvantaged groups, in particular, young adults 16 years of age and older. DDD facilities based in Phnom Penh employ over 70 workers who are landmine and polio victims as well as orphans and women victims of violence. Employees receive above-average wages for a shorter than average workday (six hours), as well as health benefits, education and training opportunities. The DDD business model, coupled with its social mission, has generated USD300,000 in revenue over its two-year existence. There are plans for expansion into rural Cambodia and Lao PDR. The initiative is completely self-sustaining as revenue is channelled back into operations and employee benefits.

Although there is a plethora of community-based centres, few have been assessed to have truly generated direct employment and income generation for their users. Initiatives such as DDD and India Shop, are based on niche markets and local demands and capacities, and are more the exceptions rather than the rule. Nevertheless, there are implications for capacity-building efforts, particularly with respect to human resource development, that perhaps have widespread relevance.

Conclusion

Human capital is frequently cited as the one common factor for success throughout the region. The level and quality of employment generation depend largely on local capacities; conversely, the nature of national capacity-building programmes depends largely on existing and projected employment opportunities, both within the local market and in international markets. From software exports to the sale of village handicrafts, success is determined by comparative advantage, local assets, and whether or not the human capital is able to adapt and utilize ICTs to meet short-term and long-term needs and strategies.

In examining ICT capacity-building polices and strategies within the region, the focus and target groups depend largely on two main interconnected factors: (*a*) the baseline adoption of ICTs; and (*b*) the overall national strategy for the utilization of ICTs. Not surprisingly, the more advanced nations focus on ICT sectoral development and global competitiveness, with the aim of producing as many highly ICT skilled professionals as possible. Less developed nations tend to focus on general capacity-building to achieve national programmes for socio-economic development.

Just as ICT in education policies should be developed in a holistic manner, and should be integrated with other areas of ICT policies, capacity-building policies must take into account stakeholders, infrastructure, targets etc., in a holistic manner. In formulating policies, developing nations need to prioritize their goals in accordance with the social, vocational, pedagogical and catalytic rationales for the introduction and integration of ICTs in education.

The primary growth factor and rapid adoption of ICTs within nations have been ascribed to, among others, the liberalization of telecommunications, the adoption of cutting-edge technologies, the establishment of national ICT councils, the encouragement of technopoles and provision of incentives for the expansion of international ICT-based industries within nations. All these underscore the immediate and long-term need for concrete, coherent policies that encourage, strengthen and enable substantive measures for training knowledge workers and ensuring that reasonable employment is generated. It is critical for governments and stakeholders to ensure that capacity-building efforts that are undertaken successfully, do not lead to a situation where there is a dearth of opportunities and options to practise and apply the knowledge and skills learned. An environment where innovation is encouraged, must be created. The two-pronged approach that must be taken, includes both capacity-building and establishing a positive income-generating environment.

Chapter **Eight**

Legal, Regulatory and Policy Issues of e-Commerce in Asia

—Samtani Anil and Harry SK Tan*

Abstract

This chapter reviews the current status and ongoing development of ICT law and regulation as it impacts on electronic commerce, or e-commerce, and economic development in the Asia-Pacific region. In particular, the chapter looks at how the countries in the region have developed their local laws to address the various legal issues of e-commerce law and regulation. While many countries have adopted or adapted model ICT laws, such domestic legal development would arguably be only the first of many to come. The immediate regulatory issues that need to be addressed for the continued growth of e-commerce are also surveyed.

Introduction

A recent study predicts that the Asia-Pacific region will overtake Europe and challenge the US as the pre-eminent e-commerce area within the next few years.[1] According to this study, Australia, New Zealand, Singapore and Korea are expected to experience far more intensive e-commerce activity than Europe and possibly the US, as a direct result of the current aggressive exploitation of e-commerce throughout the region. In addition, other noteworthy Asian entrants to the burgeoning field of e-commerce include India, an emerging powerhouse that recently announced a target of US$50 billion export software sales by 2008,[2] and China, which is leapfrogging over the PC era to launch straight into mobile Internet access.

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1 This study, conducted by Professor Steve Burdon, Visiting Professor of Electronic Commerce at Sydney's University of Technology, will be presented at the World e-Commerce Forum, held in London in October 2003, 'Study: Asia Emerging as e-Commerce Powerhouse', *Computerworld*, Vol 6 Issue 44, 1–7 September 2000, p 4.

2 Sundaresan, S. 'Plotting India's Online Future', *International Internet Law Review* (February 2000), p. 16; and Anand, S. and Goswami, H. 'The Indian Stock Market Prepares for Take-Off', *International Internet Law Review* (May 2000), p. 32.

To be effective and competent in doing business on-line in Asia, it is necessary for businessmen and their legal advisors to be familiar with the ever-changing landscape of e-commerce laws in the different Asian countries. The country reports in the Forum series for the year 2000 of the *Asia Business Law Review,* provide an overview of the applicable laws governing e-commerce in select Asian jurisdictions and help the foreign investor to understand the applicable legal regime in these countries.

e-Commerce and the Internet

e-Commerce is an important part of the growth of the Internet. It is a general term for the Internet and non-Internet computer-to-computer processing of a growing variety of transactions, ranging from electronic data interchange (EDI)—the well-established handling of business-to-business purchase orders, invoicing, remittance notices and other routine documents—to electronic payment systems, credit cards and consumer sales of goods and services.

Increasingly, however, e-commerce is used to mean Internet commerce for two reasons. First, the Internet's size, growth rate and ease of access, open up immense market opportunities for large, medium and small firms. Second, the economics of the Internet will make it increasingly attractive—under some circumstances—to move e-commerce onto the Internet from the many company, industry and special-purpose value-added networks that are currently the main vehicles for EDI, financial EDI and other e-commerce transactions.[3]

The Internet greatly increases the ease of accessing, reproducing and transmitting information. This raises a host of legal issues, including the risk of copyright infringement, protection of patent rights and preservation of trade secrets. There are also privacy concerns and issues pertaining to the validity and enforcement of agreements entered into via the medium of the Internet. Conflict of legal issues take on an added dimension of complexity and confusion, due to the inherent fluid nature of the Internet, where users habitually trigger the application of the laws of multiple jurisdictions in a matter of seconds. It is becoming increasingly evident that the process of mapping existing legal concepts and tools into this new domain is not straightforward, and that a number of familiar legal concepts will need to be re-thought and perhaps re-engineered, before they can be efficiently applied in the new environment.

In dealing with the disparate areas of e-commerce law, one is constantly reminded of the tale of the tortoise trying to keep up with the hare.[4] Technology develops at an extremely rapid pace. As a result, the formulation of new government regulations or legal principles governing new technologies, practically always lags behind. Most governments act reactively and amend or create regulations after

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[3] Keen, P.G.W., Mougayar, W., and Torregrossa, T., *The Business Internet and Intranets: A Manager's Guide to Key Terms and Concepts* (Massachusetts: Harvard Business School Press, 1998).
[4] Electronic Commerce Law country report, *Asia Business Law Review,* Vol. 27 (2000), p.38.

industry acceptance of these technologies has taken place. This gives rise to the maddening and steadily widening gap between new technologies and adequate government regulation.

The existing body of law is, however, not entirely helpless. Often, the law is able to adapt and tackle some of the emerging legal issues that arise due to e-commerce. This is done through the process of drawing from precedents and reasoning by analogy.[5]

Unfortunately and perhaps understandably, there is a limit to the ability of the law to adapt itself to emerging technologies: timely legislative intervention to supplant the existing law and to fill in the existing lacunae, is often needed to ensure that the law remains current and relevant.

Legislative Initiatives

Frenetic activity in the past few years has ensured that lawyers and policy makers specializing in information technology law are kept busy monitoring developments that are taking place in many parts of Asia, as well as in other parts of the world. Examples of legislation passed or sought to be passed in Asia include Australia's Electronic Transactions Act 1999, Broadcasting Services Amendment (On-Line Services) Act 1999, Privacy (Private Sector) Bill and the Copyright Amendment (Digital Agenda) Bill 1999; South Korea's Electronic Transaction Basic Act; Singapore's Electronic Transaction Act 1998; Hong Kong's Electronic Transactions Ordinance 2000; Japan's Draft Bill Concerning Electronic Signatures and Certification Authorities and the Law Partially Amending the Trade Mark Law; Malaysia's Malaysian Communications and Multimedia Commission Act 1998, Communications and Multimedia Act 1998, Digital Signature Act 1997, Computer Crimes Act 1997 and Telemedicine Act 1997; the Philippines' Electronic Commerce Act; and India's Information Technology Act 2000.

Many governments and regulatory bodies in Asia are beginning to recognize the economic potential of e-commerce and are considering a number of policy initiatives designed to encourage its development. These initiatives include attempts to overhaul or effect amendments to existing laws to deal with the emerging legal issues that e-commerce raises.

In China, for instance, there are efforts to regulate e-commerce in a more integrated fashion.[6] A set of draft guidelines governing the development of e-commerce in China has already been prepared by the Ministry of Information Industry and submitted to the State Informization Leading Group. According to the report, the guidelines include a discussion of comprehensive changes needed in China's legal system, in order to support the development of e-commerce.

[5] The authors of the Asia Business Law Review report on India, for example, remark on the ingenuity of the Indian judiciary in applying existing laws, such as copyright laws and obscenity laws, to deal with internet-related issues; see Electronic Commerce Law country report, *Asia Business Law Review* (2000).

[6] Electronic Commerce Law country report, *Asia Business Law Review* (October 2000), p.32.

In Singapore, various amendments to existing legislation and subsidiary legislation have been put in place, rationalizing the existing law to cope with moves in various industries towards the electronic framework.[7] The amendments have collectively dealt with computer and electronic evidence, copyright, income tax concessions for cyber-trading, electronic dealings in securities and futures, electronic prospectuses and deregulation of the telecommunications industry.

In New Zealand, attempts are being made to update the applicable laws and these have been identified in the New Zealand Commission's reports: Electronic Commerce Part One, a guide for the legal and business community; and Electronic Commerce Part Two, a basic legal framework.[8]

In Malaysia, the Multimedia Development Corporation has been working on a National Electronic Commerce Masterplan, that is designed to facilitate the creation of an environment conducive to the development of e-commerce.[9] The four key elements in this Masterplan are: boost confidence in on-line trading, prepare a regulatory framework, build a critical mass of Internet users, and introduce an electronic payment system.

In the Philippines, the passage of the Electronic Commerce Act underpins the Philippine government's resolve to create an environment of trust, predictability and certainty in the Philippine system, to enable e-commerce to flourish.[10]

In India, there have been feverish attempts to update the Indian legal and regulatory framework to make it more relevant in the face of rapid developments in ICTs.[11] The ISP and gateway markets have been liberalized and the national long-distance sector has been opened up. In addition, discussions are ongoing for the liberalization of the international long-distance sector and India's uplinking policies are slated to become more liberal.

A closer examination of the legislative activity in this area, however, leaves one with the uncomfortable feeling, that what is taking place across a large part of Asia (with the possible exception of the ASEAN member countries in so far as current and future collaborative plans are concerned),[12] is probably more a knee-jerk reaction to perceived legal problems presented by e-commerce rather than a careful and considered response to the *actual* issues that this new method of doing business raises. As is clarified in the ensuing discussion, the primary focus of most of these laws and regulations, is to update the substantive *territorial* laws of the

7 Ibid. p. 37.
8 Ibid. p. 42.
9 Electronic Commerce Law country report, *Asia Business Law Review* (October 2000).
10 Ibid.
11 Ibid.
12 See the following discussion on the e-ASEAN Task Force.

jurisdictions concerned. This, as we will see shortly, will prove to be ineffective, unless concurrent steps are also taken to harmonize the laws among the different countries.

The e-ASEAN Task Force

At this stage, it is also instructive to note that the ASEAN economic ministers created a high-level public-private sector advisory body to develop a broad-based and comprehensive action plan towards evolving an ASEAN e-community or ASEAN e-space. The action plan will cover the necessary physical, legal, logistical, social and economic infrastructure for such an endeavour. Each ASEAN leader is required to name two members to the task force, one being a private sector individual and the other being a public official.

Hopefully, the e-ASEAN Task Force will have the effect of ensuring that the e-commerce laws of the various ASEAN member states develop in a unified manner and take due account of developments taking place in other parts of the world. This common front and unified stance would also give the ASEAN grouping further leverage, in situations where proposals for reforms are made at an international level.

Followers and Not Leaders?

A discernible trend in the development of e-commerce laws of Asia (although there are some notable exceptions),[13] is that the passing of appropriate legislation tends to lag behind similar action taken by countries in the West. For example, we see that Japan's Draft Bill Concerning Electronic Signatures and Certification Authorities was passed only on 14 April 2000 and came into effect only on 1 April 2001. Similarly, Malaysia's Digital Signature Act 1997, which is based on the Utah Digital Signature Act,[14] was passed two years after the latter was passed.

A question this raises is whether Asia is destined to be a mere follower in the field of e-commerce law, policy and regulation and is merely rubber-stamping similar initiatives taken in the West, as opposed to actively dictating the development of international e-commerce laws. It must be noted, however, that caution in the field of e-commerce law is not necessarily a bad thing, as it enables a country to critically access similar initiatives undertaken by other countries in the past and implement a model that suits its specific needs and aspirations. In e-commerce law, the need for uniformity is as important as—if not more important—than the substance of those laws. Viewed from this perspective, wholesale replication of existing laws that

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[13] An example would be Singapore's early embrace of the United Nations Commission on International Trade Law (UNCITRAL) Model Law via its Electronic Transactions Act 1998.

[14] This model has been criticized for entailing significant governmental licensing and state involvement in digital signature regulation. See Thomas, S.K. 'The Protection and Promotion of e-Commerce: Should There be a Global Regulatory Scheme for Digital Signatures?', *Fordham International Law Journal*, Vol. 22 (1999), p. 1002.

have found a degree of acceptance in the major trading nations of the world, is not only an acceptable practice but also a desirable and necessary act to ensure harmonization in the field.

Regulating Electronic Commerce

The pervasive growth in e-commerce in recent years has raised concerns that existing legal and regulatory regimes are too inconsistent or inadequate in dealing with the issues that e-commerce raises. However, most commentators have noted, that ironically, it is the lack of a substantial legal or regulatory infrastructure that has made the unbridled growth of e-commerce possible and this has caused some to worry, that the application of too much traditional regulation will stifle growth.[15] Some other commentators have taken the point further and argue that modern information markets should largely be defined by agreements and other manifestations of market choice rather than by regulation.[16]

At various stages during the development of the Internet, several commentators have also lamented the inadequacy of domestic legal systems in dealing with issues in cyberspace. This is hardly surprising, as the principles developed to deal with legal issues in the physical world are sometimes inadequate in dealing with the emerging legal conundrums thrown up by the Internet.

Most countries have sought to respond to the novel legal problems that crop up in cyberspace by enacting new legislation, while others have sought to extend the ambit of their current laws to cover the novel scenarios occurring in cyberspace. In this flurry of activity, it is not surprising that most countries have not addressed the fundamental issue of whether it would be wise or desirable to apply existing national laws, which have evolved mainly to deal with 'territorial-based' concepts and rights, to the realm of cyberspace.

Accordingly, there have been calls to treat cyberspace as a separate jurisdiction for the purposes of legal analysis. Some commentators have suggested that a separate law of cyberspace, akin to the law of the high seas, should be devised. Others have proposed that the norms and practices of the users of the Internet could be relied upon in determining the applicable and appropriate legal principles that should apply to transactions conducted via the Internet.[17] This would include 'Netiquette', which has the potential to constitute the foundation pillars of a workable uniform

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[15] Pisciotta, A.A., Wilson, H.M., and Wenzel, J.A. 'European e-Commerce Directive Will Have Controversial and Far-Reaching Impact', *Global eCommerce Law and Business Report*, Vol.2, No. 7 (July 2000), p. 1.

[16] Nimmer, R.T. 'International Information Transactions: An Essay on Law in An Information Society', *Brooklyn Journal of International Law*, p. 5.

[17] Ibid.

cyberspace law[18] (at least uniform in the sense that the laws are uniform across jurisdictions; there is still adequate scope for formulating differing levels of 'netiquette' to apply to different activities in cyberspace and to various different communities[19] that exist in cyberspace).[20] There would, doubtless, be specialized fields of activity,[21] where complete uniformity of laws will not be possible. However, for most types of transactions, uniformity is not only achievable, but also increasingly desirable to avoid needless confusion in cyberspace.

In the same way that early legal precepts drew upon the customs of commercial parties[22] for its evolution, the information technology era presents us with the opportunity of observing the customs and practices of persons in cyberspace in formulating appropriate rules to apply to parties engaged in activities in cyberspace.

This exercise would have the added benefit of allowing the laws of cyberspace to develop in a textured manner that takes into account the vagaries, idiosyncrasies, complexities and nuances of cyberspace. In this manner, the law will hopefully be able to encompass the unique norms and customs[23] that have developed in

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[18] There should also be harmonization of the private international laws of different jurisdictions, so that parties are better able to determine the countries that could legitimately exert jurisdiction over their activities. It should be noted that there continues to be considerable controversy over the appropriate approach to adopt in determining issues relating to the scope of personal jurisdiction. The difficulty is further compounded by the different conceptual approaches, such as the realist, representational, post-modern and liberal-constructivist approaches, that could be employed when dealing with jurisdictional issues.

[19] As may be easily appreciated, there are various different types of communities that exist that evolve over time. Of particular significance is the current popularity of communities that deal in less interactive and more commercial exchanges as contrasted to the popularity of the interactive and non-commercial communities that dominated the Internet in the past. It should also be appreciated that the Internet allows a single individual or corporate entity to take on different roles depending on the context and circumstances and one could be a member of different communities in cyberspace. See, generally, Shapiro, A. 'The Disappearance of Cyberspace and the Rise of Code', *Seton Hall Constitutional Law Journal* (1998), p. 703; and Lessig, L. 'The Zones of Cyberspace' *Stanford Law Review* (1996), p. 1403.

[20] Some commentators have rightly suggested that it is not appropriate to apply the traditional, territorial and geographical conception of community in the physical world to cyberspace, where an alternative 'experiential' conception of community seems to exist. See Falk, J. 'The Meaning of the Web', *Information Society* (1998), p. 285; and Giordano, P., 'Invoking Law as a Basis for Identity in Cyberspace', *Stanford Law Review* (1998), p. 1.

[21] Such as securities regulation and activities impinging on issues pertaining to civil and constitutional liberties.

[22] In fact, the better part of English commercial law owes its legacy to the *lex mercatoria*, otherwise known as the law merchant. *Lex mercatoria* refers to a body of law that had its source in the trading fairs and merchant communities of medieval Europe and the Middle East. As trading fairs evolved in the late seventh century, merchants developed sets of commercial customs to regulate their activities. These customs followed the merchants when they traveled to other cities and gradually over time, these customs gained the force of law as governments recognized that merchants should be able to resolve their disputes by their own rules.

[23] These include norms such as open participation, consensus-building, a prioritization of freedom of speech and grass-roots organization that have become identifiable with the Internet.

cyberspace and provide a regime that is practical, real and familiar to persons engaged in activities in this area. This is undoubtedly a much more attractive proposition than ramming clearly inapplicable rules and principles developed for a physical world into a setting that is alien and vastly different.[24]

This approach also has the added benefit of allowing a 'universal' Internet law to eventually develop free from the shackles of domestic laws.[25] Different national legal systems provide different answers and responses to legal problems, which creates enormous difficulty whenever an individual participates in an activity that potentially subjects him to the overreaching arms of multiple jurisdictions. A uniform law[26] that applies equally to all jurisdictions would help to introduce a degree of sanity to the conduct of activities in cyberspace. In addition, the emergence of a uniform cyberspace law may go some way in minimizing the prospects of a decision given in one jurisdiction, not being enforceable in another jurisdiction, on the grounds that the decision fails to adhere to minimum standards of law.

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[24] As one commentator aptly puts it, 'advanced computer technology undermines the assumptions of older categories [of the law]. For example, interactive networked hyperlinked media eviscerates the idea of authorship, and with it one of the fundamental concepts of … copyright law … Second … advanced computer technology conflates distinctions that made much sense under older regimes and which informed law that grew up in the older regimes. New technology eviscerates the distinctions between public and private, the telephone and mail, the written and spoken word, broadcasting and point-to-point communications, and between the publication, consumption, and distribution of information … Third, increased automation, with a concomitant reduction in the role of effective human oversight, creates difficulties in the assignment of liability or legal blame … The legal system is inhibited in its use of traditional metaphors and analogies for a fourth reason. The pace of technological change is not only rapid, it is, more importantly, highly uneven. Whereas we may have a relatively coherent and congruent set of assumptions about the way the physical world works, we do not have that common basis in the fabricated world of the computer, in what we might call the electroverse.' See Karnow, C.E.A. *Future Codes: Essays in Advanced Computer Technology and the Law* (USA: Artech House, 1997).

[25] It has been argued that complete harmonization of the law pertaining to cyberspace may be difficult to achieve because of the lack of an emerging consensus on some key issues and areas of the law such as formality requirements, joint liability of intermediaries and the law of conflicts. See Reed, C. 'Internet Contracting', *Computers and Law* (February/March 1999), p. 36. It is suggested that these problems are not insurmountable and, as an appreciation of the importance of having uniform laws apply to transactions in cyberspace develops, countries will come under increasing pressure to resolve these differences in their laws. It is noteworthy that we are already starting to see some signs of convergence in hitherto controversial areas of the law, such as the effect of an offer and acceptance in the formation of contracts, copyright issues in relation to hypertext linking and framing, and the liabilities of network service providers.

[26] Judges and other adjudication bodies may, of course, adopt differing perceptions of what this 'universal' law is and therein lies some potential for the law to develop in divergent paths in different jurisdictions. To overcome this difficulty, it is suggested that the practice of courts when interpreting the provisions in multilateral treaties or conventions, be followed. In this regard, it should be noted that the principle of good faith imposes on every court that is hearing a dispute involving the provisions of a multilateral treaty, the obligation to harmonize its decision with those of other courts and, where there are conflicting precedents, to harmonize the precedents.

Regulation of Electronic Transactions

The sheer number of electronic transactions taking place worldwide has inspired a plethora of proposals for its regulation. In addition to the patchwork of national laws that already govern electronic transactions, regulatory bodies worldwide are constantly promulgating new proposals for laws and conventions intended to facilitate e-commerce.

Essentially, there are two key approaches that could be adopted to the regulation of electronic transacting. The approach more commonly utilized is the 'functional equivalency' approach. This entails an examination of the role currently played by a particular legal rule in the non-digital commercial world, identification of the way in which the same function can be achieved in electronic transactions and extending the existing rule by analogy to electronic transactions. As can be seen, this approach attempts to fit cyberspace within the ambit of familiar legal rules.

A second approach to the regulation of electronic transacting, would be to move away from a preoccupation with picking out the best rules devised in a non-digital context and importing them into cyberspace, and towards starting with the identification and application of first principles.[27] This approach stresses the need to identify the fundamental principles that inspired the rules governing non-digital transactions, and to look afresh at how those principles could be best served in the uniquely different realm of cyberspace. This approach conceivably has the merit of leading to a much more healthy development of the law in the long term, as this would probably lead to the discovery of *sui generis* rules for electronic transacting, that takes into account the unique features and potential of computer-based communications systems.

While both approaches have been used in developing regulatory regimes for cyber-based transactions, it is noteworthy that the functional equivalency approach has dominated proposals for regulating e-commerce. A familiar example is the model law prepared by the UNCITRAL, adopted by a United Nations resolution in 1996.[28] Another example is the draft Electronic Commerce Directive, published by the Council of the European Union.[29] This directive seeks to address the issue of how electronic communications can complement existing modes of worldwide commercial activity, rather than developing a new system of regulation that could respond more flexibly to new and unanticipated practices that might

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[27] For a detailed analysis of this approach and a comparative analysis of the two approaches, see Murray, A.D., Vick, D.W., and Wortley, S. 'Back to Basics: First Principles in the Law of Electronic Transactions', *Intellectual Property & Information Technology Law,* Vol. 5, Issue 3 (June 2000), p. 2.

[28] The full text of the Model Law is available at http://www.un.or.at/uncitral/english/texts/electcom/ml-ec.htm.

[29] Council of the European Union, Draft Directive on Electronic Commerce 98/0325 (COD), 28/02/2000.

emerge with technological advances. The functional equivalency approach is also employed in the United Kingdom's Electronic Communications Bill,[30] which embodies the principle that electronic documents should be treated the same way as paper-based equivalents, although this is to be accomplished in stages rather than through a single act.

The Model Law on Electronic Commerce

The UNCITRAL Model Law on Electronic Commerce (Model Law) is a generic law that can be extended and enhanced by individual countries, should they so wish. In devising the Model Law, UNCITRAL had set out to develop rules that could be used in all countries regardless of their technological proficiency or the legal framework under which these countries operate. This automatically pre-empted the possibility of developing *sui generis* rules that are sensitive to the full possibilities of digital technology. The Model Law generally provides that electronic communications should be given equivalent legal effect as paper-based communications[31] and specifically addresses how certain types of electronic communications could substitute for existing paper-based means of satisfying requirements of writing, signatures and contract formation.[32] The Model Law has received a mixed reception in Asia. As of 30 August 2000, the countries in Asia that have adopted the Model Law are Australia, Hong Kong, Republic of Korea, Singapore and the Philippines.[33] The e-ASEAN task force also announced that there has been agreement among the various ASEAN member states to base their respective national e-commerce laws on UNCITRAL's Model Law.[34]

It must be noted, however, that the Model Law is not without its fair share of detractors. One commentator, for instance, has rightly noted that it is damning that the Model Law does not deal with the question of when a message is effective, but instead concentrates on the issue of when the message is received. This approach may suit the contract regimes in civil jurisdictions, but it makes little sense in those based upon the common law. This is because the common law focuses on when a message takes effect and not so much on when a message is received. A classic example of this focus is seen in the postal rule, which does not depend on the receipt of a message at all for the message to take effect. The rule simply provides that a message takes effect once it has been sent irrespective of actual receipt. The Model Law appears to have simply attempted to clarify certain issues of message communication and has failed to address the tenuous and difficult issues associated with the postal rule. It

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30 The full text of this Bill can be viewed at http://www.publications.parliament.uk/pa/pabills.htm.

31 See Article 5.

32 See, in particular, Article. 6, 7, 11, 12, 13, 14 and 15.

33 Information obtained from UNCITRAL's website at http://www.uncitral.org/en-index.htm.

34 ASEAN countries agree on e-commerce laws', *Computer World,* Vol. 6, Issue No.43, (25-31 August 2000), p. 11.

would, therefore, be prudent for parties that are subject to the Model Law to continue to take steps to avoid the application of the rule or, alternatively, to adopt the arduous process of analysing the communications topography to determine if the rule applies.

In this respect, it can be seen that the approach adopted in the Draft Revision of the Uniform Commercial Code[35] is better suited for dealing with the difficulties highlighted above. The Draft Revision of the Uniform Commercial Code stipulates that messages take effect when they are received, even if no individual is aware of its receipt.[36] It then goes on to state that contracts may be formed by electronic transactions,[37] or by the use of electronic agents.[38]

In the specialized area of digital signatures, some commentators believe that the written signature requirements pose the greatest stumbling block to the development of e-commerce,[39] and they advocate a unified global regulatory scheme for digital signatures. It must be noted that different countries or, in some cases, different states within the same country, have considered or proposed digital signature statutes. These statutes address digital signatures from different approaches and may have the unintended effect of hampering international e-commerce transactions.

Some Tough Questions Ahead

Cyberspace — A Separate Legal Arena?

As the above commentary suggests, it may be timely to have a concerted global effort to deal with some excruciatingly difficult questions that may require a complete reorientation of hitherto held opinions of how the law should operate. In particular, a pertinent question is whether the unique characteristics of the Internet should create a separate legal jurisdiction. An ancillary question that may be asked

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[35] The American Law Institute (ALI) and the National Conference of Commissioners on Uniform State Laws (NCCUSL), the two organizations jointly responsible for drafting, updating and promulgating the Uniform Commercial Code (UCC), announced in August 1999 the formation of a new Drafting Committee to continue the effort to revise Articles 2 (Sales) and 2A (Leases) of the UCC. The UCC has achieved substantial uniformity of commercial law throughout the US through enactment in whole or in part in all 50 states as well as in the District of Columbia, the Virgin Islands and Puerto Rico. The present revision of Articles 2 and 2A is part of an ongoing undertaking by the ALI and NCCUSL to modernize the UCC, originally promulgated in 1952 and keep it responsive to contemporary commercial realities; see ALI and NCCUSL's joint press release dated 18 August 1999 which can be viewed at http://www.nccusl.org/pressrel/ucc2a2.htm.

[36] See Article. 2, 2A and 2B.

[37] See s 2B–102(18).

[38] See s 2B–102(16).

[39] Gliniecki, J.Y. and Ogada, C. G. 'The Legal Acceptance of Electronic Documents, Writings,Signatures, and Notices in International Transportation Conventions: A Challenge in the Age of Global Electronic Commerce', *Journal of International Law & Business* (1992), p. 117.

is, whether a separate jurisdiction would be beneficial to the development of the Internet.

At this juncture, one could rightly query whether the global nature of the Internet naturally forms a separate legal arena. This leads us to another question: there is an inherent and separate jurisdiction that can be 'reserved' for Internet-based activities, should special laws be enacted to govern the Internet? In this vein, an important issue is whether a convention of cyberspace should be drafted similar to the separate international conventions governing the law of the sea and admiralty law.

The answers to these questions lie in part, on whether we accept the Internet as a community and self-regulating body and on our understanding and perception of the scientific traditions and philosophies that govern such technology.

New Property Rights?

Another important issue is whether e-commerce will trigger the creation of new forms of property. An important sub-issue is whether these forms of property can be adequately protected by existing legal systems, or will businesses have to resort to self-help to adequately protect their rights.[40] Some commentators argue that property in cyberspace is no different from that which exists in the real world and that existing doctrines are well-equipped to deal with any legal dispute that arises. The practical reality, however, appears to be that new forms of property are emerging, with their own unique legal frameworks. The field of domain names and the accompanying registration systems provides a good illustration. The controversy over the domain name system[41] has resulted in unique laws being developed, such as the Anti-cybersquatting Consumer Protection Act in the US, a governing body set up, namely, the Internet Corporation for Assigned Names and Numbers (ICANN), and the creation of distinct dispute resolution mechanisms such as ICANN's Uniform Domain Name Dispute Resolution Policy.[42]

The Internet also poses a viable threat to the protection hitherto afforded by intellectual property rights. In the past, where production and distribution channels were visible and capable of being regulated, intellectual property rights could be enforced through legal remedies. With the instant transmission and global distribution enabled by the Internet, legal protections for intellectual property owners appear to be inadequate.[43]

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[40] Lessig, L. *Code and Other Laws of Cyberspace,* (New York: Basic Books, 1999).

[41] Litman, J. 'The DNS Wars: Trademarks and the Internet Domain Name System', *The Journal of Small and Emerging Business Law,* Vol. 4, p. 149.

[42] Baratta, O.M. and Hanaman, D.L. 'A Global Update on the Domain Name System and the Law: Alternative Dispute Resolution for Increasing Internet Competition—Oh, the Times They Are a-Changin'!', *Tulane Journal of International and Comparative Law,* Vol. 8, p. 325.

[43] Heinrich, A., Manheim, K., and Steele, D.J. 'At the Crossroads of Law and Technology', *Loyola of Los Angeles Law Review,* Vol. 33, p. 1035.

Electronic-commerce also requires us to ask some fairly hard-hitting questions in relation to intellectual property rights, that may have been taken for granted until now. One such question would be what position the law should take in relation to applications for patents for on-line business methods.[44] The recent furore in the US over the issuance of patents for some on-line business methods,[45] is probably indicative of the expected debate that will ensue when other patent registries in other parts of the world are similarly inundated with claims of this nature.

Changes to Political and Legal Institutions?

Technological change transforms not only substantive rights and obligations but also the political and legal institutions involved in the creation, development and enforcement of these rights. It is envisaged that in the coming years, we will see greater institutional changes in legislatures, courts, regulatory bodies and law enforcement agencies. It is noteworthy that some countries in Asia have taken strident steps in ensuring that the judicial system and problems, such as delayed court dates due to backlog of cases, do not act as a damper on parties' willingness to engage in e-commerce. Singapore, for instance, launched e@dr, a new electronic alternative dispute resolution system where the subordinate courts will provide mediation and settlement conferences for e-commerce transactions via the Internet.[46]

The very real problems posed by technological development to the work done by legislatures, cannot be underestimated. The social repercussions of many recent technological developments would inevitably trigger quick and broad legislative responses. The relentless pace of technological change, however, sometimes has the effect of undermining legislative formulations. Legislatures around the world must therefore ensure that their appreciation of the ramifications of technology remains relevant, and that they endeavour to predict future trends in technology or enact technology-neutral legislation.[47]

In the future, legislatures may also have to seriously re-think their roles and contemplate the possibility of delegating large chunks of their rule-making

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[44] Wiese, W.D. 'Death of a Myth: The Patenting of Internet Business Models After State Street Bank', *Marquette Intellectual Property Law Review*, Vol. 4, p. 17.

[45] North, M. 'The US Expansion of Patentable Subject Matter: Creating a Competitive Advantage for Foreign Multinational Companies?', *Boston University International Law Journal*, Vol. 18 (2000), p. 111; and Cantzler, C.S.'State Street: Leading the Way to Consistency for Patentability of Computer Software', *Colorado Law Review*, Vol. 71 (2000), p. 423.

[46] According to Chief Justice Yong Pung How, e@dr is '[a] first of its kind in the region and the world for a judiciary' and that '[i]n addition, our partners, namely the Singapore Mediation Centre and the Singapore International Arbitration Centre will offer services in mediation and arbitration respectively, for such disputes'. See Ng, J., 'Singapore Judiciary Launches e-Commerce Dispute Resolution Hub', 16 September 2000; accessible at http://www.channelnewsasia.com/articles/2000/09/16/singaporenews16926.htm. The e@dr service may be accessed at http: //www.e-adr.gov.sg.

[47] In some cases, however, the latter course of action may defeat the purpose of enacting legislation in the first place.

authority to specialized administrative agencies that typically have the added benefits of being more nimble and flexible in devising solutions to the problems that may arise.

Increasingly, many governments must also give due weight to the clarion calls from certain quarters of society for a hands-off regulatory approach to e-commerce. It must be appreciated that sometimes this appears to be the best course of action to adopt, especially when viewed against the backdrop of scenarios where regulatory agencies have blindly enacted legislation, only to find that these efforts serve to frustrate technological advancement.[48] Regulatory agencies must also increasingly seek to engage industry and other stakeholder groups in formulating their policies and, in appropriate cases, promote industry self-regulation as a first-step response to the issues that crop up before implementing legislation. There are, however, limits to industry self-regulation and, in appropriate instances, governments must have the courage to make hard decisions and formulate suitable responses.

Courts also face similar difficulties in meeting the challenges of the information era. As one commentator aptly notes, '[t]raditional rule-based, categorical reasoning, one of the hallmarks of the judicial decision-making process, is ill-suited to address areas of dynamic change'[49] and '[j]urisprudence in an era of dynamic change may well proceed on an increasingly case-by-case basis'.[50] Earlier, it was observed that courts will increasingly face tricky issues in relation to the reach of their authority. With the proliferation of e-commerce, courts will increasingly be asked to deal with disputes involving international dimensions or, in some cases, involving no clear geographical dimensions at all. At the same time, the effectiveness of orders given by a judge may be circumscribed by enterprising defaulters or their supporters, through postings via servers hosted or the use of Internet service providers located in other countries.[51]

The transnational and inherently anonymous nature of the Internet presents serious challenges to law enforcement agencies as well.[52]

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[48] Some commentators have argued that the US Digital Millennium Copyright Act is one such example: see Samuelson, P. 'Intellectual Property and the Digital Economy: Why the Anti-Circumvention Regulations Need to Be Revised', Berkeley Technology Law Journal, Vol.14 (1999), p. 519.

[49] Heinrich, A., Manheim, K., and Steele, D.J. 'At the Crossroads of Law and Technology', *Loyola of Los Angeles Law Review,* p. 1035 and p. 1045.

[50] See footnote 55, p. 1045.

[51] In the DVD DeCSS case, for example, the court issued a preliminary injunction prohibiting the posting of the DeCSS code anywhere on the Internet, even as it recognized the likelihood that its order would be disobeyed. In fact, the DeCSS code has recently been embedded within a Domain Names System (DNS) record and continues to spread across the Internet, despite the court's injunction. See also Coats, W.S., et al. 'Legal and Business Issues in the Digital Distribution of Music: Streaming into the Future: Music and Video Online', *Loyola of Los Angeles Entertainment Law Journal,* Vol. 20 (2000), p. 285.

[52] A good overview of the problems that exist is provided in Cilluffo, F.J., Pattak, P.B., and Salmoiraghi, G.C. 'Bad Guys and Good Stuff: When and Where Will the Cyber Threats Converge?', *DePaul Business Law Journal* (1999/2000), p. 131.

Increased awareness of privacy concerns

Electronic-commerce activities often lead to several ways of processing personal data. To protect the privacy of the persons involved, it is important that personal data are used with care, required for legitimate purposes, not disclosed to the wrong persons and not processed without the knowledge of the persons concerned. Therefore, the processing of personal data has to meet certain conditions derived from the principles of privacy, which are provided in the laws of some jurisdictions and international treaties. Even parties from countries with lax privacy laws should be mindful of these requirements and ensure that they comply with them if they intend to do business with parties in jurisdictions with strong privacy laws.[53]

It is also, perhaps, timely for ASEAN member countries to give serious thought to developing a common charter on privacy and, where necessary, implement appropriate privacy legislation. This would serve the dual purposes of providing a sense of comfort to potential investors as well as ensuring that the privacy laws of the ASEAN member countries are in line with international norms in the area. It is useful to note that some countries in Asia are already starting to conduct bilateral discussions for the purposes of streamlining their privacy laws.

The Future

It is expected that, in the coming months, the flurry of legislative activity in the field of e-commerce law and other related areas of law, will continue unabated. Hopefully, this will be followed by a period of reflection and consolidation, where deeper questions on the suitability of these regulations as well as the effectiveness of enforcing these laws will be asked.

The Internet is a fluid medium with no national boundaries. The regulation of rights and liabilities in such an environment requires a consolidated global approach. As one commentator aptly notes, '[o]nly when jurisdictions around the world converge

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[53] In the European Union, for instance, governments have moved aggressively to regulate the use of personal data. In the United States, on the other hand, the government has largely refrained from such regulation, instead allowing companies and associations to regulate themselves, save for a small number of narrowly drawn regulations targeting specific industries. These divergent responses can best be explained by different cultural mores and the different legal approaches to privacy in general. The EU's aggressive regulation of the use of personal data originating in its 15 member countries is embodied in its Directive on the Privacy of Personal Data 95/46/EC ("the Directive"), which took effect on 25 October 1998. The Directive embodies the principle that privacy is a fundamental human right. It also serves the purpose of equalizing the level of data privacy protection guaranteed in each EU member country so as to decrease transaction costs for entities that operate across national borders. The Directive provides a high level of protection for the privacy of personal data, and it extends that protection beyond the EU by prohibiting the transfer of data to third countries unless those countries can guarantee a vaguely defined "adequate" level of data protection. See also Fromholz, J.M. 'The European Union Data Privacy Directive', *Berkeley Technology Law Journal* (2000), p. 461.

towards a generally accepted standard of legal rights and liabilities that all parties in the digital environment may then enjoy true and meaningful protection'.[54]

In the next few years, we will probably see greater concerted global action in formulating international solutions and conventions to deal with the emerging legal issues in e-commerce. In the meantime, organizations such as the ICANN, the World Intellectual Property Organization (WIPO) and the WTO, will continue to play an important role in bringing about uniform practices in their niche areas of focus. An example would be ICANN's current work on administration, best practice and registration and delegation guidelines in relation to the domain name system and its implementation of a uniform dispute resolution process,[55] to govern certain domain name disputes. Another example is WIPO's recommendations and guidelines for trademark and domain name disputes.[56]

During the coming years, we may also see the development of a World Electronic Commerce Organization, an idea proposed at the 1999 meeting of the World e-Commerce Forum in Perth, Western Australia. If this materializes, it may pave the way towards a more consolidated approach in solving legal issues that arise from e-commerce, and in all probability would give an added impetus to harmonization efforts in this field.

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[54] Leong, S.H.S 'Internet Copyright Singapore', *Computer Law & Security Report,* Vol. 16, No. 3 (2000), p.180.

[55] Walker, L.A. 'ICANN's Uniform Domain Name Dispute Resolution Policy', *Berkeley Technology Law Journal,* Vol. 15 (2000), p. 289.

[56] See footnote 48.

Chapter **Nine**

Public-Private Partnerships and Financing ICT Developments

—Paul Ulrich

Abstract

The chapter begins with a taxonomy of the different sets of actors involved in public-private partnerships, identifies their respective roles and interests, and discusses the factors that cause partnerships to succeed or fail. It then analyses how partnerships provide funding for ICT development, with particular emphasis on the promotion of innovation, employment and small business in ICTs—through incubators, technology parks and special zones—and the provision of access to ICTs for the poor via rural ICT deployments, universal-access funds and targeted subsidies. The discussion describes how various options for funding, recent advances in technology and creative programme designs can enable governments to achieve their objectives in developing ICTs.

Classification of Public-Private Partnerships

Development agencies, civil society organizations (CSOs) and businesses bandy about the term 'public-private partnerships'. In fact, fostering global partnerships figures as a separate UN Millennium Development Goal (MDG)—the last of eight—with diffusion of the benefits from ICTs mentioned as the final target. Partnerships and ICTs, however, are not merely an after-thought to be addressed once communities achieve the other needs of poverty alleviation and sustainable development. Rather, they are integral to the process of reaching those goals. At the same time, while development generates much rhetoric about the need for, and benefits of, public-private partnerships, there is little clarity as to what exactly the term means, its consequences, advantages and potential pitfalls.

The nebulous nature of the concept partly stems from the myriad actors who can act as partners on either side of the public-private relationship. The constituents of governments, businesses, CSOs, academia and donors come most readily to mind. However, how does one classify them and their roles? Upon initial reflection, governments, donors and academia fall into the public domain, while businesses and CSOs represent the for-profit and non-profit private sector respectively. Yet, as shown in Figure 1 below, governments may control state-owned enterprises, donors may be private foundations, and academics may belong to private universities or work within corporate-research departments. Some businesses are public-stock companies or non-listed parastatals, with specific government-mandated obligations to fulfill, and CSOs may actually be state-owned or government-organized non-governmental organizations (SONGOs and GONGOs, respectively)—a contradiction in terms that nonetheless occurs in places like China.

Public		Private
Government	→	SOEs
Listed Firms	←	Business
GONGOs	←	CSOs
Academia	→	Corporate Research
Donors	→	Foundations

Figure 1 A Taxonomy of Entities in Public-private Partnerships

Moreover, the direction in the flow of funds between the various parties can vary. CSOs may be recipients, but in the case of international NGOs, they more often serve as conduits between international donors and local NGOs. Many large companies practise corporate philanthropy and act as donors in their own right. Others are publicly listed and receive much of their capital from the public and, in some cases, debt financing as well. Partnerships may be bilateral, but can frequently be trilateral or even multilateral, with a host of organizations involved. In some Asian countries like China, private CSO interactions with government are less partnership and more uneasy alliance: the state makes registration difficult, requires local government oversight, and permits neither geographic nor sectoral expansion without approval.[1]

Factors Affecting Performance

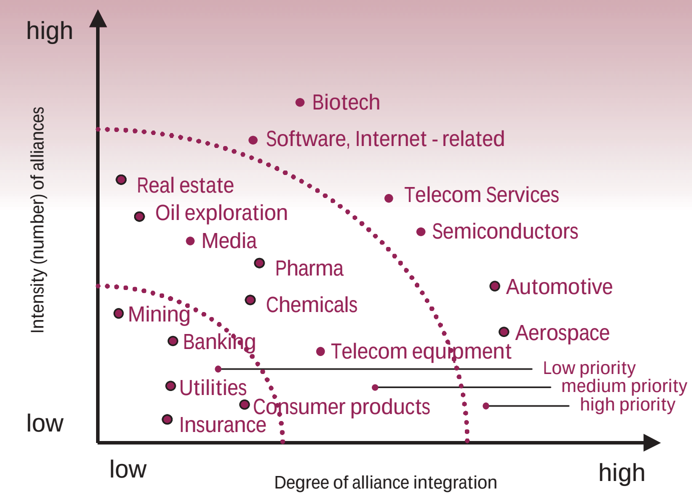
Partnerships take many forms and are inherently complex and management intensive. Even between similar ICT businesses, they have a high rate of failure. In the early 1990s, studies by consulting firms McKinsey, Booz Allen Hamilton and Dataquest, found that half of all such partnerships failed, in that they destroyed, rather than added, shareholder value or ended in dissolution. Strategic alliances tended to have a higher rate of success, followed by equal joint ventures where each held a 50 per cent stake. Acquisitions and mergers fared the worst. After mention of overly optimistic expectations, the second leading cause of failure revolved around poor communication and inadequate sharing of information—a shortcoming that ICTs can address, but only if the organizational environment permits it.

[1] Young, N., 'Searching for Civil Society,' *China Development Brief*, Vol. VI No. 1: July 2003.

In compensation for the higher risk inherent in partnering with another firm, the studies showed that alliances also provide higher annual returns than going it alone (at an average of 17 percent versus 11 percent), which explains their popularity, with the frequency of such partnerships growing by as much as 25 percent per year.[2] By far the highest returns can come from venture-capital investments, but the chances of any one investment's succeeding are slim, thus leading to a portfolio approach of investing in multiple non-related ventures.

Like best pairs with like, but such partnerships of equals are not possible in public-private arrangements of inherently very different entities. Looser alliances and those that are open in dealing with the other party, often do well in business ties. That feature can characterize public-private partnerships as well. Clarity in respective roles is important—for surveyed ICT businesses, this feature, along with communication between partners, was the third and fourth most cited attributes of success, after selecting the right partner and senior management's commitment to the endeavour.[3]

Among all sectors, telecom services, software, semiconductors and biotech tend to place a priority on alliances with a relatively deep integration and a high number of such partnerships. Telecom equipment vendors and the media tend to have both fewer alliances and less integration than the other three, but still occupy the middle of the range among all sectors. Please see Figure 2.



Source: TA, 1998

Figure 2 **Variance by Industry in Number of Alliances and Degree of Integration**

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[2] Toffler Associates (TA), unpublished research and presentation for an executive management meeting of a Brazilian telecommunications provider, 1998.

[3] Ibid.

Strategic alliances fare better than acquisitions, mergers or joint ventures because the looser arrangements allow partners to more easily isolate and benefit from the other's strengths, without also inheriting its weaknesses. Another risk of tighter arrangements which is especially prevalent in venture-capital investments is the need for a viable exit strategy should things go wrong or to recoup one's investment. For example, over three-quarters of joint ventures end in sale by one of the partners, but once a joint venture has been formed, it is virtually impossible to sell to anyone but the partner, which means that the sale, often inevitable after a number of years, occurs at 'firesale prices'.

In contrast to some of the many failed corporate tie-ups in ICT, privatization of public telecommunications operators, which reached their heyday in Asia and elsewhere in the late 1990s, has had a stable track record. Perhaps because of the large sunk costs and high transaction expenses involved in the process, very few privatized telecommunication infrastructure projects have been re-nationalized, re-negotiated, cancelled or transferred to another private operator[4].

In general and for smaller-scale endeavours, the success factors of public-private partnerships in development mirror those in the corporate world and include:

- mutual trust, complementary strengths, reciprocal accountability, joint decision making and a two-way exchange of information;
- clearly articulated goals, equitable distribution of costs and benefits, performance indicators and mechanisms to measure and monitor performance, clear delineation of responsibilities and a process for adjudicating disputes;
- shared perceptions and a notion of mutuality with give-and-take;
- mutual support and constructive advocacy; and
- transparency with regard to financial matters, long-term commitment to working together and recognition of other partnerships.[5]

Motivations for Business Involvement in Public-Private Partnerships

As in any form of negotiated agreement, public-private partnerships that succeed share a complementarity of interests. The key interests of respective parties need not coincide or even overlap, but they must not fundamentally come into conflict. Ideally, the two or more parties share, or at least profess to have, the same goal—the development of society. Some companies put the notion of corporate social responsibility higher on their agenda than others. Ultimately, however, for-profit businesses intend to make money and will not enter a partnership that does not in some way lead them toward that aim.

[4] Harris, C., 'Private Participation in Infrastructure in Developing Countries: Trends, Impacts, and Policy Lessons, '*World Bank Working Paper No.5*: Washington D.C., 2003.

[5] Lister, S., 'Power in Partnership? An Analysis of an NGO's Relationships with its Partners,' *CVO International Working Paper 5* November 1998.

From the business's viewpoint, a public-private endeavour may be entirely philanthropic, and most major ICT corporations have departments for this. A well-known example is Hewlett Packard's e-Inclusion programme to bring development through ICT projects to underserved communities. Another is Cisco's global system of networking academies, which train and certify ICT professionals and students in the use of Cisco equipment. Like Cisco, other leading vendors such as Oracle in databases, Microsoft in software and Intel in microprocessors, provide certification courses and often train those in less developed countries for free, or at concessional rates.

Many view corporate philanthropy or social responsibility as being good for business—directly in its impact on public relations in the marketplace, and indirectly in improving the likelihood that those it helps will become future customers as well. Winning a new customer can cost as much as 10 times that of keeping an existing one, so ICT firms—like most others—will do what it takes to enter or gain dominance in a market. Microsoft, for example, offered to share its secret source code with the Chinese government and tends to turn a blind eye to widespread piracy in Asia—in part as a way of reinforcing the spread of its software as the *de facto* standard. Other firms enter money-losing alliances with governments as a way to gain potentially lucrative future public sector contracts in related areas.

For the same reason, corporations partner with civil-society organizations in developing standards that the businesses feel will ultimately help the sale or development of their products. The standards may benefit the entire industry and society in making technologies simpler and cheaper to deploy, but that is not necessarily the reason for corporate support.

Cisco's networking academies have succeeded because the goals of the company in developing a broader group of technicians able to use its product complements that of the host countries which need more and better-trained ICT personnel to take advantage of the economic opportunities presented by the sector.

Another success, the Digital Opportunities Initiative, which resulted in one of the better and more widely read analyses of ICT, was a partnership of a donor (UNDP), a private CSO (Markle Foundation) and a major ICT consulting company (Accenture). Accenture benefited by strengthening its credentials for ICT strategies in the developing world. However, the initiative was continued, and Markle Foundation, which focuses on media and society, has exited from its involvement in the partnership.

The success of partnerships often hinge on personal relationships between individuals rather than on formal institutional structures. Despite the well-intentioned dialogue about the virtues of partnering for development, a truly equal partnership may be impossible due to the asymmetry in power that characterizes most public-private endeavours. The unequal power relationships depend largely on who provides the bulk of the funds and the degree of concentration in that funding. For example, a strategic investor or large minority shareholder in a publicly held firm frequently has more influence on the company's actions than the public at large, which may hold more shares but is not organized to exercise its shareholder rights.

In addition to 'hot' money flows of foreign capital, a lack of corporate governance and transparency in public-private partnerships contributed to Asia's financial crisis in 1997 and 1998. An overly cozy relationship between government and the country's major domestic firms led to insufficient oversight over loans made on relationships or directed-lending policy, rather than strict financial criteria.

Public-private partnerships inevitably involve negotiations, but getting to 'yes' can be easier than it may at first seem. Even if the two (or more) parties have diametrically opposed views on key points of negotiation, as long as they place differing priorities on the interests in contention, there is a good deal of scope to reach an agreement, combining the top few priorities of each and a blend of those that rank equally in importance between them.

The Need for Transparency, Accountability and Vigilance in Partnerships

Information is the lifeblood of finance and the efficient allocation of capital. Just as public stockholders need to know what a company's management is doing to make informed investing decisions, so too do a country's citizens need to be aware of the terms of any deals between its government and firms contracted to work for it. Subsidies and other incentives provided by the government to a business represent an aspect of partnership. To avoid public discontent about crony capitalism or unfair tendering processes, governments (and donors) should make their awarding of grants and contracts as transparent as possible. South Korea's OPEN programme is notable for its use of ICT in facilitating this process of good governance and public accountability.

Strong personal ties, or 'social capital', can help bridge the disparities in status between partners, but not overcome them, which makes such arrangements especially vulnerable to changes in leadership. Some have said that the partner that most completely assimilates the knowledge of the other will benefit most from the relationship; another view states that one party exercises power by shaping the needs of the other, so that it not only acts in ways it might not otherwise do, but actively wants to pursue the aims in the former's interests[6]. According to the first approach, those who succeed are good learners; according to the second, they are good manipulators.

By virtue of their grass-roots presence close to communities, many CSOs can act as honest brokers in partnerships between governments and donors on the one hand

[6] Ibid

and private ICT firms on the other. They are able to monitor the results of the endeavour and ensure that those affected have a voice in the decision process and actually benefit as intended. For the more remote communities, ICTs represent an entirely new product or service that may initially seem to be of dubious benefit. Since all new markets tend to follow an S-shaped curve of market demand, characterized by initially slow uptake by a few early adopters, followed by a rapid surge once the items become mainstream, and finally a second levelling off at the market's saturation, CSOs can also help catalyze demand in the early stages by explaining the uses and benefits of the new technologies.

Academic institutions can help design and evaluate joint projects that often involve technically demanding research. They and their corporate research counterparts are active in developing standards that are revolutionizing the spread and use of ICT: from open-source software and the next-generation Internet (IPv6), which will enable pervasive telemetry, to wireless local-area networks (IEEE 802.11b or 'Wi-Fi'), the longer reaching standard of 802.16 (or 'Wi-Max') and the proposed 802.20 'Wi-Mobile'.

Governments and big businesses that close the deals for a joint endeavour may be far removed from those who experience (and sometimes suffer) its impact. As in any complex undertaking involving multiple stakeholders, public-private partnerships can also have unintended consequences outside the interests of any one party.

For example, some groups like Digital Partners in the UK, have hit upon the eminently reasonable notion of donating used (or 'pre-owned') corporate ICT equipment to communities in developing countries that can ill afford to buy the products themselves. Indeed, the OECD estimates that companies worldwide will decommission 500 million PCs over the next five years. Digital Partners has lined up a number of top-tier corporations who are more than happy to participate. And why not—by the time of disposal, their idle stocks will have a net negative value to the company: the components contain so many hazardous materials that strict environmental policies in their host countries mean that they would have to pay recyclers to dispose of the equipment for them. In fact, it is 10 times cheaper to ship what has come to be known as e-waste to Asia than to recycle it in the US.[7] Thus, 80 percent of discarded computers and components go to Asia for recycling and most of that to just one country: China. The transfers are illegal, as China has banned the import of hazardous waste, but it is smuggled in and dumped in places not far from Hong Kong.[8] Admittedly, the work of recycling provides much-needed jobs, but it also generates horrific environmental and health damage in the affected area.

e-Waste is the dirty secret of an otherwise model industry. A true public-private endeavour to solve this problem must involve global organizations like the UN, to

[7] Goodman, P. 'China Serves As Dump Site For Computers: Unsafe Recycling Practice Grows Despite Import Ban,' *Washington Post,* 24 February 2003.

[8] Basel Action Network (BAN) and Silicon Valley Toxics Coalition. 'Exporting Harm: The High-Tech Trashing of Asia,' 25 February 2002.

pressure the US to prevent its companies from shipping hazardous materials overseas for disposal, or better yet, to design the products from the start to be more easily disassembled and environmentally friendly. To defray the costs of re-designed products, governments might enlist consumers to pay a small tax on all product purchases, with proceeds going into a fund for payment to those who re-design their products. Producers of such components—and many of them are in Asia—would be eligible recipients.

Sources of Funds

The private sector– in particular, large, Western firms – is commonly thought of as the primary source of funds for public-private ICT partnerships in Asia. During the 1990s, flows of private portfolio and direct FDI to the region swamped in magnitude the degree of aid provided by international financial institutions (IFIs): nearly a quarter trillion dollars of private investment flowed into infrastructure projects, and much of this, perhaps a third or more, went into telecommunications. Indeed, for this reason, the World Bank has stopped making loans to many large telecom projects in Asia's emerging markets, which nevertheless may still receive support in social infrastructure like health and education, for which private capital is less forthcoming.

A recent study by the United Nations Commission for Trade and Development (UNCTAD) surveyed the effect of host-country policies in attracting FDI. The study found that investment incentives ranked lower than access to markets (the top priority), the policy environment, production costs, workforce competence and level of education. This confirms similar findings from the past 20 years that LDCs frequently give away too much in hopes of getting foreign investment. The process leads to a 'race to the bottom' as country competes against country as to who can give the biggest or longest tax holiday. The same process repeats itself within countries between different regions or even between different counties vying for the jobs that a new production plant or service centre might offer.

China has recently overtaken the US as the world's largest recipient of FDI. However, one should read investment data with care: there is a fair amount of 'round-tripping' of money that goes from China to Hong Kong (and another tax haven, the British Virgin Islands) before returning to China for registration as 'FDI'—a kind of tax dodge to earn rebates from apparent exports. Similarly, by a strict accounting measure, the tiny country of Luxembourg—not the US—ranked in 2002 as both the world's leading source and recipient of FDI. Large corporate mergers and acquisitions involving multinational companies with headquarters based in that country (again, for tax reasons) resulted in the accounting anomaly.[9]

[9] Sauvant, K., *World Investment Report 2003: FDI Policies for Development—National and International Perspectives,* UNCTAD, Division on Investment, Technology, and Enterprise Development, 4 September 2003.

China's dominance in attracting FDI becomes apparent in comparing its levels with those of ASEAN. Around ten years ago, ASEAN received 75 percent of US FDI in East Asia; today much of that goes to China, and ASEAN's share in East Asia has dropped to 10 percent. China's huge domestic market, disciplined labour force and low production costs are key inducements. While Indonesia has the largest population and market in the ASEAN region, its periodic flare-ups of instability are not conducive to encouraging foreign investors who abhor risk and uncertainty.

FDI to fund Asian ICTs need not come from the West: it may come from other Asian countries within the region. Throughout the Asia-Pacific region, a number of countries share related historical or cultural similarities. Such ties and mutual understanding facilitate foreign investment. South-South efforts at cooperation might try to pair these with businesses and governments of economically more advanced countries partnering with their poorer or smaller neighbours—Thailand helping Laos; India helping Sri Lanka, Bangladesh or Pakistan; Central Asian countries cooperating with Mongolia; Singapore with Malaysia; Indonesia with Timor_Leste; and so on. As channels for FDI, Taiwan and Hong Kong have contributed enormously to China's development, particularly in its most dynamic region, the Pearl River Delta, while the Japanese and Koreans are more prominent in northeast China's Bohai rim. China also has a formal programme of internal partnerships, pairing each of its most advanced eastern provinces with a relatively backward Western one as a means for spurring development and convergence of living standards.

In addition to job creation and economic growth, countries encourage FDI to transfer knowledge and technology. China presents probably the best case study in successfully attracting FDI and requiring explicit conditions of joint research and training as part of the package. However, smaller countries, generally without the enticement of a large internal market, lack the leverage to make similar demands.

Forms of private financing for public-private ICT partnerships resemble those of conventional private-sector investment and run the gamut from direct domestic investments to foreign direct investments as well as domestic and foreign portfolio investment in publicly listed entities. In privatizing major telecom assets, the government can involve the private sector: through (*a*) joint ventures, as in Indonesia; (*b*) build and then transfer facilities back to the government entity; (*c*) build, operate for a fixed period and then transfer, as in Macau; (*d*) build, transfer and then operate, as in Thailand (where the country's constitution does not allow the private sector to own such strategic assets); or, (*e*) undertake some form of outsourcing arrangement.

Some IFIs, such as the International Finance Corporation of the World Bank, or a similar facility at the Asian Development Bank, can take equity stakes in private ventures. Others cannot: they either provide loans, typically on concessionary terms (and hence containing a grant component), give loan guarantees, or provide outright grants. A few donors have also tried to use fancier instruments like subordinated debentures to get around restrictions on taking equity shares. Such debentures are like equity in having a subordinate claim on the investee's assets. Governments may also provide grants directly to a partnership, but more frequently offer grants in other ways: as discounted rates on the use of supporting infrastructure, as tax holidays or as exclusive territorial and service franchises. In return, they may take a share of revenues, royalties or licensing fees.

Alliances need not involve equity or debt financing, but can be contractual in, for example, a marketing alliance. In China, one cellphone manufacturer partnered with the government postal system to market its handsets at local post offices. No matter how loose the arrangement, alliances and partnerships require a standard legal contract defining the terms and spelling out the parties' responsibilities and recourse should any party fail to meet its commitments. Informal agreements based on intentions or goodwill alone are unlikely to produce meaningful results.

The bursting of the stockmarket bubble in 2000 and near ruinous over-bidding for 3G wireless licenses among Europe's telecom providers have meant a slowdown in overseas capital for Asia's telecommunications investments. Foreign telcos are strapped for cash and wary of new entanglements, so large domestic players are increasingly filling the void. Several major providers in China and Singapore have even purchased stakes in, or acquired, Western telecom companies. At the same time, funds from IFIs and bilateral donors are unlikely to rise and may decline as the rebuilding of Iraq swallows an ever-larger share of foreign-aid budgets.

While most governments in the region recognize the benefits of liberalized telecom regimes of independent regulators and multiple private competitors, even private monopolies have generally brought better telecommunication services than those run by the state. However, where markets fail—when benefits accruing to society exceed those captured by the private participants—the public sector of governments and donors need to craft public-private solutions to provide appropriate incentives for investment. In the realm of ICTs, two such areas are the funding of innovation to spur growth and the extension of services to apparently unprofitable, isolated communities as a way of enhancing equity. The need to generate economic growth without compromising societal equity, illustrates two potentially competing priorities for policy makers.

High-Tech Zones, Industrial Parks and Incubators

Although some Japanese firms lead in the number of annual high-tech patents they receive, Asia as a whole invests a lower percentage of its gross domestic product in research and development than the US and Europe. Large companies often have their own internal research departments, but the vast majority of employers and sources of jobs are small businesses, and an increasing number of these are in ICT sectors.

Software constitutes an ever-growing part of telecommunications devices. For example, the Indian government recognized its importance early on, and now others like those in China and Viet Nam actively support the industry, consisting mainly of small firms, with tax policies and investment incentives unavailable even to other ICT firms.[10] However, the recent accession by China and the ongoing effort by Viet Nam to join the WTO may mean a phasing out of some concessions, due to the WTO requirement of non-discrimination in the treatment of national and foreign companies.

Software firms and Internet start-ups, by virtue of their small size, low capital intensity and high potential for growth, are well suited for business incubators and government research grants. Studies of programmes from the US Small Business Innovation Research programmes to incubators in OECD countries, have shown the efficacy of incubators in generating jobs in surrounding communities and in doubling the survival rates of member firms. Growing in number at an estimated 20 percent per year, incubators in Asia are a relatively recent phenomenon. Nevertheless, South Korea has over 300, China well over a 100, and both Malaysia and India have invested considerably in them as well. China also has dozens of software parks, many supported by the Ministry of Science and Technology, while its incubators tend to be physically larger in floor space per firm, to have close government support, and to receive more foreign investment than in many other Asian countries.[11] The country even has special science and technology parks specifically for Chinese students returning from overseas to set up businesses. Others are targeted at women, particularly those laid off from restructuring state-owned enterprises. Since much of China's ICT services fall in the realm of sensitive or protected sectors, most of the country's venture-capital firms are government-owned.

Surprisingly, most incubators worldwide are non-profit and supported by local governments while the fewer for-profit business incubators receive help from both private and public sources, including international donors—often, for example, in the form of subsidized use of facilities or help in licensing and marketing new products. In return, the member start-ups sometimes offer an equity stake or a share of royalties from sales. Once they leave the protective environment of the incubator, wealthy private investors or 'angels', venture-capital funds and large high-tech firms sponsoring their own R&D—either as separate spin-offs or sometimes in the form of internal 'intrapreneurs'—are the main sources of capital in addition to the business founders themselves.

Incubator models range from those with a strong real-estate component located near universities in specially designated technology parks or in high-tech zones with government provision of advanced infrastructure to 'virtual' incubators of companies linked primarily via communication networks, but not physically collocated, to international incubators with foreign joint-venture investment.

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[10] Chidamber, S. R., 'An Analysis of Viet Nam's ICT and Software Services Sector,' *Electronic Journal on Information Systems in Developing Countries* (www.ejisdc.org), Vol. 13, 2003.

[11] Scaramuzzi, E., *Incubators in Developing Countries: Status and Development Perspectives,* InfoDev Program. (Washington DC: World Bank, 2002).

China, Korea and Malaysia have successful examples of the latter, while mainly non-Asian countries have tried the virtual format. Since much of innovation depends on the informal and serendipitous sharing of ideas fostered by proximity, it is doubtful that virtual connections can achieve the same results as more conventional ones. Incubators tend to have a time limit—typically one to several years—by which point, members must graduate and move out on their own. The dot.com phenomenon in recent years accelerated that period to tenures lasting just a few months, but such a breakneck pace ultimately proved unsustainable.

Funding Expansion of ICT to Supposedly Unviable Areas

Unlike other utilities, such as water and electricity where revenues cover only a fraction of the costs, telecommunications overall generate surplus revenues. In many Western countries, legislation requires universal service, whereby an incumbent operator or a fund created from general tax revenue, or from pro-rated levies on operator proceeds cross-subsidizes the deployment of phone services to remote households that may be economically unprofitable to serve. Most developing countries cannot afford this and, for the time being, are opting instead for universal access—cross-subsidies to pay for shared rural community facilities, like payphones or Internet kiosks within, for instance, a 5 km or 30-minute walk of all inhabitants. In the poorest countries with weak government budgets and insufficient telecommunications revenue, donors like the World Bank often provide initial seed financing to get the universal-access funds operational as quickly as possible.

In 1995, Chile pioneered an approach to reduce the cost to the government's fund of providing payphones in rural areas. Over five years, the government set up multiple rounds of reverse auctions whereby pre-qualified private operators bid for the chance to enter new rural markets with help from a government subsidy. Administrators of the fund estimated the maximum subsidy needed to allow an operator to serve a designated area or group of communities and made that amount potentially available to the winner in competitive bidding. Bids requiring the least subsidy won for each round, and winners, upon fulfilling the mandate to provide coin-operated payphones, could also provide additional revenue-generating telecommunication services to the same communities. The technique reduced the share of Chile's population without access to basic telecommunications from 15 percent in 1994, to one percent in 2002, and the least-subsidy auctions resulted in huge savings from what the government would otherwise have had to pay, with total subsidies costing just 0.3 percent of overall telecom revenues. In addition to its careful design, the process encouraged efficiency by transferring market risk to the operators themselves—those best able to bear it.[12]

In Chile, the fund granted the subsidy to a winning bidder only once—as an enticement to cover any capital or expected operating shortfalls and thereby yield an acceptable rate of return on the investment. Future plans may shift

[12] Wellenius, B., *Closing the Gap in Access to Rural Communication: Chile 1995–2002.* (World Bank, 2002).

from this format, to one of extending a line of credit from, for example, an IFI, which might provide greater leverage in ensuring that the operator actually fulfilled its commitments.

The success of the Chilean endeavour prompted other countries to follow suit. As of mid-2002, four additional Latin American countries had least-subsidy auctions underway, and Uganda and Nepal were also beginning the process.[13] A year later, it seems that Nepal is still the only Asian country adopting this approach, although Sri Lanka has announced intentions of doing so as a way of encouraging the private sector to provide broadband access to rural areas. Elsewhere in developing Asia, Malaysia and India have created universal-service and universal-access funds, respectively, and the Philippines and China also have plans. Malaysia has not used competitive bidding as in Chile and opted instead to distribute funds based on the applications, development targets and actual investments in uneconomic areas by a single incumbent, Telekom Malaysia Berhad.[14] This approach, however, may be less transparent and more prone to error or interference than open bidding.[15]

Countries vary in their requirements as to who should contribute to the funds: from fixed operators alone, to fixed and mobile carriers, ISPs, and even the postal sector. Typically, operators do not receive exclusive licenses, but as the first to enter a remote region, they are unlikely to face competition for some time. Initial rounds, as competitors seek footholds in others' territories, tend to be the most hotly contested and generate the greatest savings in spread between low winning bids and the amount of funds potentially available as subsidy.

Certain elements have characterized successful auctions: a well-designed process providing contracts worth bidding for, careful research to give baseline data to help bidders make informed bids, and a regulatory regime that lets rural operators charge higher rural tariffs (within limits) and higher access charges on interconnection for calls terminating in the countryside. Appropriate inter-connection policies are crucial because they can allow rural operators to profit from what is often significant demand for incoming calls from urban relatives phoning the village. This phenomenon has led to the cellular practice of beeping, where a rural cell-phone user calls the cell phone of a (typically wealthier) urban one and hangs up just before incurring charges. The recipient then returns the call, based on the number left on the handset.[16] As in the US, where long-distance providers pay

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[13] Dymond, A. and Oestmann, S. *Universal Access and Rural Communication Development Funds: Success Factors Worldwide and Practical Insights from Uganda,* Intelecon Research & Consultancy, 5 August 2002.

[14] Abdul Hamid, N., 'The Need for an Enabling Regulatory and Legislative Framework: The Role and Functions of the Malaysian Communications and Multimedia Commission', Presentation to the Africa-Asia Workshop Promoting Co-operation in Information and Communication Technologies Development, Kuala Lumpur, 25 March 2002.

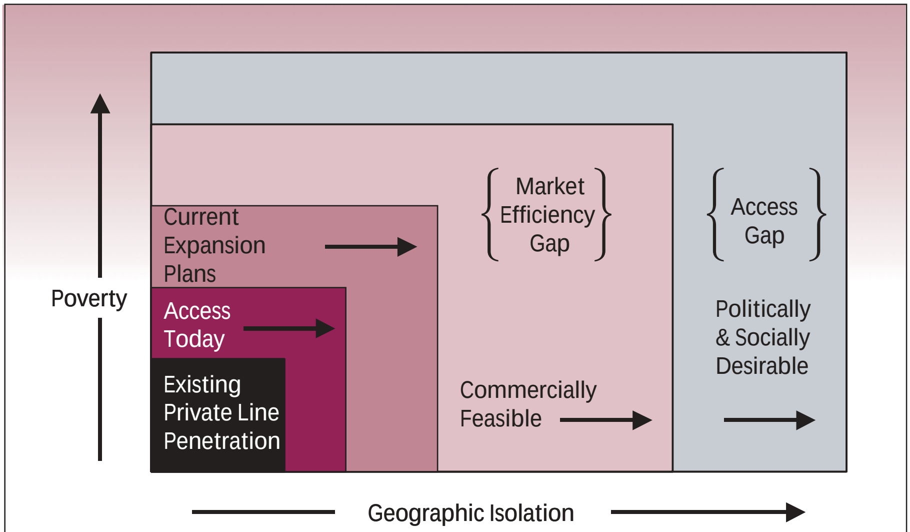
[15] Navas-Sabater, J., Dymond, A., and Juntunen, N. 'Telecommunications and Information Services for the Poor: Toward a Strategy for Universal Access'. *World Bank Discussion Paper No.432.* (Washington DC: World Bank, 2002).

[16] Oestmann, S., 'Mobile Operators: Their Contribution to Universal Service and Public Access', Intelecon Research & Consultancy, January 2003.

five times more to connect calls into rural networks than into urban ones,[17] several Latin American countries have instituted asymmetric interconnection plans to help rural operators cover their costs.

Public-Private Cooperation in the Countryside

The lower cost of deploying mobile services versus fixed-line infrastructure in rural areas has expanded the boundaries of commercially feasible territory, illustrated in Figure 3 below. Mobile investments are more amenable to economies of scale with low marginal costs of serving additional customers. Moreover, as the first mover in many rural areas, they attract a great demand for services. For mobile operators targeting urban users roaming outside the cities, rural users represent additional income. Popular mobile pre-paid phone cards also provide operators with cash upfront, and eliminate customer administration, credit checking, billing, collections or exposure to bad debt—a problem particularly prevalent in poor areas.[18] These attractions mean that even fixed-line operators like Philippines Long Distance Telephone are starting to use pre-paid cards.



Source: Navas - Sabater et al., 2002

Figure 3 **The Market for Universal Access**

In countries with micro-credit programmes, it may make sense to integrate these with the expansion of rural telephony where such programmes are viable and not, for example, subject to anti-usury laws that prevent the charging of interest rates

[17] Witte, G., 'Call Forwarding for Pain or Profit: According to AT&T, It Paid Access Fees That MCI's Routing Avoided', *Washington Post,* 3 October 2003.
[18] Dymond, op.cit.

sufficient to cover costs. In the Grameen Phone programme of Bangladesh, for instance, the Grameen Bank recruits women entrepreneurs and gives them each a micro-finance loan to buy a mobile-phone handset to operate as public phones in rural areas. The International Finance Corporation of the World Bank Group has invested in Grameen Phone to expand its franchise network to 30,000 villages. In India, Spice Telecom, a mobile operator, likewise enlists small entrepreneurs to operate mobile phones as payphones. Similarly, Indonesia has several thousand telekiosks and 'Xpress Connection' revenue-sharing phone businesses in remote villages based on very-small-aperture-terminal (VSAT) satellite stations. In Thailand, village heads and storeowners provide public-phone businesses as agents of the Post and Telecommunications operator.[19]

Even with declining technological barriers and improvements in the competitive and regulatory environments, there will remain areas that require government subsidies for access. Where commercial markets fail to reach, local governments can encourage telecentre start-ups through competitive bidding procedures, following principles that have so far succeeded with least-subsidy auctions for rural-telephony funds.

Conclusion

Public-private partnerships are fundamental to the development process and to the diffusion of the benefits of ICTs. Despite the complexities of interaction among inherently different entities, both sides, and society in general, benefit from the process. Where markets work, the private sector is best suited to capitalize on them in spurring development; where markets are weak or absent—as in financing innovation or in extending ICT to remote areas—the public sector can catalyze participation with public funds. In all circumstances, successful joint programmes and projects require due diligence, careful design, monitoring and clear communication at every stage of the endeavour.

[19] Navas-Sabater, op.cit.

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