Innovation, Technology, and Knowledge Management

Nagy K. Hanna

# Transforming Government and Building the Information Society

## Challenges and Opportunities for the Developing World

Springer

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ISBN 978-1-4419-1505-4 e-ISBN 978-1-4419-1506-1
DOI 10.1007/978-1-4419-1506-1
Springer New York Dordrecht Heidelberg London

Library of Congress Control Number: 2009943302

# Preface

This book argues for the need to merge governance reform, public sector modernization, and information society development with national policies and strategies for ICT, e-government, and e-society. The book draws on my 35-year journey in international development, primarily with the World Bank. It is motivated by the promise of the revolutionary advances in information and communication technologies to address development challenges facing poor countries and emerging economies, particularly those concerning governance and building the information society.

*Transforming Government and Building the Information Society* builds on the integrated framework of information and communication technology-enabled development, as presented in my book *e-Transformation: Enabling New Development Strategies*, published by Springer in 2009. It focuses on ICT-enabled innovation in the public sector and thus complements my book *Enabling Enterprise Transformation: Business and Grassroots Innovation for the Knowledge Economy*, also published by Springer in 2009. Together, these three books present a trilogy of a still-unfolding ICT-enabled development paradigm.

*Transforming Government and Building the Information Society* presents a holistic approach to meet the long-term challenge of strategically integrating new ICT technologies into development. Even a premier development institution such as the World Bank has had difficulty in integrating the new technologies into development strategies and governance reform. Despite superior payoffs from such integration, most incentives within aid agencies and developing countries reinforce a split between development practitioners and technology specialists. Additionally, integration challenges have been neither obvious nor easy to overcome despite growing awareness that advances in information and communication technologies represent a techno-economic paradigm shift demanding strategic responses.

Strategic and holistic approaches are needed to realize the potential of ICT to reforming governance and transforming public agencies and services. Inserting ICT into development thinking and governance reform requires overcoming major challenges. The gap is wide, as ICT specialists fail to speak the mainstream development language, and policy makers, public sector reformers, and governance specialists view ICT as an add-on or marginal technical fix to development. This gap is shared across developing countries, aid agencies, think tanks, and academia. The perspectives of governance studies and ICT science need to be integrated. When effectively

leveraged, ICT tools can slash the costs of public services, enhance access and quality of services, reduce the burden of regulatory compliance, and render public agencies more transparent and accountable. But none of that will happen without fundamental change in thinking about ICT, governance, and development. Our thinking about the future of government has to catch up with the potential of our new tools and the imperatives of 21st century knowledge economy. Public sector reformers and ICT specialists must communicate across the divide and manage the transformations brought about by a new techno-economic paradigm.

Development theory and practice cannot afford to miss or mismanage the most powerful and transformative technology of our time. The new information and communication technology can be central to building transparent government and an inclusive information society. It can provide a renewed sense of excitement and hope about governance and public sector reform. But ICT is not a magic bullet to be pursued by the technologists in isolation of development and governance practice. The ongoing technological revolution must lead to a new conception of government and governance that integrates ICT into all development options and reforms. This book offers a number of frameworks and tools to advance this integration agenda.

This book was inspired by the former President of the World Bank, James Wolfensohn, who advocated a comprehensive approach to development where ICT can be a powerful transformer. Thanks to Mohamed Muhsin, former CIO of the Bank, I had the opportunity to test many of the ideas of this book while developing the pioneering, Bank-financed e-Sri Lanka Program (Hanna, 2007a, 2008). Through the e-Sri Lanka Program, I learned with and from Milinda Moragoda, then minister of economic reform, science, and technology; Lalith Weeratunga, secretary to the president of Sri Lanka and a passionate advocate of a reengineered government; Manju Haththotuwa, the first CEO of Sri Lanka's ICT Agency; and the Agency's current leadership team—Reshan Dewapura (chief operating officer), Jayantha Fernando, and Wasantha Deshapriya.

The book draws on the insights and contributions of many colleagues in developing countries, independent international consultants and academics, and colleagues at the World Bank. I acknowledge the excellent comments of Professor Richard Heeks, University of Manchester; Professor J.-P. Auffret, George Mason University; Professor Sandor Boyson, University of Maryland; and Silvana Rubino-Hallman and Larry Meek, Inter-American Development Bank. From the World Bank, I acknowledge the contributions of Eduardo Talero, Randeep Sudan, Philippe Dongier, Samia Melhem, Christine Qiang, Arsala Deane, and Chew Kuek. I owe special thanks to Peter Knight and Joseph Del Casino, independent consultants, for commenting on the draft. A final thanks to the editorial staff of Springer, Elias Carayannis and Nicholas Philipson, and Leah Paul of Integra.

The book's intended audiences are mainstream development practitioners and ICT strategists. The book aims to bridge the gap between the disciplines of ICT and economic development. Bridging the gap requires mutual understanding and movement by both groups. For academics and students of ICT and development policy, this book can be used as a textbook. It offers an integrated framework that guides our inquiry into the future of government in development and is enriched

by lessons of experience. For practitioners, including aid agency practitioners and program designers in developing countries, the book offers a guide to translating their visions of ICT-enabled information society and government transformation into sound strategies and investment programs. It contributes to the "how to" literature—bridging the gap between theory and practice, between vision and reality.

My hope is that this book will provide the impetus for a more active dialog and partnerships among development researchers and practitioners concerned with governance reforms and information society, on the one hand, and, on the other, ICT for development, e-government, information systems and innovation specialists who are concerned with using the new technologies to transform government and build an inclusive information society. The book is as much a plea for interdisciplinary communication as it is about how policy makers and development practitioners may frame the possibilities and lead the next phase of transformation.

Bethesda, MD, USA Nagy K. Hanna

# Contents

# Chapter 1
# An ICT-Transformed Government and Society

The information and communication technology (ICT) revolution is shaping our world, public and private. It has created a new playing field for worldwide competition with an increasing premium for knowledge, learning, agility, and connectedness. It has made it possible to capture and deploy information and knowledge for all kinds of activity. It has also put innovation and ICT more than ever at the heart of smart development.

Can the transformative power of the ICT revolution be harnessed to generate sustainable growth, empower the poor, and extend public, health, and educational services beyond the richest markets? Can ICT accelerate productivity, innovation, and learning in government and poor communities as it has been doing in business? Can ICT become the platform for state modernization and economic inclusion?

Information technology promises to be the catalyst for an unprecedented productivity surge, provided that investment in the technology is complemented by investment in organizational capital, processes, and culture (Brynjolfsson, 2009). But for the majority of mainstream development practitioners, ICT, e-government, and e-society applications remain a specialist domain with very limited influence on their own development thinking and practice.

Understandably, there is a yearning for using ICT as a "magic bullet" for development. Much progressive thinking about the role of ICT for development is based on the slowly emerging but clear evidence of ICT's impact on OECD countries and some dramatic results from a narrow range of pilot projects in developing countries (OECD, 2004a; World Bank, 2009b). However, the magic bullet approach carries as many risks as ignoring the potential of the ICT revolution.

A key challenge of the 21st century is the increased risk to the poor and poor countries from a globalized knowledge economy spurred by the ongoing ICT revolution. This revolution has provoked intense hopes and fears in countries at all levels of development. The hope is to leapfrog to a fast-paced, knowledge-based, innovation-driven, networked economy. The fear of many poor countries is to be kept out of the knowledge and learning loop, fail to surf the wave of change, and perhaps to be left irremediably behind.

Two contrasting views have emerged, reflecting the cyber-optimists and the cyber-pessimists (Norris, 2002, Chapter 6). The cyber-optimists believe that

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_1,

digital technologies will quickly reform and revitalize government. The pessimists view governments as inherently slow to change and adapt, regardless of technology, and ICT will thus play only a marginal role in shaping future government. From a practitioner's perspective, neither view is helpful. A cyber-realist view of e-government acknowledges the transformative possibilities that new technologies offer, the pluralistic and political nature of government reform, and the constraints of time, know-how, and resources. It approaches e-government as opportunity to improve governance and to reinforce all other reform initiatives and development efforts. Such a view also acknowledges that improperly applied technologies can lead to waste, disenchantment, and delay in the pace of public sector reform.

The response of many governments to the ongoing technological revolution has been to formulate national ICT policies and strategies. Donors and aid agencies have responded by piloting a variety of ICT applications for specific sectors or target groups, by including ICT components in development projects, by giving a facelift to government through portals and web sites, and most recently, by benchmarking e-government and carrying out assessments of e-readiness. But these initiatives remain separate from governance, public management, community-driven development, and other "mainstream" development initiatives. Government agencies usually operate in silos and few have the leadership and institutional mechanisms to develop a holistic vision of e-transformation. Few progressive policy makers are leading e-strategies for their sectors, in education, health, or other priority sectors.

e-Transformation strategies for government can use ICT to address urgent and perennial public sector performance problems and to realize a vision of responsive and accountable government. e-Transformation for an inclusive information society can harness ICT to empower poor communities and enhance their capabilities and livelihood. Public policy makers must link the potential of ICT to the specific challenges of governance, employment, grassroots capacity building, and access to basic services.

## Structure of the Book and First Chapter

The first section of this book—Chapters 1 and 2—addresses the basic question of why countries should be concerned with the impact of information and communication technology on their government and society, and why they should fashion national strategies that harness and integrate ICT into government reforms and social inclusion. Although awareness of ICT roles and impacts has increased substantially over the last decade, their systematic harnessing for public sector reform and social development are lagging far behind. This section provides a big-picture view for policy makers, strategists, and students of development.

The second section—Chapters 3, 4, 5, 6, 7, and 8—deals with how to transform government and build an inclusive information society with the help of ICT. It outlines the strategic policy options and designs issues involved in leveraging ICT to maximize developmental impact by transforming public institutions and services and by empowering poor communities. It draws lessons from diverse development experience to guide countries as they design their own national strategies for e-government and e-society. This section may, therefore, appeal most to development and ICT practitioners who are interested in reforming governments and promoting social inclusion.

Chapter 9 puts e-government and e-society applications in a holistic context. e-Transformation is a holistic approach for thinking about and acting on integrating ICT into public sector reform and information society strategies. This framework helps create an ecosystem that harnesses ICT for sustainable and accelerated development. It takes account of interdependencies among policies, institutions, human resources, information infrastructure, and ICT investment priorities to make the new technologies work for economic and social development. This section is most relevant to ICT strategists and policy developers who are interested in understanding the building blocks for using and diffusing ICT through public institutions and civil society organizations.

The final chapter deals with implementation issues, the reasons for the current gap between the potential and actual performance of ICT for transforming government, and the role of leadership, consultation, monitoring, and evaluation. It draws on lessons of experience arising from designing and implementing e-government and information society strategies in diverse country conditions. This section is likely to attract public sector reformers, ICT leaders, and e-government and e-society program managers and practitioners.

This first chapter starts by identifying several disconnects between ICT specialists and other development practitioners, and their consequences for missed development opportunities and wasted ICT investments. It draws on lessons of development experience and conceptualizes e-government and e-society as a long-term transformation and social learning process. Next, it argues that e-enabled government transformation has become as an imperative, a basic mode for adapting and competing in a globally connected world. Global forces are pressing for accelerated institutional change, and government institutions are not immune. A digital-era government paradigm is shaping the future of government. Next, this chapter outlines the imperatives for building the information society and assigns a key role to ICT in catalyzing community knowledge, innovation, and capital to promote inclusive development and complement government transformation.

The remaining part of this chapter outlines the process of designing and implementing transformation strategies in the public sector. This process should be conceptualized as one of strategic and creative thinking, so as to open up new development possibilities, and of continuous learning, to secure adaptive implementation. ICT is central to this process as the powerful and transformative technology of our time. The chapter concludes with the themes of the book.

## Disconnects and Their Implications

There are three basic disconnects between ICT specialists and: (1) the providers of complementary assets; (2) public sector reformers and governance specialists; and (3) community developers and their grassroots organizations. Such disconnects and communication gaps have serious consequences for realizing the potential benefits from ICT investment and for opening up options for governance reform and broad-based development.

The first disconnect is between ICT managers and those managing other factors that are essential to economic productivity and institutional transformation, such as human and organizational capital. The potential contribution of ICT will be determined by factors such as leadership, human capital, local institutions, supporting mechanisms for innovation and diffusion, complementary investments, spillovers, and learning. Investments in human resources, business process innovation and reengineering, and organizational change are necessary to realize the benefits from ICT. The prevailing disconnect ignores the interdependencies between ICT and other factors, in favor of a technocratic approach. A holistic approach would integrate and invest in complementary factors, promote adaptation and innovation, and align ICT to institutional reforms and development strategies.

The root of many failures in ICTs for development projects is due to their techno-centric approach, poor understanding of the socio-institutional context, and consequently, neglect of complementary investments in human resources and organizational change (Heeks, 2006; Mansell, et al., 2007; Fountain, 2001). A holistic approach implies adaptation and optimization of various complementary factors to fit the context. ICT project managers have to connect with stakeholders and the providers of complementary change factors. The potential of ICT must be tested and deployed in diverse contexts, and such testing must lead to adapting the human, technical, and institutional factors to ensure that ICT investment contributes to development. Models for mainstreaming ICT in government and communities are not yet clearly established in most developing societies. Those models or best practices are unlikely to be universal as much of the nature and scale of ICT's impact is influenced by these complementary investments and contextual factors.

Concerning the second disconnect, the current status quo in which mainstream development practitioners and governance specialists continue to ignore the potential roles of ICT poses serious risks to reform and development efforts. The complexity and expense of some ICTs and the poor understanding of the political economy that governs their use have led some to doubt the relevance and priority of these technologies for public sector reform and poverty reduction. Others have hailed these technologies as the great hope for improved governance and social inclusion in developed and developing countries. Neither posture is effective.

Currently, this is a big communication gap between ICT and technology policy specialists, who understand the requirements and potential of these new technologies, on the one hand, and policy makers and governance reformers, who understand the context and imperative for reform, on the other. The latter do not see the importance of this technological revolution. Yet, their awareness and ownership

are critical to marshal complementary policy and institutional measures for ICT to induce change. This gap remains remarkably difficult to bridge despite two decades of profound global and local changes brought about by ICT.

This disconnect is reinforced by the current isolation of the disciplines of information systems and computer sciences from development economics and development studies. Information and computer studies tend to ignore the ideas of development economics and development studies (Heeks, 2009). Even though science and technology and innovation policy are moving back to the mainstream development agenda, ICT concerns are not considered a part of the innovation or science and technology agenda or the larger development paradigms and processes.[1]

Another form of this disconnect between public reformers and ICT providers is when policy makers delegate investment decisions in ICT systems and operations to the specialists. Accordingly, public managers rely on powerful global ICT providers to define their needs, without adequate ICT policy or in-house competency to hold powerful providers' accountability (Dunleavy, in Mansell et al, 2007). Government information and communication systems have become big business in modern economies. Investment in ICT is increasing faster than most other elements of government budgets in developed and developing countries. Developing countries spend about 6% of their GDP on ICT, including ICT in government. This amounts to US$ one trillion annually (2009). Public sector managers need to understand ICT as a critical aspect of the modern state and as a force for reform and transformation. They need to develop some basic expertise within government to exploit the new technologies and maintain well-contested markets for ICT services.

The third disconnect is between ICT policy makers and specialists, on the one hand, and community development practitioners and poverty specialists, on the other. Poverty in all forms is perpetuated by a severe lack of access to information, knowledge and skills, and by the prevalence of institutions of exploitation. Sen articulated a conception of "development as freedom" (Sen, 2000). And ICT has been viewed by some as a "technology of freedom" and empowerment. Yet integrating these perspectives has not materialized. A few community development leaders and NGOs have appropriated ICT among their tools to empower their communities, practice community-driven development, and enhance the livelihood strategies of the poor. But ICT and community development practitioners are not yet engaged in exploring what role information and communication play in poverty reduction and social learning processes and where digital technologies should fit into these processes.

These three disconnects led to highly polarized attitudes concerning the impact of ICT on government and society. At one end of the spectrum is the e-utopianist or technological determinist literature, supported by ICT specialists, suppliers, consultants, and even politicians. At the other end, is public management and administration literature, written in often strongly backward-looking vein, with

[1]This separation is most evident in the publications of the World Bank.

a blind spot about the importance of information for governance and the delivery of public services, and with ICT developments assigned a footnote to history (Dunleavy, in Mansell et al., 2007, pp. 404–425). A few researchers, such as Fountain (2001), have transcended this divide by viewing the Internet as a revolutionary lever for institutional change, and at the same time, by acknowledging the importance of institutional and political processes in shaping the use and dissemination of ICT in governance and society.

## Missing a Techno-Economic Paradigm Shift?

Taking a macro and long-term perspective, technological revolutions are associated with socio-institutional transformations or techno-economic paradigms (Perez, 2002). Each technological revolution leads to a surge in productivity development. We are living through one of these technological revolutions, perhaps one more profound than any other in history (Hanna, 2009, 1991a). The impact of the ongoing revolution extends beyond the developed countries to countries at various levels of development. It extends from industry to services, and from private to public agencies, communities, and civil society organizations.

There is a significant risk that development practice will fail to appreciate the profound implications of the new techno-economic paradigm, and the need to respond in real time to consequent challenges. An incremental and narrow perspective of development misses viewing development as a process of transformation, as a nonincremental paradigm shift, and as a discovery of new sources of growth and innovation. As Meier (2005, p. 183) has rightly noted, and Yusuf (2009, pp. 45–46) reinforced in reviews of development economics, development economists tend to think incrementally, and short term. Meier states that "much of the evolution of development economics has been based on the reductionist model . . . failing to focus on development as a dynamic process with attention to the interrelation of the parts" (Meier 2005, p. 185). This tendency and the consequent failure to prepare countries to master the new paradigm would constitute a strategic failure in development thinking and practice.

A backward-looking development strategy misses the new possibilities opened by the ICT revolution. Development strategies tend to be based on "me too," global "best practice," or a "Washington consensus" mentality. The East Asia "miracle" presented an anomaly to the consensus of development strategies of the last two decades of the 20th century, as it took a long time to interpret and absorb its lessons. To avoid being left behind, developing countries must be active innovators and agile followers in order to ride this technological wave. They should build the necessary experience for the digital age, as they cannot afford to rely only on the "tried and proven" development strategies of the industrial age. This forward-looking posture is particularly pertinent to reforming government and building the information society.

## *Building on Emerging Lessons of Development*

While forward looking, e-transformation for government and society draws on the hard won lessons of development, that is, the centrality of knowledge, learning, technological change, institutions, and governance (Yusuf, 2009; Stiglitz, 1998; Rodrik, 2007). As the focus on development broadened and became most holistic, incorporating such issues as governance and institutions, policy recipes have become less certain and less universal, hence the growing emphasis on experimentation, participatory development, and learning processes. Development is a transformation process that requires holistic and long-term vision, broad ownership, stakeholder partnership, and enhanced experimentation, learning, and evaluation (Hanna and Picciotto, 2002).

There is a growing recognition of the role of knowledge in development (Stiglitz, 1999a; World Bank, 1999). There is also growing awareness of the enormous disparities in access to knowledge and communication and of their implications for development and income inequality. The role of public policy in redressing these disparities is increasing, in line with the need to reduce or at least contain the growing inequalities.

Development is increasingly viewed as a learning process (Rodrik, 2007, 2004; Stiglitz, 1999b, 1998). Innovation, technological change, institutional transformation, and capability development are at the heart of this process (Rodrik, 2007; Dosi et al., 1988; Freeman and Soete, 1997). As technology changes, it opens new frontiers and sets new conditions that generate development opportunities. Development becomes one of learning to benefit from opportunities arising from technological change. A new technological revolution would constitute major discontinuities and shifts in the direction of change, providing new paths to development and opportunities for learning and catching up (Perez, 2001; Perez and Soete, 1988).

The ICT revolution is changing the context of development. In a globalizing and connected world, ICT, the Internet, and institutions that are governing and transforming the sharing of information and knowledge have become integral to growth and poverty reduction. The digitization of information flows is enabling massive knowledge sharing. Developing countries can move closer to the knowledge frontiers in health and educational standards, public sector management, and business models. Smart growth could be pursued through "inspiration," not just "perspiration" (Krugman, 1994). Growth could be generated from intangible resources, putting knowledge to work, adopting networked forms of organization, outsourcing business processes, practicing new ways of doing business, and pursuing both technological and non-technological innovation.

Development experience also points to the centrality of institutions, leadership, and governance (North et al., 2008).[2] Structural adjustment programs since the

[2]In the context of development, governance refers to an essential cluster of institutions: those concerned with the process of collective decision making and checks and balances (political institutions), legal and regulatory institutions, and state capacity or institutions concerned with the delivery of public goods.

1980s proved inadequate to spur growth without getting the institutions right. A long stream of reforms failed because they did not pay attention to governance and institutional issues. Deliberate and broadly owned strategy, strong government leadership and commitment, functioning market institutions, transparency and accountability, and taking a longtime horizon proved necessary for sustained growth and poverty reduction (World Bank, 2002). Development experience indicates that the success of market economies depends on institutions, social capital, norms, and trust (Hirschman, 1970; Fukuyama, 2004).

But development experience has also indicated the limits of our knowledge about how to go about building good institutions (Easterly, 2002). The only viable approach is often the slow process of building institutions through local efforts and local innovation. Reform and the development of institutions must rely on positive internal dynamics and broad local participation. Policy and institutional reforms have to be based on understanding the political economy that shapes policies and institutions in the first place. Each country and perhaps each community must find its own path to institution building (Amsden, 1994).

Development of economics has long neglected leadership, managerial, and entrepreneurial development as key determinants of development. Political leaders and managerial cadres are assumed to be given, not developed. Yet, experience demonstrates clearly that leadership, particularly political leadership, is essential to policy reform and institutional transformation. The quality and determination of the political leadership make a deep imprint on economic performance, as demonstrated by the superior economic performance of several East Asian and Nordic countries. Recently, some leading development economists have challenged this neglect. Rodrik, for example, writes "An attitudinal change on the part of the top political leadership . . . often plays as large role as the scope of policy reform itself" (Rodrik, 2007, pp. 38–39). Attitudinal changes on the part of leadership can improve the investment climate, shift e-government applications from window dressing to true transformation, and help build an inclusive information society.

e-Transformation, as explored in this book, builds on these lessons. It provides powerful tools for accelerating the development of institutions and governance. ICT can enhance transparency in government and reveal information on policy making and uses of public expenditure to the public, with the potential of generating internal dynamics in support of political economy reforms.

e-Transformation offers powerful tools for addressing the long-standing issues of institutional development, as they enable advanced forms of transparency, accountability, and organization in an economy. The reorganization that results from digital coordination brings about new and more advanced forms of organization, ways of doing business, and rules of the game. Advanced tools of information and communication can enhance the speed and reduce the costs of transactions, reduce uncertainties, promote effective interactivity, and enable the enforcement of the new rules of the digital economy. They can facilitate experimentation with institutional forms and enable institutional flexibility and diversity.

e-Transformation also emphasizes the role of leadership—political, managerial, social, and technical—in leading the necessary policy reforms and ICT-enabled

process and service innovation. It gives due attention to developing e-leadership institutions, e-policy frameworks, and effective regulatory bodies for the digital economy. e-Transformation invests in new leadership and managerial skills—including new cadres of information, innovation, and ICT leaders—to promote innovation, cross-agency coordination, and government and social transformation. Leaders are also needed at the grassroots to integrate information centers (telecenters) and local networks into local development and to use ICT to empower communities and promote pro-poor innovation at the bottom of the pyramid.

## Imperatives of ICT-Enabled Government Transformation

It is important to clarify what is meant by government transformation and why ICT-enabled change offers great promise to accelerate the transformation imperative. Like enterprises, government agencies may cope with change using various strategies. Strategies vary in scope and speed of change: shock therapy (turnaround of business), reengineering business processes, continuous improvement, and fundamental and sustained change, that is, transformation (Fig. 1.1).

"Shock therapy" strategy for institutional reform in government (the equivalent of turnaround in business) is very costly in human and economic terms, involves high risks, and is often driven by a crisis, as a government or public agency attempts to survive through broad change to be carried out within a short time, and without the benefit of experimentation, phasing, or learning. Crises allow for deep change and social engineering. They allow for adjustments without a human face. An example is the IMF-imposed reforms after the 1997 East Asia financial crisis and after several debt crises in Latin America. A fundamentalist form of capitalism often needs crises or disasters to advance (Klein, 2007). However, shock therapy or turnaround strategy is unsustainable and inequitable, in view of political and social

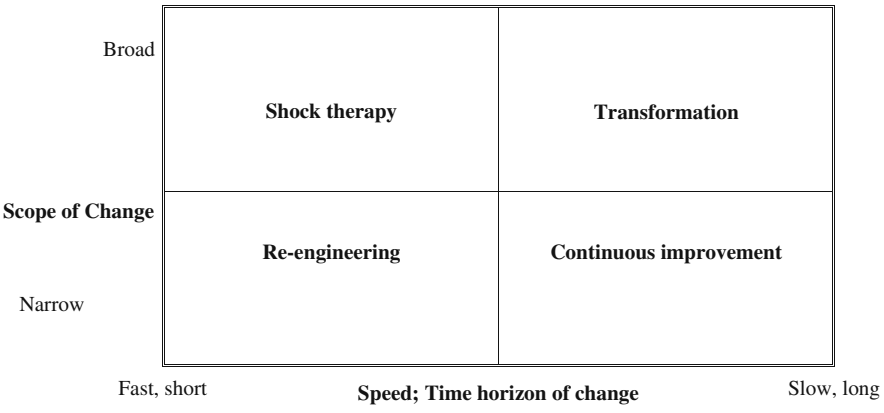


**Fig. 1.1** Public sector change strategies

costs, civil service constraints, weak ownership, and uncertain outcomes (Stiglitz, 2003). For economic shock therapy to be applied without constraints, it required additional major collective trauma, "one that either temporarily suspended democratic practices or blocked entirely" (Klein, p. 13). It resulted in high human toll and diminished social cohesion, public good, and national freedom.

Reengineering and continuous improvement strategies are relatively more viable strategies for change in the short and long term, respectively. But alone, they are too narrow and inadequate to cope with the forces shaping our world and the demands of the current techno-economic paradigm. Those strategies are about doing the same things better, while our fast-changing world is also about doing different things—reforming government, reaching underserved populations, solving complex and messy problems, and making growth and development sustainable.

Transformation has emerged as a basic mode for adapting and competing in this new world environment. Transformation is a process of continuous and sustained change, not a onetime fix. It is about deep change, to be realized over time. It is driven by a vision of future government and an inclusive information society. It encompasses broad changes in the structure, systems, skills, and culture of the public sector. It also involves fundamental changes in the relationships between public agencies and their environments, including relationships with suppliers and customers, and partnerships with policy centers and nongovernment organizations (NGOs). ICT is fundamental to this transformation process.

Several factors are making government transformation an essential matter of sustainable growth, social harmony, and political legitimacy. At the global or macro level, these factors include: globalization, liberalization, and deregulation across many sectors and countries; population growth and urbanization in developing countries, combined with population aging and decline in developed countries; climate change and the consequent need for a new paradigm for growth; and a powerful technological revolution spurred by ICT. Local challenges also include public security, rising inequalities, and the need for policies to build and maintain social cohesion.

These local and global challenges demand new policy responses and new service paradigms. The economic crisis that started in late 2008 may be short term, but its fiscal consequences are likely to be of a long-term nature. It is likely to lead to a decade of austerity even among the most affluent countries. Heightened expectations of citizens for responsive public services will be confronted with increased constraints on public resources. Societies will expect more and will hold governments to account more.

Institutions have not kept with the pace and demands of the ongoing economic, demographic, market, political, and technological forces (Fig. 1.2). These changes have created a new world economy with new imperatives that so far outpaced the capacity of current institutions to adapt (Rischard, 2002). This adaptation gap is widening and leading to major stresses and frequent crises in governments, financial institutions, and economies. Hence there are mounting pressures to find ways to accelerate institutional adjustments and government transformation.

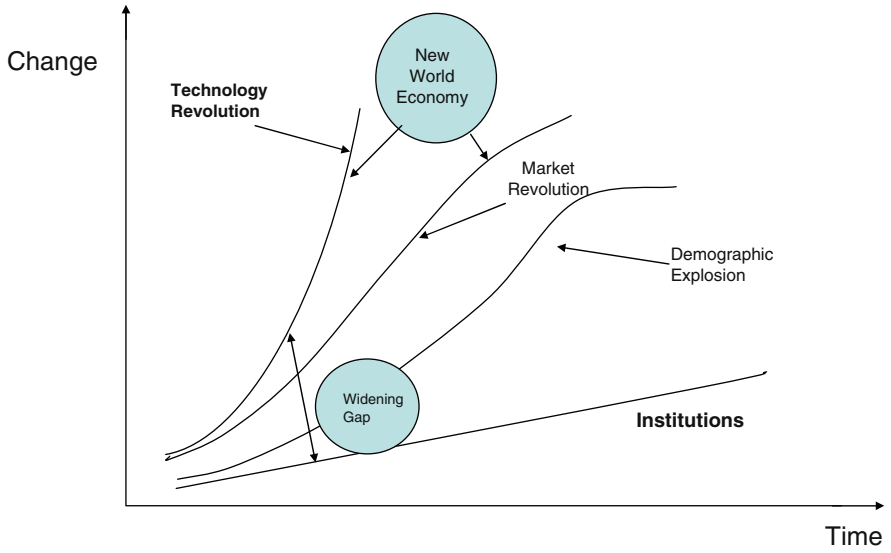


**Fig. 1.2** Technology, market, and demographic changes far outpace institutional capacity to adapt! Adapted from Rischard, 2002

Developing countries' governments face daunting challenges, demanding broad, deep, and sustained transformation from public institutions: severe financial constraints, poor infrastructure and public services, largely unmet basic needs and expectations, widespread corruption, fragile democracies, high inequalities, and information poverty. This calls for transformational change. The broad thrusts for this transformation are greater collaboration at and among all levels of government; strategic partnerships between the public and private sectors and civil society; consolidation and sharing of information infrastructure and delivery channels; different and collaborative service delivery models; active engagement with stakeholders; and user-driven innovation and customization of services.

Leading nations are responding by reforming and reinventing government along promising lines: promoting managerial flexibility and accountability for results; providing choice and customized service; using partnership and competition to deliver public services; engaging citizens to cocreate services, shape policy, and hold government accountable; and building collaborative, innovative, and integrated government (Chapter 3).

The ICT revolution offers many new tools and many new opportunities to advance these reforms, and in turn, calls for rethinking government. Today's governments are the relics of the industrial age, when government-as-machine is the dominant metaphor (Eggers, 2005). Even the movement of "reinventing government" of the 1990s in the USA and European Union, has focused on reforming individual bureaus, rather than the government as a whole. The bureaucracy of the

industrial age must now be transformed to one that fits the age of information society and knowledge economy. ICT provides powerful tools to transform the way government works and relates. But this potential will not be realized without creative thinking about the transformative use of the new technologies. Understanding the why and how of this transformation process is essential.

## A Digital-Era Government Paradigm

Public management scholars argue that a Digital-Era Governance paradigm is replacing the new public management (NPM) wave of public sector reform of the 1980s–1990s (Dunleavy et al., 2008). The NPM wave was founded on themes of disaggregation, devolution, incentivization, managerialism, market orientation, and contracting out. This wave has largely ebbed in the key leading-edge countries, reflecting the cumulative adverse effects of increased fragmentation and institutional complexity on citizen's capacities to solve social problems.

The digital-era governance paradigm benefits from ICT tools that can help realize the themes of the NPM, such as managerial accountability and flexibility, while avoiding the NPM's side effects of fragmentation. It is characterized by reintegration, holism, and digitization. This involves reintegrating functions into the public sphere, such as effective regulation of financial institutions and government becoming information broker. It also involves adopting holistic and client-centered structures by networking government and organizing it (often virtually and temporarily) around distinct client groups. It exploits Internet communication, digital content management, and ICT-enabled business intelligence and relationship management.

Government agencies, much like all large organizations today, were designed for the world of high transaction and interaction costs of the 20th century, but a steep fall in these costs has been underway due to the Internet and ICT advances. This sea change opens the possibility of remaking these organizations by mobilizing their intangible assets and the knowledge and creativity of their workforces (Bryan and Joyce, 2007). In a low-transaction-cost world, issues of trading off hierarchy versus collaboration and centralization versus decentralization are resolved in ways than can mobilize knowledge, innovation, and minds. ICT enables efficient and effective large-scale collaboration, greatly increases the value of intangibles assets relative to tangible assets, reduces organizational complexity, and simultaneously increases the economies' scale, scope, and specialization.[3] It has opened new frontiers to organizational and managerial innovation, enabling a digital-era government.

[3]For research or empirical basis for these possibilities, see Bryan and Joyce, 2007.

## The Future of Government and Competition

Leading scholars of business strategy envision a new age of competition and innovation where value will be based on increasingly personalized services that are co-created with customers and that draw on partnerships and networks of providers, enabled by ICT (Prahalad and Ramaswamy, 2004; Prahalad and Krishnan, 2008). This new age will be founded on three pillars: value is based on personalized experience of customers; customers will actively cocreate content and add value to services; and organizations will partner with a variety of players in a global ecosystem. Organizations will focus on the unique needs and experience of the individual, drawing on clients and global resources to respond and cocreate. These pillars are forged by digitalization, ubiquitous connectivity, and globalization.

Understanding this underlying transformation and the role of ICT in shaping this future is critical for governments as well as enterprises, to transform their roles, services, and public value. This understanding is important for public policy makers, educators, policy centers, and research institutions as they attempt to help public sector agencies and civil society organizations to build the institutional, human, and technological capabilities to perform in an increasingly demanding environment.

The role of citizen is changing as a consumer and an active participant in advanced information societies. The citizen has become increasingly connected and informed. In advanced information societies, citizens are able to challenge providers of public and private services, ranging from health care to education and social services. They can access information on programs, services, performance, costs, and consumer satisfaction around the world. Consumers are using the Internet to experiment with and develop services and to learn from the experience of others. Thematic communities are emerging to share consumer experiences. Citizens are also acting on their experience and seeking to influence public agencies through voice, interaction, and cocreation.

The future of competition lies in a new approach to value creation, based on a customer-driven or citizen-centered cocreation of value (Prahalad and Ramaswamy, 2004). This approach challenges the traditional service-delivery assumption: that public agencies and enterprises drive innovation and create value unilaterally. It promotes new practices and capabilities for public organizations to create environments and networks that enable diverse cocreation experiences.

In conceptualizing the nature of future government, we need to take into account the above forces that are shaping the future.[4] These may be captured in terms of three trends: personalization, cocreation of services, and governing by networks and partnerships (Box 1.1).

[4]This section borrows from the concept of cocreating value with customers as detailed in Prahlad and Ramaswamy, 2004; and Prahlad and Krishnan, 2008. I am also indebted to Randeep Sudan for his insight and contribution to this section.

## Box 1.1 Future government services: Personalization, cocreation, and partnership

*Personalization.* Governments today typically deal with a mass of citizens and businesses, with little differentiation or customization. This will need to radically change in the future. Governments will be required to deliver services that are highly personalized not merely to the individual, but to individuals in a given time, place, and context. Services required by an individual involved in a traffic accident, for example, need to be highly personalized in the specific context of the time, place, and nature of the event. The concept of "citizen-centric government" tailors public services to broad categories of customers; it should be viewed as a step toward full personalization of public services.

Such personalization will necessarily require information to be shared and unified not merely across the internal boundaries of government (in the example of the traffic accident, the departments of health and police) but also across external boundaries with the private sector (insurance companies). It will also mean greater use of business analytics and business intelligence to cater to the needs of the individual. The increasing penetration of mobile phones will reinforce personalization as individuals have access to a communication device, no matter where they are. This will require a new class of employees with access to unified data and information to effectively intermediate on behalf of the individual citizen across organizational boundaries.

*Cocreated services.* The move from generalized government portals to "My Portals" as in the case of UK, Cyprus, and Malaysia is symptomatic of a transition from "citizen-centric" to "citizen-driven" government. This transition has just started in some developed countries. It will be facilitated by government services being cocreated by or for the individual. Citizens will configure information and services either by themselves or through intermediaries including community and social networks.[5] Such cocreation of services will revolve around deep engagement of the citizen (as an individual and as a class) in the decision-making processes of government, easy access to information, and a high degree of public transparency.

The recent move of the US federal government to publish government data on Data.gov is a significant development in this context. Machine-readable data from Data.gov could be mashed up by public and private sector players and in some cases by individuals themselves in order to cocreate more personalized and meaningful services. A site like Data.gov would moreover allow private sector and nongovernmental players to offer innovative public–private services by deploying new business models.

[5]Andrea Di Maio, Gartner Research, "Moving from Citizen-Centric to Citizen-Driven Government," April 2009.

*Governing by partnership.* The boundaries between government and the private sector are likely to get increasingly blurred in the future.[6] For instance, instead of notifying the government about a change of address, an individual's credit card company or bank may perform this service. Banks may also undertake tax filing on behalf of their clients. Similarly, partnerships are increasing among public agencies and NGOs to deliver social, health, and educational services. These partnerships and network-based delivery of services require shared data on citizens.

The ownership of citizen data which currently vests in governments could be transferred to citizens. Ireland had experimented albeit unsuccessfully with a citizen data vault that transferred control of citizen data to citizens who could authorize access by various agencies. Recent initiatives by Microsoft and Google to create services for storing patient data records could hypothetically expand to data vaults owned by citizens rather than by governments. This would offer a high level of convenience to citizens as they need not maintain their data in multiple places and avoid data inconsistencies. For governments, this may require publishing all government data (except data with privacy/security implications) in machine-readable format in an easily accessible manner.

## Imperatives of Inclusive Information Society

Building an inclusive information society is a necessary and complementary measure to reforming governance. It empowers citizens to access information, register their demands and shape public services to meet these demands. Recognizing the limits of the state and the market, development thinking turned to catalyzing and leveraging community knowledge, creativity, and capital to promote grassroots development. Sustainable development depends on local participation, community empowerment, and multi-stakeholder partnership.

Viewed from the perspective of ICT for Development (ICT4D) or the development informatics discipline, e-transformation would represent a new phase of applying ICT for development, an "ICT4D 2.0" (Heeks, 2009). e-Transformation shifts attention from preoccupation with technical novelty to contextual understanding of how existing technologies can be effectively used to solve problems of poor communities. It shifts the locus of innovation from supply-driven solutions to collaborative innovation that emerges from working with poor communities, and even more radically, to grassroots innovation that mobilizes and empowers communities to innovate by and for themselves. It shifts ICT initiatives from an exclusive focus on investing in physical access to ICT to taking a holistic approach that invests in local competency development to create and use content. It shifts emphasis from

[6] Andrea Di Maio, Gartner Research, "The Future of Government is No Government," April 2009.

designing top-down blueprint plans to developing local processes and grassroots institutions that enable flexibility, beneficiary participation, local leadership, and local innovation and learning.

Viewed from the perspective of development strategy, e-transformation is a "second generation" strategy for a smart, holistic, inclusive, and participatory development. e-Transformation is not just about a new paradigm of designing and deploying ICT. It is about creating new styles and paths for development. The challenges of development can now be made more manageable, and ambitious development goals, within reach. Accordingly, e-transformation draws on widely distributed information and communication tools to support grassroots innovation and collaboration. New tools like mobile phones and collaborative technologies enable more targeted and strategic communications, peer production, and broad participation in development programs. They facilitate local partnerships, enhanced experimentation, and local monitoring of development programs. They support community learning and knowledge sharing, network-based innovation, and the building of community-based institutions. They help promote rural livelihood, access to health information and learning resources, and new ways to deliver extension and support services to small farmers and businesses.

Fortunately, the ICT revolution is making it possible to build a more widely distributed information environment and knowledge-enabled collaborative world. In this environment, inclusive and pro-poor growth strategies can harness the collective knowledge of society and the resourcefulness of communities. For example, widely diffused mobile communication devices and ubiquitous networks make user-driven innovation much more possible. The applications to which mobiles are being put by the users, frequently the poor, show extraordinary creativity (Box 1.2).

### Box 1.2 User-Driven Innovation and Mobile Phone Networks

Companies such as Nokia and Intel are devoting significant resources (including ICT anthropologists) to looking at how people in poor countries are using ICTs to improve their design and applicability. For example, because people in developing countries share mobile phones, Nokia introduced multiple address books on devices to enhance privacy. Prepaid and cost-tracking applications have been also introduced to price-sensitive users and to enable sharing and reselling service.

Increasingly, mobile phones are put to uses that were not anticipated by device designers and service providers. Users add value to services in ways that range from contributing user-generated content to social networking. They interact with other people and devices through communication networks in ways not originally intended or anticipated. ICT anthropologists have been documenting the uses and customization of phones for various purposes and local conditions. This information is fed back to design teams. Many uses go beyond telephony and involve value-added services and new streams of revenues for users, network operators, and third-party service providers. These

unanticipated applications, pioneered in developing countries, are now being made available to people in both developed and developing countries, for example, to extend payment mechanisms and financial remittances to "unbanked" people. Examples from developing countries include the following:

*Mobile phones as broadcast technology*: NGOs have used SMS software to broadcast text messages to users for purposes ranging from providing information on health care and drugs to monitoring elections, corruption, and human rights. Some authorities have also used text devices to broadcast information about natural disasters.

*Mobile phones as financial intermediaries*. One service provider enabled mobile users in Kenya to transfer money, and in the first 18 months of service, it transferred over US $500 million and registered 3.8 million customers; the Kenyan banking system took a century to reach the latter figure.

*Mobile phone networks as platform for commerce*. For example, CellBazaar service in Bangladesh links many-to-many using the same mobile infrastructures to advertise a wide variety of things, from agriculture produce to jobs and services. TradeNet, an agricultural market information and trading service for farmers and their suppliers, was pioneered in Ghana, but now available across Africa, and can be accessed by mobiles.

Source: Paltridge, 2009.

## Community-Driven and Participatory Development

Development practitioners have learned—slowly but conclusively over time—that strong participation on the ground by primary stakeholders boosts the performance of development programs.[7] Strengthening participation and ownership require institutional innovations at all levels. The community-driven development (CDD) movement and the creation of social funds are examples of such institutional innovations. Interventions from above—such as microfinance and small grants for innovation—can provide the enabling tools and resources to empower community-based organizations to harness new information and technologies for local problem-solving and home-grown strategies.

Lessons from both development and corporate planning indicate that strategies often emerge from bottom-up learning and experimentation (Rodrik, 2007; Mintzberg et al., 1998). Strategy formulation and implementation are intertwined as adaptive learning processes (Hanna and Picciotto, 2002; Hanna, 1985b). Successful strategies involve the ability to use local knowledge to create local solutions (Scott, 1998). They emerge where people have the capacity and resources to learn. Once recognized as promising, pilots, local experiments, and emergent strategies can be identified, evaluated, selectively propagated, and scaled up. No amount of blueprint

[7] Blackburn et al. (2002).

design, central planning or international best practices imposed from above or outside can substitute for agile and systematic learning from local experience.

Other lessons come from pedagogy, social learning, and development assistance (Hirschman; Schumacher; Freire).[8] These lessons suggest that development planners have to start from where the local actors are, using incremental improvements and grassroots initiatives. Planners have to see through the doers' eyes. Planners cannot impose transformative change from above; local actors must be motivated and actively engaged in the transformation process.

Much of development practices are not amenable to importation or imposition. They must be developed and adapted locally—relying on local knowledge, experimentation, and hands-on experience. Top-down blueprint plans tend to perpetuate dependency and overwhelm local capacity. ICT could mobilize practical local knowledge and learning to enrich the repertoire of development practitioners.

ICT-enabled development is an unexplored territory. Much of the know-how of using ICT is tacit knowledge that involves institutional learning and social adaptations. e-Transformation is specific to local conditions and factor endowments; it is a low-specificity activity area where everything depends on context, past history, social structure and culture, and local leadership and capabilities, among others.[9] It is an area of development practice where design and input from people immersed in local conditions will be the most critical. Moreover, the repertoire of ICT applications available in advanced countries may be limiting or inappropriate to the diverse needs of developing countries—let alone diverse local communities. There is no automatic "technology transfer."

Financing bottom-up ICT-enabled initiatives can promote social learning and empower change-oriented grassroots institutions. e-Society applications can promote institutional innovation, adaptation, and learning at the grassroots levels. When locally driven, ICT-enabled applications and institution building may be better positioned than nationally driven societal application programs to take account of potential interactions among new and existing local institutions (Chapters 7 and 8).

Using ICT for promoting grassroots innovation and solving local development problems must mobilize local knowledge and experience to create local solutions. Such use demands a high degree of diversity in deploying ICT to empower communities and building capabilities to participate in an information society. Societal applications of ICT to support the livelihood strategies of the poor are shaped by social structure, culture, and other variables that are not always under the direct control of public policy or central government. Many scholars have warned of the dysfunctional character of "global" best practices mentality and of externally or centrally imposed recipes, institutions, and programs in development (Scott, 1998; Fukuyama, 2004; Rodrik, 2007). This lesson applies with equal force for using ICT for development.

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[8] "Helping People Help Themselves: Autonomy-Compatible Assistance" by Ellerman, in Hanna and Picciotto (2002), pp. 105–133.

[9] See Fukuyama (2004) for discussion of high versus low-specificity activity in development.

## Toward a Networked Society

It has become a core competency for information societies to produce, select, and interpret new information and knowledge and to turn it into productive activities (Castells, 1996). Information, knowledge, and innovation are increasingly the main inputs and outputs of modern economies. The speed of diffusion of information and knowledge has increased dramatically. In such a world, access to information, knowledge, and networks become essential to participation, capacity development, and even economic survival.

The world is becoming increasingly networked—interconnections among individuals, businesses, governments, universities, and civil societies. Flat, networked, adaptive, and open structures are more aligned with knowledge-based and innovation-driven economies than bureaucratic, hierarchical, and closed organizations. In a networked society, connectivity is a key component of public and social infrastructure, as essential as water in an agricultural society.

In the networked economy, the technology infrastructure makes information more accessible and hence more valuable. Improved information infrastructure has vastly increased our ability to capture, retrieve, filter, organize, and distribute information. A networked economy is dynamically driven by network externalities, positive feedback cycles (Shapiro and Varian, 1999). The value of a network, real or virtual, depends on the number of other people connected to it.[10] Positive feedback and learning loops are a more potent force in the network economy than ever before. The old industrial economy was driven by economies of scale of production and physical assets; the knowledge economy is driven by economies of scale of demand and intangibles.

Public agencies are learning to govern and deliver services by networks—by engaging public, private, and civil society partners in information, knowledge, and innovation networks. Information and communications technologies are providing the foundational blocks and tools for establishing, facilitating, and managing these networks. They are also enhancing the capacity of public and private organizations to network, partner, and learn, and be flexible, agile, and smart.

## ICT-Enabled Transformation as a Process

The ICT-enabled transformation process may start with a broad assessment of e-readiness and the enabling environment, country development strategy, and the role of government in leading this strategy (Fig. 1.3). These inputs should help create a shared vision of ICT-enabled transformation for government and society, identify the key stakeholders, and engage e-leadership institutions (Chapters 3 and 9). Subsequently, a shared vision and engaged stakeholders should set the directions

[10] According to Metcalf's law: the value of a network goes up as the square of the number of users.

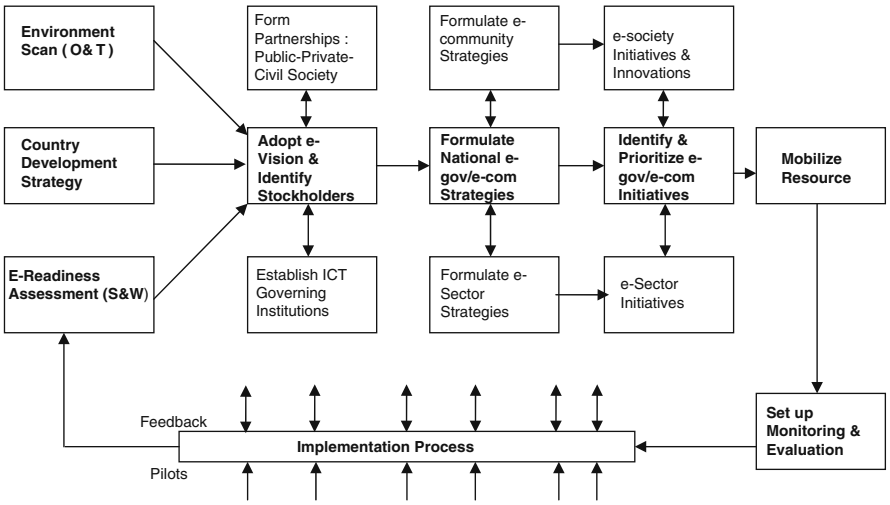


**Fig. 1.3** The e-government and e-community strategy process

for government-wide and local e-strategies. In turn, these directions should help identify and prioritize e-transformation initiatives (Chapters 4 to 6).

This process can be replicated at the sectoral and local levels and connected with the national process to ensure bottom-up initiative, broad ownership, and deep integration across sectors and levels of government. Striking the right balance between local and national initiatives is a critical aspect of the strategic management of this process. The next step is to mobilize the necessary resources from all stakeholders.

Holistic e-transformation for government and information society faces many implementation challenges (Chapter 6). Countries have experienced significant vision implementation or aspiration reality gaps in implementing their e-transformation programs. These gaps need to be understood if ICT-enabled transformation is to become a development practice. Moreover, ICT is a versatile technology, with many possibilities to be discovered and diverse contexts within which it should be tested and adapted. The key to implementation success, therefore, is establishing monitoring, evaluation, and learning systems as early as possible. Monitoring and evaluation results should feed back into continuous assessment of progress, performance indicators, and development outcomes. Integrating lessons of experience is critical to speed up learning and reduce the costs of ICT-enabled transformation (Chapter 10).

## Thinking Strategically about e-Transformation

The e-transformation strategy process is not primarily about developing detailed planning documents or conducting exhaustive analyses and measurements. It is the first and foremost about thinking strategically about the fundamental options and

opportunities for transformation made possible by the information technology revolution. *Dirigist* and bureaucratic planning processes have been discredited in both the business and public sectors. Leading practitioners in strategic planning have increasingly relied on agile processes and tools to engender creative and strategic thinking (Mintzberg et al., 1998; Hanna and Picciotto, 2002; Hanna, 1985b). A creative and adaptive process is particularly necessary when dealing with fast moving technologies and highly dynamic global economy.

But from where should we start to think strategically about transforming government and society? Should we start from a comprehensive public sector reform strategy based on analysis of current problems in governance and public services? Or should we start with formulating a comprehensive ICT sector strategy based on ICT trends and their implications for government and information society? Or should we first focus on partial ICT interventions in the context of a fully articulated public sector reforms? Is there an optimal sequence to follow in order to maximize the benefits from this fast evolving technology?

To promote strategic thinking about the options, we may analyze the potential range of country conditions and describe them along governance and ICT strategies. This yields four scenarios (Fig. 1.4). Many countries neither have a clear public reform strategy nor a holistic ICT strategy (scenario 1). Promoting a holistic approach to ICT may be an attractive entry point to induce more thinking about the governance reform strategy itself. But adopting a major thrust in ICT in the context of unclear reform strategy would be constrained by the lack of complementary inputs and would lead to modest payoffs (scenario 2). It could become even counterproductive if national and sectoral reform priorities remain unclear and thus investment in ICT becomes an end in itself. Under these conditions, it may be prudent to focus on partial interventions in those sectors or government agencies where

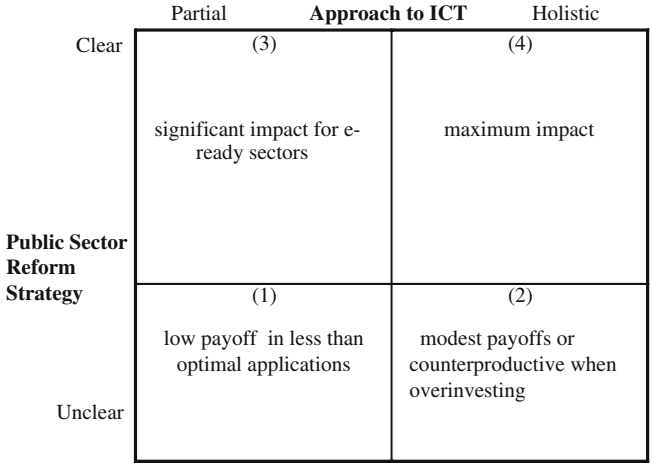


**Fig. 1.4** Thinking strategically about integrating ICT and public sector reform

there are relatively clear reform priorities and payoffs. A partial approach for using ICT to enable a clear reform strategy would yield significant benefits but would be limited to those sectors where ICT is deployed (scenario 3).

Finally, the evidence from leading countries suggests that the development impact of ICT is highest where governance reform strategy is clear, and ICT is approached in a holistic fashion as the enabling platform for this strategy (scenario 4). Countries may strive to move to this last scenario to maximize the development impact of ICT investments. This demands thinking simultaneously about ICT and development strategies and then planning and experimenting to align and integrate both strategies. It calls for a dialectic among development ends and ICT means (Box 1.3)

## Box 1.3 Thinking dialectically about development ends and ICT Means

Although technology is only a means to an end, any public sector modernization effort must be based on a full appreciation of the tools and options made possible by the underlying power of ICT. Technology is often used as an add-on to existing ways of doing business in government, with IT solutions being merely an overlay on existing manual processes. Even when manual processes have been changed as part of a broader public sector reform effort, technology has been perceived to be a more downstream activity. But government processes cannot be fundamentally reformed or reengineered without a deep understanding of what the technology can deliver. Among leading-edge corporations, ICT has become a strategic platform for achieving competitiveness. Companies like Walmart or Fedex have developed their core business models and processes around technology. The increasing digitization of information and growing penetration of networks will only accelerate this trend.

This means-end dialectic may be viewed as a process, whereby the chosen visions or ends should guide the use and adaptation of the new technology, and in turn, appreciation of the potential and trends of the technology should further our visions and aspirations of what is possible for future governments and information societies. Visions or ends-planning for governments and communities would be enriched and made operational by understanding and taking account of the transformative power of ICT. In turn, means-planning and investing in ICT needs to be guided and challenged by a holistic vision of governance reform and information society.

Public agencies tend to approach innovation as a “one-off” change using a big bang, instead of a series of tools and approaches that systematize the innovation process and develop a culture of innovation. Fortunately, researchers are learning more about the approaches and conditions that could stimulate creativity; these approaches apply equally to government, enterprise, and social transformation. A multidisciplinary approach that engages both development

and ICT specialists would be necessary for promoting creativity and innovation in using ICT in government and society.

The interactions between ICT, governance, and poverty-reduction strategists should facilitate thinking creatively and simultaneously about the means and ends of transformation. They help shape and are shaped by a shared vision of transformation and the role of ICT in the process. They evolve over time, in response to mutual adjustments, experimentation, learning, and discovery. They are not the product of a single leader or institution. They can be nurtured by networks of institutions and champions who represent demand for reform and supply of ICT-enabled solutions. Such interactions should be facilitated institutionalized in e-leadership and policy-making institutions.

The same logic applies to the use of ICT for poverty reduction and socially inclusive transformation. Payoff from ICT investments and associated capabilities is highest when embedded in and informed by livelihood strategies, community-driven development, and poverty reduction programs.

## Thinking Creatively about e-Transformation

Transformation or "creative destruction" demands creativity and innovation, and these in turn involve exploration, idea generation, discovery, experimentation, and a culture of learning. Lessons of development point to the risks of applying a single recipe, a "Washington Consensus" of economic policies and institutions to diverse contexts (Rodrik, 2008; Stiglitz, 1999b, 2003). They also suggest that development is a process of change, innovation, learning, and ultimately, social and institutional transformation. The ICT revolution can help speed this process by opening up new options for development and innovation. Thus, creativity takes an even more important role than in the past in aiding the transformation process. Creative thinking about ICT use to enable transformation becomes an imperative. In particular, governments have to become better at leveraging the creativity of those closest to the problem, be they employees or citizens. Governments can and do innovate, but there is an innovation gap that needs to be overcome (Eggers and Singh, 2009).

A holistic approach to e-government and e-society would present ICT strategies and applications in challenging and broadening terms. Recent studies of creativity suggest that challenging and broadening techniques help us capture interconnections and diverse ideas and thus boost creativity, learning, and problem solving (Scientific American Mind, June/July, 2008, pp. 24–31). Such approaches can stimulate and systematize the innovation process at all levels where ICT is harnessed for transformation.

Promoting grassroots participation and tapping community knowledge and creativity are necessary, since innovation and creativity cannot rely solely on top-down mechanisms. Systems and institutions may be developed to generate and maintain

the flow of good ideas and to build local capacity for innovation over time. This is particularly important for ICT-enabled innovation and transformation as ICT is a versatile technology whose impact is conditioned by contextual factors. Generation and diffusion of creative solutions would emerge from the interplay of locally driven initiatives and nationally set enabling policies and scaling up mechanisms.

## Key Themes

This book is about e-government and e-society as a multidimensional transformation process, involving institutional, social, and technological change. The book's main themes are:

- e-Government is about integrating ICT strategically and organically into development policy and public sector reform processes. The transformative power of ICT will not be tapped without new thinking that integrates ICT as enabler of governance reform programs (Chapters 1 and 2, in particular).
- The ICT revolution is raising expectations and opening opportunities to enhance governance, reduce corruption and red tape, and improve access and quality of public services. The range of possible ICT applications for government is almost limitless, but should be driven by reform objectives, and guided by holistic approaches to institutional change and government transformation (Chapters 3, 4, 5, and 6).
- Partnerships among government agencies, private sector, and NGOs are essential to build common infrastructures, tap synergies, harness network effects, exploit comparative advantages, and promote innovation and learning. Government has to lead in promoting e-transformation in government and society (Chapters 5, 7, and 8).
- Experimentation and learning are at the heart of e-transformation and much of the learning occurs at the local level. A national ICT-enabled transformation strategy should, therefore, emphasize bottom-up initiatives and participatory approaches to enable grassroots innovation and learning (Chapters 6, 7, and 8).
- An inclusive information society is essential to a broad base of e-literate population and to engage communities in mobilizing local knowledge, accessing global knowledge, and using ICT to solve local development problems. e-Society should provide a laboratory for grassroots innovation, social learning, and emergent strategies (Chapters 7 and 8).
- Policies, institutions, and leadership are central to creating the enabling environment for the effective use of ICT in government and society at large. Understanding the stakeholders and the political economy of reform is essential to reform e-policies, build ICT governance, and induce transformation (Chapters 6 and 9).
- Holistic approaches are needed to exploit externalities and network effects of ICT and to secure co-investment in complementary resources. e-Development is

essentially about thinking holistically and long term, to maximize synergies and development outcomes, yet acting selectively, to maintain focus, leverage entry points, and harness learning dynamics (Chapters 9 and 10).

- Transformation programs should draw on lessons from the pioneers. Among these lessons, countries may adopt participatory approaches, seek quick wins, take long-term perspectives, address the soft aspects of transformation, and balance strategic direction with local initiative and learning (Chapter 10).

# Chapter 2
# Implications of the ICT Revolution

This chapter explores some of the ways ICT is likely to impact social and economic development and points to the strategic significance of ICT for enabling national development and poverty reduction strategies. ICT offers many promises and opportunities, even while posing serious risks and uncertainties. Its impact is likely to be pervasive. Countries must fashion their own responses. Ad hoc or passive postures are likely to lead to increasing digital and economic divides, marginalization of poor, and increasingly costly and burdensome government that erodes economic competiveness.

First, we are still in an early phase of a long-term technological wave and productivity revolution. Promising paradigm shifts within computing and communication point to a continuing dramatic decline in prices and increase in performance and intelligence of ICT systems. Moreover, long adjustment periods are needed for an economy to fully benefit from a revolutionary new technology. The ICT revolution and the accompanying socio-economic adjustments constitute a techno-economic paradigm shift with profound implications for the renewal of the productive and institutional structures in developed and developing countries alike.

Next, the pervasive and increasing impact of ICT is examined in a few areas related to public sector, community development, and poverty reduction. This impact covers organizations and markets, competitive strategies, innovation, financial services, employment, media and cultural development, regional and urban development, governance and participatory democracy, education, health, and poverty.

ICT's impact is accompanied by downside risks such as: wasting scarce development resources; exacerbating inequalities; reinforcing existing power distributions; and controlling, rather than empowering the individual. None of the promises or risks is predetermined by the technology; they are outcomes of complementary economic policies and socio-political choices. This argues for integrating the ICT agenda into the development and reform agendas in creative and dynamic ways.

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_2,

## Early Phase of a Technological Revolution

Before assessing the revolutionary potential of information and communication technologies, we need to appreciate the phase we are in and the lead time needed for the full impact to be realized. The infancy and pace of the ICT revolution suggest that ICT is still undergoing revolutionary change and that many ICT tools have yet to diffuse to the majority of mankind. Technical advances in many ICT areas continue apace and could level or change the playing field for developing countries, provided policy and institutional changes are made to capitalize on these advances. These include mobile devices, wireless communications, open source software, low cost access devices, and the coming paradigm shift to utility computing. The recent explosive growth of mobile phones in developing countries opens up massive possibilities for delivering services to rural and remote areas of the world, as will be illustrated later.

A paradigm shift is underway to deliver Internet-based software service (cloud computing) and to have computing power made available as a utility (utility computing), much like electrical utilities (Carr, 2008). This shift will have profound impact on ICT investment and diffusion: reducing the cost of ICT ownership, emphasizing the importance of shared infrastructures and broadband communications to realize economies of scale, and accelerating the diffusion of ICT as a general-purpose technology.

Advances in Internet technology are likely to provide the interactivity and real-world awareness needed to support business-to-business transactions, even while demanding limited communication capacity (by optimizing use of bandwidth). It will exploit sensors and smart tagging and tracing technologies to enable manufacturers to track every product they make from inception to phase out, and thus help manufacturers optimize their sensor-enabled supply chain assets countrywide. The promise of next generation Internet is already being realized by early adopters in developing countries for logistics by companies such as Cemex in Mexico and for enhanced customer service by Carrier China (Colony et al., 2002).

## Early Phase of a Productivity Revolution

Not only is the world at an early phase of a sustained technological change, but also it is in an early phase of realizing the productivity gains from those ICTs already available. In assessing the productivity impact of ICT, it is important to take account of the fact that long adjustment periods are needed for an economy to fully benefit from a revolutionary new technology.

It is instructive to understand the dynamics of the productivity surge of the 1920s arising from electrification and draw lessons for the anticipated lead time for economy-wide productivity surges from ICT (David, 1990, 2000). In the case of the electric dynamo, the great productivity gains came not from the fact that electrical engines were faster and stronger than steam engines, but that they facilitated more

efficient organization of work. It took decades for factories to be reorganized and for the full gains to be realized, but there were overall surge in productivity growth once a certain critical mass was reached. There are parallels between the interconnection of electric motors through grids—and the associated transformation in manufacturing practices—and the interconnection of computers via communication networks. The Internet, diffusing much faster in the United States than electricity did during 1880s–1920s, is a major step in this interconnection throughout local and global economies.

The ongoing technological revolution is so profound and pervasive that it challenges many traditional economic concepts that are rooted in incremental thinking. The transformative role of ICT has been difficult to capture in national statistics due to several kinds of measurement problems and time lags (IMF, 2001; David 2001). However, the evidence in terms of economy-wide productivity has become most clear in the case of the United States, as a range of studies have measured a contribution of about 1% in labor productivity in the 1990s (Gordon, 2000; Oliner and Sichel, 2000; Jorgensen and Stiroh, 2000; Council of Economic Advisors, 2001). Other studies have suggested significant (0.8%) increase in total factor productivity (TFP) growth, particularly driven by both ICT-producing and intensive ICT-using sectors (Kenny and Motta, 2002; Gordon, 2000; David, 2000).

Relatively more recent research suggests that ICT has driven the post-1995 revival of the productivity of US economy, almost doubling TFP (Brynjolfsson, 2003); US productivity growth continued even during the economic downturns of 2000 and 2008 (Brynjolfsson, 2009). The evidence of impact on productivity is even more compelling and persuasive across countries at the microeconomic, firm, and industry sector levels. Evidence from recent research provides a compelling case for ICT as a driver of productivity growth across many sectors of the US, EU, and emerging economies.

The relatively recent adoption and low usage of ICT in many developing countries suggest that this revolution had not yet had a significant impact on economy-wide productivity, except among the Asian tigers and perhaps a very few emerging economies. In order to have significant impact on growth, a country needs to have a significant stock of ICT or users in place, and perhaps be more advanced in using that stock for economic transformation. But even in the context of a number of middle income developing countries, studies indicate significant ICT contribution to firm productivity (for example, Brynjolfsson and Saunders, 2010). In Korea, a comprehensive ICT strategy has been a key driver in the fast rebound of its economy from the financial crisis; the ICT industry's contribution to GDP growth rose from a mere 4.5% in 1990 to an astounding 50.5% in 2000 (www.mic.go.kr). Most recent evidence on ICT contribution to growth comes from large countries such as India and China, best reflected in terms of their substantial exports in IT services or hardware.

Economic history, the cumulative learning and transformation process involved in using ICT, and the pace of this wave of technological change suggest that a "wait and see attitude" would keep many developing countries out of a technological revolution no less profound than the last industrial revolution (David, 2000; Perez, 2001;

Freeman and Soete, 1997). Countries that adopt an inactive or reactive posture, rather than a proactive one, are likely to lose windows of opportunities to leapfrog or fail to exploit a structural change to gain or maintain competitive advantage in many of their industries and services. These countries may be simply locked out and marginalized. The millennium development goals of halving global poverty, among others, are also unlikely to be met without these technologies.

Raising productivity through ICT use is essentially a developmental task that requires cumulative socio-technical learning and orchestrated investments in a combination of technological and social capabilities. Applying ICT to increase employment opportunities for the poor and empower them with information and learning also requires strategic intent, substantial experimentation, grassroots participation, social learning, and strategies for scaling up and sustainability.

New growth theorists and economic historians have characterized general-purpose technologies (GPTs) by: (i) wide scope for improvement and elaboration; (ii) applicability across a broad range of uses; (iii) potential for use in a wide variety of products and processes; and (iv) strong complementarities with existing or potential new technologies (Bresnahan and Trajtenberg, 1995; Helpman, 1998). General-purpose technologies are engines of growth. They play the role of "enabling technologies," opening up new opportunities rather than offering complete solutions. They act as catalysts, inducing complementary innovations in other sectors. While the steam engine is widely accepted as the GPT of the first industrial revolution, the electric dynamo is viewed as the GPT for the second industrial revolution.

ICT is the GPT of our age. As in earlier GPTs, the short-term impact (reflected in economy-wide productivity surge) may be uncertain, but the long-term impact will be profound and has been typically underestimated. The lead time for ICT to have its full impact may be shorter and the impact more transformative than for earlier GPTs. But advances in the technology are running far ahead of potential applications and the capacity of institutions and society to absorb and adjust to take full advantage of these technological capabilities. Moreover, the institutional changes and complementary innovations necessary for ICT diffusion and effective use in the public and educational sectors are likely to come at a slower pace than in business.

## A Techno-Economic Paradigm

It is also instructive to understand the ongoing ICT revolution in terms of the overarching concept of a techno-economic paradigm that defines a new technical and institutional best-practice frontier (Box 2.1; Perez, 2002). Each technological revolution provides a new set of general-purpose, pervasive technologies and a corresponding set of new organizational practices for a significant increase in productivity in existing sectors. This combined best practice is referred to as a techno-economic paradigm. A techno-economic paradigm provides the means for modernizing all existing industries, activities, and infrastructures. This was the case

with the deployment of the mass production paradigm in the mid-20th century, and currently, the early phases of the ICT paradigm. A techno-economic paradigm articulates the technical and organizational model for taking the best advantage of the technological revolution and results in the rejuvenation of the whole productive structure.

## Box 2.1 Technological Revolutions and Techno-Economic Paradigms

Drawing on Kuhn, Dosi, and Freeman, and other leading economic, development, and technology historians, Perez has articulated the overarching concept of techno-economic paradigm as a best-practice model made up of a set of all-pervasive generic technological and organizational principles (Perez, 2002, p.15). It represents the most effective way of applying a particular technological revolution and of using this revolution for transforming a whole economy. When broadly accepted and adopted, these principles or generic tools become the common sense basis for innovation and investment, for organizing activities, and for structuring institutions. A techno-economic paradigm gradually defines the new best-practice frontier.

Technological revolutions are defined by a powerful cluster of new and dynamic technologies, industries and products, plus associated infrastructures, and together be capable of bringing about a long-term upsurge of productivity and development. Each of these sets of technological breakthroughs or sets of interrelated generic technologies spreads far beyond the sectors where they originally developed. It is observed that these technological revolutions occur with some regularity, every 40–60 years, starting with the first industrial revolution around 1770, combining cotton industries, canals, and water power. The second, the age of steam and railways, started from 1830, using steam engines and steam-powered railways. The third, the age of steel and electricity, combines heavy engineering industries with rapid steel-steam ships and railways, electric networks, and the telegraph. The fourth, starting early 20th century, started the age of oil, automobile, and mass production, combined with roads, ports, airports, universal electricity, and analog telephones. The fifth, starting around 1970, is the age of information and telecommunications, combining cheap microelectronics, control instruments, software, computers, combined with a new kind of infrastructure: digital communications and the Internet (Perez, 2002).

With each technological revolution, a set of dynamic new industries are accompanied by a facilitating infrastructure. Each technological revolution induces a techno-economic paradigm shift, as it demands new organizational models and practices to take advantage of the new potential. The new possibilities and associated requirements unleash transformation in the way of doing things across the economy. This transformation reaches beyond the

economic sphere or the organization of production to involve the socio-institutional sphere and to become the shared organizational common sense of the period. For example, in the era of car and mass production, the paradigm principles were: mass production/mass markets, economies of scale, standardization, centralization, and hierarchies. In contrast, the guiding principles of the information age are: decentralized integration, network structures, adaptability, agility, customization, knowledge as capital, clusters, and economies of scope.

Without subscribing to the details of regularity of this techno-economic paradigm, this model offers a powerful lens through which to view the ongoing information technology revolution, its dynamics, and its requirements, to unleash, and harness its potential. Societies are shaped and shaken by each technology revolution, and in turn, the technological potential is steered by social, political, and policy choices, compromises and adjustments. Each technological revolution encounters powerful resistance from established institutions and vested interests. Matching and realigning the social and institutional environment to assimilate fully a technological revolution and its techno-economic paradigm involve painful changes, and at times creative disruption and destructions. Similarly, realizing the potential of the information and communication revolution requires revamping the productive structure, the building of new networks of institutions, the transformation of regulatory frameworks and governance, and even deep changes in ideas and culture.

Each techno-economic paradigm or surge involves a period of installation, during which a critical mass of investments in the new technologies and infrastructures are put in place against the resistance of the established paradigm. At about middle of the surge, there is a turning point when the built-up tensions are surmounted, creating the conditions for the deployment and wide diffusion. Such evolution by long leaps and massive economic transformations involves radical changes in production, consumption, management, organization, skills, communication, and transportation. It involves learning at all levels of society.

Understanding these dynamics and the necessary investments and changeover in governance and institutions is most critical to the information and communication revolution—perhaps the most pervasive and global technological revolution in recent human history. For the modern knowledge-based economy, the information and communication technology revolution combines the innovative and transformative powers of the earlier revolutions of the printing press, railways, electricity, and telephone. It further combines the new powers of microelectronics and the computing grid with those of biotechnology (bioinformatics), and nanotechnology. For slow moving economies, this techno-economic paradigm shift may present a tsunami rather than a new technological wave.

The transition to the new practices is not easy and takes decades. It is best described by Schumpeter (1942) as a process of “creative destruction” where the established leaders are unlearning much of the old and inventing or adapting to

the new. Despite the challenges of transition and transformation, the process of diffusion of the technological revolution and its paradigm generates a great surge of development.

Newcomers who understand the dynamics of the techno-economic paradigm shift can direct their efforts toward learning the new practices and may even find a route to leaping forward and catching up (Perez, 2001). The four "Asian tigers" took the leap forward with the microelectronics revolution, rejuvenated mature industries, and entered new and fast-growing industries. This involved intense learning and substantial investments in human capital and active absorption of technology. Similarly, development under the current techno-economic paradigm requires proactive and sustained efforts. According to this new paradigm, capacity to handle information, knowledge, and innovation will be more central than ever. This paradigm also calls for radical transformation in education and training systems, science and technology policies, and more broadly, in conceiving development strategies.

## Pervasive and Increasing Impact

Early evidence from advanced economies and some new industrializing countries suggest a pervasive impact of ICT on many aspects of development. The remaining part of this chapter focuses on those impacts most relevant to governance, public institutions, and socio-economic inclusion:

- Governance and participatory democracy
- Education and health
- Poverty reduction
- Communication and service delivery
- Regional and urban development
- Innovation
- Organization
- Media and cultural development

### *Governance and Participatory Democracy*

The information revolution is changing the institutions of governance and participatory democracy. It is enabling more access to information for all, and thus transparency, accountability, and citizen empowerment. This potential presents many promises and daunting challenges for governance. Information technology is decentralizing power over information, fostering new types of community and different roles for government (Kamarck and Nye, 2002; Eggers, 2005). Timely information on results is enabling governments to improve performance management and adopt more outcome-oriented and client-focused approaches. The

information technology revolution is also enabling new forms of democratic input and citizen feedback.

Accountability and trust in government rely on easy and free access to public information. Transparency keeps government accountable to citizens. In most developing countries, and until a decade or two ago, in developed countries, citizens have to go to great investigative lengths to find public information on budgets, services, and comparative performance of basic public services. Today, the Internet has become one of the most important tools in achieving a more transparent state in developed countries. In the United States, public officials are moving from a reactive stance of simply responding to freedom of information requests to proactively putting all kinds of public information online (Egger, 2005). Transparency drive is moving beyond displaying government documents to giving citizens access to government databases.

Increasing transparency in government also increases citizen involvement in government, boosts government credibility, reduces corruption, and raises performance. Transparency generates accountability, which in turn generates pressure for improved performance. Applied to government, ICT and the Internet allow citizens to scrutinize the political process. Corruption flourishes in darkness and thrives on ignorance. In Latin America, Chile is the most corruption-free country as well as the leader in electronic government. All areas where corruption thrives in developing countries—permits, licenses, fees, taxes, and procurement—are now web-enabled. In South Korea, Seoul's municipal government anti-corruption web site (OPEN) has subjected key administrative processes to public tracking and scrutiny. Customs is also another area rife with corruption in developing countries. In the Philippines, where customs is identified as the most corrupt office in the country, web-enabling the customs process has not only reduced fraud but also cut the time to release cargo by about 50–80% (Egger, 2005, pp. 134–36).

Government practices in information sharing have wide ramifications for the whole economy. Governments are the largest collectors, users, and disseminators of information resources on individuals and the economy. Their information sharing infrastructures and knowledge management practices have major consequences for individuals, businesses, and civil society, well beyond the functioning of government institutions.

Information technology is also being applied to the legislative branch of government, to enhance citizen participation in policy formulation and monitoring, and to promote democracy and the rule of law. e-Government enables a more honest dialog with the governed. Timely access to information, knowledge, and feedback is crucial to the policy-making process and the identification of policy impacts and dissemination of good policy practices. It is critical to the practice of pragmatic and evidence-based policy formulation. Creating information-rich environments means not only assuring transparency, but also assuring that multiple voices (including those of the disadvantaged) are heard.

But ICT is not a silver bullet. Local realties matter. Corruption and accountability involve complex economic, cultural, and governance issues. It usually takes intense and prolonged pressures from outside stakeholders and citizens for

governments to let the e-sunshine in. Citizens can be provided with the ability to comment online on all laws and rules before they are voted or finalized. But, will citizens use e-democracy forums to influence policy debates? Will public officials be able to manage the growing number of citizen comments on rules? Can elected officials use digital tools to enhance their ability to represent their citizens? Engaging stakeholders, building reform coalitions, and reaching more citizens by partnering with media are among the necessary measures to translate the enabling potential of ICT into improvements in governance and participatory democracy.

## *Education and Health*

Technology and skills play critical and complementary roles in increasing productivity, and thus in economic growth theory Goldin and Katz (1998) show that during the industrial revolution of the 18th century, mechanization of industrial processes were profoundly deskilling. During the first half of the 20th century, by contrast, technical change slowed and became skill intensive. Since the last decades of the 20th century technological change has increased both in pace and skill bias. It may be the first case during which technical change has been simultaneously rapid and skill intensive (De Ferranti et al., 2002).

Globalization and the ICT revolution combined are rapidly raising the demand for, and changing the nature of, education and skills. New competencies are required for participating in the information society and knowledge economy: e-literacy, technological literacy, communication skills, problem solving, critical thinking, self-learning, team work, network management, change management, creativity, and initiative. Understanding this interplay at a relatively detailed level is critical to enable firms to adopt and adapt this general-purpose technology in developing countries and to focus reforms and content in education and training to those critical to participating in this revolution.

With accelerated technological change, a growing premium for educated and skilled manpower, and new channels for knowledge and learning, learning has become a lifelong imperative. A culture of openness and continuous learning is necessary for an inclusive information society and a sustainable knowledge economy. Educational systems have to shift from established textbook knowledge to teaching how to learn and enabling individuals and organizations to become agile problem solvers. A lifelong learning system covers learning from formal and informal sources. Much of this learning has to occur through networks that cut across academic, business, local, and global communities. Digital communication and the recent tools of social networking and collaboration technologies further enable the creation and dynamism of these learning systems.

Unlike earlier technological changes, this one is impacting the supply as well as the demand of education and training. The expectations are high that this technological revolution is central to learning and will change how education

services are delivered. Research and pilots suggest that ICT has the potential to fundamentally transform how and what people learn throughout their lives (www.techknowlogia.org; Resnick, 2002).

Learning is an active process in which people construct new understandings of the world around them through exploration, experimentation, and discussion. ICT is more than a tool to access and transmit information, but more broadly, a new medium through which people can simulate, create, express, and interact. Computers can be seen as a universal construction material, greatly expanding what children and adults can create and what they can learn in the process (Resnick, 1998). For example, children can now use computer simulations to explore the workings of systems of the world, from ecosystems to economic systems to immune systems. The Internet and distance learning are expanding the learning ecosystem beyond schools, enabling new types of "knowledge building communities" in which children and adults around the world collaborate on projects and learn from each other (Selinger, 2004; Box 2.2).

### Box 2.2 The School of Tomorrow

The possibilities for using ICT to transform learning and schooling are enormous. Teaching and learning can be shaped in various ways to promote personalization, individualization, and localization. Teaching will increasingly involve teaching learners how to locate relevant information, judge the credibility of their sources, engage in collaborative problem solving, and take responsibility for how and what they learn. Young learners want to think for themselves and come up with their own complex questions. Giving students the space to do this in school time is motivating and should prepare them for real-life complex problems. Text no longer has to be the main medium for conveying meaning, as multimedia can more effectively demonstrate and develop understanding. Curricula can incorporate projects that call for teams with mixed sets of skills and backgrounds, enabling networked learning and learning communities.

In the school of tomorrow, teachers become learning companions; they accompany students on their learning journey. The borders between home and school will increasingly disappear. Schools will become community learning hubs. Knowledge will be increasingly constructed in collaborations among learners. A flexible, rich, and dynamic learning environment will emerge. The school of tomorrow will be integrated into its local and global environment and open to the world.

Source: Selinger, 2004.

The role of ICT is increasingly evident in higher education, mainly in response to the crucial role of higher education in the transformation toward a knowledge

economy. Countries are pressed to reform their higher education systems, to develop open systems that recognize prior experience and exchange schemes, and establish lifelong learning frameworks. Universities are called upon to collaborate with public and private sectors to contribute to innovation and tap global and local knowledge. New competition, modes of operation, and forms of delivery are emerging in higher education and corporate training, including distance education, mixed-mode teaching, open online universities, mega and virtual universities, corporate universities, and various forms of private sector participation and borderless educational services. Connectivity, knowledge management, education technology, and partnership are keys to these new forms of higher education. In turn, these forms raise new demands for governance and management of educational systems including flexibility, quality assurance, industry linkages, and intellectual property rights.

At a more basic level, ICT is critical to containing the fast increasing costs of education.[1] Without the redesign of education systems to make greater use of ICT (and e-learning), whose relative price is falling, the price of conventional education will continue to rise and perhaps become prohibitive to many in the developing world. With traditional educational technologies, there may have been some qualitative improvements. But productivity in the educational sector is diminishing, stagnant, or at best increasing at only a glacial pace.[2] As a consequence, the relative price of educational services tends to rise. Educational systems in many developing countries are in organizational and financial crisis. Public officials, businesspeople, families, and workers are having difficulty restructuring expenditures to finance needed increases in the coverage, quality, and duration of education. But, to gain or maintain competitiveness in a knowledge-based economy, achieving these increases is a strategic priority.

Technology-enhanced learning will require substantial innovation or reinvention of the education sector. Competition among providers of education and training services is crucial. The private sector has a comparative advantage in introducing technology to train existing members of the labor force who require just-in-time knowledge. The private sector has the flexibility, agility, competitive environment, and market responsiveness necessary to provide just-in-time training. It could also partner with governments and engage in "education on demand," and help spur productivity increases in the provision of timely learning for business and government.

In the health sector, ICT applications span health education and training, diagnostics, telemedicine and telecare, medical records and information management, patient administration, and almost all aspects of health policy, research, and delivery. Health services delivery is essentially a knowledge transfer activity that is highly dependent on communications, knowledge management, and information support systems. The health sector is changing rapidly due to ICT-enabled technological

[1] See Knight www.knight-moore.com/pubs/halflife.html

[2] See Knight (1998).

advances—but the potential for transformation remains huge. Advances in telecommunications are enabling health professionals in rural areas to receive information and specialized knowledge and to keep track of disease outbreaks. The explosion of mobile phone usage in developing countries also has the potential to improve health service delivery on a massive scale, support increasingly inclusive health systems, and provide real-time health information and diagnosis in rural areas (Box 2.3).

## Box 2.3 Mobile-Health for Development

Developing countries face enormous challenges in meeting the health-related millennium development goals. The ability of developing countries to overcome these challenges is hindered by several core challenges, among them a global shortage of health-care workers. There is a growing recognition among governments, businesses, and NGO of the importance of leveraging new tools and solutions to address these interrelated challenges, and in particular, the use of mobile digital devices to capture and deliver health information (mobile-health or m-health). The range of m-health applications in developing countries is fast expanding to include: education and awareness, remote data collection, remote monitoring, communication and training of care workers, disease and epidemic outbreak tracking, and diagnostic and treatment support.

Here are some examples of m-health applications from developing countries.

Short message service (SMS) now offers cost-effective, efficient, and scalable method of providing outreach services in awareness and education applications. Pilots in India, South Africa, and Uganda have shown that interactive message campaigns have greater ability to influence behavior than traditional means, offering information about testing and treatment methods, available health services, and disease management in areas such as AIDS, TB, maternal, and reproductive health. SMS messages offer recipients' confidentiality in environments where diseases such as AIDS are often taboo. And they have proven effective in targeting remote and rural populations.

Gathering data where patients live, keeping them updated and accessible on a real-time basis can be more effectively and reliably done via smart phones, PDAs, or mobile phones rather than paper-based surveys. Various initiatives in multiple developing countries are closing the information gap for patient data and in turn enabling public officials to gauge the effectiveness of health-care programs, allocate resources more efficiently, and adjust programs and policies accordingly. Similarly, the use of mobiles for remote monitoring of patients may become a crucial capability in developing countries where access to hospital beds and clinics is very limited. In Thailand, for example, TB patients were given mobiles so that health-care workers can remind them daily of their medication; medicine compliance rate increased to 90% as a result.

Disease and epidemic outbreak tracking m-health are being used in Peru, Rwanda, and India as an early warning system. Deployment of mobiles, with their ability to quickly capture and transmit data on disease incidence, can be decisive in prevention and containment of outbreaks, as in Cholera, TB, and SARS. Real-time tracking of incidents of Encephalitis in Andhra Pradesh helped government prioritize vaccinations, based on evidence of clusters of outbreaks.

Finally, the mobile phone is being equipped with specialized software applications for use in some African countries for diagnostic and treatment support. The phone is used as a point-of-care device. The health-care worker is led through a step-by-step diagnostic process. Once data are entered (image and symptoms of patient captured on phone), remote medical professionals can diagnose and prescribe. These applications have the potential of dramatically increase access to care.

For middle income countries, these applications will be also increasingly relevant for the prevention and early treatment of noncommunicable diseases such as diabetes and for health-care needs of the aging population.

Source: Vital Wave Consulting, 2009.

In advanced countries, the explosion of public access to health information on the Internet is changing the relationship between the patients and the organizations that care for them throughout their illness. e-Learning enables people to adopt behaviors and lifestyles that keep them healthy and productive as well as improving their quality of life. Information management support for health care can bring immense value—from shorter hospital stays and waiting times for operations to radically lower costs for health care over a patient's life. Policy makers, health-care professionals, and patients need to understand the full power and associated responsibilities that integrated information systems bring to care delivery as e-health does not simply automate paperwork but changes the way people work and relate.

## Poverty Reduction

The array of ICT-enabled options for poverty reduction is growing fast (Box 2.4). As a communication and delivery infrastructure, ICT can assist the government to provide effective health and education services, facilitate citizen to government transactions, and promote participation and accountability. As a sector, ICT can create employment opportunities and improve incomes for the poor by targeted programs to support the activities of the poor and increase their productivity, improve their access to market and technical information, and lower the transaction costs of small farmers and traders. ICT can play a major role in helping to monitor food security-related issues (weather, droughts, crop failures, etc.) as well as alerting on natural

disasters. As a tool for empowerment, ICT can support democracy, participation, mobilization, and civil values. Electronic interaction between government and citizens can provide citizens with access to the information and knowledge, consultancy, and online voting opportunities, among others.

## Box 2.4 A Growing Array of ICT-Enabled Options for Poverty Reduction

The promise of improving citizen to government transactions (C2G) has inspired many governments to create one-stop services, such as Singapore's eCitizen, and to integrate electronic government into their broader public sector reforms. Even less integrated and more modest bottom-up initiatives, such as land record computerization in Karnataka, India, have delivered land certificates in 15 min, instead of 20–30 days, and in the process, reduced transaction costs and corruption, created a viable land market, enhanced the creditworthiness of farmers, and improved the life of the common man.

A major opportunity for using ICT in poverty reduction is to provide information and knowledge to rural populations and to empower local development agents to serve the poor. A variety of informational and connectivity advantages can accrue to the poor through improved operational capacities of the specialized local agencies. One example is Chile's electronic rural information system which connected farmers' organizations, rural municipalities, NGOs, and local government extension agencies to the Internet. It was estimated that transmitting information on prices, markets, inputs, weather, social services, and credit facilities cost 40% less than using traditional methods (S. Balit, 1998). Similar pilots and programs have been applied in Mexico. In Maharashtra, India, a cluster of 70 villages is covered by the "wired village" project, which is modernizing the local cooperatives, and aiming to provide agricultural, medical, and educational information to the facilitation booths in the villages (Bhatnagar and Schware, 2000).

Perhaps the area of most promise but least evidence of successful large-scale application is in the use of ICT to promote broad participation, grassroots innovation, and social learning. Telecenters or community information and communication centers can play several roles: provide affordable public access to ICT tools including the Internet; extend and customize public services, including those offered through e-government; provide access to information in support of local economic activities and learning opportunities; and connect and network people. The last function proved to be the highest priority for many communities who would otherwise have remained isolated. These centers have enabled them to carry out local dialogue, share practical and locally relevant information, and support community problem solving. Given the limited relevance of the vast amount of global Internet content to these communities, the role of these centers in networking

and creating local content becomes all the more important. Community centers could also provide women with a medium to participate as producers, consumers–providers–users, and counselors–clients. In South Africa, women's organizations are linked to various resource web sites which aim to mobilize women around common concerns. Digital literacy centers in Benin and Ghana have become an important instrument of empowerment of low-income communities, enhancing employability, increasing capabilities, and extending learning opportunities beyond those available in educational institutions (Fontaine, 2000).

Recent emphasis on poverty analysis and on mainstreaming results-oriented development programs has reinforced the need for relevant, reliable, and timely information for policy formulation and program implementation and adaptation. Smart policy and dynamic investment programs rely on access to local and global knowledge and timely information on implementation and impact. Lacking reliable feedback and timely information on implementation, development planners tend to rely on rigid designs, uniform top-down solutions, and limited participation—leading to slow learning and disappointing results (Hanna and Picciotto, 2002).

Much of the practice of ICT in development has focused on pilot projects and proof-of-concept experiments about applying ICT for poverty reduction. Much of the literature on ICT impact on poverty has been anecdotal. The impact of ICT on the poor is at an early stage, even in developed countries. The potential is being demonstrated at the micro, intermediate, and macro levels. Donors and development practitioners have sought quick, off-the-shelf solutions that could be replicated in the poor communities of developing countries. However, experience has shown that such ready-made solutions could not be transferred and integrated into new development contexts and programs without raising issues of affordability, sustainability, scalability, and impact.

The impact of earlier information and communication technologies, particularly radio and television, is better known, although their use as tools for informing and educating the poor is still relatively unexploited and disconnected from poverty reduction programs. The new ICTs do not replace the older technologies but can blend with them and extend their reach, enrich, and tailor their content, and add new forms of "many-to-many" communication and action that bypass traditional power relations. For example, in Kothmale, Sri Lanka, a live radio program uses a panel of resource persons to browse the Internet at the request of listeners and thus adds value by interpreting Internet information into a local context, in local languages, and by providing a platform for feedback and local discussion (http://www.kirana.lk).

ICT can open up new opportunities for poor communities and small enterprises, even in remote areas. In Brazil's urban slums, the Committee to Democratize Information Technology (CDI) has created self-managed community-based "Computer Science and Citizenship Schools" using recycled ICT and volunteer

assistance. As of July 2008, there were almost 840 such schools located in all of Brazil's major regions and six other Latin American countries: Argentina, Chile, Colombia, Ecuador, Mexico, and Uruguay. CDI schools train students for better opportunities for jobs, education, and life changes. Many other examples are available at www.Infodev.org.

ICT also offer the opportunity to provide investment resources to groups previously denied them. In South Africa, for example, "AutoBank E" has developed an automated savings system using ATMs and aimed at the poorest depositors. The system proved to be highly popular, with 2.6 million depositors and 50, 000 added each month (Economist, 3/25/2000, p. 81). More recently, the mobile phone has become an "electronic wallet," enabling all kinds of small funds transfer and financial transactions, and as a result, in a year or so, enabling over seven million Kenyans for a country with 38 million population; (Economist, September 26, 2009) to have accounts with the mobile phone operator, that is, more than the total established accounts the population have with the local banks. Small retailers act like Bank branches. Similar schemes have become popular in the Philippines and South Africa. This can be a stepping stone towards full financial service access for the billions of people who currently lack access to savings accounts, credit, and insurance. ICT can also help intermediary institutions and local agents to work more efficiently and responsively and to target interventions to the needs of the poor: intermediaries such as health workers, agricultural extension agents, teachers, local planners, and local NGOs.

ICT may be also used to empower women, as both producers and consumers. For example, in the Philippines women account for about 65% of total workers in IT services and ITES. They account for 30% in India—a much higher rate of female participation in services than in the general economy. Given the higher wages in IT services, this participation may contribute to improving the status of women. The potential to access relevant public services, at less cost and time, at home or at a local center can be also a source of empowerment. Having access to relevant information such as rights, benefits, inheritance laws, health care, municipal services, and education should enable women and marginalized groups to access services and make informed decisions to meet their basic needs.

Various ICT tools are also used to assess and reduce vulnerability to natural disasters, where the poor are the most vulnerable—especially in cyclone warning, communication and response, awareness raising, and community involvement in hazardous reduction activities. ICT is increasingly used to improve disaster risk management at the global, national, and local levels. It can enable monitoring and enforcement of environmental quality. In Indonesia, for example, with weak enforcement of water pollution standards, government developed a public access information database rating firm compliance, and within the first 15 months of the program, about a third of the unsatisfactory performers came into compliance (World Bank, 1999).

The real challenge in all such applications is not the management of technology, but the institutional capacity and coordination processes to capture and share disaster risk management information that should go hand in hand to make effective

use of the technology. As will be discussed later (Chapters 11, 12, 13, and 14), the technology enables but does not substitute for complementary investments in institutional capacity and process innovation.

Making ICT work for the poor will require new conceptions of development, a new view of the world's poor, and a new approach to innovation with ICT (Heeks, 2008). Rural telecenters and shared access have been the focus of much of ICT for development programs targeted to poor and rural communities. But these programs have raised issues of sustainability and scalability and the search is on to address these issues (Chapter 10). We still confront the challenge of how to connect the remaining five billion people who still lack access to the Internet. Low-cost terminals will remain central to ICT for poverty reduction. But efforts to develop "people's PC" and one laptop per child (OLPC) are still struggling to deliver on their promise. Wireless technologies such as WiMax offer also major promises to leapfrog and connect poor communities.

Deploying ICT for poverty reduction will inevitably require engaging poor communities in grassroots innovation and in coproducing relevant content and applications. A major challenge for using ICT for poverty reduction will continue to be the development of relevant content, services, and applications on increasingly affordable platforms. Countries are experimenting with new approaches and mechanisms for developing relevant content for poverty reduction and innovating applications for community empowerment.

## Communication and Service Delivery

ICT can be leveraged as a networking infrastructure to connect government agencies, NGOs, SMEs, and even the poor to participate in development. Many NGOs in Latin America, for example, are assisting micro enterprises such as artisans to integrate into the global economy by using web sites for retail and wholesale buyers in industrialized countries, providing timely information on markets and buyers, and delivering a variety of training and business support services (Susana Sanchez, 2001). Chapter 7 explores the issues surrounding the use and diffusion of ICT as a networking and delivery infrastructure for grassroots innovation and inclusive information society.

Access to information and communication is central to empowerment and to building human capabilities. Accordingly, this new infrastructure would enable local economic and social agents to network, mobilize, and share local information, access global knowledge and markets, coordinate local action, share local experiences and innovations, and accelerate social learning. It enables real-time information sharing among change agents, communities of practice, and otherwise isolated communities. No wonder that the Internet has powered global civil society movements for causes such as debt relief, banning land mines, and providing HIV drugs in poor countries. The Internet was just as powerful in mobilizing people locally in campaigns against corruption (Korea), for democracy (the Philippines), and to protect the environment (Brazil).

Strategic applications, or strategic information systems, are those of central importance to economic competitiveness and functioning in an increasingly integrated global economy, and hence should be essential to any national ICT strategy. For example, one of the most strategic and early applications of ICT in the merging economies was the modernization of the port of Singapore and establishing an electronic trade facilitation network—key steps in positioning Singapore as a global hub for logistics and regional hub for services. Another example is financial payments clearance and settlement system—a necessity for economic management and financial transaction in any globally integrated economy. In general, such systems represent new forms of national infrastructure because, like roads or utilities, they have major economies of scale, require substantial investments, and underpin other economic activities. These are the new infrastructures of the knowledge economy.

Which systems have this strategic importance is determined by country conditions and development priorities. Increasingly, globalization and international agreements are enforcing performance standards that can be met only with the aid of modern information and communication systems, as is the case with trade facilitation networks and customs modernization. Experience also suggests that there is a core group of information infrastructure and applications that all countries should put in place for the functioning of a modern economy. Included in this group are those concerning the modernization and integration of public finance and trade systems (planning and budgeting, debt management, expenditure management), tax administration, and trade facilitation.

Integrated financial information systems, for example, are being adopted to support control of aggregate spending, to prioritize expenditures across programs for allocation efficiency and equity, and to achieve outcomes and produce outputs at the lowest possible cost. For example, an integrated tax administration system for Jamaica has reduced the processing of some types of taxes from 4 weeks to 1 hour or less. Critical systems also include those enabling the functioning of financial and other markets such as payment clearance and settlement systems, financial institution oversight systems, and land and business registry systems. Others are critical to the functioning of basic infrastructures such as air transport control, port operations, and utility management. Yet others may be critical to managing natural resources such as environmental monitoring, early warning, and geographic information systems.

Past experience indicates that governments in developing countries are rather quick, comparatively speaking, to realize the benefits of the systems that improve their own internal efficiency, oversight, and control mechanisms in finance-related areas, as described above. At the same time, ICT applications and services that improve interaction of the public sector with citizens and businesses, as well as those promoting ICT use in small businesses and social applications often get limited attention. They are mistakenly perceived as “luxury” that developing countries could not afford.

e-Government services, for example, are capable of delivering both significant short-term benefits and long-lasting impact for developing countries. They can

promote transparency and improved government responsiveness to the needs of citizens and businesses. ICT-enabled services can also bring about a number of important spillover effects, such as improve competitiveness of the private sector, decrease the brain drain of knowledge workers, and promote use of ICT among citizens and businesses. Last but not the least, e-services can transcend geographical, ethnical, and administrative divisions and thus can benefit economic and social development of countries with a legacy of civil wars, ethnic, or regional unrest.

ICT use in government can also facilitate effective decentralization, more transparent and accountable governance, delivery of responsive public services, making public information resources available to all, and improving the quality and reach of health, education, and other basic services. This role is still in its infancy, but results of various pilots in many developing countries, particularly in Latin America, are encouraging. It is fast taking a central stage with e-government, e-commerce, e-learning, and other Internet-enabled activities.

Mobile telephony is serving as a digital bridge to the majority of mankind. For the short to medium term and for the vast majority of low-income population, mobile telephony is likely to be the sole tool connecting them to the information society. Among ICTs, mobile phones are most widely spread in developing countries. In the last 5 years (2003–2008), mobile subscribers in developing countries almost tripled and now account for about 60% worldwide. It has quadrupled in Africa. Mobiles do not require much complementary investment in infrastructure or skills. The cost of access has declined dramatically. Moreover, mobile telephony is growing in sophistication and functionalities. It provides a gateway to digital literacy and once it is appropriated on a large scale, the adoption of subsequent higher-level technologies may become less intimidating.

Mobile telephony is offering a growing and distributed platform for delivering services to the poor and generating income by them. With existing functionality, SMS can be used for tasks ranging from seeking market prices for farmers and fishermen, to monitoring elections, to alert in case of natural disasters. Mobiles can transform how distributed organizations operate. For example, ministries of agriculture and health, with many rural extension and health workers distributed across the country, suffer from slow reporting and feedback and much field time wasted on reporting and filling forms or awaiting information. In a pilot in Uganda, mobile phones are being used to diagnose and treat crop diseases that cause massive losses to farmers, presenting an opportunity to increase yields as location-specific information about disease threats is made available.

With smart phones (increased functionalities to affordable phones), mobiles could also be used to deliver financial and banking services to those currently excluded. They are already playing a significant role in the receipt of remittances from distant relatives. New business models are also being created by the poor themselves, starting with the use of air time as currency, turning the mobile phones into mobile wallets (Heeks, 2008). The potential of mobiles is primarily constrained by user capabilities and presents limited attention to applications for those at the bottom of the pyramid.

In particular, mobiles hold great potential for small and medium size enterprises in all types of uses ranging from communicating with clients, ordering of supplies, receiving daily price quotes for agricultural exports and local fish markets, buying and selling of goods and services through e-commerce, as well as e-payment, and e-banking. The use of mobile phone services by the small-scale fishing enterprises in Kerala, India, demonstrates the dramatic effects of simple ICT applications for poverty reduction (Box 2.5).

### Box 2.5 Mobile Phone Impact on Small-Scale Fishing in Kerala

The fishing industry in Kerala is important as 70% of its population eat fish daily and over a million people work in fisheries. Fishing is done primarily by small enterprises. There is little storage of fish and little transportation between markets. Fishermen are traditionally unable to observe prices in other markets. Thus the quantity and prices of fish in any local market is determined by the local catch. This results in significant differences in prices, daily and across markets as well as wasted catches.

As mobile phone was introduced in Kerala in 1997, fishermen adopted it quickly, reaching a penetration rate of 70%. Fishermen use the phones while at sea to find out the prices of different markets and to decide where to land their catches, conducting auctions by phone. After phone adoption, 30–40% of fishermen began selling fish outside their home markets. This significantly reduced the dispersion in prices among markets, from 10 rupees per kilogram before adoption to a few rupees after adoption. It also reduced wastage. The profits of fishermen jumped by 133 rupees a day—a 9% increase. Impact on consumer is relatively modest—4% price reduction (Jensen and Trenholm, 2007).

## *Regional and Urban Development*

The spatial implications of the communication revolution are likely to be profound, impacting governance, decentralization, urbanization, growth, and inclusion. Lower transaction and communication costs, combined with goods production that is increasingly based on flexible specialization, tend to favor the dispersion of economic activities. Yet, real-time information about consumers, easier sharing of tacit knowledge, and the proliferation of producer-support services tend to favor locating knowledge-intensive production near to large markets and dense urban centers. As for services, the ICT revolution is promoting the dispersal of services that can be delivered remotely and effectively based on codified knowledge. Meantime, for creative services, electronic communication complements and even reinforces rather than substitutes for

face-to-face communication. ICT is inducing concentration of services that are driven by innovation, tacit knowledge, and face-to-face interactions.

The twin challenges for developing countries are: how to use ICT to reduce disparities and help integrate lagging regions? And, how to use ICT to leverage the innovative and creative potential of cities in a globally connected, knowledge-based economy?

Governments have many reasons to worry about disparities in welfare among regions and to help lagging ones. When today's rich countries were developing during the 19th century, the growth of their leading areas was constrained to the rate of growth of their domestic markets and the world technological frontiers. Since, technological progress and globalization have increased market potential in leading areas of developing countries, intensifying concentration of economic activities and amplifying spatial disparities. Governments cannot stop or ignore these forces, but can help lagging regions most by strengthening their economic integration with the leading areas (World Bank, 2009a).

Governments have many policy instruments for promoting economic integration to reduce those disparities: (1) policies and institutions such as land and labor regulations and social services such as health and education; (2) incentives and investments in spatially connective infrastructure that facilitates movement of goods, services, people, and ideas; and (3) spatially targeted programs to help the lagging regions directly. Can ICT enable these three instruments and promote spatial integration? Yes, in various ways, as explored in Box 2.6.

## Box 2.6 Can ICT Help Lagging Regions?

Set against this faster rise in disparities among leading and lagging regions in the developing world is the opportunity for faster convergence—because ICT tools offer a wider range of methods and more affordable access to services and knowledge to bridge the economic distance between leading and lagging areas.

ICT can be an enabler of improving coverage of social services to lagging and remote regions as well as a cost-effective tool for delivering and managing spatially targeted programs. Telecenters can help deliver much needed e-government services, as well as e-education and e-health services and in the process equalize access and quality to these regions.

The diffusion of mobile services, even in remote areas, opens new opportunities to provide financial services over a mobile phone network. Many people in lagging regions have limited access to financial services. With the rise of remittances, better access to financial services help people in these areas overcome credit constraints. In the Philippines, 3.5 million people (out of 20 million mobile phone subscribers) have access to mobile phones that can transfer money (Mas, 2008).

Producers in lagging areas can access better information on prices they can get for their products. Small enterprises can also market their handicrafts

through web sites. Communities can attract tourists to their unique cultural heritage and ecological diversity. With coordinated efforts, locally relevant content and solutions can be widely disseminated within and among lagging regions.

ICT is an increasingly critical spatially connective infrastructure in its own right as well as modernizer of other integrative infrastructures. ICT can modernize transport, facilitate international trade, and dramatically increase quality and speed of logistics, even for remote and lagging regions. Moreover, low communication costs make it possible to control production processes over long distances and reduce the need to colocate management and experts with unskilled workers. This allows vertically integrated companies to outsource production to low-wage countries. It also facilitates the breakup of production processes into supply chains of companies distributed across countries. Low communication costs are particularly important for offshoring services.

Although urban and leading regions in developing countries are likely to benefit most from these processes, rural and lagging areas can participate in this offshoring through various measures, including telecenters combined with specialized training, as demonstrated by pilots in rural India. The biggest outsourcers, in relation to local value added of these services, have been small countries in Africa like Angola and Mozambique.

Countries such as China are giving special attention to ICT as a tool for spatial economic integration. Empirical evidence confirms the link. For 29 areas in China, between 1986 and 2002, telecommunication infrastructure was strongly associated with subnational GDP growth (Lei and Haynes, 2004). Efforts to promote rural informatization in China are growing through a variety of central and local initiatives such as developing local content, Internet-enabled rural services, and shared access centers. Rather than resisting the forces of unbalanced growth, policy makers are using some of the growing resources from fast growth to balance development outcomes across regions. ICT is viewed as a critical tool in doing so.

Traditional regional policies focus on attracting individual firms to lagging regions through taxes, subsidies, and regulations by central and regional governments. Many countries have offered incentives to create economic mass in lagging areas and offset the higher transport and logistics costs and lower levels of public services. European countries have a long history with such spatially targeted policies and interventions. But even these countries now focus on "soft" interventions such as investing in innovation and supporting science and technology institutions, parks, and infrastructures. Investing in ICT infrastructure, including broadband, research, and innovation networks is a critical part of such soft interventions.

Source: World Bank, 2009a.

What role is ICT playing in the changing role of cities? Globalization, far from undermining localization, actually intensifies local agglomeration by extending markets for regional products to the world. Globalization simultaneously frames and induces localization and locational specialization (Yusuf et al., 2000). It tends to heighten locational specialization and reinforces the advantages of large urban centers.

Cities have been always the engines of growth in regional economies and no country has achieved sustained growth without accompanying urban growth. Enabled by advanced communications in knowledge-based economies, cities are increasingly becoming the focal points for global and national economies. Cities are best endowed with knowledge infrastructure and educational institutions, higher shares of educated people, advanced communications infrastructure, and access to the global economy. Further, the scale of cities and the diversity of inhabitants create the interactions that generate new ideas. Urban regions also attract talent, as talent attracts talent (Florida, 2005). Cities are emerging as platforms or gateways to services, learning, innovation, creativity, and entrepreneurship, more than ever in history.

Cities are also differentiating and competing on a global scale, giving rise to global urban networks (Scott, 2000). They are seeking to secure and enhance their competitive advantage in a globalizing economy. They seek to combine both rich local knowledge spillovers and international best practices. They are the arenas of synergies, externalities and agglomeration. Local governing coalitions, therefore, seek to harness these synergies, upgrade local human resources, promote incubators and risk capital, build advanced information infrastructures and information services, promote information flows, cultivate collaborative relationships and firms, and promote export markets for local products. Singapore envisioned its future role as an intelligent island or a regional hub for information-intensive services. The "walled" cities of China are opening up to all kinds of information flows.

Urbanization and the growing concentration of economic power and knowledge-based services in cities are strengthening demands for a power shift to cities. Modern communications and greater openness to trade and ideas have circumscribed the authority of central government and enlarged the freedoms of subnational entities.[3] Many developing countries are acceding to diverse pressures to increase democratic participation and devolve authority to local governments. Heightened awareness of ethnic or regional identities, combined with increasing inequalities and diverse responses to globalization, is contributing to the trend of placing greater responsibilities on local authorities. Municipalities are facing greater challenges in delivering an increasing array of services and satisfying demanding and diverse clients. They have to partner with private sector and civil society.

Political and economic dynamics are favoring decentralization from national to city level. More and more national development business moves through subnational

[3]Naisbitt and Barber, among others, show how subnational and global or regional institutions are gaining relative power vis-a-vis nation states.

levels of government. In China, for example, local government budgets are more than 70% of total government spending. Cities are recognizing they have more scope to act, more leverage to effect change, more prospects for trade, and more opportunities to shape their futures. Technological changes are favoring local agglomeration. The new emerging paradigm of flexible production systems is able to achieve considerable variety and significant scale of production by exploiting ICT. It relies on external networks and intensive transactions, complementarities, and specialization.

Information and communication technologies are thus inducing or reinforcing these trends, and when appropriately harnessed, can facilitate effective decentralization and efficient and sustainable urbanization. Service sector jobs in industrial countries are increasingly contestable by developing countries. Beyond enabling global trade in services, advanced information infrastructures are increasingly important to attracting foreign direct investment, facilitating technology diffusion, and developing innovation clusters. ICT is contributing to the growth of highly dynamic, knowledge-based, and creative services, mostly clustered in cities. In turn, cities must compete for highly mobile knowledge workers and for innovative and income elastic economic activities. They have to develop skilled human resources, attract global capital flows, address quality of life issues, and develop the software as well as the infrastructure of livable cities. Shanghai drew a "smart" growth strategy to attract knowledge-based and information services industries, enhance access to information infrastructure, and enrich learning opportunities. The "digital cities" movement aims to enable relatively small cities to have many of the advantages of larger ones, without some of the agglomeration costs.

Cities are not just economic engines—they are centers for culture, innovation, and learning. They are also social communities. They are bearers of significant informal knowledge and repositories of tacit know-how. Regional agglomerations of producers are sites of accumulated cultural conventions, trust-based relationships and social capital—a key factor in economic development. Cities that facilitate active participation in local affairs and collaboration among local institutions are nourishing not only a healthy community, but also a local competitive advantage. A rich cultural environment and a vibrant local community are increasingly important for attracting knowledge workers and sustaining knowledge industries.

The cultural-generating capabilities of cities can be harnessed into productive use with the help of ICT. Cities have always played a privileged role as centers of cultural activities such as tourism, arts, crafts, entertainment, fashion, advertising, publishing, etc. That is unlikely to change. What is new is the likely impact of ICT on both the renewal of local cultures and the dissemination and use of cultural products on a global basis. ICT is leading to urban cultural synergies—strong interdependencies and spillovers in localized cultural production. Meantime, media companies are engaged in developing electronic platforms for use of cultural products on a global scale—projecting the cultural products of cities like Los Angles and Paris. Johannesburg is undergoing radical transformation in post-apartheid period, not only by modernizing its services, but also by tapping its cultural origins in music, tourism, and performing arts.

It is projected that by 2020, over four billion people (55% of the world's population) will live in urban areas, and almost 94% of this increase will be in developing countries. It is, therefore, important to create the capacity to produce and diffuse technologies that support efficient and sustainable urbanization and favor local development processes. Some examples of the roles of ICT in facilitating effective decentralization and local management are explored in the chapters concerned with e-government and e-society. ICT applications can be targeted to strengthen local government management, revenue and expenditure management, citizen participation, and monitoring and accountability. Successful decentralization is contingent upon effective local governance, resource management, and accountability.

## *Innovation*

Understanding innovation trends and the role of ICT in accelerating and disseminating innovation is as relevant to government transformation and information society initiatives as it is for business and enterprise transformation. Information and communication technology has become a powerful enabler and facilitator of innovation—perhaps the most influential technology in powering the wave of innovation since the last quarter of the 20th century. Its application to research, design, services, logistics, finance, marketing, and learning has enabled enterprises to become more efficient, flexible, and innovative—through process innovation, product and service innovation, and the creation of new business models. Now governments are considering the use of ICT to improve not only the way public services are delivered, but also the way they are created. Governments are beginning to set a service innovation agenda.

Information and communication activities are at the heart of the innovation process, and ICT has become a tool for amplifying brainpower and for innovation. ICT is transforming the way researchers conduct their research, communicate with other researchers and potential users, and instantaneously access relevant knowledge from a vast and growing global knowledge. For example, bioinformatics has emerged as a field arising from the essential role of ICT in enabling biomedical research. ICT is further accelerating the codification of knowledge and thus knowledge sharing. Science and industry are more closely integrated with ever shorter product life cycles.

Innovation practices are changing. Why? Various forces are pressuring companies to open up their innovation process (Chesbrough, 2006). The perennial quest for growth is increasingly challenging in the era of global competition, fast commoditization, and shrinking product life cycles. In such an environment, process and product innovation have become crucial for sustained growth, competitiveness and moving up the value ladder. The combination of fast-changing demand patterns, shortening market windows and product life cycles (as in mobile phone), and the rising costs of product development (as in new drugs) compresses the economics of investing in innovation and depresses the returns to the "closed" model or internally focused innovation. How can firms compete effectively? By looking outside.

Innovation is increasingly global, multidisciplinary, collaborative, open, and driven by an ecosystem. Successful organizations will increasingly tap into a global marketplace of innovators, experts, and collaborators—the global brain (Nambisan and Sawhney, 2008). New types of innovation intermediaries, as well as the Internet and related global platforms for the digital economy have made tapping into such global networks of inventors, scientists, and innovative firms easier than ever before. Network-centric innovation relies on harnessing the resources and capabilities of external innovators, networks, and communities to amplify innovation reach, innovation speed, and the quality of innovation outcomes. Examples include open source software, open source journalism, electronic R&D networks such as InnoCentives, and the community-based encyclopedia Wikipedia.

New tools for communication and collaboration are enabling networked and grassroots innovation. ICT is reducing coordination and learning costs, enriching relationships with clients, enabling a shift in responsibility for adaptation and customization to users, harnessing knowledge from multiple experiments, and creating user communities and new forms of user-led innovations or user–producer coinvention. Global enterprises like Proctor & Gamble now draw more than 50% of new product innovations from outside the corporation's own R&D—from users and partners.[4] IBM has subscribed to the open source model and invested substantial resources to align many of its product and process innovation initiatives with the open source model.

In addition to connecting the traditional actors of a national innovation system, collaborative technologies are engaging users, communities, small enterprises, and grassroots organizations in product innovation and adaptation. These actors practice new styles of innovation: being open, peering, sharing, and acting globally (Tapscott and Williams, 2006).

Collaborative ICT tools have given rise to new models of sharing knowledge and collective production of ideas and innovations, which often bypass proprietary systems. The power of these tools is reflected in many massively produced knowledge products and infrastructures: the Linux ecosystem, Wikipedia, and open source software. They draw on collective intelligence and mass collaboration. These tools can be also harnessed to promote inclusive, pro-poor innovation that would address the needs of the bottom of the pyramid and help share indigenous knowledge and empower local innovators.

Governments are challenged to leverage the creativity of their citizens and stakeholders, and to institutionalize the innovation process. Some examples of the innovation strategies offer a window on the possibilities for improving governance and service delivery with ICT. Studies of innovation in government suggest that public agencies tend to approach innovation as a "one-off" change or "big bang" instead of an ongoing process and a core value of the organization. But in an era of

[4]This "connect and develop" innovation strategy led to R&D productivity increase by nearly 60%, innovation success rate more than doubled, and the cost of innovation significantly fallen (Huston and Sakkab, 2006).

rapid changes in technology, competition, consumer demands, citizen expectations, and public sector challenges, a capacity for continuous innovation and adaptation is an imperative. Fortunately, some governments and policy makers are leading the way with innovation strategies that tap into the creativity and knowledge of employees, citizens, and external and internal partners (Eggers and Singh, 2009). Much of these strategies are enabled and made effective with the help of ICT and its applications through networks, open source, and knowledge management tools. Examples of these strategies will be shown in Chapter 3.

## *Organization*

The ICT revolution is shaping the structures of organizations and how organizations work and relate, and this impact is fast diffusing beyond business to public and civil society organizations. New forms of organizations have become possible or even necessary to leverage ICT: flat, agile, lean, extended, globally networked, and client focused. The reorganization of production and distribution around ICT has enabled the adoption of new processes, procedures, and organizational structures, which in turn, have led to sustainable gains in productivity, quality, and responsiveness. Early evidence started to emerge in the late 1990s in the business sector in advanced countries (Brynjolfsson and Hitt, 2000; Litan and Rivlin, 2000). ICT has made it possible to have very large-scale organizations that are at the same time flexible, agile, and focused. The latest advances in areas such as mobile, broadband, and collaborative technologies (Web 2.0) have further intensified the transformative impact of ICT on organizations.

The forces of globalization and increased competition, combined with the ICT revolution, have spurred organizations to focus on their core competencies while outsourcing increasing amounts of activities and services. These organizations are also designing their supply chains ever more tightly and strategically (Fine, 1998). The ICT revolution had given rise to network-centric enterprises, virtual organizations, and business ecosystems. This involves establishing a network-centric enterprise that connects the different partners in a company's business ecosystem to support different value creation processes. The customer is put at the center of the value chain and significant infrastructure, process and data standardization enable real-time communications, agility, and synchronization across boundaries. In supply chain management, this means establishing dynamic connections between enterprisers, suppliers, customers, and other partners to maximum value. It involves integrating enterprise information systems with external partners' systems and processes to enhance "sense and response" capabilities (Nambisan and Sawhney, 2008).

Network centricity is applicable to government as well as business and NGOs. For example, it is being applied by social advocacy groups to enhance the reach, speed, and overall effectiveness of social movements. Another contrasting example comes from the US Department of Defense (DoD). In contrast to the traditional

chain of command model, which epitomized military organizations for centuries, the network-centric model is flatter, less hierarchal, and aims at "total information awareness." The goal is to give everyone, from soldiers to commanders, access to the same data, so they react and interact in real time. Radio frequency identification (RFID) and satellite tags, allowed DoD to have total asset visibility of every item in every container as it moved across the world to field operations. Sensors and Internet-based communications systems, seamlessly linked, gave forces "situational awareness"—enabling widely disbursed units to fight with real-time knowledge of each other's movements and those of the enemy (Eggers, 2005, p. 6). The promise of transition from an industrial age to information age government extends to all domains.

Information technology is also changing the workplace in fundamental ways, with important implications for human resources. Firms in industrial countries are restructuring from segmented (hierarchical, compartmentalized) organizations to holistic organizations, characterized by job rotation, integration of tasks, and learning across tasks (Lindbeck and Snower, 2000). Studies suggest increasing returns to worker characteristics such as people skills, capacity to work in teams, multitask, work without supervision, take initiative, and be entrepreneurial (Levy and Murnane, 1996). A variety of managerial innovations like total quality management (TQM) are designed to exploit these changes. Simple tasks are automated, while the premium on complex tasks increases dramatically. The demand is for both human capital deepening and widening and for workers able to adapt to rapidly changing environments.

Together, ICT and complementary organizational innovations are enhancing access to information resources and management of knowledge assets. It is also accelerating product innovation, empowering project-based teams, and enriching learning and knowledge sharing at all levels of the extended enterprise. A new breed of event-driven organizations is emerging to exploit and tailor real-time information for decision making and service delivery (Ranadive, 1999). Consequently, companies are giving increasing attention to their information infrastructure, knowledge management, and communication competencies. Investment in such intangibles (knowledge, information and communication systems, talent, intellectual property, reputation, relationships, etc.) in advanced economies now exceeds 35% of total corporate investment.

Most organizations today were designed for the world of high transaction and interaction costs of the 20th century, but a sudden fall in these costs is now underway due to the Internet and advances in ICT. This sea change opens the possibility of remaking these organizations to mobilize their intangible assets and the knowledge and creativity of their 21st century workforces (Bryan and Joyce, 2007). In a low-transaction-cost world, issues of trading off hierarchy versus collaboration and centralization versus decentralization are resolved in ways than can mobilize knowledge, innovation, and minds. ICT enables efficient and effective large-scale collaboration, greatly increases the relative value of intangibles assets relative to tangible assets, reduces organizational complexity, and simultaneously increases

the economies' scale, scope, and specialization. It has opened new frontiers to organizational and managerial innovation, beyond current best practices.

At a more basic level, information and communication are the lifeblood of efficient markets, and ICT could develop markets and alleviate poverty, even without advanced ICT applications like e-commerce. Market prices act as coordinating signals for producers and consumers. But in isolated villages in developing countries there are virtually no sources of information regarding market prices and other production-related information. Studies suggest the pervasiveness of poor and late information on prices, work, and income opportunities in rural areas, with heavy toll on the rural poor in developing countries (Eggleston, et al.; 2002). Under these conditions, even basic communication technologies could play a major role in creating efficient markets, improving producer practices, and speeding innovation. The Grameen's program to lease mobile phones to low-income women in Bangladesh indicates that close to half of all calls involved economic purposes such as discussing market prices, employment opportunities, land transactions, among others. Rather than creating a "digital divide," ICT could be used to create "digital provide."

## *Media and Cultural Development*

One final impact of the ICT revolution of most relevance to governance and information society is that of digitization of content and communication, the emergence of the broadband and participative Internet, and the active cocreation of content by users, citizens, and grassroots organizations.

It has long been recognized that media and communications play a key role in development—social, cultural, and economic. The media plays diverse roles in development: (i) improving governance, public decision making, transparency, accountability, and responsiveness; (ii) promoting behavioral and social change in support of reforms and development (through social marketing and policy reform campaigns); and (iii) generating new sources of growth and employment, mainly through content creation by SMEs and significant multiplier effects (World Bank, 2007a; UNESCO, 2005; EU, 2007). These influences depend on the availability of relevant content that can educate and inform as well as entertain, the plurality and independence of media, enabling legislation and support for community-level broadcasting, and access to infrastructure and communication platforms (Locksley, 2009).

The media is undergoing massive transformation, as a result of digitalization of content, platforms, and devices. The digital transformation is significantly enhancing the fluidity of media content and producing an abundance of sharable content. It is changing and revitalizing the role of libraries to become active agents of knowledge capturing and sharing for an information society, as being demonstrated by the innovative initiatives of the Library of Alexandria (Box 2.7).

## Box 2.7 Bibliotheca Alexandrina: Digitizing and Sharing Knowledge and Heritage

The Bibliotheca Alexandrina (BA), the new Library of Alexandria, was mandated to provide access to knowledge to all people. BA's four main objectives are to become the world's window on Egypt; Egypt's window on the world; a leading institution in the digital age and a space of freedom for vibrant intellectual discussion; and the dialogue between peoples and cultures. According to Dr. Ismail Serageldin, the BA Director, ICT is a fundamental catalyst in realizing this mission and the future of Egypt and, indeed of all the developing countries, will depend on the strategic deployment of ICT to capture and share knowledge.

Since its birth in 2002, BA's information and communication infrastructure has been the best in Egypt. Moreover, most of the standard functions, such as *Library Information System, integrated digital library services, intranet, Enterprise Resource Planning, and access control and ticketing systems*, are computerized and continuously being updated according to the latest standards, mostly through in-house developed tools. Its high-speed Internet connection allows for quick access to the wealth of information offered through the BA serving both local and international communities in addition to enhancing the quality of services provided by the Library to its physical and online visitors.

BA adopts all up-to-date technological tools, often in collaboration with the national and international specialized organizations, to document and present information in digital form. This is reflected in CULTNAT—*Center for Documentation of Cultural and Natural Heritage*; www.cultnat.org, whose main focus is documenting Egypt's tangible and intangible cultural heritage and natural heritage. Its aim is to raise public awareness by utilizing all available media as well as building the capacities of professionals in the fields of conservation and documentation of cultural and natural heritage. One of the main endeavors carried out by CULTNAT was the award-winning www.eternalegypt.org that offers guided tours reflecting the Pharaonic, Greco-Roman, Coptic, and Islamic periods in Egypt's history.

BA's role extends to generating the technological tools and infrastructure needed for knowledge dissemination. And this is being achieved through the International School of Information Science, ISIS, a research center affiliated with the BA. ISIS works actively as an incubator for digital and technological projects, thus nurturing innovations that encompass the spirit of the BA's mission. From documenting heritage to promoting research and development of activities and projects related to building a universal digital library, ISIS strives to be the hub for generating and deploying new technological tools to address the digital and knowledge divide.

Building a digital laboratory with state-of-the-art technologies was an essential starting point toward digitizing the Bibliotheca Alexandrina's collections

and the collections of other international libraries that are interested in pursuing the goal of "Universal Access to Human Knowledge."

Since 2002, the BA made its mark as a leading digital library, building collections of both traditional and digital materials. ISIS has worked on digitizing valued references and availing them in a user-friendly interface with the necessary search and browsing tools. In addition to digital archives, the BA holds the largest Arabic Digital Library worldwide, http://dar.bibalex.org, which contains to date more than 135,000 searchable Arabic books. This represents a significant contribution to the Arabic content on the Internet.

BA is currently working on availing the out-of-copyright books for printing through a "Print on Demand" facility using the "Espresso Book Machine." Efforts are underway to settle agreements with some publishers to include the out-of-print, in-copyrighted books in the Print on Demand system. The user will be able to choose and order online a certain book from the database where the Espresso Book Machine would start the printing process automatically upon request. Then the printed book will be sent to the client via express mail and half of the revenue will be due to the author and the publisher. ISIS has adapted the machine software to handle Arabic data, layout, and content. The project is considered a new business model for book publishing and knowledge dissemination which is consistent with the digital libraries concept, as it would ensure the availability of out-of-print, out-of-copyright, and rare books at any time and in a cost-effective manner.

In partnership with Pittsburgh University, the BA has implemented the *Science Supercourse,* a digital repository of lectures made available for free online for science students and teachers. Initially, the project started as a prototype covering epidemiology and preventive health. A network of over 65,000 scientists from 174 countries was created, reaching out to millions of students worldwide. Currently, ISIS is working on expanding the scope of *Supercourse* to cover science in four major fields: health, engineering, agriculture, and environment. The new online system is being developed using the features of web 2.0 tools that allow for further engagement and interaction of the scientific community worldwide.

The BA has also deployed ICT tools to reach out to remote areas throughout Egypt. This is being done through the *Embassies of Knowledge* that were created to replicate the full functionalities of the BA including speed of access to knowledge. So far, two regional libraries were built to be the BA's *Embassies of Knowledge* and to provide users with the functionalities privileged to users on the BA premises, such as the full searchable collection of the Arabic Digital Library and the Library's digital assets (including books, manuscripts, pictures and maps, audios and videos); a good quality webcasting service to the lectures and events taking place at the BA Conference Center; access to the Library's multimedia content; and the privilege of using the Supercomputer facility for research.

Acting as an incubator for digital initiatives, ISIS is a partner in the Universal Networking Language (UNL) program, initiated within the United Nations and devised by the Universal Networking Digital Language (UNDL) Foundation. The UNL program addresses the issue of breaking language barriers between cultures and enabling all people to generate information and to have access to cultural knowledge in their native languages. The BA has created a UNL center, which is implementing the Arabic component in the development of UNL and acts as an active language center for Arabic. The center has been working on building and designing the Arabic Dictionary in the UNL system which as of 2009 contained more than 140,000 entries and more than 80,000 concepts, conversion rules for the Arabic language, and an Arabic corpus which has reached 60 million words.

The BA also acts as a platform for scientists and researchers, offering them the necessary tools to carry out their research. VISTA, *Virtual Immersive Scientific and Technological Applications*, for instance, provides researchers with an interactive three-dimensional environment that facilitates the development of new insights and understanding to their research subject. Also, the Supercomputer—*A high performance computing cluster* at the BA represents enhanced capability for scientific research in Egypt and the region, with computational ability at a rate of trillions of operations per second.

The BA mission is challenging. According to Serageldin, "We need digital libraries of the future to be committed to providing all knowledge to all people at all times, and to help turn the 80% of humanity living in the developing world into producers of knowledge rather than just consumers of technology."

Source: International School of Information Science staff, Bibliotheca Alexandrina

Rather than diminishing the role of libraries, the Internet is liberating "the book" and the library beyond physical boundaries and opening opportunities for wired libraries to become anchor institutions for access to global knowledge. These new possibilities are being realized in various ways: by building local content through digitalization and partnerships with local universities and educational institutions; by disseminating content through local intermediaries; and by providing training and guided instructions through librarians and other infomediaries. Often, librarians are members of the communities, and the Internet can transform their roles into true guides to the digital as well as the physical content. By aggregating demand for broadband at specific locations, public libraries can also serve as initial points of community broadband access upon which local markets can build.

Digital transformation and new networking technologies are also introducing two-way, bottom-up and lateral content production, distribution, and services. The

top-down nature of traditional mass media is being challenged by the changing nature of choice from "on offer" to "on demand," from mass to individualized, and from corporate-created to user-created.

User-created content, enabled by widespread access to broadband Internet and social networking tools, is emerging as a major force in shaping media, communication, and culture (Vincent and Vickery, 2008). User-created content has exploded into major bottom-up and lateral trends (OECD, 2007). The Internet has altered the economics of content production and information sharing. With lower access barriers, increased demand for content, lower entry barriers in upstream supply, and advances in collaboratively developed platforms and news aggregators, media, and cultural content are advanced and increasingly shaped by broad user participation. The Internet is increasingly influenced by intelligent web services with technologies enabling users to be growing contributors to developing, collaborating, and distributing Internet content, and developing and customizing Internet applications. A participative web is emerging and is providing a testing ground for low-cost production of content and low-cost experimentation of services, with social change implications.

Apart from technological factors, user-created content is driven by economic factors such as lower entry barriers to content creators, increased interest to user-created content by mobile operators and search engines, and growing availability of new business models to monetize content, such as advertising-based models. Social drivers for user-created content include the young "digital natives," the growing desire to express oneself and be more interactive than possible on traditional media platforms, and the growth of community-driven projects. This is leading to increased user autonomy, diversity of users and content, and a shift from passive consumption of broadcasting to interactive and participative web.

The rise of effective, large-scale cooperative efforts—peer production of information, knowledge, media, and culture—is parallel to those of business applications. The impacts of user-created content are wider than enabling network-centric innovation and competition in the business sector. They can help influence the traditional media, create alternative information and communication channels, help change government politics and civic life, and enable mass collaboration and community-driven programs.

User-created content and the growing wealth of networks raise many legal, institutional, and governance challenges (Benkler, 2006). Among the key immediate issues are copyright infringement, privacy concerns, content quality, and cyber-attacks making user data vulnerable. They also led increased urgency to issues of media literacy, e-literacy, strengthening capacities for local content production, and widening access to broadband infrastructure and digital tools—issues of special relevance to developing countries.

But they also raise societal issues and choices that are fundamental to long-term social, political, and economic development. For more than 150 years, communications technologies have tended to concentrate and commercialize the production and exchange of information. The recent ICT developments present the possibility of a

radical reversal of this long trend—a reversal toward mass participation and radical sharing of information and intelligence. Depending on societal choices, we may also witness the emergence of a substantial component of nonmarket production and exchange of information and of information-based tools, services, goods, and capabilities. This may lead to substantial redistribution of power and wealth from the 20th century industrial producers of information, media, and culture. This raises the central issue of whether public policies will promote a common infrastructure that is governed as commons and, therefore, made available to anyone who wishes to participate in the networked information environment outside the market-based proprietary framework (Benkler, 2006). Or, will new business models emerge to appropriate and commercialize these bottom-up contributions?

How will the technological and economic forces that are shaping the media play out in the developing world? Will the Internet, digitization, and collaborative tools reduce inequalities and promote diversity in the media and communication environment at the local and global levels? Will this transformation allow more people to participate in knowledge creation and cultural sharing on a global basis? Will the economies of scale and scope of digital content production further reinforce the imbalance in trade and further displace local with global media? Unencumbered by legacy assets, will developing countries be able to leverage newly available and affordable technology platforms (mobile phone, wireless) to deliver relevant content?

Global debates on the need to foster a development-friendly New World Information and Communication Order raged during the 1970s and 1980s at UNESCO and other UN organizations, including how developing countries might use the media and communication networks to become more economically, politically, and culturally self-reliant. Since, progress has been slow. The recent World Summits on Information Society of 2003 and 2005 have revisited many of the issues of inequalities but in very different technological, economic, and political contexts. Today, equally and strongly contested are the need to expand the opportunities for open access to media content and the Internet to limit intellectual property rights protection on digital information resources and to finance literacy and other capabilities necessary for people to participate in information societies (Mansel and Nordenstreng, 2007). The outcomes are likely to be shaped as much by geopolitics and globalization as by technological advances. They are also likely to be significantly influenced by mobilizing local NGOs, building social capacity to appropriate the new tools, promoting user- and community-created content, and pursuing national media and telecommunications reforms within an inclusive e-development strategy.

While focusing on ICT use for opening opportunities and delivering services to the poor, we must also monitor and address the impact of ICT on equity and income distribution within and among countries. The ongoing revolution is likely to be a driving force in processes of restructuring economies, generating wealth, and concentrating or distributing the new wealth. Would it inevitably lead to exacerbating the income disparities within developing countries? What role should the state play in these processes? This leads us to the next topic, managing risks.

## Managing Risks

The likely course of the ICT revolution is uncertain and unpredictable. ICT is a disruptive technology. There will be winners and losers. There is a legitimate worry that ICT may be promoted as a development fad, not dissimilar to earlier ones, disregarding the risks (Wade, 2002; Kraemer and King, 2005; Carr, 2008). Key risks are:

- Wasting resources: unrealized benefits at substantial costs
- Exacerbating inequalities and exclusion within and across countries
- Reinforcing existing power distributions and hierarchical structures
- Controlling, not empowering
- Polluting, not greening.

The benefits from ICT investments are not automatic. To be realized, they require complementary investments in human capital and much organizational and social learning (Abramovitz and David, 1999; Brynjolfsson and Saunders, 2010). ICT-enabled restructuring is fraught with difficulties and risks, including outright failure to deliver the promised benefits. A growing literature has documented these difficulties, particularly concerning the introduction of complex and integrated software infrastructures that require extensive process reengineering and behavioral changes in large organizations. The use of ICT in the public sector, as in e-government, is fraught with even more risks and frequent failures than the private sector (Heeks, 2006, 2002; Hanna, 2007b, 2008).

The ongoing technological revolution may also exacerbate inequalities, as technological change always favors the prepared. In this case, ICT has been the fastest technological change in history, thus exacerbating adjustment problems. While as far reaching as the agricultural and industrial revolutions of the past, the current technology revolution is unique in its pace of change and diffusion: it took a century for the printing press to reach 50 million people, 40 years for the radio, and 4 years for the Internet. Driven by "Moore's Law," ICT advances are proceeding at enormous speed.[5] Some developing countries may take advantage of their late start and leapfrog intermediate technological stages, as in wireless communication technologies. But, for reasons of financial and human resources and other complementary factors, and the presence of "network externalities," the majority of poor developing countries are likely to face the risk of a widening digital divide.[6]

This fast-paced technological revolution is also divisive within countries as individuals are in different positions to adapt. The digital divide may merely parallel

[5]Gordon Moore observed an exponential growth in the number of transistors per integrated circuit and predicted a continuation of this trend. This has been generalized into a continued exponential growth in ICT capacity.

[6]Network externalities are derived from the fact that the value of a telephone line increases with each new subscriber by the number of potential connections between users. This indicates substantial externalities and there may be a threshold effect through which ICT begins to have substantial impact only when at a certain penetration level in the economy.

to similar disparities in income and access to services such as education and health. But ICT and e-government services, in particular, may reinforce the divide in access to services, and even dampen the pressure to reform and improve such services for all citizens. The already highly skewed access to literacy and ICT may well deepen all other divides. The inequality effects of the early stages of installation of ICT can be at least partly reversed at later stages, as occurred in the case of deployment of the mass production paradigm (Perez, 2002). Unless strong countervailing policies are established, this divide is likely to grow over time.

A number of factors point to the threat of exclusion of the poor in the current information revolution. With the exception of mobile phones, the gap in the provision of new ICTs is much larger within and among countries than income disparities. Benefiting from ICT requires complementary investments and skills, including literacy. Threshold effects are also at work: network externalities, scale economies, lack of local content in local languages, fragmented markets for software applications, and high cost of access for remote areas—factors that lead to or reinforce poverty traps and economic isolation for poor communities and poor countries. Poor and disadvantaged groups, particularly women, often face special constraints in accessing ICT and using them for their specific needs. The risks of economic exclusion suggest that countries should be concerned with the level of connectivity and ICT provision—and with enabling access and deploying ICT and content in ways that expand relevant information for the poor, increase their voice in decision making, and address bottlenecks to their trade.

Then there is the risk of ICT becoming a tool for reinforcing current hierarchies and power structures, rather than reform and empowerment (Kraemer and King, 2005). The potential for ICT to produce reforms and broaden participation, in government and society, can be thwarted because public administrators and local elites will instead use ICT to serve their own interests and maintain the status quo. There is a long history of literature and empirical evidence that suggest ICT has been used most often to reinforce existing structural arrangements and power distributions rather than change them (Kraemer and King, 2005). Top managers use ICT to enhance the information available to them, to increase their control over resources, and in general to serve their own interests. In less liberal and more unequal societies, ICT benefits are less likely to be fairly distributed, unless political will and social values push for applying ICT for empowerment and public sector reforms.

Although government and business organizations exhibit fundamental differences that influence the outcomes of ICT use, political and societal organizations are under increasing social and global pressures to perform and open up, and they can learn a great deal from the lessons of business organizations. Many political and public leaders are expressing interest in using ICT to improve government operations and enable new services. They are increasingly aware of the rising demands of businesses and citizens and of the shrinking public resources. The most recent US Presidential elections (of 2008) has shown the potential of ICT use in political mobilization, including the Internet-based fund raising, weblogs and Internet-based news sites, mobile messaging. There is no reason that government cannot learn to take advantage of ICT for mobilization of public opinion and reform.

A related risk is that ICT may lead to control rather empowerment of citizens, and the poor in particular. Despite its promise for personal liberation, the Internet can become a tool of bureaucratic control. As search engines and data mining algorithms are refined and made more powerful, they will enable governments and corporations to discover hidden relationships among the various information we place on the web. Analyzing these relationships can unlock substantial confidential information about Internet users. While these capabilities put enormous power into the hands of individuals, they put even more power into the hands of companies, governments, and other institutions whose business is to control or influence individuals (Carr, 2008, p. 191).

The technology's ultimate impact on public good will be determined by how the tension of its dual nature—liberating and controlling—will be resolved. Although ICT as a tool for personal and community empowerment has been shaping modern society in recent years, large and powerful institutions have been adopt at reestablishing control, and ICT continue to be applied at higher levels of control (Carr, 2008, pp. 196–209).

Finally, ICT may become a major source of pollution and energy consumption, rather than a greening technology. A major challenge of the 21st century is catastrophic climate change and the growing pollution of the environment of most urban areas of developing countries. A key promise of ICT is to provide less energy and less material consuming solutions to all kinds of manufacturing, services, and entertainment. This promise is particularly important to meeting the challenge of climate change as well as urban pollution, with the emergence of smart transportation and urban systems, smart energy networks, lean supply chains, telecommuting, and other energy-efficient practices. Yet ICT products, such as televisions, mobiles, and computers may become a major source of dumping and pollution in developing countries. The energy consumption of data centers is also rising rapidly. Without a deliberate strategy, strong incentives and political commitment, the promise of the "green IT" may not materialize.

## Productivity, Growth, and Technological Determinism

Will the ICT revolution lead to a "soft landing" or to an upheaval as traumatic as that of the first industrial revolution? Would it lead to new divides, break up of neighborhoods, increased job insecurity, financial volatility and concentrated wealth, or lean and green production, revitalized and connected small-scale communities, and more inclusive societies? Will ICT lead to further centralization and control by a small group of elite, or fulfill the promise of becoming a tool for reform and empowerment?

The author does not subscribe to technological determinism and the inevitability of the promises or risks of ICT. The role of technology is neither deterministic nor wholly malleable. The printing press, for example, has been an agent of change, but its impact varied across societies (Einstein, 1979). Different technologies make

different kinds of human action and interaction easier or harder to perform. So, there is no guarantee that ICT will lead to improvements in productivity, growth, employment, and poverty reduction—or even more ambitiously, advances in innovation, empowerment, decentralization, human freedom, organizational transformation, cultural diversity, and social production of information (Benkler, 2006). These are societal choices. They depend on many cross-cutting social and economic policies.

Consider the potential impact of ICT on growth and productivity. We need to assess the prospects and conditions for ICT contribution to productivity, growth, and poverty reduction in developing countries. The "productivity paradox" and the slow emergence of ICT impact on productivity even in OECD countries can be explained among others by the considerable time needed for the diffusion of new technologies and for institutions to adjust or transform—changing from hierarchical to networked organizations, upgrading the workforce, or reengineering and inventing business processes. It takes time to build networks within and across firms and to enable new forms of interactions throughout the economy. Understanding this time lag is important in the development of ICT-enabled development strategy.

OECD (2004a) research shows that several conditions or complementary factors influence the extent of diffusion and use of ICT and thus its impact on firms and economies: the extent of competition and nature of the regulatory environment, the availability of appropriate human capital, the ability and willingness of organizations to restructure and change work practices, the relative total costs of ICT deployment, and of course, the nature of the business, or the structure of the economy. While complementary factors are important to payoff from all kinds of investments, they are most critical in the case of ICT investment since ICT transforms the intellectual content and human interaction as well as the physical aspects of work.

Significant differences between OECD and developing countries are likely to influence the extent and speed of impact of ICT on growth and productivity. Relatively few developing countries have sizable ICT production sector and their ICT sectors have fewer backward and forward linkages into their domestic economy than in OECD countries. With the exception of a few large developing countries, most lack mass markets for ICT goods and services, resulting in higher costs and less efficient use.[7] ICT investments are generally higher in developing countries where equipment is imported and telecommunications user charges are much higher than in OECD countries. Most developing countries also have poor communication infrastructures, mostly limited to the urban centers, and with poor quality international connectivity. The most critical difference is in the absence of complementary factors: enabling legal and regulatory environment to reward innovation and entrepreneurship, competitive regulatory telecommunications framework, extensive human capital to use ICT, and access to high-quality business advice and venture capital.

[7]This could change with strategies to develop and produce low-cost ICT products that are adapted to local markets in poor countries.

These differences are not insurmountable. Rather, they point to ways in which governments, businesses, and aid agencies can act to increase the pace of ICT diffusion and the rate at which contributions to economic growth can be realized. The benefits and risks associated with this revolution are not predetermined. They are a product of social and political choices. A passive public policy stance that leaves to market alone the direction of change will reinforce divides (ILO, 2001; UNDP, 2001). Passivity will also lead to economic marginalization and increasing social stress. The unprecedented advances in ICT and decline in prices imply a faster rate of diffusion than in previous technological revolutions. The constraints and risks to realizing the full benefits are significant, but a vigorous and coherent effort to harness the potential of ICT and synergize with complementary factors is likely to be critical to future growth and poverty reduction.

In a similar vein, whether the ICT revolution would exacerbate inequalities and reinforce existing power distributions, or promote more equitable and inclusive societies would ultimately depend on socio-political and economic policy choices. These choices cover the whole gamut: trade policies, tax policies, safety-net policies, training and education policies, competition and innovation policies, capital and labor market laws, and civil service and governance systems, among others. These policy choices encompass a broad spectrum of development issues and actors. They shape and can be shaped by the strategic options for leveraging ICT for development.

In sum, the ICT revolution will have profound impact on all aspects of growth, equity, and governance for countries at all levels of development. It presents a fundamentally changed global context for development. It offers unprecedented opportunities, risks, and strategic options. Neither the benefits nor the downside risks are predetermined. The opportunity costs of failure to respond are high. These prospects argue for integrating the ICT agenda into the governance reform and development strategy agenda. Leveraging ICT for transforming government and building the information society can no longer be left to the technologists or ignored by policy makers and mainstream development practitioners.

# Chapter 3
# Transforming Government: Vision and Journey

For a variety of reasons, public agencies at all levels are pressed to respond to growing challenges. e-Government provides powerful tools and new opportunities to address both old and new public sector challenges. The use of ICT can significantly improve the range and quality of public services to citizens and businesses while making government more efficient, effective, responsive, transparent, and accountable.

e-Government is about effective government, whereby ICT is used to modernize government services and make them accessible, responsive, transparent, and client-centered. It is about transforming relationships within government, and between government and its citizens and the economy at large. A main challenge is to prepare policy makers to take the lead and to influence their thinking on the future role and shape of government. e-Government may be viewed as a business strategy to enhance performance, service, and accountability of public institutions. It is less about managing technology, more about promoting service innovation and institutional transformation. It should be driven by a vision of a desirable future government. It offers fundamentally new options for outsourcing, decentralization, and redefining the role of government. It supports the country's economic competitiveness and public service reform agendas. It put much of the "wish list" of a citizen-centric, integrated, and transparent government within our reach.

Technology is increasingly becoming an integral part of transformation efforts in the public sector. While technology alone cannot achieve transformation, increasingly, transformation cannot be achieved without technology. Decades of experience in reforming the public sector and revitalizing the civil service in developing countries have not been encouraging, and the tools available have been blunt. But ICT in general and e-government in particular have been a recent source of inspiration for both developed and developing countries. The promise of ICT can be a trigger for innovation and value creation in government, as in business. The transformative power of ICT has the potential to realign government to a changing context and to reshape government's social technologies in order to remain relevant in a more turbulent, global, interactive, and informational era.

This chapter attempts to answer some key questions: What are the megatrends and imperatives that may drive government's role and behavior in the modern

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_3,

economies? What will the government-of-the-future look like? What visions and aspirations may shape government transformation or the demand for e-government? What are the key objectives of public sector reform and what e-government solutions would be most responsive to these objectives? If government transformation is a long journey, then what are the milestones of this journey and what may be the initial steps? The next three chapters attempt to answer the questions of the "how" and to draw on lessons learned by early travelers.

This chapter outlines the trends and challenges in transforming government and changing the role of the state. Governments all over face increasing budgetary pressures, rising expectations, growing inequality, and declining trust. The imperatives of an increasingly integrated and competitive global economy add more demands on all levels of government—to be agile and innovative. Understanding these global forces is useful in shaping the value propositions of e-government.

This chapter then takes a future-oriented perspective on government, building on recent trends and advanced practices in reinventing government among leading nations. These key reform trends include: promoting managerial flexibility, responding to demand, becoming client-centric, providing choice and competition, focusing on performance management, engaging citizens, and using networks and partnerships.

Next, various visions of future government are presented. These visions capture the key trends in transforming government, in putting citizens at the center, and in delivering value and service on demand. They also capture the elements of an emerging public sector for the new century: agile, smart, innovative, collaborative, knowledge-based, and competency-driven. These visions are not limited to the central government; they are increasingly critical to cities and local governments. Visions of future government based on the innovation and transformation potential of e-government lie at the heart of national ICT initiatives. Total transformation to such desired states is a challenging journey, to be pursued in phases and sustained over the long term.

Chapter 3 concludes with an overview of the stylized phases of an ICT-enabled government transformation process. Policy makers should be aware of the various phases, of the challenges of each phase, and the opportunities for leapfrogging. In all phases, the need for piloting and sequencing before scaling up is also explored. A stylized road map is outlined to initiate an e-government program, set common structures, prioritize pilots, and set mechanisms for scaling up. Some of the tools outlined here are further developed in the next chapter, together with frameworks to manage change and facilitate implementation.

## Imperatives for Government Transformation

The role and value propositions of e-government must be understood as a response to global forces facing governments. The role of the state is changing, and ongoing public sector reforms and efforts to reinvent governments provide the context and imperatives for ICT-enabled public sector transformation.

Governments all over face a potent combination of challenges: increasing budget pressures and shortfalls; rising public expectations for service and responsiveness; growing inequalities in incomes and in access to information, knowledge, and opportunities; declining legitimacy and trust in government for failing to deliver on promises; and meeting the imperatives of competing a fast moving, knowledge-based global economy.

Although governments in developing countries share similar challenges, the challenges differ in severity and initial conditions. e-Government must be understood in a developmental context. Much of the literature on e-government is focused on technological imperatives and the challenges facing developed economies. The imperatives for transforming governments in developing countries are further driven by severe financial constraints, poor infrastructure and public services, unmet basic needs and expectations, fragile democracies, weak governance, high levels of inequalities, and prevailing information poverty.

Most governments face budget pressures and shortfalls, caused by increased demand for services combined with insufficient tax revenues. In higher and middle income countries, aging populations add a huge burden to health, pension, and other support systems. In poorer developing countries, budget pressures are much higher and caused by additional factors such as fast-growing populations, nascent social protection systems to compensate for the volatility of the global economy, global competition for FDI through tax reductions, and the drying of some traditional sources of revenues such as tariffs on international trade. New programs are introduced when economic outlooks look promising, then when cyclical budget shortfalls occur, politicians are reluctant to cut programs—particularly when faced with a huge backlog of unmet social and popular demands. Many governments face the combination of increasing costs of public services and rising demand of these services.

Governments are also facing rising expectations for demonstrable results and enhanced responsiveness, from citizens and businesses. Their clients and employees understand how business enterprises constantly improve services, and they have come to expect and even demand similar information, services, and support from government. This is particularly the case for middle income developing countries where e-business has been spreading. Moreover, multinationals are setting the standards for service through their global services, client support, as well as their own service requirements from local governments. Citizens are increasingly mobile and they are expected to be connected to government information, services, and assistance anytime and everywhere. These developments make government clients in developing countries even more impatient in dealing with slow and multiple bureaucracies, even for simple services.

There are also the challenges of rising income inequality and asymmetric access to information, knowledge, and opportunities. In many poor countries, public services are exclusively available to the wealthy and middle class in the major urban areas, if at all. Public services are failing the poor in most countries. Whatever services are provided, they are poor quality, provided inefficiently and at high costs, and are a major source for bribery and corruption. As new technologies are

implemented, governments face the further challenge of making public services accessible to all citizens through multiple channels. A digital divide may further reinforce the service divide by reducing the pressure from the well-served classes for reforming and improving public services across the board. And the digital divide is not only about access to ICT, but also relates to the associated skills to deal with Internet-based information and e-services.

Governments all over, especially among the poorer developing countries, also encounter declining trust and legitimacy, leading to frequent crises and many failed states, as, for example, those in Africa. Rising democracies do not avoid these challenges when they fail to deliver basic services and security to large segments of their populations, as in many Latin American countries. The current democratically elected governments are particularly vulnerable to charges of corruption and of failure to deliver basic public services equitably. Social and political forces are exerting strong pressures for decentralization, while economic forces are exerting pressures for integration with the regional and global economies. The current crisis of political institutions and democratic governance in many developing countries can be construed as a unique opportunity to review the framework that inspires and guides how new technologies can assist in designing a holistic reform process of the public sector (Rubino-Hallman and Hanna, 2006).

The standards for competing in the global economy are growing. The speed with which capital flows around the world in search of higher returns demands a more agile and innovative government. Globally integrated and demand-responsive supply chains are setting standards for customs, ports, multimodel logistics, and trade facilitation functions. Governments are pressed to modernize these infrastructures and processes in partnership with the private sector. Traditional approaches of tariff-based protection for local industries and tax incentives for multinationals become less effective in a global knowledge-based economy. Also, the "cost of doing business" is now open for all to examine, and countries are benchmarked annually in the globally competitive race to attract investment (World Bank and International Finance Corporation, 2009). "Business as usual" is no longer a viable strategy for governments to help their industries compete in the global economy. For small business, government overhead and regulatory burden can spell the difference between thriving and not surviving. No wonder business associations are often a strong ally and advocate for government to simplify operations and adopt e-government practices. Growth and economic development are in significant part determined by how the government can intelligently regulate and facilitate business participation in the global economy.

For a growing number of tough economic and social problems in knowledge societies, success increasingly depends on communication, information, and innovation. The more rapid the pace of change, and the more novel the challenges, the greater is the need for information and innovation and for knowledge-based learning and adaptive organizations. Increasingly, governments are called upon to manage complex programs requiring complex administrative technologies and partnerships among multiple organizations, at all levels of government, and between public, for-profit, and nonprofit sectors. More of the problems facing governments are nonroutine, allowing little time to react and involving a high cost of failure, such

as new types of flues and threats to public health, security threats, and natural disasters. Policy problems are increasingly interconnected. Responsibility for solving such problems is highly diffused across organizations and both locally and globally multilevel. Such problems require innovative solutions, drawing on information and communication, on situation-based coordination, network-based approaches, and boundary-spanning performance management (Kettl and Kelman, 2007).

All the above imperatives suggest moving beyond incremental change to transformational change in public sector management. They dramatically increase the stakes associated with the pace of government transformation. They demand painful integration of entrenched silos, partnerships with business and civil society, and enabling employees to be part of the change through retooling and reskilling. Transformation of government operations must also occur within very tight financial constraints in most developing countries. Transformational change is demanding and disruptive, but the longer government delays action, the worse the problems become. The business world is changing fast and becoming more responsive, connected, knowledge-based, and globally competitive. Governments have to act with a sense of urgency or run the risk of becoming economic burdens or even irrelevant to their societies.

## Cutting-Edge Practices in Government Reform

How are progressive governments responding to these imperatives? The role of the state has been changing, and so is the way it is working. The debate about government is shifting from one about size to one about the quality of government—smart, agile, effective. The emerging trends in terms of reform and cutting-edge practices have the potential to transform government to become more agile, results-driven, customer-focused, externally oriented, knowledge-based, and collaborative in nature. Global competitiveness and the rise of the digital economy are forcing countries to reexamine the core functions and rationale for government—not to proclaim the end of government, but to reinvent government and discover its new roles and forms.

We focus here on selected responses of leading nations in reforming and reinventing government. The key best practices involve: promoting managerial flexibility; using performance management; providing choice, competition, and incentives; responding to demand, becoming client-centric; engaging citizens; using networks and partnerships; and pursuing innovation (Kettl and Kelman, 2007; Abrmason et al., 2006; Eggers and Singh, 2009). Subsequently, we illustrate shared visions of future government that embody these trends and practices.

### *Promoting Managerial Flexibility for Results*

The trend among progressive governments is to let managers manage, by setting clear targets and holding managers responsible for results. The aim is to give more

flexibility for managers to manage for results by liberating them from ex-ante controls on inputs and operating procedures of the central agencies.

This trend has significant implications for human resources management, financial management, budget processes, contract management, and organizational structures. For human resources and performance management, it means giving managers greater flexibility in hiring, promoting, and setting pay-for-performance. It requires setting results-oriented measures of performance, aligning information and communications systems, incentives, and sanctions accordingly. It also means tailoring human resource management practices to an organization's mission, technology, and culture.

In financial management, this trend often means adopting and adapting successful financial management practices from the private sector, such as increased emphasis on measurement of the true costs of providing services and creating a cost-conscious environment, understanding costs, and maximizing productivity. Much of these innovations in financial management are spurred and enabled by strategic uses of information technology.

Budget processes play a key role in managerial flexibility and efficiency. Prevailing budgetary practices tend to prevent managerial flexibility in spending across line items or over the multiyear life span of a project and in allowing procurement incentives such as share-in-saving contracting. Some OECD countries are experimenting or introducing reform to allow for such flexibilities. Over 50% of OECD countries no longer classify expenditures by line item, but by programs, economic classification, and/or administrative units (Kettl and Kelman, 2007). Reform also aims to link budget practices to the public management performance improvement agenda, relying less on managing budget inputs and more on managing performance targets and outcomes.

Outsourcing is becoming an important part of how governments do business and a tool for managerial flexibility. In the case of the United States, the Department of Defense and the Department of Energy spend 46 and 94% of their budgets on contracted products and services, and most agencies outsource their ICT applications that are crucial to running their organizations. This trend put increasing emphasis on contract management and procurement reform, including the use of e-procurement to reduce transaction costs, the development of in-house competency for contract management, and the use of performance measures for contracts. For large and complex procurement, outsourcing is becoming relational, that is, adopting long-term partnership frameworks with significant investment in governance structure and incentives for performance. Modern information and communication systems can substantially reduce the transaction costs of governing a growing network of outsourced contractors to coproduce results.

Finally, governments continue to search for appropriate organizational forms in response to increasingly complex problems and programs. The traditional approach of creating separate agencies or silos is no longer viable in an increasingly complex and interdependent world. Leaders are learning to operate across silos, devise new and dynamic partnerships, and broaden their repertoire of techniques for reorganizing. These techniques may include: mergers, virtual reorganization, coordination

mechanism, commissions, creating new organizations, and perhaps most fundamentally, moving organizations from the public sector to the private sector. Information and communication technologies have enabled and expanded this repertoire of organizing techniques to allow for networked and virtual organizations.

## *Responding on Demand, Becoming Customer-Centric*

Governments are striving to be better at sensing and responding to economic, social, and health changes and crises. In many developing countries, they also strive to increase the quality and reach of basic services. These forces, coupled with new technological possibilities, are shaping different program design choices and their underlying information and communications infrastructures. In leading countries, public agencies are moving from process-centric, silo-bound, and inward-looking organizations to customer-centric, outward-looking, and responsive organizations. This is a difficult transformational change.

Performing on demand has many characteristics: responsiveness, to deliver the right service at the right place and time, to the right degree; client-focus, to provide seamless and integrated services; and resiliency and reliability, to maintain service levels regardless of circumstances (Abrmason et al., 2006; Ramsey, 2004). On demand government requires transforming processes and integrating operations across the whole of government—beyond putting services online. Solutions are sought by taking a customer view of what is needed, then reengineering government processes and generating the information required to support these solutions.

Enabled by information technology, leading governments now provide service capability on a 24/7 basis, requested from anywhere to anywhere. Cities and local governments have established call centers to provide a one-stop access to public information, service, and assistance. In addition to enhancing response to calls for assistance, calls and complaints are linked to customer service intelligence systems for statistical analysis and improvement of public information and services. One-stop government portals organize services around events and client groups, instead of by agencies and silos. Mobile technology is enabling government to provide information and services to on-site public servants, businesses, citizens, and non-profit organizations, and to receive site-specific information and feedback. But these possibilities are unlikely to be captured unless governments develop the appropriate corresponding service skills and service cultures.

## *Providing Choice, Competition, and Incentives*

Another trend is the use of market-based approaches, such as competitive sourcing, public–private partnerships and vouchers, as a tool for performance improvement. A review of experience in 30 developed countries has shown that the use of such approaches continues to increase because efficiency gains have been

substantial (Blondal, 2005). Chile has been using vouchers as a choice system since 1980. In the UK, contestability and competition in health and education, among others, are used as complements to a target-based public service improvement strategy.

The range of tools that can be used for a market-based government is expanding but can be grouped into three strategic approaches (Kamensky and Morales, 2006). The first approach is the delivery of services to the public via market-based tools such as competitive sourcing, public–private partnerships (PPPs), vouchers, outsourcing, and privatization. Second is the delivery of internal government services using market incentives such as franchising, pay-for-performance, and competitive grants. Third is the market-based setting of regulatory standards and pricing levels through auctions, tradable permits, and user charges. These approaches are promising and have broad applicability across different government programs and policy areas.

In a world of choice and competition among public service providers, performance measures matter even more beyond their use as internal performance improvement tool; they become report cards that guide consumer choice. These tools also need to be properly managed and creatively used, since they have their pitfalls. Their usage presumes that customers will have sufficient information to make reasonable choices. Regulation is required to deal with the potential negatives and externalities that unfettered choice can create. Service-level agreements need to be monitored and managed. They may include incentives for innovation and service improvement over the duration of the outsourcing agreement.

All these considerations point to the need for advanced information and communication support and knowledge-based management systems to enable these choices and expand competition. These systems can reduce information asymmetries, capture transaction information in real time, link incentives to performance, and enable information and knowledge sharing among large numbers of partners, service providers, and users. e-Government applications should be used to enrich these choices rather than foreclose them.

## *Using Performance Management*

The increased use of performance measurement in government is another key trend in OECD countries. For a decade or more, there has been a major expansion in the use of outcome-oriented, nonfinancial performance measures for government agencies. This outcome orientation places emphasis on results that matter to clients. Strategic approaches link organizational goals to intended results, often in client-centric terms, and occasionally beyond the boundaries of single agencies. Some scorecards have included performance measures such as the voice of the customer, the voice of the employee, and the voice of the business. Information and communication systems have greatly facilitated the generation and use of such performance measures.

While performance measurement has been institutionalized in USA and many OECD countries, only a few countries, such as the UK, are moving from

performance measurement for accountability to using such measurement for active performance management and improvement. Since 1997, departments in the UK have negotiated public service agreements with the Treasury (Kettl and Kelman, 2007). In turn, the central units monitor local organization performance on an ongoing and comparative bases, provide consulting services for poorly performing local units, and do research on best practices. Country experiences so far suggest that moving from performance measurement to using measurement as a tool for performance improvement is a slow process. This move demands leadership, sequencing the use of performance measurement so as to aim for performance management and improvement and training managers for such use. It also demands a fundamental shift from compliance to improvement mind-set.

## *Engaging Citizens*

The landscape of citizen involvement worldwide is changing. Over the past decade, many OECD countries have created new and broader forums for engaging citizens in informing and shaping public policy decisions. Citizens are engaged not only as consumers of government information and services, but also as advocates and participants in public decision making and policy making.[1] An increasing number of ICT applications are enabling these new consultative forums and innovative engagement, including broadcasting town-hall meetings, and the use of surveys, referenda, blogs, and wikis. Citizen engagement models range from informing citizens of planned programs to empowering them to make decisions.

Many of these pilots and initiatives face bureaucratic challenges to scale up and need both local champions and central policy support. Despite these challenges, the trend toward deliberative democracy and citizen engagement is strong among but not limited to OECD countries. Many examples come from local governments. Some have been promoted by progressive state and city governments in developing countries. For example, some communities in Brazil have enabled their citizens to vote on how budgets are spent in their neighborhoods. Governments are exploring new ways of entering into relationships with their citizens in ways that are meaningful and valuable to the citizen. This should lead to a shared understanding among citizens of the issues and trade-offs and, ultimately, to better decisions and increased transparency, citizen satisfaction, and trust in government.

## *Using Networks and Partnerships*

A fundamental performance challenge facing public management is to achieve results through collaborative efforts (Goldsmith and Eggers, 2004; Kamensky and

[1] A notable case is the extensive use of the Internet and social networking tools by the US election campaign of President Obama during 2007–2008, and the subsequent attempt to keep the highly mobilized constituents engaged in shaping public policy decisions.

Burlin, 2005; Abramson et al., 2006). Partnerships are emerging as key tools for enabling government to work in response to nonroutine problems and increasingly diverse, complex, large-scale challenges. Partnerships enable government agencies to import innovations from best-in-class organizations and to leverage the investments that other organizations already made in developing new service lines and delivery channels. Citizens also expect results not silo solutions. Solutions often require reaching outside the boundaries of any single agency. Inter-organizational collaboration is therefore on the rise, and failure to collaborate leads to crisis in confidence and demand for accountability, as in US government response to Hurricane Katrina.

Government executives are deploying various types of networks to meet the challenges: networks for service implementation, information diffusion, problem solving, and capacity building (Millard and Provan, 2006). Public managers are learning to choose and effectively use these collaborative networks. Lessons are emerging about the success factors in such collaboration: cultivating a collaborative and open culture, creating appropriate organizational structures, developing collaborative leadership styles and skills, and adopting appropriate metrics for success.

Practicing these lessons is never easy, however. Collaboration is the new form of governance (Goldsmith and Eggers, 2004). Operating in networks demands changes in the habits of government organizations and requires managers with new competencies and mind-sets. Public reforms have to promote such collaboration, provide the incentives to frontline workers to collaborate, and empower them with the mindset, skills, and tools to do so. Among the new tools is the creation of peer-to-peer collaborative activities that build members' skills and form communities of practice or social learning systems. These networks complement formal knowledge management systems. The use of result-based performance management and investment in multiagency e-government applications could also become a driver of transboundary management.

## *Closing the Public-Sector Innovation Gap*

Progressive public leaders and governments are learning to deploy innovation strategies to encourage various sources of innovation and help them maximize their ability to generate innovative and adaptive approaches to governance. These strategies range from approaches focused on generating innovation from within the organization to externally oriented approaches that leverage outside ideas and knowledge. These may be classified as: cultivation, replication, partnership, networking, and open source (Egger and Singh, 2009).

Using cultivation strategy, organizations tap into diverse and tacit knowledge of employees at all levels and enable the process by using tools for collaboration such as blogs, wikis, and peer-to-peer networking. Cultivating innovation is an evolutionary process. It carries risks for innovators, and such risks are higher for civil

servants in view of public and media scrutiny. The challenge is to identify levers that create big results, drive organizational change, and influence behavior. Some governments and foundations provide financial incentives and awards and recognition to innovators. Examples are New Zealand's performance-for-pay system, USA's National Performance Review Hammer Awards, and the Ford Foundation Innovation in American government award. Innovation also requires experimentation and that means accepting and learning from failure. Emerging ideas need to be nurtured and developed through safe havens, that is, units that are kept close to mainstream activities but away from line organizations. For example, New York's Center for Technology in Government permits state and local governments to do low-risk experimentation with computer-based processes before making big investments (Egger and Smith, 2009).

Replication strategy is about public agencies creating systems to identify, tailor, and adopt innovations from elsewhere. Governments need structured ways of discovering and tracking innovations and best practices, as governments often have similar needs and common means for meeting them within the country. One example, the Texas Performance Review, created in 1992, reviews Texas agencies' performance and compares it to best practices around the world and selects ideas that hold promise for further development and tailoring to a local context. Replication must also rely on mechanisms to evaluate and adapt practices to local contexts, such as partnerships with other government agencies, reaching out to neighboring jurisdictions, and using communities of practice networks.

An example of local government innovation that has been widely replicated is the innovative service called "311," started in Baltimore and soon spread to Chicago, New York City, Barcelona, Tokyo, and dozens of other cities around the world (Egger and Smith, 2009). Assisted by a customer relationship management software system, a citizen's issue is distributed to the appropriate agency, then tracked and monitored to resolution. The system renders all of a city's services within easy, around the clock reach of residents, and is increasingly used to generate statistics, spot trends, and make better resource allocation decisions. This innovation is being adapted and introduced in modest ways in many developing countries, such as the government call center in Sri Lanka.

Partnership-driven innovation strategy covers public–private, public–public, and public–nonprofit partnerships. It lets governments test new ideas quickly by sourcing them from innovative partners, helps agencies overcome both bureaucratic and financial constraints, and encourages holistic and personalized solutions. By partnering with NGOs, governments can reach deep into and support more effectively community development efforts. By partnering across jurisdictions, local governments can offer joint solutions to common problems. As governments outsource or partner on a growing number of projects with the private sector, they can create or expand a network of best practice exchange and benefit from cross-sector or cross-jurisdiction diffusion. Private sector organizations deliver government services across the globe, building their ability to collect and disseminate ideas and practices nationally and worldwide. This reinforces the importance of using

public–private partnerships for e-government projects and developing the capacity of local management consulting and ICT services industry.

More recent innovation strategies for government rely on networks. Network strategy gives government the ability to in-source innovations and ideas, much like P&G used a "Connect and Develop" strategy to leverage innovation assets of others, thus adding about 1.5 million outside personnel to its 7500 R&D staff. InnoCentive.Com broadcasts or discloses an issue to problem solvers outside the research lab and seeks solutions to complex scientific problems. Similarly, government can use networks to engage citizens and groups in defining citizen needs and in developing policy and program delivery. The Australian Taxation Office's "listening to the Community" involves its customers in the design process to create more user-friendly tax system, including the creation of a simulation center where users and designers work together to test products (Egger and Singh, 2009, p. 84). Learning from the private sector, governments can also identify lead users or civil society organizations and use networks and workshops to tap their knowledge for public service improvements and for addressing issues ranging from health and welfare to environment and energy conservation. Networks and community information centers can also collect citizen reactions to public services and provide a basis for continuous learning and improvement.

Finally, an even more radical model is open source innovation, which was made popular by the open source software movement. It applies to many kinds of innovations and particularly those that support the public good. An open source innovation strategy can create repositories of ideas and tools. An example is Ontario's e-Learning initiative, which built an online repository of resources developed by teachers that can be customized to local needs and made it available to teachers and students at no cost. Open source strategy is also used to build mechanisms for continuous improvement in government. For example, Melbourne, in the state of Victoria, Australia, used wiki technology to develop the city plan as a shared document to be edited by the public and to create a shared vision for 2020. The strategy is also used to gain customized solutions with minimal investments. An example is the District of Colombia's contest, called "Apps for Democracy," which invited open source applications to convert real-time data from multiple government agencies into accessible and useable format. For a $50,000 investment, the government received 47 applications worth $2.7 million in 30 days (Egger and Singh, 2009, pp. 98–99).

These various forms and strategies of innovation demand leadership and entrepreneurship within government. It takes visionary leadership and entrepreneurship to realize the potential opportunities for innovation and transformation. ICT expertise does not substitute for leadership, entrepreneurship, and change management. Innovation is not requirements-driven, but opportunity-driven.[2]

[2]This may challenge the notion that "necessity is the mother of invention."

## Visions of Future Government

How can the state respond to the forces of globalization and the rising expectations of the information society? How can the state harness the ICT revolution to enable fast adaptation to new global and local contexts, and fast adoption of cutting-edge business innovations and public management reforms?

A starting point is to create a motivating vision of a desirable future government. Visions of the future government should capture cutting-edge practices in reforming government, such as result-based management, putting citizens at the center, and delivering service on demand. They should reflect citizen aspirations for transparent, accountable, and participatory government. Defining the visions of future government should help policy makers and strategists in setting the priorities and defining the uses of e-government and in marshalling the necessary human and institutional resources for the fundamental changes implied by these visions.

An e-government strategy should be based on a holistic vision of public service transformation. An energizing vision of a transformed public service—one that is connected and client-centered—can drive and sustain the intensive coordination and collaboration required from the agencies involved in e-government. This vision should be clearly communicated to all stakeholders, including citizens. Broad buy-in from citizens can be the key in countering resistance from organized groups with strong vested interest in the status quo. Moreover, investments in e-government can have the greatest impact when combined with civil service reform: e-government involves not only introducing ICT-enabled process reengineering, but also transforming the skills, incentives, and culture of the civil service to increase professionalism, collaboration, accountability, and transparency. Achieving these changes requires substantial investment in transforming routines, organizations, and power relations—a long-term investment that can be sustained only with a clear and motivating vision.

Transformation is about creating the future, not perfecting the past. However, taking a future-oriented perspective of e-government initiatives does not mean ignoring current performance problems or urgent needs. Neither does it save leaders from facing the sustained effort needed for transformation. e-Government programs should prepare and enable the government of the future to solve current and future challenges in more creative and effective ways than in the past.

The difficulties of transformation should not be underestimated and must be anticipated and planned for. How can we avoid automating the status quo? How can we avoid reinforcing the hierarchical, stovepiped, inwardly focused, routine-based bureaucratic culture of government? How can we reduce the frequent failures or unmet expectations of large e-government projects? The remaining part of this chapter outlines the visions that are motivating governments to pursue the challenges of transformation. It concludes with a map of the long journey toward true transformation. In the following three chapters, we take further steps toward understanding the tools and frameworks needed to guide this journey and the piloting and sequencing involved.

## *Agile, Integrated, Client-Centric Government*

This vision responds to the imperatives of matching rising expectations, redressing service inequities, rebuilding trust in government, and meeting the standards of a demanding global economy, and doing so within real budget constraints. "Doing more with less" cannot be achieved only by constant reorganizing or sharpening performance management systems. What is needed is a more fundamental change that transcends silos and delivers focused efforts and services through flexible and dynamic networks of agencies or what may be called virtual networked organizations. An agile government will focus on what they can do best and outsource noncore functions to other partners, private or voluntary or local governments who may be better suited for these functions. Public agencies will systematically focus on functions where they add the most value and where customer satisfaction is high, and intelligently outsource others (Fig. 3.1).

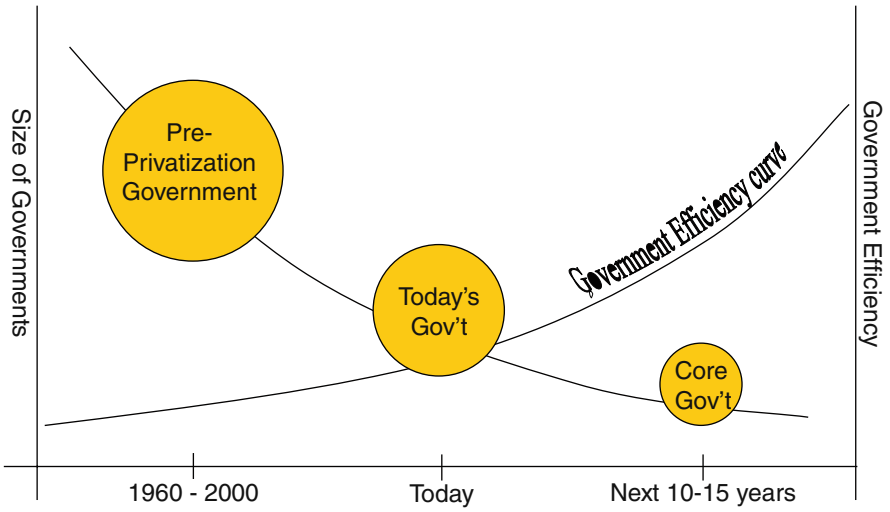


**Fig. 3.1** Outsourcing government. Source: IFC

This vision is not without risk. Outsourcing public services must be managed effectively. Excessive or premature outsourcing, ahead of built-in information, measurement, communication, and accountability systems can be costly politically and economically. However, many developing countries have a long way to go before engaging the full knowledge and innovative capabilities of their partners in the private sector and civil society and thus striking and managing the right balance. Building a virtual networked organization that adapts to changing demands, works closely with other partners, and leverages advanced information and communication systems is a key to enabling an agile and focused government.

e-Government makes it possible to decentralize management structures and virtually integrate together various government agencies. This means moving away

from static, silo-based models of public services to a business model that builds virtual networked organizations to deliver high public value to the citizen (Abramson et al., 2006). The citizen becomes at the center of the network, a partner in the process. Business processes would be standardized across the networked virtual organization and outside partners so as to simplify, unify, connect and collaborate, and create a virtual network ecosystem. The goal is not to move toward an ideal structure but to create a network infrastructure that adapts continually to changing demands and nurtures a network culture that rewards citizen centricity over a silo mentality. e-Government links organizations through both the front-end systems that interact directly with citizens and the back-end systems that manage common business processes such as finance, procurement, and human resources. A whole-of-government approach may facilitate this drive to integration (Chapter 5).

This is a vision of government whose business processes are integrated end-to-end across the whole enterprise and with key suppliers, partners, and customers, thus enabling the government to respond with speed and flexibility (Ramsey, 2004). This is an extended enterprise that aims to increase the productivity of the whole supply chain and uses partners and suppliers to deliver better service and to respond quickly to changing conditions. It extends its basic operating processes to suppliers and clients and contributes to their productivity and effectiveness. According to this vision, business process reengineering in government would extend beyond organizational silos to transform and integrate agencies, jurisdictions, and/or the public and private partners. Leading governments are piloting and mainstreaming such integrated and client-centric processes in areas such as international trade, health care, and one-stop public services.

## *Transparent, Accountable, Engaged Government*

This vision responds to the rising demands for accountability, clean government, quality service, equal access, and citizen participation. Securing quality of public services has been a major challenge in developing countries, especially those services that are targeted at poor and disadvantaged groups (World Bank, 2003). Citizens and businesses are users of public services but, unlike in the competitive market, there is no direct accountability of service provider to the consumer. In theory, the accountability should come through an indirect route: from citizens and businesses (the users) influencing policy makers and, in turn, policy makers influencing public service providers (Fig. 3.2). In reality, however, this scheme often does not work as intended. In many countries, service users have no mechanisms to influence policy makers, while the latter lack incentives and feedback from customers to properly monitor service providers.

Political leaders have three mechanisms that can help provide incentives for public actors to pursue social ends, hold them accountable for results, and restrain corruption and arbitrary action (World Bank, 2000). These mechanisms are: (1)

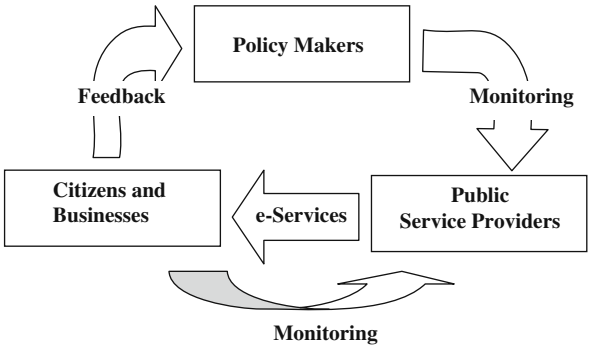


**Fig. 3.2** Framework for accountability for public services

rules and oversight mechanisms within the public sector; (2) mechanisms to promote citizen voice and participation; and (3) mechanisms to promote competition in service delivery. Public sector reform and accountability can be sustained only when government control over public service providers is reinforced by the citizen's willingness and ability to find alternative sources of supply or to exert pressure on the providers to perform.

This vision of a transparent and accountable government may guide the development of e-government strategies in general, and the use of e-government applications to enhance governance and transparency in particular. It is crucial for e-government projects to establish clear standards of performance, feedback, and monitoring channels to ensure openness and accountability. They should also specify and enable the legal, political, and economic means for customers to influence policy makers and providers.

e-Government can enable transparent and accountable public service by introducing and supporting broader consumer choices, better information and monitoring systems, and effective participation. e-Government introduces new delivery channels for services, thus giving consumers choice and some direct influence over providers. Electronic service delivery also provides users better access to information and feedback channels, such as e-mail, online performance surveys, government information online, and forums to lodge complaints, thus helping to hold both policy makers and service providers accountable. The poor are often the victims of petty corruption associated with the provision of basic services, and access to information can help the poor fight petty corruption such as payment for registration for child school enrollment.

e-Government can also enable policy makers to monitor service provision, including outsourced services. Evaluation-based information is a crucial tool for policy makers to be able to monitor providers and encourage innovation and adaptation of services to changing needs. With ICT support, certain services can be subcontracted to private enterprises and NGOs. This enables separating back-end

decisions by civil servants about eligibility for service, from front-end service provision by the private sector or NGO, and establishing contractual relationship with rewards and penalties depending on monitored performance of the providers.

The vision of an engaged government is one where the entire political and policy making processes cater to citizens, from the initial agenda setting, to the policy deliberation, to the final decision making—creating a virtuous circle of participation and democracy. Citizens become true partners in the emerging information society. The promise of e-democracy and e-participation goes beyond electronic voting and extends to transformational engagements. Early examples of the possibilities already used in USA and Europe include webcasting, e-petitioning, e-polling, online consultation, referenda, opinion surveys, negotiated rule making, focus groups, consensus conferences, citizens' juries, and electronic town halls. e-Democracy and citizen engagement have even more varied and wider applicability to local government and local issues.

## *Smart, Innovative, Collaborative Government*

A vision of smart and collaborative government would be responsive to the rising expectations, declining public resources, and increasing global competition. Future government, enabled by ICT tools, will become knowledge-based and intelligence-driven organization. It will increasingly rely on evidence-based policy analysis and formulation. e-Government will become a key enabling tool for simplifying and enforcing regulation. Regulations have become more complex and information intensive. In a globally competitive environment, governments are increasingly concerned about regulatory burdens. Yet, in a globally integrated and volatile markets and fragile environments, smart regulation is essential. The skillful and innovative use of technology should lead to new and more effective approaches to regulation (OECD, 2003b).

There is also an increasing premium on policy agility. Modern information systems and shared databases will enable policy monitoring and policy agility. Real-time reporting will drive real-time policy making. Reports will become increasingly dynamic. They will draw on broad data assets to add context that would inform and transform policy making. Custom-relationship management, case management, document management, and records management will enable rapid, customized, and seamless service delivery as well as provide new capabilities for policy analysis. Seamless, streamlined, and instantaneous reporting would change the context and dynamics of policy development. Information becomes insight, not only informing policy, but also shaping the nature of policy options (Fishenden et al., 2006).

Collaborative technologies will further enable timely and robust policy and decision making. They enable task forces to operate across functional boundaries. They enable staff to work together more effectively. Complemented and supported by knowledge management systems, they can empower teams and accelerate organizational learning. The policy-program delivery lifecycle—research, design, delivery,

reporting, and evaluation—would be transformed when collaborative technologies and interoperable systems would be designed to operate across the whole lifecycle (Fishenden et al., 2006).

Governing by networks represents a synthesis of several trends, combining the level of public–private collaboration characteristic of third-party service delivery with the robust network management capabilities of joined-up government (Glodsmith and Eggers, 2004; Fig. 3.3). Technology is used to connect the network together and gives citizens more choices in service delivery options. Facing interrelated and complex problems demanding collaborative innovation, governments are creating extensive networks to join agencies horizontally and to integrate them vertically. The challenge is how to manage such diverse webs of relationships to create public value. This requires thinking strategically about the options for public–private collaboration and correspondingly the required network management capabilities.

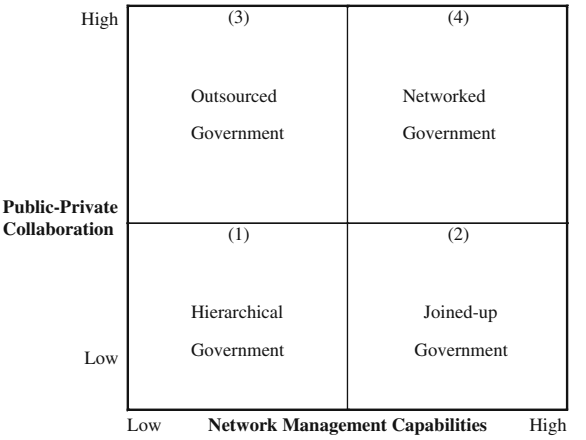


**Fig. 3.3** Thinking strategically about collaborative, networked government. Source: Goldsmith and Eggers (2004)

Public services demand innovation no less than business services. Many OECD governments are differentiating the functions of service innovation and design from service delivery. They are beginning to develop a service innovation agenda (OECD, 2005a). Accordingly, governments are exploring opportunities to use ICT not only to improve the delivery of services, but also to create new services and reach the underserved. This service innovation agenda is not viewed as a technology agenda. Rather, it is a management innovation and transformation agenda. It requires public agencies to work together with internal and external stakeholders on priorities for process and service innovation and on the joint development of existing and new services and delivery channels.

Based on leading practices from the business sector, four network-based collaborative approaches to innovation and problem solving in government may emerge: government as innovation integrator, seeker, champion, and catalyst (Nambisan,

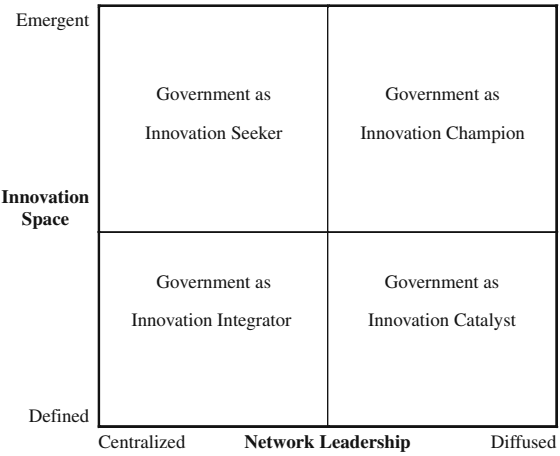


**Fig. 3.4** Approaches to Innovation in Government. Adapted from Nambisan, 2008

2008). These roles vary based on how well the problem or innovation is defined and on whether network leadership is centralized or diffused (Fig. 3.4).

As innovation seeker, government can harness the vast creative potential of the citizenry to create new services or enhance the effectiveness of existing programs. As innovation integrator, government moves from traditional contractual arrangements to enable partners to assume greater risks and rewards for solving well-defined but complex problems. Playing the role of innovation champion, government agency may help bring together the relevant set of partners and steer them toward innovative solutions for the public good in areas like environmental conservation, emergency preparedness, and health care. When the problem is clearly defined and solutions are reached collaboratively and owned by the community, such as crime prevention, governments can be innovation catalysts. All these roles will be increasingly enabled by ICT.

Advances in data-capturing technologies, data storage, and modeling have created opportunities for large-scale analytics (Devenport and Jarvenpaa, 2008). These vastly improved analytical capabilities and business intelligence systems have been tapped by the private sector for fact-based decision making and competitive advantage. Application of analytics and business intelligence, although in its infancy, has significant promise for government to pursue strategic goals in agile and smart ways. For example, it can be used in improving revenue management: revenue analysis, compliance systems, fraud detection, and taxpayer services. It can be applied to supply chain and inventory management in government to identify and eliminate bottlenecks and optimize inventory. Human resource analytics may support forecasting, recruitment, attrition, and strategic staffing functions.

Business intelligence applications and analytics should grow in line with the analytical needs and capabilities required for smart and strategically managed

government. While the opportunities from applying analytics in government appear limitless, they do require more than technological innovation. They require dynamic managerial capabilities. Like other visions of the future government, a smart, innovative, and collaborative government can be enabled by analytics and knowledge management systems, but only when accompanied by leadership, managerial innovation, and strategic orientation.

### *Locally Responsive, Globally Competitive Cities*

The leaders and mayors of many cities have been inspired to envision their cities as: knowledge, innovation, and intelligent cities; cyber, digital, and connected cities; livable and sustainable cities; and global hubs for trade and culture. Every city is potentially an autonomous competitor in a globalizing economy. These visions reflect concerns about competing in a knowledge-based global economy, and opportunities to leverage the role of urbanization in creating innovation economies and information societies. Many cities, such as Singapore and Shanghai, are reinventing themselves to meet global imperatives and regional challenges.

Competitive cities are increasingly regarding investments in broadband networks as compelling as in transport networks. Increasingly, city governments are stepping as a fundamental partner, stakeholder, and investor for connectivity and city-service applications. They are redefining their role as orchestrators of networked information and knowledge-based services, organized around the needs of their citizens and their role in a global and inclusive information society. A responsive, service-oriented local government, enabled by e-government applications, has become essential to competing for foreign and local investment and for attracting a creative workforce for knowledge-based industries and services.

Singapore envisioned itself as an intelligent island. Some cities, like Stockholm, are turning into a wireless hotspot. Shanghai is creating a knowledge city. Several advanced states in Brazil are competing to develop their broadband-connected, service-oriented digital cities. Several Indian states and cities are competing as choice destinations for innovative businesses and globally distributed corporate research. Dubai is reinventing itself as a trade and knowledge hub for its broader region—envisioning and orchestrating initiatives like the Dubai Internet City, Media City, and Knowledge Village.

## The Journey to Transformed Government

The visions of future government, enabled by a variety of ICT uses, may present foreseeable destinations, but not the journey. Exploiting the full potential of e-government involves a long journey that requires sequencing and cumulative learning. Understanding this evolutionary, multifaceted process can be helpful to policy makers in preparing and leading government transformation.

In its most simplified model, the e-government journey may be conceptualized as consisting of four phases. Several models have been proposed to capture this process. In e-business, the mother of e-government, the most basic "e-business ladder" consists of four stages: informate, automate, integrate, and finally, reinvent (Swahney and Zabin, 2001). These steps move along the value chain, from organizing information, to process-level automation, to enterprise-level integration, and to network-level transformation.

A corresponding conceptual model of understanding the e-government journey has been proposed first by Gartner Research, with many variations and adaptations since, by IBM and others (Ramsey, 2004). Figure 3.5 outlines the phases of e-government evolution as they relate to the degree of technological and implementation complexity and value delivered to the end users—citizens and businesses. The proposed model suggests four phases: publish, interact, integrate and transact, and transform. This model is applicable to all levels of government: national, provincial, municipal, and local.

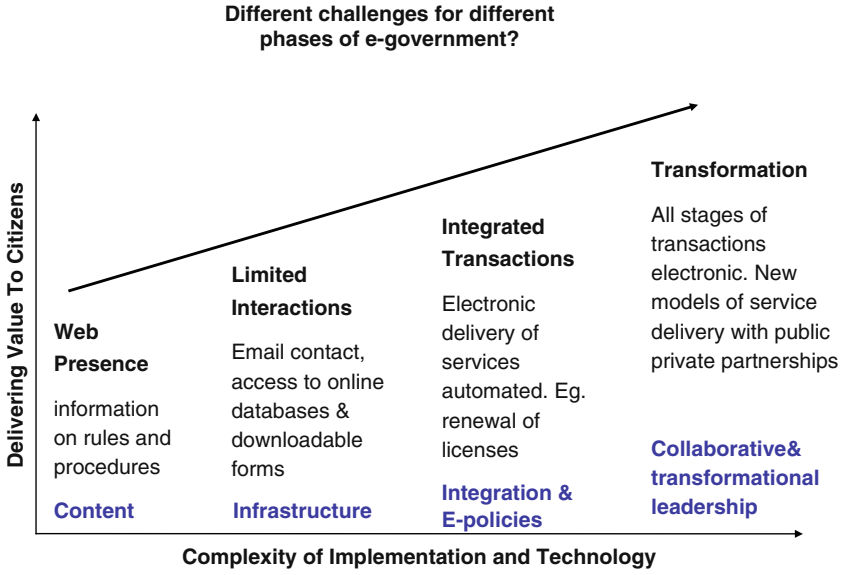


**Fig. 3.5** e-Government evolution

Each phase of e-government has its own challenges and payoffs: content, infrastructure, policies for integration, and collaborative leadership. These phases are not strictly sequential. Advances on all phases may be possible for different parts of a single government. Opportunities for leapfrogging several phases are possible for latecomers as technologies advance and lessons of experience accumulate. Advanced phases of integration and transformation are substantially more difficult to reach and may take decades of concerted efforts at the national level.

The web *presence or publish phase* is characterized by putting government information and services online. It provides forms and lists of services online. This is relatively easy since it can be done with little interaction or coordination with other

departments.[3] But even this seemingly simple step can be a valuable quick win and can make significant difference in the lives of citizens and small businesses who typically suffer from the prevailing scarcity of information about public services and government regulations or requirements to access such services. Making such information and services available 24 h a day, 7 days a week, for all year, is a big step forward—particularly given the alternatives of waiting in long lines at inconvenient times and locations at many agencies to seek information or get service. During this phase, few resources are needed to provide direct support to customers and government can reduce the costs of traditional provision of such information. This stage also includes "push" systems that send information to users via e-mail, SMS, or disseminating content to mobile phones.

This phase is further advanced as government aggregates content and services in ways that make it easier for users to find information from multiple web sites hosted by different ministries. For example, New Zealand has created a site on "things to know when," which provides access to content and services based on activities such as "starting a school" or "having a baby." Australia enables users to browse by subject. Even more advanced portal applications provide "personalized" content. For example, Singapore enables users to create their own "my government" web pages, configuring e-government content based on their individual needs and interests (www.egov.infodev.org).

During this phase, government focuses on providing relevant, reliable, timely, and accessible content. The various types of content can be presented through "portals" which aggregate and organize content. Portals and "publish" web sites, that is, the front-end facing the user, may be supported by back-end systems called content and data management systems. The quality of publish web sites depends on the amount of content, its usefulness, and how often it is updated, as well as navigability, usability, search capacity, accessibility, and download time.

Even at the publish phase, governments can initiate process reform or simplification measures. For example, rather than merely creating electronic versions of existing paper forms, publish applications present an opportunity to reexamine processes. Process reengineering may eliminate some forms altogether and streamline the steps in an administrative procedure, thereby simplifying both online and off-line processes.

The *interact phase* is when government organizes front-end interactions with clients for better access to services. Users may interact with public officials, such as by commenting on proposed regulations, engaging in e-consultation and e-decision making, or filing corruption complaints. As agencies move services online, a confusing array of web sites emerges, making it difficult for potential users to find the right site for particular service. Online presence for various services and agencies is, therefore, consolidated into portals and organized along life cycles and/or user groups.

[3] Web sites may follow a centrally defined format to provide common experience for users.

In this phase, government focuses on improving the infrastructure to ease access to information and services. The portal acts as an index to help customers navigate to the correct site and becomes a gateway to the increasing sources of information and transactions on the Internet. Portals are designed and optimized to reduce the number of clicks needed to find information or complete multistep transactions—by grouping functions and employing user-friendly terminology, among others. More advanced applications in support of the second phase may include searchable databases, powerful search engines, content management, and knowledge management systems. The central government of Canada, for example, used customer focus groups to make the portal user-friendly in terms of organization and terminology.

Countries may take different routes to front-end integration of information and services. Governments may rely on information intermediaries through citizen assistance service centers, as in Bahia, Brazil. In Bahia, each of these centers provide over 500 services from the federal, provincial, and municipal governments—citizens see one face of the three levels of government. This intermediary step may be necessary for some developing countries where individual access to Internet is low, e-literacy is limited, and integration may take a long time to realize.

The first two phases may be characterized as access phase. The challenge of the first phase is providing relevant and timely content, and the second, the infrastructure to organize and make access easier and user-friendly. Most governments in developing countries are still building some part of an intelligent infrastructure that improves access as well as the processes to generate relevant, reliable, and timely information.

Even in early stages of online presence, there are many steps to achieve sustained improvement. An evaluation study of government web sites in Malaysia shows that while the overall e-government is ranked relatively high on the UNPAN's and Accenture's lists (as interactive presence and platform builder, respectively), Malaysian web sites suffer major deficiencies when assessed in terms of currency, reliability, interactivity, privacy, responsiveness to inquiries. They also suffer in terms of quality and functionality of web sites at local government levels and the availability of local content in local language. They served little and stale information (e-Gov Magazine, Volume II, Issue 3, 2006, pp. 8–12).

The *integrate and transact phase* is when citizens and businesses can complete transactions online, such as filing tax returns or applying for government jobs. The focus shifts toward redesigning and integrating back-end processes to provide responsive, customer-centered services. Completing transactions fully online also requires the development of policies for privacy and confidentiality, e-authentication, linkages to legacy systems, business process reengineering, relationship and channel management, and institutional and skill changes, among others.

Applications that involve complete transactions are several steps (and in some cases, a quantum leap) above just providing information or forms to download. Implementation will neither be simple nor cheap. Consequently, transacting such services may require significant changes in back-end or core processes of

government and government workforce. Success also depends on responding to the needs and capabilities of the intended users.

Internal integration across government agencies may also progress in several steps. Cross-agency virtual integration may start with internal support functions (common business processes, lines of business) like finance, human resources, and public procurement. Later projects may integrate mission critical processes that directly support the customer. Integration may proceed faster among the more advanced agencies or clusters of departments with common clients or needs. Government begins to function as a cohesive unit and employees are in a better position to collaborate.

A "Transact" web site makes government services available at any time from any Internet-connected computer or mobile phone. Traditionally, government services may have required long waits, confrontation with stifling bureaucracy and the occasional bribe. Innovations such as citizen service kiosks located in shopping centers in Brazil or smart mobiles and portable computers that can be shared in rural India bring e-government directly to the citizens.

The stage of fully integrated and transformed government is more of a vision than a reality of any existing e-government so far. It represents a new and expansive view of e-government, along the visions outlined above. It embraces the power of end-to-end integration in an extended enterprise and the optimization of the whole supply chain. Suppliers, partners, and customers begin to change their own ways of operating and collaborating. Business process reengineering is extended across the public and private sectors. New applications and services are created, with innovations driven by customer experience. This phase is enabled by open standards, modular IT infrastructure, and modular business processes (Ramsey, 2004).

Challenges and priorities change from one phase to another, demanding higher levels of leadership, institutional coordination, process innovation, and technology management to deliver higher value to customers. Each phase involves several levels or degrees of execution. Some simple solutions can deliver substantial value if they are well targeted and executed. For example, online downloadable official forms decrease the amount of time businesses have to spend in dealing with the government, reducing compliance costs and improving overall business environment.

As government moves to the integration and transformation phases, enabling policies and cultural change become essential, and leadership challenges more demanding. Leaders must take active role in driving change, setting new expectations, and bridging silos within government, then extending outside to all key partners. A transformation map would align culture, human resources, business process transformation and IT infrastructure in support of a clear vision of future government. While these later stages are much more difficult to implement than earlier phases, they offer increasingly significant payoffs.

Can this evolutionary process be accelerated? Can a government leapfrog some of the early phases? Yes, with caution. For example, the transact phase usually requires more investment in integration and back-end capabilities than the interaction phase, and government may opt for integrating both front-end delivery

and back-end processes at the same time. An e-government project may have activities covering more than one phase, ranging from web presence to back-end process reengineering and integration. All four phases may be implemented simultaneously in different parts of the government, depending on the e-readiness and leadership commitment of various concerned agencies. Government may also continue to improve its web presence and deepen its publish applications, even while implementing projects in the transact and transformation phases.

A mix of leapfrogging and evolutionary approaches can accommodate constraints in implementation capacity while promoting results over the short and long term. Few governments in developing countries can afford to leapfrog to full integration of all public services or deep transformation of all agencies. Instead, they may select a few promising entry points—key services with a broad impact—for reengineering and full integration. In going straight toward transformation of key functions, governments would build on lessons learned from others. But pursuing transformation, with the corresponding complex back-end process reengineering and change management, will still take time. In the meantime, many other services could be improved through an evolutionary process of small steps and incremental quick wins, perhaps starting with publishing relevant priority information.

# Chapter 4
# Uses of e-Government

Development challenges, best practices, and visions of the future should help define the broad objectives of public sector reforms and transformation. In turn, reform objectives should guide the process of transformation and the use of information technology to enable this transformation. Visions are intended to support coalition formation and mobilize demand for reforms. By deriving ICT uses from public sector reform objectives, governments may avoid supply-driven approaches and promote alignment between ICT investments and public sector reform and development objectives.

This chapter continues the vision-driven and future-oriented perspective of transforming government outlined in last chapter by proposing a framework that links the potential uses of ICT in the public sector to key reform and governance objectives. We classify and illustrate e-government applications in terms of enabling public sector reforms and development outcomes: increased efficiency and effective resource management; improved access and quality of public service; improved investment climate and private sector competitiveness; enhanced governance, transparency, and accountability; and improved policy analysis and knowledge management. Our aim is not to provide a comprehensive coverage of e-government applications, but to draw the attention of policy makers to the strategic options available to use e-government to pursue sector reform and development objectives.

Traditionally, e-government applications are categorized in terms of users or target clients being served (Fig. 4.1, adapted from Heeks, 2002). These categories include improved government services to citizens (G2C); improved transactions between government and business (G2B), leading to improved business environment and a viable SME sector; and improved internal government management through integration and coordination across government agencies (G2G) and informed and empowered employees in the public service (G2E).

I propose a framework that classifies e-government uses and applications in terms of enabling public sector reforms: increased efficiency and effective resource management; improved access and quality of public services; improved investment climate and business sector competitiveness; enhanced governance, transparency, and accountability; and improved policy making and knowledge management. This may be captured in Fig. 4.2.

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_4,

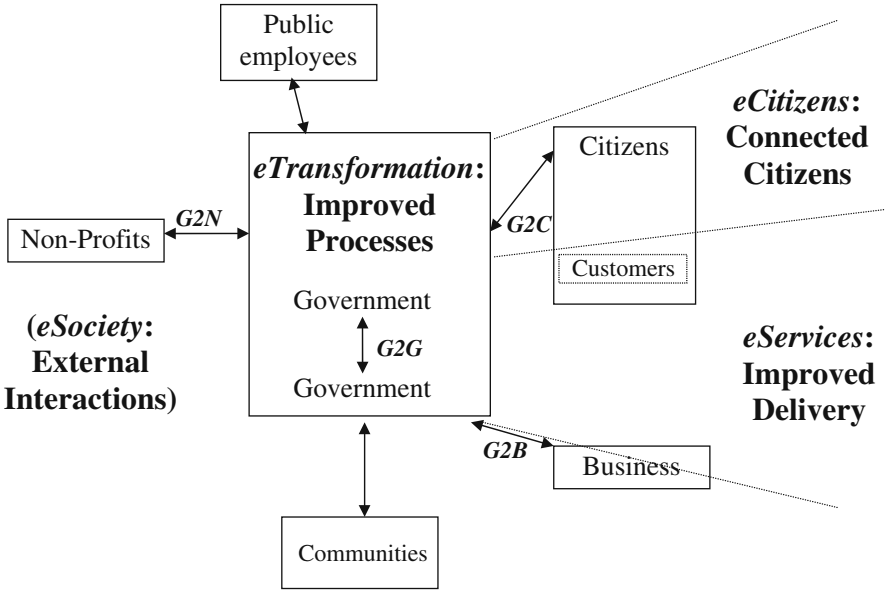


**Fig. 4.1** Relating e-government applications to user or target groups

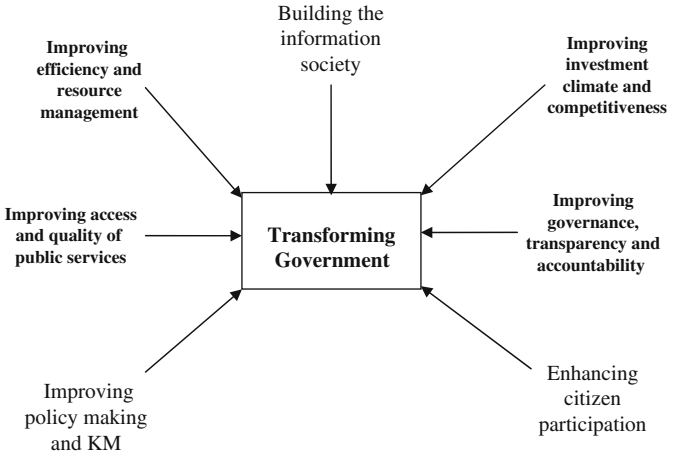


**Fig. 4.2** Reform objectives of e-government

A framework for e-government that links uses and applications to reform objectives and development outcomes offers several merits as it:

- promotes demand-driven, not technology or supply-driven uses of ICT in government;

- focuses on the broad objectives and common challenges of public sector reform, and thus help mobilize political and social demand for effective use of ICT in government;
- identifies those applications that can potentially support multiple public reform objectives, so as to leverage their uses simultaneously for these objectives (for example, to use e-government procurement, to improve resource management, increase competitiveness, provide transparent pricing, reduce corruption, improve the business environment, and enable participation by large number of local enterprises and SMEs);
- identifies gaps in current ICT application and support to key reform objectives, and opportunities to expand the possibilities and strategic options of using ICT to deliver new services and higher value-added via old and new channels;
- bridges the gap between policy reformers and development practitioners in the field of public sector management, on the one hand, and e-government and ICT specialists, on the other, starting from the common language of development and governance; this should facilitate effective communication among managers of development, business process and technology, and the alignment of ICT investment with development objectives.

Table 4.1 gives an overview of the widely agreed public sector management reform objectives in developing countries and the uses of ICT to enable these reforms. Many e-government applications span across several objectives and uses. These are only illustrative since ICT applications are growing in diversity and their uses are increasingly spanning the fundamental objectives of public sector reforms.

**Table 4.1** Reform Objectives, ICT Uses and Common Applications

| Reform objectives | Uses, impact | Applications, solutions |
|---|---|---|
| Improving efficiency and resource management | Focusing and downsizing | Outsourcing public services delivery to private sector |
| | Reforming civil service human resource management | HR management systems; HRIMS; payroll, talent management system; e-training systems |
| | Improving financial resource mobilization | Tax administration modernization; Tax policy analysis |
| | Improving expenditure management | Integrated financial management systems (IFMS) |
| | Reforming public procurement | e-Government procurement; contract management |
| | Improving physical resource planning | Geographic information systems (GIS) for physical planning and urban management |
| | Improving government processes | Process simplification; Process reengineering |
| | Improving coordination and program management | Management information systems |

**Table 4.1** (continued)

| Reform objectives | Uses, impact | Applications, solutions |
|---|---|---|
| Improving access and quality of public services | Improving quality and reach of public services | Integrated and client-centric portals |
| | | e-Services delivered via telecenters to rural and underserved population |
| | Reducing transaction costs to citizens | Issuing online permits, licenses, certificates, visas, grants, land records |
| | | Social security modernization e-health, e-education, e-pension, e-employment |
| | | Providing one-stop service center |
| | | Single window; e-citizen portals |
| | | Government call center (311): single number to access all government information, services, assistance. |
| | | Remaining connected to government info and services thru mobile |
| | | Developing client-focused content for categories of population |
| | Providing choice and competition in service delivery | Customer relationship management and intelligence tools; analytics; performance metrics |
| | | Outsourcing services to private sector and NGOs; monitoring service-level agreements |
| Improving investment climate and business competitiveness | Reducing transaction costs to business | e-Registration |
| | | e-Reporting |
| | | e-Permits |
| | | e-Taxation |
| | | e-Procurement |
| | Supporting entrepreneurship and small enterprise development | Online business support services |
| | | Portals for SMEs |
| | | Portals for microfinance |
| | | Online land and mortgage Info |
| | | Online legal and regulatory info |
| | Facilitating international trade | e-Trade network |
| | | Port and customs modernizations |
| | Meeting global standards | IPR database |
| | Promoting private investment in public infrastructure and delivery service | Portals for investors, FDI |
| | | e-Finance, credit info database |
| | | Private investment opportunities in public info infrastructure and services e-government procurement |

**Table 4.1** (continued)

| Reform objectives | Uses, impact | Applications, solutions |
|---|---|---|
| Improving governance, transparency, accountability and participation | Fighting corruption through transparency, e.g., budget monitoring by citizens, making procurement open and transparent | e-Budget and financial performance monitoring, accessed at local levels |
| | Promoting performance management; Tracking decisions and outcomes | Results-based management systems; scorecards; performance rating of public agencies |
| | Engaging citizens in policy development and reform | e-Participation, online discussion forums, public e-mail box, online surveys; e-voting |
| | Promote effective decentralization | e-Cities, e-municipalities; municipal management systems |
| | Promoting the rule of law | e-Courts; e-justice<br>Legal portals |
| Improving policy making and knowledge management | Improving policy formulation and implementation, including macroeconomic management | e-Cabinet: document management systems; decision support systems<br>e-Parliament |
| | Building public sector analytical capabilities | Modernizing national statistical systems |
| | Leveraging knowledge resources and sharing best practices | Business intelligence systems; data mining; knowledge management systems; communities of practice networks |

The following illustrates the innovative ways countries are implementing e-government in support of various public reform objectives and the range public services that can be made accessible online.[1]

[1]There are thousands of examples of successful e-government applications in both developed and developing countries and several compilations of case studies and links to e-government projects. InfoDev's e-government toolkit (www.egov.Infodev.org) provides many examples and resources covering e-government services and applications. UNDESA "Compendium of Innovative e-Government Practices" has been issued in two volumes: Vol. I (2005) and Vol. II (2006). Another is the e-government library and other resources of the United National Online Network in Public Administration and Finance (UNPAN). A third useful resource is the UN's annual Global e-Government Readiness Reports (published annually since 2004) which provides both quantitative measures and illustrative examples of successful e-government projects. Finally, the e-Government Good Practice Framework compiles examples of portals, services, and resources from the developed countries of the EU.

## Improving Efficiency and Resource Management

Reform objectives to improve efficiency and resource management in government are at the forefront of the development and competitiveness agenda of many countries. Pressed by increasing budgetary constraints, rising expectations and demand for services and accountability, and meeting the imperatives of a global economy, governments are seeking to become agile, to promote managerial flexibility, and harness their financial and human resources for an increasingly challenging development agenda. This is an area where ICT has made substantial contributions in the finance and private sectors, and where the potential is vast and relatively untapped for the public sector.

Public reform objectives of improving efficiency and resource management can be enabled by ICT uses and applications that: (1) focus and downsize government through increased employee productivity; (2) systematic outsourcing and partnerships with private sector and civil society; (3) improve public resource mobilization and expenditure management through tax modernization and integrated financial management systems; (4) improve human resource management information and processes and facilitate civil service reforms; (5) increase competitiveness and reduce transaction costs of public procurement with electronic procurement applications; and (6) simplify and reengineer government processes.

e-Government can also improve efficiency and reduce costs to government by improving supply chain management for goods and services, enable more efficient markets, reduce travel and training costs, reduce fraud, automate many routine transactions, consolidate field offices and reduce duplication, and improve program coordination and management. But realizing these benefits is not automatic. It requires strategies to boost take-up rates of e-services, and holistic approaches and complementary managerial innovations to make manage the costs and capture the benefits, as will be discussed in Chapter 6.

Most common of ICT applications in support of efficiency and resource management are those concerning financial resource mobilization and expenditure management, including treasury systems, tax and customs administration, and integrated financial management systems (IFMS). Integrated treasury systems, for example, offer significant benefits in managing public resources, including real-time information on the funds available to the state, greater financial control, improved financial transparency and accountability, better reporting at various levels of budget execution, sound planning for future requirements, and better data for budget formulation. Introduction of IFMS can provide the backbone to broad managerial improvement and government transformation. Pressures from the global financial system, aid agencies, and the Ministry of Finance often make IFMS applications an attractive entry point for ICT-enabled policy and institutional reform.[2]

[2]Including meeting standards prescribed under various international standards and codes, such as the IMF code of good practice on fiscal transparency—Declaration on principles and the fiduciary standards of the World Bank. Of course, these systems are only enablers and not a substitute for the necessary and accompanying policy and institutional reforms.

Tax administration, tax policy analysis, and taxpayer services are being transformed under e-government programs. Peru's National Superintendent of Tax Administration initiated an online tax payment system in 2003. The social security and health systems of Peru are also part of the system. The system is credited with significantly increasing the efficiency of tax administration. For example, it identifies and automatically rejects incomplete returns, reducing the number of returns that require verification and correction. Argentina and Brazil also have e-tax systems allowing both individuals and businesses to submit tax returns online. More advanced online filing systems, as in Chile, precalculate the taxes due and allow the tax payer to just accept the filled-out forms based on payroll deductions and other automated tax payments, or to modify as needed. This saves time and avoids filer mistakes.

The challenges and benefits of the use of ICT in tax modernization do not start or end with tax reporting and payment. In fact, much of the benefits come from the quantum leap in administrative reforms and productivity increases that result from transforming back-end processes to enable both within government productivity increases in administering and processing taxes as well as improvements in services and reduction in transaction costs to businesses and citizens. It also has the potential to improve tax policy analysis, compliance, and detection of tax fraud.

Human resource management is a relatively underdeveloped area of public sector management, even though it is essential both to realize substantial gains in productivity, to align incentives and learning to reform goals, and to enable overall change and transformation of government. The integration of human resource management functions such as competency-based training and promotion system are enabled by interlinked ICT applications: HRM system, learning management system (LMS), learning content management system (LCMS), e-training, etc. Given the poor state of information on the civil service of many developing countries, these applications could offer powerful tools and a quantum leap to government capacity to analyze, reform, and manage a modern civil service.

Another area of increasing attraction and potentially vast efficiency gains is e-procurement by government or e-GP. This is one application that has been successfully implemented in several developing countries with a wide range of benefits. Experience so far suggests that electronic procurement can save as much as 20% of the costs of publicly procured goods and services. This can amount to half the annual budget of education or health of Latin America. Electronic public procurement can widen competition, reduce prices, lower process and inventory costs, increase transparency, reduce corruption, speed transactions, and support procurement policy analysis and public financial management.

In both Andhra Pradesh of India, and Chile, e-government procurement led to an initial 5% savings in the total public procurement bills—substantial savings in view of the small investment costs involved in establishing these systems. In Andhra Pradesh, the tendering cycle was also shortened from an average of 120 days to 32. No capital costs or project risks were borne by the state government since the project followed a public–private partnership model where the private sector

partner was expected to generate its revenue from transactions fees in the context of a well-designed service-level agreement. In Brazil, an e-procurement system, at $1.6 million cost, enabled savings of $107 million for the state in 2004 alone, and an estimated savings of $35 million for suppliers using the fully automated tendering (Crescia, 2006).

Chile's e-procurement system is often cited as a success. It is credited with making government procurement more transparent, reducing businesses' transaction costs, enhancing cooperation between firms and public agencies, and reducing opportunities for corruption. Under Chile's e-procurement system (*Chilecompra* or Chile buys), companies that wish to do business with the public sector only need to register one time in areas in which they do business. Whenever a public agency needs to purchase goods or services, it will fill out a request in the electronic system, specifying the kind of operation and including all the documentation and information associated with the request. Automatically the system sends an e-mail to all the private companies registered in that area, minimizing response time and providing an equal opportunity for all firms. At the end of the bidding process, the results are provided online, including details on the participants, the proposals, the economic and technical scores, and the winning contractor.

Although the benefits from e-procurement can be clearly measurable and even dramatic, and thus attractive to private investment or PPP, these benefits are not automatic (Box 4.1). Realizing the payoffs depends on, among others, complementary infrastructures, supplier incentives, user capacity building, coalition building, and change management. For example, despite years of effort and investments since 2001, the use of e-procurement system in Malaysia has been very low and the benefits far below potential, for various reasons (E-gov Magazine, Volume 3, Issue 4, April 2007, pp. 8–13). To become e-procurement enabled, suppliers must pay for smart card, training software renewal, and other costs that in total may be unaffordable to SMEs. These suppliers face challenges in using advanced systems, including lack of bandwidth support, poor information systems infrastructure, and relevant skills. Traditional small suppliers are slow to change their mind-set and embrace new ways of doing business. Although the supplier community is encouraged to be part of the e-procurement community, this requirement has not been made mandatory. More broadly, the e-procurement initiative in Malaysia lacked a holistic vision of procurement reform, a clear strategy for change, and active and continuous promotion, and education.

## Box 4.1 e-Procurement and the Political Economy of Reform

Realizing the benefits from e-procurement requires understanding of the political economy of reform. One interesting example of mobilizing demand for reform of public procurement is the Philippines. The legal foundation for procurement was fragmented, with over 100 laws and regulations. A new omnibus

law was needed to bring clarity and predictability to the process and to provide the enabling environment for investing in e-procurement systems. The law, enacted in 2003, was the result of determined efforts of officials allied with unified advocacy efforts of civil society organizations (CSOs), designed to offset entrenched vested interests. Passing laws and investing in systems, however, are not enough to secure the intended results. Credible enforcement and oversight institutions are essential. In this case, all bids and awards committees must have at least an observer from certified CSO. To enable CSO to fulfill their role, CSO observers have received extensive training.

The e-procurement application may illustrate the critical success factors for e-government applications in general. These factors include both demand and supply factors, with the most determining factors on the demand side. On the demand side, strong political leadership and commitment, sustainable coalition for reforming public procurement, and fighting corruption are essential. This support must materialize in terms of appropriate procurement laws and regulations, and social, political, and judicial oversight to make sure the laws are applied, and transparency enforced by e-procurement. The Ministry of Finance, parliament, and civil society organizations can be crucial allies to secure value for public money.

On the supply side, e-procurement should be developed in line with local capacity for institutional and technological change—fitting into the technological and connectivity infrastructure of government, phasing implementation in line with political commitment and the e-readiness of various government agencies, and accompanied with process reengineering, providing incentives and managing resistance to change, training and communicating with the middle-level managers involved in procurement, outsourcing, or partnering with the private sector as may be appropriate, mandating the publication of tenders, and developing mechanisms for enforcement of regulations and resolution of conflicts.

## Improving Access and Quality of Public Services

Applications of e-government to improve access and quality of public services are the most politically popular in developing countries. This is understandable in view of rising expectations for better public services, the huge deficits in access and quality of such services in developing countries, and the high transaction costs of dealing with unwieldy bureaucracies. Service delivery, particularly when delivered in person, is an expensive part of government work. Governments often face the difficult trade-off between improving service quality to those who are better off, mainly in the urban areas, and extending access to those with limited or no access, particularly the poor, rural areas, and SMEs. e-Government applications can deliver on both quality and access.

There is also the political imperative for public sector leaders to use visible service improvements to build external support for broader government reforms. This support could come from business associations, private groups, organized citizenry or, more broadly, the electorate. Unlike using e-government for transparency, participatory democracy, and other visions, an initial focus on service improvement is the least threatening to the social and political status quo. An emphasis on service delivery can be a neutral entry point to build longer term political support for performance improvement and government transformation (West, 2005).

This is a rich category with many examples of innovative applications to: (1) improve quality and reach of basic public services to rural areas and underserved populations including land titles, permits, licenses, permits, certificates; (2) support health, education, and lifelong learning; (3) provide choice and competition in service delivery through information brokerage and the use of public–private partnerships; and (4) substantially reduce transaction costs to citizens by providing one-stop service centers, single windows, and citizen-centric portals, among others.

Around the world, government portals are providing points of entry for reshaping, reorganizing, and recreating governments—virtually. Appropriately organized around citizens' needs and increasingly made amenable to citizen-driven personalization, these portals usher the era of seamless government, or "government without walls" (Eggers, 2005). Accordingly, citizens and business can transact with multiple agencies and multiple levels of government in a single place or portal. Web presence of government is organized around terms familiar to citizens, like life events or target groups, thus eliminating the need for citizens to decipher the increasingly complex and incomprehensible organization of governments.

e-Government can also help citizens make informed decisions by sharing and widely distributing the information they collect about the public and private sectors. One of the most vital roles for government in the information society is to act as information broker. The internet, and information kiosks in the case of developing countries, can facilitate this role by aggregating and distributing information about access, quality, and price of any service, public or private. For example, some state governments in the United States have compiled online report cards on schools to enable parents to make informed choices about their children's educational options, and at the same time, to expose schools to public pressure for improved performance (Egger, 2005). One study of several states in the United States indicated that publication of state "school report cards" correlated with improvements on National Assessment of Educational Progress (Hoxby, 2001).

Other ways to facilitate markets and improve choice is to deploy eBay-like feedback mechanisms to allow consumers of public services to rate various services and providers. Similar public report cards have been introduced online for hospitals. Similar surveys have been developed by NGOs for a few Indian cities to rate the services of local public agencies had a perceptible impact and can now be extended and shared online and at kiosks.

For many citizens in developing countries, information on quality and cost for many services is not available or costly to obtain. The poor suffer the most from such information poverty, as producers and consumers. Making such information

available through the Internet and kiosks or infomediaries could help citizens weigh choices and allow better match and flexibility to meet diverse needs and preferences. In some service areas and for some special populations, navigators or special guidance systems may be needed, and electronic matching systems may provide such guidance to facilities to match the needs. Publishing public data, transactions and services on the web, allow other government agencies, the private sectors, NGOs, and other infomediaries to integrate, package, or customize the information and services into their own service offerings, thereby providing additional choices and pathways into services.

The range of "e-Services" applications is broad and expanding rapidly in many countries. Initially, they may cover online versions of high-priority transactions that citizens or businesses must engage in with central, provincial, local, and municipal governments. In 2003, the EU identified 20 e-services as common priorities (Table 4.2).

**Table 4.2** Public Services Online in the EU

| Government to citizen | Government to business |
|---|---|
| Income taxes | Social contribution to employees |
| Job search | Corporate tax |
| Social security benefits | Value Added Tax |
| Personal documents | Registry of a new company |
| Car registration | Submission of data to the statistical office |
| Application for building permits | Customs declaration |
| Declaration to the police | Environment-related permits |
| Public libraries | Public procurement |
| Birth and marriage certificates | |
| Enrollment in higher education | |
| Announcement of moving | |
| Health-related services | |

Source: European Commission, http://ec.europa.eu/pol/infso/index_en.htm, p. 16

In developing countries, a wide range of basic services is in demand. Examples include: driver licensing, automobile registration, land and property registration, birth registration, procurement, invoicing, employment, education, professional training, pensions, health services, tax reporting and payment, customs, and immigration and border control. Popular services include school and exam results and health services appointments. In the case of Mexico, the federal government identified high-impact services—those services most important and heavily used. These are classified by themes, based on users' needs and the rule of 80/20—20% of the most relevant information or services are looked up and used by 80% of clients. Examples are passport appointments, job applications, health insurance, driver's licenses, labor rights, and information on women's health. In Brazil and South Africa, as in many developing countries, public safety is a major issue, and in response, some of the emerging uses of ICT include online crime reporting, police electronic records, and GIS crime mapping.

In the context of developing countries, many of these services may require significant improvements in back-end processes to provide reliable service and completed transactions. The challenge in developing countries is not only to put services online, but also to carry out the internal process transformation and integration necessary to enable complete transactions of such services. This calls for prioritization and sequencing of e-services to ensure that the transformation process is not aborted by limiting e-government to web presence or window dressing.

The e-Seva service of the state of Andhra Pradesh in India provides citizens with a wide-spectrum of services ranging from the payment of utility bills to registration of motor vehicles. In Karnataka, India, the Bhoomi land registry system has automated 20 million land records since its inception in 1998, yielding benefits to farmers, financial institutions, and public officials. Farmers, for example, can quickly get their land records from kiosks and are protected from harassment and extortion. Whereas getting records formerly entailed a delay of up to 30 days, farmers now get their records in less than 2 minutes. In this as in other e-government projects, benefits include not only increased efficiency but also reduction in opportunities for corruption: Making government services available to citizens in a transparent and efficient manner can also empower them against corrupt and arbitrary bureaucratic action.

Provincial, local, and municipal governments are also offering localized and specialized government services. India is moving in a big way to support municipal governments to provide services, using a common suite of applications under the National Mission Mode Program for municipalities, and covering birth and death registration and other 40 types of certificates or permits delivered through a single window system, property billing for all services within the jurisdiction of the Urban Development Authority, property taxes, water billing, and complaint monitoring system, among others. Examples of already developed municipal sites include the city of Bangalore, India, India's Andhra Pradesh province, and the Varna district in Bulgaria. Peru's "Public Window" system gives citizens in three cities the ability to learn how their local governments are structured, to access information on municipal officials, to see how public funds are spent, and to obtain information on procedures for obtaining a birth certificate, restaurant permit, and other official documents. The UK national government has provided resources to help local governments create their own e-government sites.

One of the rare surveys of rural users of e-government, in Madhya Pradesh, India, found the following services most in demand: personal documents, including birth, marriage, and death certificates, land registry or cadastral services, anticorruption complaints and other grievances with public services, and transportation-related services, including car registration and purchase of bus and rail passes.

## Improving Investment Climate and Business Competitiveness

The imperatives of growing in globally competitive economy are driving governments to improve their business climate and provide effective support services

to their SMEs. Public sector reforms to reduce transaction costs to business, to support entrepreneurship and SME development, and to facilitate trade are significantly enabled by e-government applications.

e-Government offers many ways to improve the investment climate and business competitiveness. One broad area of application is to use ICT to streamline administrative procedures so as to reduce transaction costs between business and government. Electronic public procurement, for example, is an area where results can be demonstrated early and clearly in terms of efficiency, agility, and transparency. Another broad area of e-government applications aims to provide business support services and facilitate access to finance to SMEs. Investment promotion may be supported by applications to provide access to information on policies and regulations for investors. We illustrate these two types of applications.

## *Simplifying Government-to-Business Transactions*

One broad area of applications is to use ICT to streamline administrative procedures so as to reduce transaction costs between business and government. Businesses and investors in developing countries are often frustrated by inefficient and bureaucratic public sector, by high barriers to entry because of cumbersome, costly, and lengthy start-up process, and by corruption and red tape. High transaction costs are particularly detrimental to small businesses and small investors with limited resources to pay such costs or to avoid them. Using the business process cycle concept, ICT applications in government of special importance to improving business environment would include:

- e-Registration—to reduce time and costs of business registration process, and thus lower barriers to entry;
- e-Taxation—to improve revenue collection and enhance the efficiency and transparency of the public tax system;
- e-Reporting—to simplify enterprises' business reporting to various government agencies and improve data collection.

A key application to expanding business opportunities and enhancing overall competitiveness is e-government procurement. Beyond improving efficiency and transparency of government procurement operations, e-procurement can be designed to reduce the transaction costs to business suppliers, promote competition among a larger pool of suppliers, and broaden the participation of SMEs in public procurement. Electronic public procurement is an area where results can be demonstrated early and clearly in terms of efficiency, agility, and transparency. Whenever a public agency needs to purchase goods or contract a service, the system can automatically send an e-mail to all the private companies registered in that selected area, thus minimizing response time and providing an equal opportunity for all the firms (Box 4.2).

### Box 4.2 Compranet, a National e-Procurement System, Mexico

e-Procurement by Mexico's Federal Government was launched in 2002. Reportedly, the e-procurement system manages 80% of all Federal Government acquisitions. Compranet system has been so far largely successful in cutting administrative costs related to the whole procurement process. Consequently, the following data reveal the great potencies of an e-procurement system:

- Costs for administration of procurement and costs of items procured have been cut, with typical estimates of savings of around 20%
- Around 25,000 suppliers make use of Compranet, and many state and municipality governments have joined the system.
- Participation costs for business appear to have fallen, and small/medium enterprises from outside the capital region have joined in the procurement process.

Largely as a result of Compranet, a cultural change is underway: a large number of SMEs and public agencies have begun the process of computerization, e-commerce intermediaries have appeared, and overall, ICT is increasingly perceived as an agent of change.

Interactive online business registration system greatly simplifies the application processing and increases the speed of the business registration, which currently can take more then 100 days in many developing countries. Even in the absence of e-signature infrastructure and electronic payment system, investors may be given the possibility of downloading the necessary forms and conducting name searches online. The key is to provide a single platform allowing businesses to retrieve information and/or register with all the relevant public agencies, such as the State Statistical Office, Agency for Payments, the Tax Authorities, Customs Authorities, etc.

Online taxation systems can be introduced to enable taxpayers to submit online tax reports and make secured tax payments. It would bring major changes to the taxation process, relieving taxpayers and tax agencies from heavy workloads and improving the overall efficiency. The system ultimately results in economic and social benefits for all the players involved—taxpayers (enterprises and individuals), tax bureaus, and banks.

Municipalities play a key role in shaping the business environment through business process simplification, particularly for SMEs. Lessons should be drawn from using ICT to accelerate and sustain such reforms at the local level. Reviews of municipal business process simplification projects in Peru and Ecuador show

that administrative simplification requires implementation of ICT tools to make processes more cost-effective (Franco-Temple, 2008). Municipalities, as much as central governments, are competing to reduce their regulatory burdens and improve their attractiveness to businesses and investors but they have a long way to go (Box 4.3).

## Box 4.3 Municipal Scorecard on Business Climate and the Role of ICT

IFC, in collaboration with local institutional partners including public, private, and academic institutions, conducted a pilot to produce the Municipal Scorecard 2007 (www.municipalscorecard.org). The pilot focused on processes at 65 municipalities in 5 Latin American countries. It focuses on two key processes: operating license and construction permit. Most municipalities in Latin America use the operating license to enforce zoning, health, and safety regulations and to acquire information about economic activities in their jurisdictions and improve tax control. Similarly, municipalities use construction permits to ensure that safety requirements are met and that building plans fit with urban development plans and building norms. These are logical and beneficial goals.

Unfortunately, businesses in many municipalities in Latin America report that licensing procedures are slow, expensive, and highly uncertain. Often, business owners cannot find the information they need to complete the process. They wait in long lines and are often asked to come back some other day. They are asked to pay very high fees to obtain a license, and worse, in some municipalities, they are asked for extra payments to speed up the process. To ensure their request is processed, most business owners have to leave their businesses and travel several times to municipal offices. High percentages of these licenses and permits are also rejected, in major part due to poor process management, starting with the poor quality of information that business owners receive, and the way in which requests must be presented.

To avoid these burdens, uncertainties and costs, many—particularly micro and small owners—prefer to remain unlicensed that is informal. Unfortunately, this means that society is left without adequate protection concerning zoning, health, and safety, and municipalities miss out on much needed tax revenues. These informal businesses have less opportunities to grow, get credit, take advantage of technology, increase productivity, and resist the grip of corruption.

Municipal transactions with business owners and investors can be significantly simplified and made predictable, and the underpinning information more available and reliable with the help of e-government applications. Just having a portal for business with reliable information about business licensing and permits can go a long way toward improving the business climate.

A review of the 2007 scorecards of municipalities on business environment in Latin America indicated that those municipalities with one-stop shop portals scored the highest.

## *Supporting Access to Information, Finance, and Online Business Services*

The second broad area of e-government applications is to provide business support services and investment promotion. These applications are designed to improve SMEs access to business development information and services, to facilitate access to finance, and to support enterprise development. Key applications include:

- Mortgage and Pledge Registry, Credit Information Bureau—to provide information on financial viability of companies.
- Online Legal Information Services—to improve SME's access to information on administrative requirements and business-related legal and regulatory framework.
- Online Intellectual Property Rights (IPR) Database—to simplify initial search on issues such as trademarks and patents and promote commercialization of R&D.
- Online Business Support Services—to provide firm-level support to SMEs such as advisory services, consulting, etc.

The banking sector is a leading adopter and enabler of e-business. It is a leading and intensive user in its own right—reaping major productivity gains and service improvements. Internet-based banking or e-banking and e-payments are becoming a main delivery channel as they make it possible to dramatically decrease the unit costs of financial operations at the wholesale and retail levels.

Financial sector adoption of e-business practices also provides significant externalities and further progress of overall e-business and online activities. Secure e-banking transactions can demonstrate the effectiveness of the new e-business tools and create secure transaction systems, standards, trust, and confidence. Trustworthy payment systems can also encourage more advanced online transactions in e-government and other e-sectors.

Small, medium, and micro enterprises in developing countries are still largely excluded from formal financial intermediation. This is a long-standing development issue. It is being addressed by introducing e-finance, among others. Making e-banking and e-payments more simple and affordable remains a major challenge, particularly for SMEs and the "unbanked." Relatively new players such as mobile phone operators, e-payment technology vendors, and nonbank transfer operators are developing niches or value-added operations via cooperative arrangements with the main players. Perhaps the most important is the small-scale private financial transfer of migrant remittances. This is increasingly relying on online money

transfer systems. However, e-banking and e-payment are still at an early stage in most developing countries (UNCTAD, 2008). They raise new issues of security, cyber-crime, affordability, and credit risk information.

Government actions are needed to promote access to finance with the use of ICT (e-finance). Beyond its role in creating an enabling environment, government can improve the way it shares information like credit-related information. Existing infrastructures like post office networks can also provide access to e-finance services. Smart cards can deliver financial services even with the existing weak infrastructures. Government's role can fundamentally change in areas such as housing finance, insurance, nonblank financial services, storage finance, small- and medium-size enterprise lending, and micro lending (Claessens et al., 2001).

For example, central registry of claims, mortgages, and pledges with online access can assist the banks in improving provision of financial services, to SMEs in particular. It could help register the ownership and pledges, properly value the collateral, and ensure transparent and reliable flow of information. The Central Pledge Registry of Bulgaria is an example. It is a central database collecting registered transactions such as pledges, sales, leases, bankruptcies, etc., and is integrated into the optical archive that stores the original filing information. The system allows for web inquires and legal analysis on these data from financial institutions. The system makes it easier and faster for banks to run enquires on applicants for loans and financial services while maintaining standards of reliability and certainty of information.

The establishment of online Credit Information Bureau (CIB) can facilitate openness and foster accountability within the private sector. A CIB would allow entrepreneurs and banks to gather information crucial for business decision making, both in terms of partnering and lending. Information will particularly be useful for SMEs or unlisted companies where the disclosure of financial statements is not mandatory or reliability is poor. The establishment of a CIB could also facilitate integration among firms and ease the rigidities of the supply and demand sides of financing. Many countries are introducing such service. For example, Italy's Online Credit Information Service is the portal of a credit information service firm that is widely used. Reportedly, 4,000 firms and 300 financial institutions use the service to obtain crucial information on financial viability of companies and individuals crucial to engage in business or financing with these entities. The system provides many services—from information about creditworthiness of companies and individuals to credit ratings. It is fully supported by a functional and user-friendly online system, so that vital business information can be accessed without time and geographical constraints.

To improve access to vital legal information for businesses, a web-based information service can be designed to cover issues of administrative requirements and business-related legal and regulatory frameworks. This web service could also include sections on important judicial opinions in business-related cases, draft laws and regulations, adopted laws and regulations, government directory/organization chart (with citations to laws), and frequently asked questions. The site could have information in easily accessible form with a problem solving, "how-to" focus. For

example, it could explain legal requirements on how to start a business, initiate export/import operations, etc.

To promote R&D activities, national IPR agencies can introduce online databases with functional search capabilities to allow entrepreneurs to quickly conduct initial search on issues such as trademarks and patents. The web site may also provide a comprehensive IPR information service connected to a number of patent databases around the world to obtain integrated IPR information. This can be combined with government expert services that manage and evaluate patents and trademarks to give a picture of the strategic value for companies of a patent or a trademark.

Finally, online government business support services may be introduced to provide firm-level support to local SMEs and address the common issue of limited business and management skills among entrepreneurs. IFC-supported online SME toolkit may be used as a starting point and/or inspiration for such a portal. It has a number of how-to guides and articles in seven categories: accounting and finance, business planning, human resources, legal and insurance, marketing and sales, and operations and technology. Government business support agencies can also host online business advisory services provided by various private sector experts. Clients can choose an adviser among a number of business consultants and other advisers registered with the center. Clients would be able to get a response from the selected expert within a short period of time. Further, in-depth cooperation between the adviser and the company can be conducted on an off-line commercial basis.

## Improving Governance, Transparency, Accountability, and Participation

All the trends outlined early in this chapter motivate reforms to improve governance and increase transparency, accountability, and citizen participation. Fortunately, some countries are pointing the way by developing their own visions, reforms, and best practices, and by using e-government to enable these reforms.

These reform objectives may be pursued by using ICT in government to: (1) reduce corruption by making public procurement open and transparent and by sharing information on budgets and financial performance; (2) use performance indicators and performance management systems, track decisions and outcomes; (3) engage citizens in policy development and reform; (4) promote transparent municipalities and facilitate effective decentralization; and (5) enforce the rule of law and modernize the legislator and judicial branches of government.

A key to reduce corruption is to put corruption-prone activities online and searchable. Apart from its potential as a tool for improving the efficiency of government procurement, as discussed earlier, e-procurement can be a key tool to enable transparency and fight corruption. But it is not a magic bullet or technical fix. e-Enabled procurement reform is essentially a political, not a technical project. The e-procurement application illustrates the importance of understanding the political economy and demand side for reforms. Many vested interests are at stake. Corrupt

practices in public procurement are supported by underlying strong networks of corruption, involving private suppliers and public officials. Procurement reforms—to promote efficiency, transparency, and accountability—may involve building countervailing coalitions including not only reform-mined officials and civil servants from the executive branches of government, but also leaders from the legislature, business, media, supreme audit institutions, and civil society organizations. Political leadership and social control are essential to success.

In the Philippines, a coalition of civil society organizations was essential to enact a new procurement law embodying key reforms and to continue to provide oversight over implementation, using e-procurement to make the process transparent and amenable to monitoring. Chile used e-procurement as a key entry to fighting corruption. It used data mining of e-procurement transactions among other tools to avoid bid rigging, and break up collusive games among suppliers, officials, and procurement officers.

e-Participation tools are used to engage citizens and business and seek their views so their interests and needs are better represented in government programs or processes. The goal is to increase the responsiveness of government to citizens and businesses. e-Participation includes online surveys and polls, electronic newsletters, e-mail, feedback forms, and web forums where citizens can express their opinions. e-Participation tools may supplement public forums or meetings. They may present relevant background information, decisions, and other materials to help citizens and businesses understand certain public policy or regulatory issues. New Zealand has promoted ways for citizens to participate in government in one site.

Informing citizens of how their tax money is spent is key to reduce waste and fraud. The state of Florida shared its e-budget in ways that allow viewers to choose general overviews of state spending in different policy areas or drill down into detailed data, or compare actual results to desired results. This required leadership to overcome resistance from those who feared that e-budgeting's democratizing effect could reduce their power and monopoly on knowledge about the budget's inner workings and actual performance (Eggers, 2005).

The New York City Police Department's Compstat system illustrates the powerful causal relationship between transparency, accountability, and improved performance. Compstat tracks when, where and how crimes occur in the city on real-time basis, and helping to send police where needed most. Its keys to success are timely intelligence, swift resource deployment, informed tactics, unremitting follow-up, and continuous assessment and timely accountability. Beyond using the system as an internal management tool, most up-to-date crime statistics are now available for the public. Data-driven information management systems following the Compstat model are being adopted in other cities to publicize and diagnose city problems, from potholes to police responsiveness (Eggers, 2005).

It takes intense and sustained pressure from outside groups for governments to become open and let the sunshine in. Korea's Seoul municipal government subjected its key administrative procedures to public scrutiny through a searchable index of permit applications. Feedback or citizen comments and complaints may also support anticorruption measures. For example, the Philippine Civil Service Commission

(CSC) implemented an m-Government system that enables citizens to SMS or text in complaints or corruption charges on government officials. Mobile phone users can report grievances against the police using SMS.

e-Government may be also used to support decentralization processes by increasing the efficiency and transparency of local governments. Many countries are transferring increasing responsibilities and resources to the local level. In this context, OAS and CIDA have partnered to undertake a program aimed at addressing two key issues: the modernization of public services through e-government strategies and the generation of municipal income through the implementation of cadastre information systems for the collection of property taxes. The program is an example of knowledge partnership and collaboration among municipalities, with participation from private sector companies and international financial and aid institutions. Specific actives include municipal portals, e-municipal procurement systems, cadastre and registration systems, online forums, and online training www.swdi.oas.org/ose/english/cpo_munet.asp.

Information technology may be used to improve parliamentary processes in many ways—improving transparency and openness; providing universal access to citizens; improving the mechanisms of accountability of legislators to their electorates; enabling dialogue between the parliament, its members, and the citizenry; and facilitating deliberation and legislative decision making.

Some parliamentary web sites are intended to inform and engage the public and others are intended to facilitate the internal decision-making processes of the parliaments. The former type includes projects that disseminate information on proposed legislation and the legislative process, committees and members, parliamentary calendars, and transcripts and other materials from hearings or debates. Systems aimed at parliamentarians themselves may include online notices and voting. An example of a web site that contains both features is the site of India's Council of States. The web site for South Africa's Parliament also includes a range of information for both the public and the Members of Parliament.

The World e-Parliament Report of 2008 concludes that there is a significant gap between what is currently possible with ICT and what has actually been accomplished (UN, 2008). There is increasing pressure on parliaments to be transparent to ensure that their activities are recorded and accessible to civil society and citizens. As the Internet has become increasingly important for an informed participation of citizens, parliaments must be committed to bridging the digital divide and ensuring that their decisions can be understood and analyzed by their constituents. The crisis of legitimacy of parliaments is ascribed to their inability to safeguard the diversity of the interests of the communities they represent. Traditional practices of parliaments in developing countries, including deliberations and document processing, are highly inefficient and slow and can be significantly enhanced with modern communications and intelligent use of ICT. Moreover, many challenging issues facing parliaments are global problems or have global implications and can benefit from timely access to global knowledge and the actions taken by other legislative bodies.

ICT offers opportunities for parliaments to reach out to the public and provides an accounting of parliament and legislators actions—attendance, voting records, codes

of conduct, performance, and integrity. Moreover, in view of a declining involvement of citizens in public affairs, modern technologies have raised the prospects of reengagement in the democratic process.[3] Progressive legislators can use social networking tools like blogs and wikis to force the executive branch to account for various expenditure and to engage their constituents in timely consultations and feedback. As parliaments become more visible through the web, privacy and security issues become critical to ensure the integrity of parliamentary transparency and the confidentiality of citizen communication.

## Improving Policy Making and Knowledge Management

A final broad reform objective is to improve public policy making by harnessing public sector knowledge and experience and empowering its knowledge workers. Many e-government applications can help improve public strategic management, policy making, and the management of knowledge workers and knowledge resources. Rapidly shifting global economic conditions put an increasing premium on timely and reliable information for public policy making and macroeconomic management, as well as information systems in support of sectoral and institutional management and effective supply response.

Information in support of policy making in developing countries is scarce, dated, and unreliable with serious consequences:

- lack of evidence-based policy making;
- planning without facts;
- poor public financial controls and risk management;
- rigid information structures;
- cumbersome data collection and fragmented reporting systems combined with overload of unprocessed data;
- underdeveloped monitoring and evaluation systems; and
- poor decision support systems at all levels of public management (Hanna, 1991a).

Similarly, communication systems in support of policy making suffer from:

- poor horizontal communication across sectors;
- slow vertical communications among levels of decision making;
- unreliable feedback from beneficiaries;
- underdeveloped networks among stakeholders;
- limited exchange of local development experience; and
- isolation of think tanks from providing timely inputs to policy making.

[3] As in the 2008 US Presidential elections.

Africa's development management, in particular, has been hampered by timely and reliable data on social, demographic, environmental, economic situation. Statistical systems in many developing countries are not oriented to support macroeconomic management and policy analysis, and they have often failed to respond to changing information needs. Both vertical and horizontal communication systems are underdeveloped and highly skewed in favor of the urban elite, further impoverishing the policy-making process.

Fortunately, advances in information and communication technologies, packaged applications, remote sensing, and business intelligence systems provide a quantum leap in capturing and analyzing masses of information for policy making and public strategic management. Areas of applications range from e-Cabinet and e-Parliament document management and decision support systems to modernizing national statistical systems. One of the early decision support systems developed for a cabinet is the one developed by the Information and Decision Support Center for the Egyptian cabinet. One of its early uses was to play "what if" games to assess the impact of various tariff structures on revenue and local employment and to facilitate consensus on reforms (El Sherif and El Sawy, 1988).

Knowledge management is a relatively new and promising area of ICT use in government. Technology-enabled knowledge management solutions build on content technologies and information search tools such as data mining, content management, document management, and customer relations management systems; and collaborative or sharing technologies such as corporate intranets and web 2.0 technologies.

Knowledge management involves organizational practices related to generating, capturing, disseminating know-how, and promoting knowledge sharing within an organization, and with the outside world. These practices are being enabled and increasingly transformed by ICT tools and networks. The Organization for Economic Development defined knowledge management (KM) to include (OECD, 2003a, p. 8):

- organizational arrangements, enabled by ICT, such as decentralization of authority, opening up bureaucratic divisions;
- personnel development, such as mentoring and training practices, enhanced mobility and the management of skills;
- transfer of competencies using databases of staff competencies;
- managerial changes and incentives for staff to share knowledge, including staff performance assessment and promotion linked to knowledge sharing and changing the role of managers to empower knowledge workers.

An OECD study noted that governments, generally lagging behind the private sector in implementing KM policies, have a number of reasons for catching up (OECD, 2003, p. 10):

- Knowledge has become a critical determinant of competitiveness for the public sector. Goods and services are increasingly intensive in intangible capital, making knowledge an important element of the effectiveness of public bodies.
- Private firms produce goods and services that are increasingly intensive in intangible capital, directly competing with the goods and services traditionally produced by the public sector.
- Changing demographics and faster staff turnover also create new challenges for the preservation of institutional memory and the training of new staff.
- Increasingly knowledgeable citizens require governments to be on top of newly created knowledge, as it is increasingly produced by more differentiated actors.
- Finally, public policy goals such as fighting exclusion have become more ambitious and complex than before.

Some developing countries and advanced states have been pursuing knowledge management practices, with mixed results. One example is the state of Sao Paulo, Brazil (Knight, 2007; Box 4.4). A review of the knowledge management and innovation practices of the state of Sao Paulo suggests the embryonic stage and promise of such practices. Its recommendations include: putting KM and innovation on the agenda for public managers; treating KM in an integrated manner in the government; developing processes for creating, sharing, and using knowledge to improve public management; and identifying and disseminating initiatives along these areas. São Paulo, like the federal government, could move from isolated examples of good KM practices to the establishment of a comprehensive, government-wide policy to promote KM and innovation in public management.

## Box 4.4 Knowledge Management and Innovation (KMI) in the São Paulo State Government

The state of São Paulo—with a quarter of Brazil's population, a third of its GDP and more than 40% of its industry—is Brazil's leading state. São Paulo has followed a similar course to the federal government in preparing KM policies. It appears poised to launch a government-wide KM policy. It is being coupled with innovation, and the policies in preparation cover both related topics.[4]

The work on KM and innovation carried out in São Paulo to date has been organized by the Committee for Quality in Public Management of the Governor's staff.[5] The mission is to create "a single government" that values teamwork; collective construction of knowledge; respect for the public

[4] José Cláudio Terra of Terra Fórum Consultores. See Fundap/FIA (2006).

[5] See http://www.cqgp.sp.gov.br/

manager; shared decisions, responsibilities, and resources; interoperability, integration, and partnerships.

Knowledge management and innovation were found to require that the government:

a. provide incentives for innovative actions, especially those that can result in debureaucratization and facilitate citizen access to state services and horizontal work between the various secretariats;
b. increase the involvement of managers and high-level professionals in the initiatives of innovation management, identifying and encouraging practices of horizontal sharing within and between the secretariats;
c. expand the sharing of innovative practices of management (whether or not associated with the use of information technology);
d. disseminate metrics that show the results achieved by innovative programs in public management, giving special attention to those that include means for evaluating the satisfaction of citizens.

An evaluation study has been undertaken, together with a series of case studies with accompanying videos on best practices in knowledge management and innovation in the secretariats and agencies of the state government. The objectives were to: raise awareness of managers and civil servants; encourage debate on KMI practices; carry out a broad diagnosis and identify good practices related to KMI; develop case studies on best practices; develop directives for sustained adoption of KMI in the government; and prepare training programs to improve public management of the state.

The study findings are that there is:

a. little structured interaction between the agencies, limiting the sharing of knowledge;
b. embryonic effort at disseminating learning, practices, and improvements;
c. lack of directives and clear responsibilities regarding KMI;
d. a prevailing culture which does not promote knowledge sharing, initiatives to make improvements or collaboration through networks;
e. few information management processes to promote access and sharing of knowledge and practices; and
f. lack of metrics allowing evaluation of the creation, sharing, and application of knowledge to verify efficacy and innovation.

FUNDAP/FIA, 2006, p. 10, 11, 36, cited in Knight, 2007

# Chapter 5
# Approaches to e-Government

In the last two chapters, we introduced the imperatives for government transformation, the cutting-edge reforms of progressive government, and the visions that embody and motivate these reforms. We further illustrated the variety of e-government uses that may serve these visions and enable reform objectives.

This chapter defines six key approaches or strategic directions for e-government: adopting a whole-of-government approach; pursuing customer-centric government; developing multichannel strategy for service delivery; standardizing on common business processes and shared infrastructures and services; balancing central leadership with local initiative, and horizontal enterprise-wide foundations with sectoral ownership; and promoting public–private partnerships.

The main thrust of these approaches is to develop the guiding principles and frameworks that policy makers and strategists may use to shape e-government programs over time. They aim to take advantage of economies of scale and scope, promote sharing of infrastructures and services, leverage the comparative advantages of various partners, and reduce costs and maximize value from investments in e-government.

## A Whole-of-Government Approach

e-Government cannot proceed to advanced phases of service innovation and transformation without modernizing and integrating many back-office functions. For example, citizen-centered service delivery involves breaking up silos, integrating across agencies, innovating new ways of doing business, and creating a service-focused culture. Continuing increase in the value and responsiveness of services at the frontend, at affordable cost, is not possible without reinventing and consolidating the back-end processes. Consolidation and integration of back-end business processes across agencies also free up resources for additional service innovation. This leads to a better and responsive front end with smaller and smarter back end.[1]

[1] Jermey Millard. 2003. *ePublic Services in Europe: past, present and future: Research findings and new challenges*.

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_5,

Approaching government as a whole in e-government programs is a profound shift that is easy to grasp conceptually but difficult to practice. It is a paradigm shift toward the vision of a connected, networked, client-centered government. Accordingly, government agencies share objectives, data, processes, infrastructure, and capabilities across organizational boundaries. They work across boundaries to provide a holistic policy development and implementation, an integrated government response to crises, and a seamless service provision to clients. This shift demands transformational leadership, empowered and trained civil servants, and cross-agency coordination mechanisms. It may be driven by external demand, engagement of users as coproducers and coinnovators, and partnerships among public agencies, businesses, and civil society organizations. This shift also requires investing in cross-sector capabilities and infrastructures. The federal government of USA presents an interesting case of a whole-of-government approach and integration across agencies (Box 5.1).

## Box 5.1 US Cross-Agency, e-Government Approach

Attempts to develop cross-agencies web sites for the federal government of the USA in the early 1990s floundered due to intransigent institutional barriers and lack of oversight processes for cross-agency initiatives. Budget processes focused on single agencies and there were no budget processes to support cross-agency or networked initiatives. Government lacked a central chief information officer, and federal agencies lacked CIOs or any strong executive authority to manage initiatives across agencies.

In 2001, the president set a presidential management agenda, of which e-government was a key initiative. The federal e-government plan focused on the infrastructure and management of 25 cross-agency government initiatives. The overall objectives of these cross-agencies initiatives are: to provide one-stop site for services to citizens (government to citizen); to reduce costs to businesses of providing government with redundant information (government to business); to better share information with state and local governments (government to government); and to improve efficiency across government (internal efficiency and effectiveness). The 25 projects were selected by the US Office of Management and Budget from more than 300 initial possibilities. Projects focused attention on the development of horizontal relationships across government agencies to reduce redundancies and complexity through, among others, standardization of generic business operations in government. They were driven by the ambitious goal to "simplify and unify."

A new organization within OMB for e-government signaled a major institutional development in the US federal government. An e-Government Act (in 2002) codified the new organizational and governance structure to provide direction and oversight for cross-agency or networked governance. The formal authority for each project belongs to a federal agency, designated by OMB

as the managing partner, lead agency, or champion. Each managing partner agency is responsible for developing a consultative process among agencies involved in each project, and in consultation with OMB, they are responsible for developing project goals and objectives, funding and staffing plans, and internal governance. This lead agency model provided each of the lead agencies with several powerful incentives to shepherd the project to completion: more recognition, more turf, and more money.

In contrast to the bottom-up approach of the 1990s, the e-Government Act tied budget appropriations to strategic, business, and IT agency plans and created a fund to support cross-agency initiatives. It took a top-down whole-of-government approach and emphasized rigorous project management and cross-agency consultation processes. Yet, cross-agency projects have never been a favorite of US congress, where appropriations are awarded through a "stovepipe system" of committees that makes multiagency approach difficult. Some lead agencies resisted OMB as they felt they would lose certain degree of control under the OMB plan.

The challenges of creating a virtual state—legislative, governmental, perverse incentives, vertical structures, bureaucratic culture—are not over. The 25 projects took longer to realize than originally planned. But significant progress has been made toward a whole-of-government unification. Champions, creative funding mechanisms, and partnerships with the private sector were created. Scorecards were established and each agency was graded on their progress in meeting the president's management goals. Grades were made public and discussed in the meetings with the President's cabinet secretaries. For the 25 strategic projects, savings of more than $100 million in redundant spending and vastly improved customer service were realized.

Source: Fountain, in Castells and Cardoso (2006); Eggers (2005).

Integration and transformation phases of e-government (see the journey to e-government, Chapter 3) require effective government networking, automated data handling and database management, secure communications, and common data standards, and interoperability. Low level of computerization and, especially, networking of government bodies remains a major impediment to the advance of e-government services. To realize the transformational potential of e-government, investment programs should combine front-end service delivery with emphasis on back-office process reengineering and modernization. Such investments should follow an agreed government-wide architecture to ensure interoperability and communication across systems and agencies. Guided by an overall technology and applications architecture, government agencies may adopt a progressive approach whereby units would be allowed to experiment with different services, introducing them gradually.

A whole-of-government approach is enabled by an enterprise architecture that secures information sharing and integration of information infrastructure across

agencies and opens opportunities for innovative methods of partnering with the private sector. Governments need to assess the maturity of their architecture: the front-end and the back-end systems. The point of decision (back end) for a government service always remains within the confines of the government, for it is a statutory function. But the point of delivery (front end) can be the private sector such as a kiosk or a cable television station. This can happen only if the architecture is sufficiently mature—using a secure network and middleware. Shifting the point of delivery to the private sector has powerful implications for good governance, for it creates multiple options from which citizens can choose and, more important, injects competition into service delivery.

A strategic "whole-of-government" approach to e-government offers key advantages. While more demanding than investing in ad hoc, bottom-up initiatives, this approach is likely to economize on investments, reap economies of scope and scale, help citizens deal with government as a single entity, and integrate ICT into the national development strategy. It supports the development of common policy guidelines and frameworks—such as standards for information sharing, interoperability, security, and privacy—that are critical for effective e-government. It clarifies roles and responsibilities within government and with private sector and civil society partners for policy, planning, financing, implementation, and monitoring and evaluation. It can speed the scaling up of successful initiatives by addressing systemic constraints and establishing the enabling policies and institutions for replication and diffusion. It can support the sharing of infrastructure and of such business processes as financial management, human resources, and public procurement. And it can lower long-term support and maintenance costs.

A whole-of-government approach is not pure technical undertaking of establishing common standards and architectures. Rather, it should follow a holistic approach, to be reflected in shared visions, collaborative leadership, change management, and human resource management practices in the civil service. In many countries, for example, special attention is being given to senior management as a group within government, to promote policy coordination, cultivate a sense of culture cohesion, and to induce performance-based civil service. A whole-of-government approach to e-government is likely to be more feasible and effective when aligned with and reinforced by such civil service reforms. This senior executive group could be also targeted for enhanced competencies and accountabilities to lead ICT-enabled government transformation.

Moving toward a whole of government demands the setting of strategic directions and common frameworks. But this move does not mean wholesale centralization of e-government services and capabilities into one agency. Rather, shared capabilities may be distributed among several centers of excellence. Striking the right balance between setting top-down strategic directions and supporting bottom-up initiatives remains a key issue in designing and implementing e-government programs. The balance may shift over time as common frameworks, governance, architectures, and coordination mechanisms mature and as public agencies and local governments build adequate capabilities and shared understanding and supportive culture for networked and integrated government.

## Citizen-Centric and Citizen-Driven Government

e-Government is about redefining the relationship between government and citizen (and business) to become citizen or customer-centric. Introducing a citizen-centric approach to government is similar to introducing a disruptive technology into a traditional system. It is a paradigm shift in perspective, with the government providing services in ways that make sense from the client's point of view. Indeed, it turns the traditional model of government on its head. It is a shift from inside-out to outside-in, starting from the client, not the agency. The traditional model is centered on the agency providing the service—with service levels, timing, payment mechanisms, and procedures built around the agency. A client-centric government makes the citizen the center of all activity—government services must be available anytime the citizen demands them, anywhere the citizen wants to receive them, and through whatever medium the citizen wants to use. Countries such as Canada, Singapore, the United Kingdom, and the Nordics are adopting this perspective in their e-government programs.

This shift is again easy to conceptualize but difficult to practice. The cyber pessimists are doubtful that governments can make such a paradigm shift and fear that e-government applications may amount to no more than window dressing, a replication of government services practices in the cyber sphere, with mere change in delivery channels through numerous web sites. Governments must develop the necessary understanding, culture, structures, incentives, and capabilities to harness ICT and realize this shift in practice. A variety of mechanisms and practices can be deployed to support and reinforce a customer-centric approach to e-government.

A user-focused government requires an understanding of user needs and the ability to deliver these services according to those needs. By transforming the means of service delivery and the transaction processes involved, user-focused e-government can increase both client satisfaction and government efficiency. Customer-centric e-government strives to improve service attributes such as accessibility, convenience, cost, quality, and where relevant, fairness. Service strategies are redefined so as to start from the perspective of citizens and business. This process starts with defining the target populations that one is trying to serve, their service priorities, and their abilities to use online services or various channels of delivery. For example, in the case of Chile's Business Window Program, the administrative procedures to be "digitized" were selected by entrepreneurs themselves via five focus groups totaling 1,200 people and over a 100 of interviews. Since, key processes were put online, incorporating both national and municipal business procedures.

Among developing countries, the poor and those most dependent on public services are among the least able to access and use online services. A user-focused e-government approach would thus require defining the potential users, learning what they want from services, and what they can do (and would be motivated to do) online or through other channels of delivery. Developing countries may have to focus first on those services that have the most impact or value for users and for government. Trade-offs may have to be made between customizing services for

diverse populations and maximizing efficiency gains by e-enabling high-volume, resource-intensive services.

Citizen-centric e-government demands change in the culture of civil service to make it truly service-oriented, and this cultural change can be facilitated by enhanced user feedback and client engagement. Enhanced transparency, feedback, and tracking capabilities of service delivery can build the external demand for the cultural shift to customer-focused, service-oriented public sector. Current and potential beneficiaries may be organized to push for user-centric services. Channels to register complaints and feedback on services may be integrated into e-service delivery programs. Service providers can also put in place processes that allow user needs to be expressed, such as user surveys and focus groups. Demand for client-centric services can be measured by analyzing patterns of use. Such analysis should feed into service development and delivery. A customer-centric approach can become a tool for ongoing prioritization for public service improvement within constrained resources.

A user-focused perspective will impact not only the design of e-services, but also how public agencies shape their internal operations and structures. The challenges of integrating customers' preferences into existing service delivery and the process and organizational changes required to adapt services and client relationships to meet customers' changing needs should not be underestimated. First and foremost, it demands service-centered leadership and the reskilling of the civil service. Front-line employees' relationships with users have to change, and their skills and experiences need be managed so as to better understand customers' needs and behaviors and to encourage civil servants to listen to clients and innovate client-centered processes and services. As mentioned earlier, reengineering and consolidating back-end processes under a whole-of-government approach can release resources for front-end client-centered service innovation.

Experience from e-government programs in developed countries shows that citizens and businesses strongly prefer joined-up services through single window, or portal organized around their needs or "life events." National entry points, sometimes called "gateways" or portals, aggregate and organize content and services, often with links to web sites of individual ministries or programs. The goal of a portal is to efficiently guide users to the information and services they seek. National portals can represent the face of a country to the world and the face of government to the citizenry. National portals are the most visible expression of a nation's approach to citizen-centered government. Ultimately, national portals can have an impact on government credibility, citizen trust, and public response to e-government. They can also influence content quality, technical sophistication, and privacy and security standards of e-commerce and e-services in general.

Pursuing the "single window" approach can be initiated through the Government Services Portal (Box 5.2). This portal can provide the catalytic and integrating framework for e-government implementation first through an effective citizen-centric state portal, and later through other one-stop delivery channels. Such portals aim to package and deliver content and services in ways that directly fit citizens' or businesses' needs. The goal of these portals is to provide "one-stop shopping" so

that citizens and businesses no longer need to go to a range of separate ministries, bureaus, or departments to find information on a particular subject or complete a transaction. However, getting multiple government agencies to harmonize the many aspects of user-friendliness (presentation standards, authentication, data quality, and access rights, among others) is a major challenge.

## Box 5.2 Portals, Single Windows, and Client-Centric Practices

A special one-stop-shop citizen portal can be designed for government services to citizens (G2C). It may include job search assistance, library book search, taxation, civil registration, renewal of driver licenses, change of address notifications, school enrolment, scheduling appointments, marriage certificates, birth certificates, and many other public services. e-Government would not succeed if citizens were expected to deal with hundreds of web sites, each belonging to different agency, and each having different user interface. Serving much more than as a simple gateway, a government portal offers an opportunity to refocus services around the needs of citizens while reengineering and consolidating back-office processes.

Similarly, a special one-stop-shop business development portal could be designed around specific business-related services to provide guidance and vital information for businesses as well as coordinate and integrate the services of different government agencies. The portal would provide a single interface for different government to business (G2B) services, transactions, and inquiries. The user would not have to care about administrative divisions or moving their transactions across departments.

Portals designed around the needs of citizens or businesses are on the rise in many developed and developing countries. South Africa has moved all government departments, government information, and services into a *single e-Government portal*. Its simple, streamlined design, with few data-heavy graphics to download, is well suited for users with low-bandwidth connections. Singapore's e-Government services and information are effectively combined into one portal, www.gov.sg. *Sweden's Online Public Service Gateway* and the *Canadian Portal for e-Gov services online (English and French)* are other examples of comprehensive entry points that use a variety of indexing and organizational paths to government information and services. Other examples of user-focused portals include those of *South Africa*, the *Philippines*, the *United Arab Emirates*, and *Egypt*.

The US federal government experience in organizing public information and services into a portal called *FirstGov* as the first place one should look for federal government information and services online has been instructive in this regard. The US government has created sites that aggregate content from

various government departments and agencies into a single interface, *one for federal regulations*, *one compiling forms* from many agencies for download, and one permitting *online payments* to a range of agencies.

The merit of organizing public information and services around customers and information types, rather than organizational silos, far outweigh the costs of coordination and standardization. Moreover, the process of organizing services around clients has been instrumental in detecting information gaps, duplication costs, and quality of information issues.

Major advances have been made in portal technology and much experience has been accumulated with the development of such key tools of e-government. There are several excellent examples of single entry government portals, including those of the USA, Canada, Singapore, UK, Australia, Korea, and Germany. In the United States, the FirstGov.gov links the government's more than 20,000 web sites and 500 millions web pages and makes it possible for citizens to obtain the information and services they need without having to travel or know which agency federal agency controls which function or service. The new generation of portals allows for personalized view of portal contents and for substantial interactivity and connections to both public and private services.

Source: InfoDev Toolkit(2008), see www.InfoDev.org

A major challenge remains in mobilizing demand and educating users to take advantage of the powerful potential of portals. Unlocking the potential of e-government depends on high levels of uptake of e-services. In the case of the UK, for example, a single citizen-centric, all-of-government site is clearly branded and heavily promoted. Consistent navigation is based on user segmentation by audience and topic. High-value services are targeted based on research and analysis of user needs. Similarly, the one-top business link web site has been developed through cross-agency collaboration in response to feedback from small businesses and changes in business environment. In Germany, the government has set up user councils to support agencies of central and regional government.

A demand-led approach is recommended. Ideally, public service and administrative procedures to be simplified and put online should be selected by entrepreneurs and citizens groups themselves. The portal could start on a pilot basis and involve a limited number of agencies, initially providing only one high value-added service, for example, business registration and obtaining necessary licenses. Selection of services for online delivery should be based on a prioritization framework that takes into account the demand, legal and regulatory framework, policy and economic impact, costs, and ease of implementation.

The challenge of mobilizing demand and educating users is particularly relevant to developing countries where there is little awareness among the masses and low ICT literacy. Marketing of people-friendly web sites is necessary. The development

of a single e-government brand and a consistent way for navigation with a common look and feel is a best practice, as in Canada and Australia. High uptake is also a consequence of high-value services, and these often require collaboration and coordination across agencies. Addressing the need for affordable connectivity should also go hand in hand with investments in online government to build a broad user base and secure the benefits from such investments. Some such as Andhra Pradesh state in India has figured out a way to build significant user base.

Technical sophistication of such portals may increase gradually. At the first stage, the portal may provide only information services, "how-to" guidance, and downloadable official forms that can be faxed or sent by traditional mail to the agencies involved. Later, the portal would allow submitting and tracking applications electronically. However, even at the initial stages of implementation, the portal has the potential to make government services to businesses and citizens significantly more convenient and transparent.

Delivering joined-up government services to businesses or citizens may seem as a stretch for many developing countries. There are several strong arguments for this approach, however. It is a sensible decision from both administrative and financial points of view. Many countries, such as the UK, invested heavily into developing e-services divided along administrative lines only to discover that citizens and businesses do not like to use fragmented online services that mirror the administrative complexity of the government. Fixing the situation at later stages requires significant financial investment and process reengineering. Developing countries have the latecomer advantage to learn from early pioneers and to avoid such costly mistakes. Also, coordinated efforts for upgrading the back-office ICT-enabled business processes of agencies can decrease overall ICT investments and secure shared information and infrastructure.

The concept of "citizen-centric government" tailors public services to broad categories of customers; it is a difficult step to take but may be viewed as one step toward highly customized, citizen-driven public services. The move from generalized government portals to "My Portals" as in the case of UK, Cyprus, Malaysia, and a number of other countries indicates a transition from "citizen-centric" to "citizen-driven" government or highly personalized public services that has just started in some developed countries. This trend would be facilitated by government services being cocreated by or for the individual. Accordingly, citizens would configure information and services either by themselves or through intermediaries including community and social networks.[2] This movement raises new issues and challenges such as ownership of citizen data and potential sharing of such data across platforms and third-party providers (Box 5.3).

[2] Andrea Di Maio, Gartner Research, Moving from Citizen-Centric to Citizen-Driven Government, April 2009.

## Box 5.3 How to Realize Citizen-Driven Future Government?[3]

e-Government should become part of the strategic vision of government at the highest level and should be similarly embedded in every sector. Political leadership would define an operating model for government that would focus on the degree of standardization and integration of processes[4] across the government.

The imperatives of customizing or personalizing public services would dictate a high degree of process standardization and integration. The vision for e-government services to be personalized to each individual at a given time, location, and context would thus drive the standardization and integration of processes in government. This would imply the adoption of common interoperability standards across the government and use of tools[5] that allow changes in business processes without having to completely redesign applications.

It would also be important to create a digital platform that allows each e-government service to plug-in, so as to present a common "across the government" view of each citizen. Private companies have begun offering such integration platforms.

The default option for government data should be "Open." It would be important to put in place mechanisms and processes to publish machine-readable data in an easily accessible manner on the lines of Data.gov. of the US government. This could offer a powerful tool for private sector firms and nongovernmental organizations to develop innovative services. The Singapore government recently issued a request for information-seeking innovative services based on mashups.[6]

Governance structures and processes should be put in place that help constant engagement with the private sector and nongovernmental players. For example, the District of Columbia's contest called "Apps for Democracy" has encouraged small developers to create applications that would give residents better information on crime and pothole repairs. In 1-month time, 47 applications were created at a cost of $50,000 for running the contest. The applications would have otherwise cost $2.6 million.[7] Similarly the Sunlight Foundation has done mock-ups of government web sites in order to demonstrate how they can be improved.[8]

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[3] Based on contribution from Randeep Sudan, a World Bank colleague.

[4] Peter Weill, Jeanne W. Ross, IT Savvy: What Top Executives Must Know to Go from Pain to Gain, Harvard Business Press, Boston, Massachusetts, 2009.

[5] See http://www.ramco.com/rvw.asp

[6] See http://www.ida.gov.sg/Programmes/20090128125151.aspx?getPagetype=34

[7] McKinsey on Government, Summer Issue 2009 (http://www.govexec.com/pdfs/070209rb1.pdf).

[8] See for example http://blog.sunlightfoundation.com/taxonomy/term/redesign/ for a mock up of the US Supreme Court web site.

A vision of citizen-driven public services would raise issues about private and sharing of information concerning citizens. It might be worth considering how citizens can be given control of their data through public/private data vaults. This would open the door for many innovative applications and services with citizens willing to give up some of their privacy for greater convenience and better customization.

While the focus on governance, institutions, operating models, and enterprise architecture must continue, developing countries are well advised to focus on three key elements to orient the future design and delivery of their public services. These are:

- publishing all government data (except data with privacy/security implications) in machine-readable format in an easily accessible manner;
- transferring ownership of citizen data to citizens; and
- focusing on the mobile delivery of highly personalized and contextualized services to individuals.

## Multichannel Service Delivery

Governments strive for seamless delivery of services across various channels (over the counter, online, mobile, phone, mail).[9] The emergence of mobile as a ubiquitous platform represents an exciting opportunity for innovation in service delivery. The growing array of delivery options is creating a drive toward more collaborative models of service delivery. Moving from multiple discrete channels to a networked, multichannel approach demands cooperation across agencies to ensure data, business processes, delivery channels, and ICT infrastructures are interoperable and can be shared or integrated. Such a seamless and networked approach is the ultimate vision of many e-government strategies.

A range of models are being considered in moving toward different levels of integration (OECD, 2005a). The common practice in service delivery is to maintain discrete platforms for delivering services through different channels. Moving toward a more advanced level, another model is to seek vertical integration as well as interoperable delivery platforms. This requires a more collaborative approach, with some sharing of infrastructure and data and a greater focus on standards so as to share platforms for service delivery. The highest level of integration is the

[9]The role of mobile as a key platform for service delivery is discussed later under governing the technology.

model of vertical integration with integrated service delivery platforms. Users experience seamless, user-focused service, working both within and across agencies. This model allows users to gain access to services through different channels while ensuring that information is consistent across those channels.

A strategy for integrated multichannel service delivery starts with a common vision and governance measures to achieve this vision. This strategy calls for a single authoritative source of information and data and a technical interoperability framework that maps standards and supports information sharing. It also sets policies for security and authentication, privacy, and stakeholder engagement.

A channel management strategy takes account of the needs, priorities, and capabilities of customers and government. It should balance meeting users' preferences (via a mix of channels) against the economics of service delivery. User preferences should be central to the design of service delivery across channels.

However, policy makers should be cautioned about the cost of piling one channel on top of another without reducing expenditures for some of them. Providing the maximum possible range of channels for all services would be prohibitively costly and unsustainable, particularly for developing countries. In making optimal choices, governments need to balance costs and benefits to service users and to government. They should also aim to realize the best public value and make explicit any tradeoffs required between equity and efficiency. Assessment of opportunities to reuse or rationalize existing channels is part of the channel development strategy.

Integration of access centers across ministries and levels of government at optimal locations could also economize on delivery and access costs while maintaining multiple channels of delivery (over the counter, Internet-enabled self-service, infomediaries, mobile, etc). Several countries have experimented with a promising service delivery channel, the integrated citizen service centers. One of the Brazil's most successful channels for delivering e-government services at state and municipal levels is the integrated citizen service centers (ICSCs).[10] These are operated by an increasing number of Brazil's states and some municipal governments. These ICSCs have different names and features, depending on the states in which they are implemented—for example, citizen assistance service centers (CASC) in Bahia (Box 5.4) and Timesaver (Poupatempo) in São Paulo (Box 5.5).

### Box 5.4 Citizen Assistance Service Centers, Bahia, Brazil

Brazilian Citizen Assistance Service Centers (CASC) in the state of Bahia utilize networks to bring together federal, state, and municipal agencies to offer services that citizen most frequently use in a single location. Some of

[10]The example of Brazil's ICSC draws heavily on Knight's chapter on e-Brazil, in Hanna and Knight (forthcoming).

the CASC are located in the capital of Bahia (in shopping malls and other popular places), others are spread throughout the state, and some are mobile units serving remote areas. They offer a range of services: telecommunications services, issuance of birth certificates, ID cards, company registration, housing requests, job offers, voter registration, passport issuance, etc. While it used to require multiple visits and long lines for a citizen to receive an identification card, for example, now this is handled in 20–30 min at the SACs. The program is managed by a board for the department of public services, a body with certain level of autonomy. In a 2006 survey, over 89% of citizens evaluated the SAC performance as "excellent."

## Box 5.5 São Paulo's Timesaver (*Poupatempo*) Integrated Citizen Service Centers

The São Paulo state government established the Timesaver (Poupatempo) program in 1996 to bring together in one place, in locations and at hours convenient to citizens, a wide range of public agencies and services. The philosophy adopted was to serve the citizen quickly, with quality and efficiency, thereby saving valuable citizen time and improving the image of the state government and its civil servants.

In October 2008, there were 13 fixed Poupatempo units, six in the metropolitan São Paulo área and seven in other cities in the state. Some of them were constructed and/or run by private sector companies, under supervision of the state agency responsible for the program. There were also seven mobile Poupatempo units installed in large trucks or buses that travel throughout the state, remaining 3–15 days in different locations, depending on the demand for services.

The Poupatempo program makes available over 400 services. Of these, the issue of identity cards, police records, work cards, and driving licenses are most popular. Information on services offered can be obtained by a free telephone call to the Poupatempo call center, or an online guide available at http://domino.sp.gov.br/ug960162.nsf/webframepai?opennavigator. In 2007, the Poupatempo program delivered a total of 27.8 million services to citizens and a total of more than 200 million services since the Poupatempo program was launched. With the expansion of the Internet, an e-Poupatempo online service was developed beginning in 2002, as the first step toward a virtual Poupatempo. The e-Poupatempos offer citizens rooms with computers and printers for accessing some 2,000 public services available online from municipal, state, and federal governments, with assistance provided by trained personnel. The e-Poupatempos are located within most fixed Poupatempo posts and all the mobile units.

The latest initiative of the Poupatempo program seeks to make available in small and médium cities in the state distant from fixed Poupatempo posts the some 2,000 public services available through the state government's web site called the Portal Cidadão SP (www.cidadao.sp.gov.br) in addition to a number of federal services available fully or partially over the Internet. They are setting up in partnership with municipal governments and include a number of computers with broadband Internet connections, printers, and attendants who help citizens access the online services.

The Poupatempo program has annual evaluations conducted by one of Brazil's leading survey firms. In 2001–2004, the program was approved by 99% of its users. In the latest survey available, as of October 2008, conducted with 1700 users of all fixed and mobile Poupatempo units, in December 2007, about 97% said they approved of the service, 94% said that the program respects people, and 95% said it offered good service and a source of pride. The program won numerous Brazilian and international awards.

Sources: Knight's chapter on e-Brazil in Hanna and Knight (eds), forthcoming, drawing on Cunha, Annenberg, and Agune (2007) and www.poupatempo.sp.gov.br/home/

The objective of the ICSCs is to make citizen-oriented services widely available. Services are provided by well-trained staff respectful of the citizens and located at nodes in the transportation system or in shopping centers. The ICSCs are not like kiosks. Rather, they are akin to supermarkets, a mediated one-stop government service mall of shops—a step toward a single window model. They are also available outside normal working hours, thus saving them time and effort. In addition ICSCs provide transparency, bring the state closer to the citizen, and seek continuous improvements in service delivery.

The construction of ICSCs, and sometimes their operation, can be and often outsourced to private companies. But the elaboration of strategy and guidelines, finance of construction and most operating costs, and supervision remains with government agencies responsible for these programs. ICSCs, including mobile ones set up in trucks or buses, make heavy use of the Internet to connect to government databases and web sites. Often they include a special kind of telecenter oriented toward online government services and an online version where some services can be obtained over the Internet.

Despite this positive experience, many challenges remain (Hanna and Knight, forthcoming). To date, ICSCs in Brazil not really been "single window government" operations, but rather a collection of services of different government agencies offered under a single roof. This challenge is also faced by Brazilian government portals at all levels. Many simply direct users to separate web sites of different government agencies.

Future evolution of the ICSCs would:

- organize service delivery to use multiple delivery channels, including Internet, telephone, mobile, digital TV, and face-to-face;
- reduce costs of the ICSCs and find ways to wean them of state and municipal budgets;
- improve and make more agile the delivery of services by redesigning processes and procedures and reducing bureaucracy;
- find new ways to maintain employee motivation, gradually making them capable of performing multiple services;
- improve relations with citizens through, among others, the use of citizen relations management or a single registry for each citizen;
- reward activities related to service delivery and create appropriate career paths; and
- create channels for participation so that the ICSCs become a state policy rather than an initiative of a particular government.

## *Common Business Processes*

It is critical to understand the role of common business (government) processes in an e-government strategy. One key tool to realize economies of scale and customer-centered government is to organize and standardize these processes across agencies and around user needs. Common government processes may involve front-office business processes, such as a shared call center for answering questions and providing public information, or a common portal for online contact with enterprises. Or, they may cover shared back-office business processes, such as procurement, financial management, and human resources management (Fig. 5.1).

Organizing common processes across government agencies aims to overcome silos of public administration. These silos are even more entrenched in developing countries—duplication and fragmentation are common. Therefore, the benefits of adopting common business processes can be substantial in developing countries. Common business processes can be consolidated or joined-up within and across agencies, thus reducing waste and duplication. By reexamining and standardizing common processes, solutions can be created only once then diffused and reused many times over. This approach can also facilitate information sharing across agencies and reduce user burden of reporting. It can help agencies focus on core activities by providing them with the option of outsourcing standardized processes. Outsourcing common processes help create economies of scale and centers of excellence in performing these core functions. Economies of scale are also captured by consolidating ICT expertise for common business processes. Making elements of service delivery common also raises awareness of overlaps and inconsistencies across programs and creates pressures for alignment and administrative simplification (OECD, 2005a).

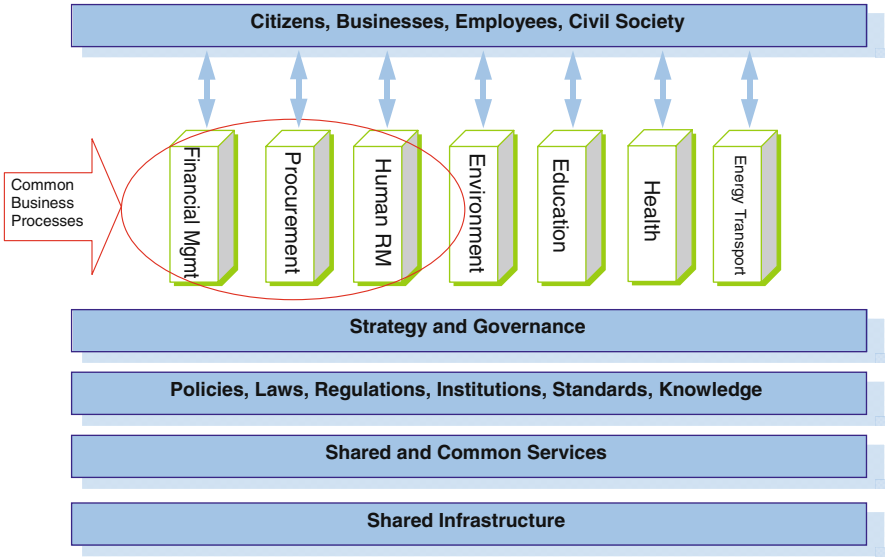



**Fig. 5.1** e-Government and common processes

Countries vary in levels of cooperation among agencies to identify common business processes, develop shared solutions, and realize the benefits. Agencies may agree to limit cooperation to information sharing, set up a knowledge center to facilitate knowledge exchange on common business processes, or agree on a referential model of standardized processes. Moving up in level of cooperation, agencies may decide among themselves on sharing some common databases and IT systems, and creating a shared service center. At the highest level of coordination of common business processes, this shared service center becomes a separate organization to meet common needs. Approaches to adoption of common business processes vary from top-down control, mandating the use of a common solution, to facilitating approach, using incentives, to a laissez-faire, passive role for the central government. Country factors—ranging from culture, legislation, and politics, to public administration traditions—influence these choices.

Leading e-government programs persuade agencies to develop and use common business processes through incentives that vary from participation in the development of government enterprise architecture to providing agencies with extra funds or budgets for shared processes. In Korea, the special committee for e-government, in the President's office, analyzes all processes and develops mandatory common solutions at the federal and municipal levels. In Germany, the e-government agency is not empowered to impose mandatory use of common processes. In the United States, e-government office in the OMB uses the federal and the agency enterprise architecture to identify common processes and then uses the budget process to align all major IT investments with this common view and shared solutions.

Implementing common business processes raises many challenges. Involved agencies must be convinced of the benefits of adopting common business processes. Clear communication of advantages and results is critical. It is easier to start small, perhaps in one agency, to show early results, then scale up the usage of the common business processes. Potential users may be allowed to participate early on in development and implementation of common business processes, perhaps through advisory boards or steering committees with representatives of all involved agencies. It is also important to agree on mechanisms to share costs and redistribute revenues. Clear implementation responsibilities should be set at the highest levels. Promoting cultural change toward collaboration is necessary. Expectations should be managed, recognizing the upfront costs and long-term benefits.

## Balancing Top-Down and Bottom-Up, Horizontals and Verticals

Adoption of a whole-of-government and client-centric approaches, an integrated multichannel strategy for service delivery, and common business processes—all call for some top-down direction and coordination mechanisms across the whole government. As depicted in the preceding figure, these directions provide frameworks for ICT governance, policies for enabling electronic transactions and information sharing, and support for shared services, capabilities, and infrastructures. These "horizontals" provide the foundations on which sectoral applications or "verticals" are established.

But bottom-up initiatives are also critical to ownership, innovation, adaptation, learning, and entrepreneurship. They allow for diversity in line with varying needs and capabilities of agencies and locations. Many e-government applications are sector specific or location specific. Public agencies and city governments want to maintain maximum autonomy to determine their path and pace to ICT adoption and transformation. Some progressive leaders, at the agency or local level, may want to take the initiative and respond to local demands and opportunities, rather than wait for the central government to deliberate on policies and investments in common resources, processes and institutions. Some agencies are likely to be more e-ready or urgently in need to modernize their operations and services than others.

While countries have followed widely varying paths in planning for e-government, these can be grouped under two fundamentally different approaches:

- An integrated, top-down strategy that is tied to broader governance reforms and development goals. The national government sets policies and provides frameworks and plans for prioritizing investments, implementing projects, and governing, monitoring, and evaluating ICT systems.
- A decentralized, bottom-up strategy that fosters entrepreneurship and allows agencies the independence to launch their own programs. Different agencies or levels of government, including states and city governments, are ICT enabled

with relative speed; applications can then be spread across other agencies, or scaled up to the national level.

Each approach has factors that support success as well as risks that may lead to failure. A national strategy directed by government at the executive level, an approach first launched by such countries as Sweden, Singapore, and the Republic of Korea, has several advantages. Guided by a shared vision, e-government develops relatively evenly across the public sector. Integrated platforms are developed, allowing seamless information exchanges and transactions between agencies. The integration of government processes reduces transaction costs to citizens, who can access services from multiple agencies through a single interaction using a smart card or a one-stop shop. Common business processes, open standards, and common guidelines for investment and procurement reduce duplication in spending and allow secure information sharing.

Many governments—and aid agencies—encourage an approach in which efforts to implement e-government target specific sectors, functions, or local initiatives. For example, most of World Bank lending for e-government applications in government follows this approach, mainly through ICT components or pilots in sectoral projects such as education or health. Bilateral and multilateral aid has also focused on pilot ICT applications without much concern about the overall government-wide transformation strategy. This decentralized approach has been politically popular because it has led to small but quick and visible wins. It allows government agencies to embark on their own initiatives, on a sector or service-by-service basis. It provides a specific service improvement to a limited target population. It avoids the problems of coordination across agencies. Speed and immediate visible gains are the decisive considerations.

Increasingly, countries are experimenting with a hybrid approach that combines features of the top-down and bottom-up strategies. A hybrid approach, for example, might adopt a top-down approach to interoperability standards, architectural frameworks, shared infrastructure, and common services while allowing for flexibility for bottom-up development of applications and services. This balance often shifts over time. The example of India is one of starting at the state or local levels, as in progressive states like Andhra Pradesh. Since 2005, India began to build upon local experience, scale up successful applications, and develop shared frameworks and infrastructure (Chapter 6).

The sequencing between sectoral and cross-sectoral e-government programs can be part of the road map of an e-government transformation process. Should a central agency first set the enabling conditions and shared infrastructure across the government, adopting a whole-of-government approach to transformation? Should the government start with a leading agency or high priority sector through pilots of common business processes, and subsequently scale up within the agency then across agencies? Would the focus on such pilots, or sector-specific applications, lead to islands of automation, duplication in investment, little sharing of data and resources and ultimately, poor and agency-centric service? As agencies deepen their own technological learning and further integrate ICT into their business units, would such

turf-based programs diminish the role of the central ICT agencies and their common frameworks?

Political and institutional traditions often shape this sequencing and balancing process. The national CIO council may orchestrate the process. Governments may adopt some form of a federated approach to e-government program, requiring a continuous balancing act, reflecting the power of central agencies like finance and the readiness and influence of key sectoral ministries like education and health. Balancing top-down direction and bottom-up initiatives would be reflected in the balance between the horizontal and the vertical integration of e-government, or between sectoral approaches and cross-sectoral, whole-of-government approaches. Vertical or sectoral applications would build on and be guided by the shared frameworks, capabilities, and infrastructure. Yet, each e-sector would be organized so as to be fully integrated into the governance and business processes of the concerned sector or public agency (Box 5.6).

## Box 5.6 e-Sector Strategies in the Context of e-Transformation

Many of the principles that apply to the national or government-wide levels are also applicable to e-transformation within and across agencies at the sectoral level. e-Sector, the vertical application of ICT at the sector or agency level, is enabled by the building blocks of e-government as treated in this chapter and by the pillars of e-development, in general.[11] Sectoral leadership and governance are critical. Each sector or agency needs its governing coalition and change agents to initiate and sustain e-transformation. Leadership must develop and communicate a vision of the transformed sector, enabled by ICT. This vision, together with e-readiness assessment, should guide the design of ICT-enabled sector transformation strategy and the pace and modalities of implementation.

The driver for e-sector transformation is best left to the ministry or agency that owns the business process to ensure ownership and accountability. The Ministry of ICT may facilitate the process by providing technical assistance and shared resources, but it should not assume the lead in developing or implementing e-health or e-education. Even for common functions or processes such as procurement or human resources management, the lead for e-procurement or e-HR should remain with the national agency that owns this function, that is the national procurement agency or civil service management agency, together with the participating user agencies.

[11] e-Sector strategies and sectoral applications are not covered in detail in this book, except by example in Chapter 6, under the section: managing e-sector: the case of ICT in education.

An e-sector strategy would start with understanding the stakeholders; stakeholder groups vary significantly in influence and support and across sectors. An e-sector strategy would address sectoral performance priorities, key client services and modes of delivery, and core sectoral functions such as policy analysis, planning and budgeting, monitoring and evaluation, and human resources management. It would examine options for decentralization and networked organization. It would set the stage for establishing priorities for ICT applications within the sector and for harmonizing and collaborating with other sectors or agencies for shared infrastructures and services.

Each sector agency should take a holistic approach to innovate new ways of doing business and to transform its relationships with its diverse stakeholders. It would deal with its own clients, suppliers, and other stakeholders in developing its own ICT-enabled transformation. These relationships are not only binary, but also include potential interactions among the stakeholders. How to unleash the innovative capacity of diverse actors? How to mobilize diverse sources of funding for sector transformation? Linkages along the supply chain and new partnerships among government, business, and civil society may be enabled to address sectoral problems and deliver comprehensive services or solutions. For example, in health care, a vision-directed e-health would transform the care delivery across many suppliers and providers, inform and empower the consumer, make costs and quality of health services more transparent to all stakeholders, create better options for promoting health and providing care, promote collaboration and innovation in service delivery, and enable government to coordinate and guide the nation to an equitable and sustainable health system.

## Public–Private Partnership[12]

Public–private partnerships (PPPs) present alternative ways to obtain goods, services, expertise, and capacity building for the public sector.[13] These partnerships are contractual agreements between public agencies and private companies to supply infrastructure assets or services that traditionally have been provided by governments. Further, in a true PPP, the private sector partner not only stands to profit from a successful project, but also assumes some of the risk of failure. In contrast, under ordinary procurement contracts, the private sector vendor is likely to be paid whether the project is successful or not. Increasingly, e-government projects have been the

[12]This section draws on infoDev toolkit (www.egov.infodev.org, 2008), among others.

[13]PPPs were used mainly for physical infrastructure projects, such as prisons, hospitals, and power plants. As the need for modern communications systems has increased, PPPs have been developed around access to ICT resources.

subject of PPP initiatives (see, www.IMF.org, "Public–Private Partnerships," March 2004).

The use of ICT in government presents substantial opportunities and options to leverage private sector know-how and resources to accelerate public sector reforms and reinvent government processes and services. e-Government initiatives in developing countries are particularly constrained by lack of financial resources, low level of skills and capacity within governments, and the absence of incentive structures for rewarding performance and innovation. Partnership with the private sector to diffuse e-government practices can help overcome many of these constraints while at the same time increasing opportunities for local private sector development. A frequently cited and early example of an e-government public–private partnership is *e-Seva* of India (Box 5.7).

### Box 5.7 PPP for Government-to-Citizen Service Portal: India's e-Seva

*e-Seva* is an innovative project between the Government of India's Andhra Pradesh province and Tata Consulting. e-Seva provides more than 100 services, ranging from the payment of utility bills to the registration of motor vehicles. In response to access barriers, e-Seva was launched with 43 service centers in the city of Hyderabad, later expanded to 213 towns, and most recently has been extending into rural areas. As a measure of success, e-Seva completes over 1.6 million transactions per month in the city of Hyderabad alone. In this case, Tata Consulting, under the "Build-Own-Operate-Transfer (BOOT)" model, built the e-Seva portal and runs the service, charging normal fees for the various government services and keeping part of the revenue.

e-Seva integrates government-to-citizen with business-to-customer services. It is a key component in implementing the Government of Andhra Pradesh's vision to create a knowledge society by using information technology in all aspects of development and governance. It engages the private sector with a progressive state government in extending public services to all.

Source: www.egov.infodev.org and *e-Seva*

Partnerships can be built up with the private sector as well as the other stakeholders, including NGOs. Private sector partners who had gained experience in e-commerce may have skills and experience in online service delivery not readily available within the civil service, and they may have greater ability to raise funds necessary for upfront planning and procurement. Through appropriate business models and service-level agreements they may also have strong incentives to mobilize demand for the e-service, scale up rapidly, ensure high-quality service, and minimize the costs of systems development, implementation, and operation.

As partners, NGOs can provide complementary resources such as local content and knowledge of target users and the poor. Civil society organizations can also form coalitions to provide oversight and enforce reforms being enabled by e-government, as has been the case in the Philippines with introducing e-procurement in the public sector to promote transparency and fight corruption.

With partnerships, e-government projects and the resulting e-services can be implemented more rapidly at a reduced risk and investment by the government. At the same time, incentives can be provided to the private sector to deliver high-quality electronic services and to scale up adoption. For example, the e-procurement system in Andhra Pradesh, India was based on PPP, where the private partner puts up the capital costs, to be paid from adopting users through the transaction fees. This business and revenue model provided strong incentives for the private partners to promote adoption and system success. The one-stop electronic service delivery of Hong Kong, provided by a private entity, is another early example of PPP (Box 5.8).

Public–Private Partnerships (PPPs) are complex undertakings. They raise critical issues not only of implementation but also of legal frameworks, concordance with

## Box 5.8 Electronic Service Delivery, Hong Kong

To develop its one-stop shop portal and deliver electronic services for citizens and businesses, the Government of Hong Kong has adopted an innovative business model that reduces its risk and investment and, at the same time, provides incentives to the private sector to deliver high-quality electronic services to the community. The private sector operator, ESD Services Limited, is responsible for financing and implementing the system. The government has not paid for the capital investment or the recurrent operational and maintenance cost. It will only start to pay for each chargeable transaction made through the system after the number of cumulative chargeable transactions conducted has reached an agreed volume. The operator is allowed to make use of the system to provide advertisements and revenue-generating, private sector e-commerce services. This provides an additional income stream to the operator.

With the flexibility of business operation, the operator was able to develop the system rapidly in a year. Moreover, by allowing an integration of public and commercial services in the same portal, the public can enjoy electronic services in a seamless and convenient manner. By allowing the ESD information infrastructure to carry commercial services, the project also promotes the development of e-commerce in Hong Kong. The project has been an innovative model for public and private sector partnership in the implementation of e-government projects and for government taking the lead in providing a community information infrastructure to promote e-commerce.

procurement rules and anticorruption efforts, principles of selection (including the relative priority given to local and international partners), and methods for assessing public costs and benefits in both the short and long term. e-Government projects involving PPPs raise governance issues that must be thoughtfully addressed.

What is most needed for practitioners in developing countries is a starting point for addressing these opportunities and challenges—where to begin when it comes to PPPs in e-government, and what experiences may be most relevant for their specific conditions and needs. The infoDev toolkit on e-government (www.egov.infodev.org, 2008) provides a good guide on partnerships with the private sector. A good starting point to start is to understand the various forms of partnerships and their relative merits (Box 5.9).

## Box 5.9 Forms of Public–Private Partnerships

Various forms of PPPs have been utilized in providing traditional government services and are being explored for e-government. The following are some of the many types of PPPs:[14]

**Design–Build–Finance–Operate (DBFO):** In this PPP, the government specifies the services that it wants the private sector to deliver and the private partner designs and builds a dedicated asset for that purpose, finances its construction, and operates the asset, providing the public services required.

**Build–Own–Operate (BOO):** The private partner builds and operates a facility/service without transferring ownership to the public sector. Throughout the process, the private sector partner owns the facility.

**Build–Operate–Transfer (BOT):** The private partner builds a facility to the specifications agreed to with the public agency and operates (but never owns) the facility for a specified time period under a contract or franchise agreement with the agency. At the end of the franchise period, the public partner, which always retains ownership, can assume operating responsibility for the facility, contract the operations to the original franchise holder, or award a new operating contract or franchise to a new private partner.

**Build–Own–Operate and Transfer (BOOT):** The private partner owns the project, invests resources, undertakes its development, owns and operates it for some time, and then transfers the assets to a public agency.

The key to effectiveness for any public–private partnership is to play to the strengths of each partner. The role of government is that of a leader, a catalyst, and, most important, a domain expert who knows "what business it is in." Government

[14] *National Council for Public-Private Partnerships (US).*

alone can resolve legal and procedural problems in implementation, bring together rivals to discuss potential means of competition for the larger public good, decide the terms of competition and regulate them where required, set standards, and provide public infrastructure for the e-government environment. The private sector can provide investments, the latest technology, expertise in delivery and execution, global knowledge, and best practices.

Decisions on PPPs, outsourcing, and other contractual arrangements with the private sector have to be made carefully. Considerations include the quality and quantity of the resources available within the government as compared to those in the private sector, the potential costs involved in outsourcing, and the timetable that is applicable to the project (Box 5.10).

## Box 5.10 Critical Success Factors in PPPs

Although there is no set formula for crafting a successful partnership with the private sector, accumulating experience, documented in several sources, suggests that the following elements should be taken into account:[15]

**Political Leadership:** A successful partnership can be formed only if there is top-level participation and commitment, starting from the conceptual stage.

**Planning:** The responsibilities of both parties to the partnership should be clearly articulated in a fully developed plan and contract, including a clearly defined method of risk allocation, change, dispute resolution, and termination.

**Legal Framework:** There should be a solid legal and policy foundation for the implementation of each partnership.

**Private Partner Compensation and Mutual Commitments:** The best partnerships will involve shared burdens and shared rewards for both the public and the private participants. The private partner should contribute to the project as a genuine partner, drawing on its unique skills and capabilities. Yet, the private sector motive is profit, so the PPP contract must be explicit in terms of minimum revenue, sources of revenue, user fees, fee caps, revenue caps, cost sharing, etc.

**Public Sector Oversight:** Once a partnership has been established, ongoing monitoring by the public sector is important in assuring its success. This is a clear weakness in many developing countries.

**Consultation with Stakeholders:** It is important to consult closely with all stakeholders in planning, implementing, and overseeing any PPP.

[15] See National Council for Public-Private Partnerships (US), "Keys to Successful Public-Private Partnership." and InfoDev's e-gov toolkit, 2008, among others.

**Selecting the Right Partner:** Awarding contracts based on the best value, not just lowest bidders, is critical. A potential partner's knowledge and experience in the areas under consideration are important factors in selecting the right partner.

**Intellectual Property Rights:** Assets in the form of products, technologies, and business models may be created during e-government project implementation. It is important to define who will own the intellectual property of these assets.

**Security and Privacy:** Government must ensure that the sensitive data collected about individuals and entities are protected against misuse. In PPPs, a private partner should not be able to use the government's data for private purposes.

**Exit Strategy**: Exit strategy goes beyond contract termination and into planning for government takeover, transitioning to a successor PPP, or transitioning to government operation of facilities with full data protection and without service disruptions.

More broadly at the country level, the success of PPPs in e-government depends on e-government readiness and the economic viability of e-government projects. These factors involve the following parameters: current access, quality, and affordability of ICT infrastructure; government outlook, policies, and environment conducive to private sector participation; e-services adoption potential, including factors such as literacy and e-literacy and per capita income levels; and the priority given to e-government on the public agenda. Assessing these factors within and across countries should guide the pace and place of PPPs in e-government for each country.

# Chapter 6
# Managing Change and Innovation in Government

In this chapter I touch on some of the key tools for strategic planning and management of ICT-enabled government innovation and transformation. The aim is to outline tools to facilitate change management, promote innovation in government, and bridge the gap between what is promised and what is delivered through e-government programs. There is a vast and growing literature on such tools. I only outline those tools of which policy makers should be aware to ensure they are appropriately deployed by program designers and managers. I offer a framework for mapping these tools on the strategic management process of e-government.

Key strategy and management tools covered in this chapter aim to:

- benchmark e-readiness and the demand for e-services;
- analyze stakeholders and form coalitions;
- organize and build leadership institutions;
- make the business case for ICT investment, and finance, and budget accordingly;
- monitor and evaluate;
- promote change, innovation, and learning; and
- govern the technology.

In the concluding section I examine how e-government can be integrated at the sectoral level, using e-education as an example. I also outline strategies for sequencing, piloting, and scaling up to national e-government programs.

## Strategic Planning and Management of e-Government

This section outlines key analytical tools and processes to complement and translate the conceptual approaches (discussed in the last section) into the practice of planning and managing ICT-enabled government transformation. There is a vast and growing literature on such tools. I only provide a strategic perspective for policy makers who must be aware of these tools to ensure they are effectively deployed by e-government specialists and program managers.

Policy makers should be aware of the steps and tools needed for assessing e-readiness, analyzing demand, and engaging users. They may use stakeholder

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_6,

analysis to manage change, mobilize coalitions, and deploy strategic communications. They need to sharpen their human resource management and incentives for adaptation and innovation and develop competencies and CIO networks to lead the change. They need to make the business case for investing in e-government and adapt public finance and budget practices to meet the requirements of sustainable e-government programs. Continuous monitoring and evaluation of ICT-enabled transformation is also critical to deal with complex and resistant public sector bureaucracies.

The process of planning government transformation strategies and managing e-government programs may be conceptualize as in figure 6.1. Various steps and tools can then be mapped along this process. The rest of this chapter discusses these tools accordingly.

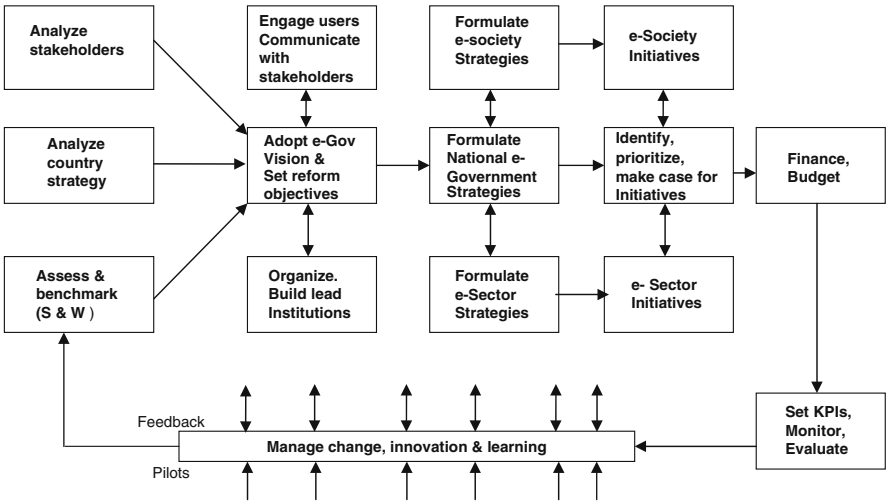



**Fig. 6.1** Strategy and management tools for e-government

## *Benchmarking e-Readiness and the Demand for e-services*

e-Government programs should be responsive to the current status of the country in terms of its ability to adopt and integrate ICT applications in public agencies. e-Government strategists would benefit from the results of e-readiness exercises already conducted for the economy as a whole. But they may want to go beyond the metrics of general e-readiness assessments and consider factors specific to the types of e-government applications they are considering. General country e-readiness assessments should complement, but not substitute for in-depth e-government readiness studies. As with country e-readiness, government e-readiness, and benchmarking should not be viewed as an end in itself, but a process to engage stakeholders and form coalitions for public sector reform.

According to the South African NGO www.bridges.org, "A range of assessment tools have been developed to measure a country or economy's e-readiness . . .

The tools use widely varying definitions for e-readiness and different methods for measurement, and the assessments are very diverse in their goals, strategies and results. The right tool depends on the user's goal." Bridges.org, "e-Readiness Assessment Comparison Tool" compares e-readiness tools in terms of topics covered, assessment methodologies, and analysis.

In assessing the needs and capabilities of citizens to utilize e-government services, e-government planners should take account of the fact that a large percentage—possibly the vast majority—of citizen interactions with the government services will continue to be in person at government offices or over the telephone. "In developing e-government services, the readiness of citizen groups to use self-service channels must be taken into account, as must the complexity and requirements of the service. A high proportion of interactions between citizens and the public service are in the areas of health and social services where citizens tend to be elderly, in poor health and of lower educational and income backgrounds. Many of these will require assistance in accessing public services, either at front desks or over the telephone. They may not be in a position to benefit from a self-service channel where the citizen has to do much of the work of data entry." See Information Society Commission (Ireland), "e-Government: More Than an Automation of Government Services" (2003).

The InfoDev toolkit (2008) presents some key resources for government e-readiness, monitoring and evaluation, and benchmarking tools and methodologies. The Division for Public Administration and Development Management (DPADM) of the UN Department of Economic and Social Affairs (UNDESA) has put together a readiness assessment methodology specifically tailored for e-government. Most important first steps in developing an e-government strategy are an IT skill inventory, a technology inventory, and a service inventory of the public sector. Key sources for e-government assessment tools include: the Center for International Development (CID) at Harvard and IBM, "Readiness for the Networked World"—A widely used general-purpose e-readiness assessment tool, and the UN Department of Economic and Social Affairs (UNDESA), "Measurement and Evaluation Tool for e-Government Readiness (METER)."

Benchmarking is a process by which organizations evaluate some aspect of their operations in relation to best practices (or the best performer), usually within their own sector. Benchmarking is used mostly to define program objectives and may lead to the identification of key performance indicators (KPIs). Progress in program implementation is measured against internally developed objectives or milestones while benchmarking is compared with other projects. On the regional and international scale, there are several comparative benchmarking programs that are measuring the progress of e-government, ranking countries from year-to-year.

It is important to be clear about the purpose and audience of e-government benchmarking (Heeks, 2006).[1] It can inform policy makers of progress and past achievements, as suggested by UN e-government benchmarking (UN, 2003). It

[1]For an excellent and in-depth treatment of benchmarking methods and their relevance to developing countries see Heeks, 2006.

can assist policy makers with setting prospective directions that will most likely deliver high e-government performance. An often neglected but important purpose is accountability. Often neglected audiences for benchmarking are citizens and civil society organizations. Ministries of finance may share interest in holding agencies to account for the resources they have invested in e-government. Evidence on demand for e-government benchmarking data can help guide the purpose, audience, and content of such studies. Since what gets measured gets done, using benchmarks and indicators not relevant to developing countries' contexts can be wasteful and misleading.

The demand for e-government benchmarking is likely to change in line with the maturity of e-government program and the corresponding change of e-government policy issues: from e-readiness to service availability, to uptake, to impact (Heeks, 2006). While advanced countries may have moved beyond issues of e-readiness and availability, to a focus on service uptake and impact, for the majority of the world's nations, many elements of readiness for e-government appear to be part of their policy agenda, and rightly so. Most e-government programs in developing countries still face challenges in terms of legal, institutional, human, leadership, and technological infrastructure. And the standards for services and technological infrastructure (e.g., personalization of e-services, broadband networks, cloud computing) are moving targets.

In defining KPIs countries are using a range of e-government metrics. Metrics include: number of agencies and functions online, download rates for forms and reports, usage rates for various services, reduction in average time for processing citizen requests or applications, reduction in number of complaints about the quality of government services, increased citizen participation in consultations and comment proceedings, lower costs to government in delivering services, lower costs to citizens and businesses in utilizing service, and user satisfaction.

e-Government can be viewed from demand- and supply-side perspectives. Demand-side metrics are designed to track use of, and satisfaction with, e-government. They can include measurements of user attitudes toward e-government and preferences for services, as well as barriers to e-government usage. Demand-side indicators require user surveys. Supply-side metrics measure the availability and sophistication of online services. They can include: portal or e-service benchmarks: availability of portals and e-service applications, sophistication of functionality, and management performance benchmarks: measurements of government progress toward stated e-government goals, including agency-by-agency status. Much of these indicators can be captured through Internet surveys.

The European Commission (EC) has developed a common benchmark measurement that has been applied annually since 2001 to measure progress on e-government program called i2010, with the 8th report made available in November 2009 (EC, 2009). Its benchmarking now covers 27 member countries, using indicators covering supply and demand perspectives that are critical to e-government implementation. The EU benchmarking has focused on the "20 basic services" (mentioned in Chapter 4), offered through 14,000 public-service provider web-sites across Europe. This systematic measurement has generated a series of trends

and patterns that measured the progress of leapfroggers, fast growers, moderate adopters, and those leading countries whose e-service supply (availability and sophistication) has reached saturation. This benchmarking system has proven to be a policy-informing tool to both the European and member state levels. Many lessons can be gained from this consistent benchmarking (Box 6.1).

## Box 6.1 Emerging Insights from the European Commission's e-Government Benchmarking System

For all the 20 basic services, 4 clusters have been assessed: revenue generating (for government); registration (e.g., births, company); service (e.g., health, social); and permits and licenses (e.g., passport, building). The assessment shows greater maturity of the income-generating services, as such services from homogeneous and high-volume activities, with measurable revenues—making them more attractive to enable first with e-government. It also shows that the sophistication and the take-up of business services (e.g., public procurement, corporate tax, business registration) is generally more advanced than e-services to citizens. Benchmarking also reveals significant gaps between online sophistication (availability) and user take-up, particularly for citizens.

The gap between putting services online and having the service used tends to persist, beyond the anticipated time lag. Using EC 2008 benchmarking results, top-performing countries provide mature services (80% online sophistication) for citizens and display relatively high take-up rates of 52–63%, while the average take-up for the 27 member countries is 30%. Leading countries provide mature business services, and their supply is matched with 90% usage; for the EU average, the take-up is also relatively high at 74%. In some countries, Internet use and broadband penetration are low, limiting take-up. Other reasons for the gap are lack of awareness and lack of added-value. This gap calls for a clearer view on how to attract, engage, and incentivize citizens and pursue inclusiveness. Barriers to take-up can be meaningfully addressed by a deep understanding of the customer's journey through service delivery, his life situation (segmentation and event-based approach), continued communication, and collaboration across administrative silos.

A common shift across Europe is toward increased focus on and involvement of the customer in service delivery. This shift is reflected in many trends: personalization by the user (e.g., my portal); organization of service delivery in ways more meaningful to the customer (e.g., life event); access through multiple and connected channels; participation in the service delivery process (e.g., problem reporting and feedback); and progress tracking of cases (e.g., job search). New technology such as mobile devices and technology capabilities such as interoperability and data security attract

users, increase engagement, and increase trust. User-empowering technologies facilitate customer engagement and service enhancement.

Benchmarking exercises have improved understanding of the digital divide so "no citizen is left behind." However, progress toward strengthening participation and democratic decision making has been slow. Significant gaps have been observed in user-centered web design, unified access, "whole customer view," channel choice, and customer involvement in service design. Engaging the citizen through user-centered service provision may provide the foundation to increase trust and online participation.

Source: European Commission, 2009.

Benchmarking is a learning process. A continuous process of enhancement of the EC benchmarking system is now planned to reflect the maturity of e-government programs among the leading member countries and to add new services of contemporary relevance like energy and environment (EC, 2009). The new system will retain the existing compatibility over time and the principle of open collaboration with participating countries. It will allow elective measurement building blocks. This will enable new policy areas to be investigated. It may consider citizen and business life events (often an aggregation and enhancement of the 20 basic services); new services to include topics like energy, environment, and transport; the enabling building blocks and governance structure that support delivery (looking behind the web sites, through end-to-end fulfillment chain into the back office); back-office modernization; delivery channel migration; the development of shared and "cloud services"; openness and transparency; regional progress.

Benchmarking also needs to take broader and longer term perspectives. While technology can move fast, societal and institutional change takes more time. Increasing concerns over global competitiveness, the growing service economy, and the transition to a single European market—all have implications for the next phase of e-government programs in the EU. The eight services for business have achieved high sophistication level (90%) and take-up (74%) on average, but they have been limited to services to meet compliance with public requirements (tax, permits, registration, customs, social contribution, statistics, and procurement). An EU Service Directive, enacted December 2009, enables service providers to establish themselves in any EU country swiftly and conveniently, including the free movement of their services. Countries are required to set up a "point of single contact" (PoSC, or front end) through which service providers can access the relevant information, forms, and applications for their establishments (EC, 2009).

More attention will be needed beyond the PoSC, to provide added-value information and advisory services and to provide seamless services. The single EU market is home to about 12 million enterprises; among them 99% are SMEs. Administrative burden presents a considerable barrier to SME start-up. They could also benefit significantly from e-government-enabled business support services. Enhanced services

to business will require service providers to bundle applications through PoCS and each connected authority to keep track of application received. A series of legal, technical, and organizational requirements will need to be met for the administration to become business-friendly and supportive of a dynamic service economy.

The current economic crisis and the resulting long-term fiscal and budget constraints and high levels of public debt call for more attention to measuring the efficiency and effectiveness of government and continuous upgrading of the e-government benchmarking. It calls attention to government-wide productivity improvements through better analytics, smart regulation, reduced administrative burden on business, and streamlining processes. In turn, this calls for increased sharing of information, cross-agency collaboration, and adoption of interoperability and service-oriented architecture (to be discussed later in this chapter). Better visibility of expenditure by government and more efficient transactions between government and suppliers (through e-procurement) are key components to making considerable savings.

In developing countries, e-government surveys, report cards, and global benchmarking exercises like that of the UNDESA are often limited assessment to the supply side, and particularly the features and functionalities of web sites, rather than the fundamental nature of ICT-enabled change and the factors supporting this change. It is important to include in such surveys and benchmarks metrics on the networking and collaboration aspects of e-government as well as the role of e-government in inducing innovation in processes and services. Even in assessing web sites, these methodologies fail to take account of availability local content in local languages, quality of local-level e-government web sites, degree of interactivity, etc. (Box 6.2).

## Box 6.2 The Malaysian e-Government Program: Measuring Progress

An evaluative survey of government web sites in Malaysia has indicated that despite fairly high marks for e-government development, most web sites served little and stale information for the citizens. The study paints a different picture from that portrayed by the vision of knowledge-economy of Malaysia, and from Malaysia's ranks in the annual surveys of different agencies such as UNPAN and Accenture. According to the evaluative survey, the Malaysian e-government is still in the early stages of e-government. The web sites are focused on the agency need to publish information about itself. Lacking a user-orientation, e-government uptake is still slow. Outdated information is common. Utility is also a major issue. The responsiveness of the agency to, for example, an e-mail inquiry is dismal. e-Government program objectives are focused on service delivery; policy makers and public servants are reticent to the idea of e-democracy and e-participation, or to transforming the relationship

between the government and the citizens. Public expectation is rising much faster than the capacity of agencies to respond, reengineer, or transform.

Source: adapted from *egov* Magazine, March 2006, pp. 8–12.

As the focus of e-government should be on the users, an important element of e-government program design and management is to measure user satisfaction: Are targeted audiences finding e-government services responsive to their needs? e-Government managers should measure whether the intended audiences are using e-government services and, if not, why not. Demand-side indicators include the preferences of citizen and business users, attitudes toward e-government, willingness to use online services, and perceived advantages of and barriers to usage (Rand Europe, "Benchmarking e-Government in US and Europe," p. 20). Demand for e-government may be measured in a variety of ways, including online surveys of users, accessible via e-government sites, focus groups, and user testing. A leading example of measurement of user attitudes toward e-government via surveys is the "Top of the Web," a user satisfaction and usage assessment of e-government sites, in which close to 50,000 Europeans are surveyed on their views on e-government and their satisfaction with various e-services in their countries.

The eUser project has developed an Inspection Evaluation Framework that uses five characteristics to measure the relevance to users of an e-government system or function:

- Visibility refers to the degree to which a system or function can become known to individual nonusers.
- Perceived usefulness and ease of use refer to the usefulness and ease of use of the system or function from the viewpoint of individual nonusers.
- Availability refers to the degree to which all types of individual users can reach the entry point (s) of the system or function.
- Quality of interaction experience encompasses the quality of interaction perceived by individual actual users and refers to the degree to which a system or function can be used to achieve useful and quality results.
- Relationship maintainability is the degree to which a good relationship with individual system or function users is effectively cultivated and maintained while the user is not working on the system.

Metrics may be developed as part of the stakeholder consultation process. This process is key to successful e-government planning. Increasing the "voice of the user" in the e-government planning and design process can also help identify KPIs or other metrics for use in monitoring implementation. Stakeholder consultation at all stages may prevent investment in projects that are too far ahead of user interest and capacity or that fail to meet current user needs. This consultation process is particularly critical in developing countries where the voice of the user is often weak

or poorly understood, and where central planners are often distant from the realties of the poor and rural populations.

More broadly, e-government strategy should be developed with the direct input from all the key stakeholders outside the government itself, such as academia, private sector, and civil society. Enabling government agencies with ICT should start from understanding the needs of the end user of government services. Focus on the end user through this consultation process may also help change the mind-set of public sector employees from a traditional department-centric thinking into a customer-centric one.

## *Analyzing, Communicating with, and Mobilizing Stakeholders*

None of public sector reforms will be realized, however, without understanding the stakeholders, communicating across various channels, developing coalitions, and broadening local ownership. Reform programs encounter resistance due to lack of ownership, poor understanding of the impact of reforms on stakeholders, entrenched special interests, weak feedback from stakeholders to decision makers, and inertia, or the need for time to build interest and commitment. More broadly, successful ICT use in government requires attending to governance, political economy, and the social demand side.

But where should we start? What tools we may use? By viewing e-government as a reform process, we may use well-established tools of stakeholder analysis and communications audit to prioritize and phase reforms, mobilize key stakeholders, and promote support for reform (IFC, 2007). This is a smart upfront investment to address the risks and barriers to reform, identify who will help or hinder reform, and use this knowledge as input to either design and sequence the reform program itself, or to influence behavior and change the stakeholders landscape in support of reform goals. It can be used to mitigate risks, accelerate reform adoption, and achieve sustainable reform (Boxes 6.3 and 6.4).

### Box 6.3 Stakeholder Analysis

Identifying and analyzing the needs and concerns of different stakeholders are fundamental to shaping and implementing reform. Stakeholder analysis is a structured process to identify, assess, and prioritize the stakeholders and interests that affect the mission and objectives of reform. Stakeholder analysis helps identify the specific interests and characteristics of stakeholders, the capacity of stakeholder groups, relationships among stakeholders to identify potential partners, potential incentives, and opportunities to participate, ways to reduce negative impacts on affected stakeholders, and mechanisms to improve sustainability.

The process starts with identifying key, primary and secondary, stakeholder groups, surveying them for insight and input, analyzing their support and influence, and then categorizing these groups along a stakeholder map or matrix (Fig. 6.2). The stakeholder map helps to assess the feasibility of reform and to focus on how to persuade, influence, or empower different stakeholders to advocate for policy changes and promote the reform agenda, together with the enabling e-government application. The stakeholder map is also used to determine the engagement approach for each key stakeholder, who, when, and how to engage, depending on the initial location of stakeholders on the map. Options for engaging allies, potential partners, opponents, and adversaries can be planned accordingly. For example, potential partners may be informed to enable implementation, motivated to become active supporters, or empowered and organized to lobby for change. For different phases of the e-government application cycle, types of stakeholders would be matched to types of engagement ranging from communications, to consultation, to negotiating for mutually binding results, to participating in a long-term-win-win outcome.

IFC, 2007.

## Box 6.4 Communications Audit

A complementary tool to stakeholder analysis, and a key one to advocacy and strategic communications, is to conduct a communications audit: assess available channels for communicating with stakeholder groups. A communication audit is a scan of the local communication environment. It covers formal channels, informal channels, supporting organizations, and the media and information environment. It must be tailored to the specific reform and relevant issues concerning e-government application or program. Each channel may be assessed in terms of reach, frequency, cost, feasibility, and effectiveness. The aim is to identify creative ways and mix to leverage existing channels or devise new ones for different target audiences. A strategic communication plan would identify with audience would be addressed at which time, which messages are most appropriate for those target audiences, what delivery channels and tactics to be used, and who will manage communication and engagement activities (IFC, 2007).

For example, in e-Sri Lanka, communication channels ranged from street dramas for rural communities to develop content and use telecenters, to radio and television programs to mobilize mass users for e-services, and to the training of journalists on information society issues to gain the support of the political elite (Hanna, 2008).

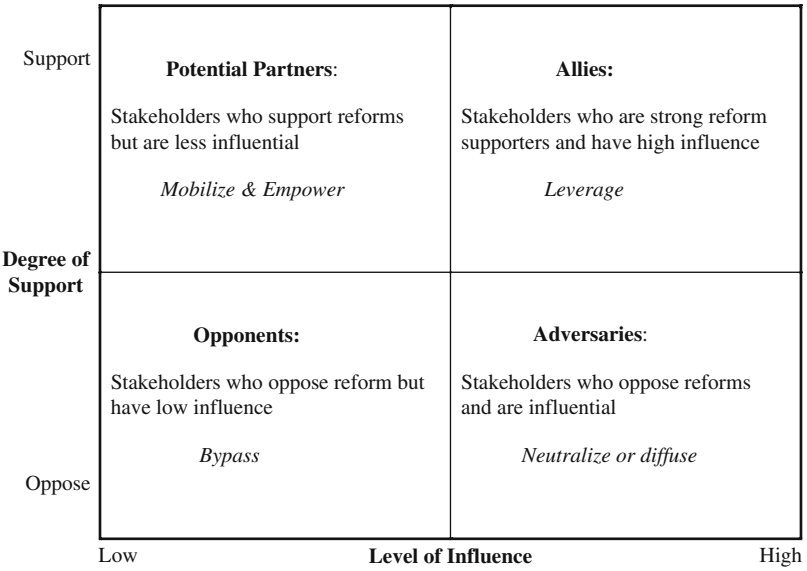



**Fig. 6.2** Stakeholder support and influence matrix

The mass media can play a crucial role in educating the public about the role and potential of e-government. Reporters help determine how the public feels about online services and e-democracy, among other applications, and the direction, scope, and pace of ICT-enabled public sector transformation. Imaginative strategies have been tried in family planning programs, through street dramas and radio and TV drama serials (soap operas), and other communication channels may reach the broad population. As more resources are devoted to e-government, as more services move online and as citizens become familiar with the "virtual state" and "on demand" government, the media will become more attendant to e-government and will come to shape citizens' attitudes about the digital-era.

## *Leading and Organizing*

Leadership at the highest levels is necessary to inspire confidence in the transformation process and integrate ICT into their strategy and change management. An analogy from the private sector is the case of ICICI Bank, India's largest private sector bank, where technology is considered so important that it is part of the CEO, K.V. Kamath's direct responsibility—he is essentially the CIO. The entire management team is deeply involved in technology and is assisted by a small number of IT professionals. In the case of Andhra Pradesh a state in India that emerged as a leader in e-government in the late nineties, the then Chief Minister Chandrababu Naidu held only one portfolio—that of IT.

Leaders and leadership institutions must bridge the communication gap between those concerned with the core business of government and those concerned with ICT, or the enabling technological tools and platforms. Technology managers should understand the broader, nontechnical imperatives of government transformation, such as the changing nature of economic competition, the increasing premium for managerial flexibility, and the rising demands for interactivity and participation at all levels. Meantime, public reformers should develop an awareness and appreciation the ongoing techno-economic paradigm and the potential of ICT tools and solutions to enable public sector transformation.

Approaches to leadership and institutional coordination vary among governments, ranging from highly decentralized to centralized (Hanna and Qiang, 2009; Hanna, 2007b). Some hybrid and flexible approaches are emerging with increasing reliance on chief information officers (CIOs). The position of CIO is vested with institution-wide authority and accountability. For this role to be effective, the center must be able to enforce some key frameworks and standards (to be discussed later). However, decentralized approaches depend more on collegiality, negotiation, persuasion, shared interests, and shared purpose.

Many countries, advanced and developing, are instituting or experimenting with national councils of CIOs, supported by CIOs in ministries and agencies. The role of such councils has become increasingly critical. These councils vary in mandate but often involve addressing common CIO concerns and challenges, such as investment planning, IT procurement practices, IT human resource development, and information security policies (Box 6.5).

CIO councils have also been engaged in CIO capacity development by providing inputs into defining core competencies, accrediting CIO education and training programs, and sharing information and best practices among CIOs. Councils are expected to play an increasing role in consensus building, vertical and horizontal communication, team-based problem solving, and knowledge sharing for e-government. When well functioning, they demonstrate the role and power of networks in leading, learning, and innovation to transform governments.

### Box 6.5 CIO Councils in Various Countries

- **Australia.** Significant e-government matters affecting all jurisdictions are processed by the Online and Communications Council. The council has a Cross-Jurisdiction CIO Committee chaired by the Australian government's CIO—who also chairs the Australian Government Information Management Office—and a Chief Information Officer Committee that investigates ICT issues, endorses solutions, and undertakes strategic ICT projects. The Australian Government Information Management Office and Chief Information Officer Committee also collaborate with a Business Process Transformation Committee that coordinates reform of agencies' business processes (ICA-IT, 2006a, pp. 1–6).

- **Canada.** To promote interjurisdictional collaboration, the Public Sector Chief Information Officer Council and the Public Sector Service Delivery Council bring together various levels of CIOs and leading service officials to exchange best practices, conduct joint research, and evaluate and pursue opportunities to adopt common practice and collaborate on integrated service delivery (CIOB web site: http://www.tbs-sct.gc.ca/organisation/ciob-ddpi_e.asp; Service Canada web site: http://www.servicecanada.gc.ca/en/about/index.shtml).
- **Singapore.** The ICT Committee aims to share experiences, promote integration across agencies, streamline processes, and share data. A CIO Forum, comprised of CIOs from key agencies, was created in 2004 to promote inter-agency sharing of best practices and systems as well as consultancy on and review of central systems and investments, increasing opportunities for collaboration. The forum also provides a venue for giving feedback to central authorities on service-wide e-government initiatives (ICA-IT, 2006b, pp. 3–5; IDA Singapore, 2005, p. 4).
- **South Africa.** The Government Information Technology Officers Council serves as a coordination and oversight unit, involved in the development of IT security policy, e-government policy and strategy, IT procurement guidelines, and project coordination. (South Africa Government web site: http://www.southafrica.info/public_services/citizens/services_gov/sagovtonline.htm; Dept. of Public Service and Administration web site: http://www.dpsa.gov.za/egov_documents.asp)
- **United Kingdom.** The CIO Council was created to support the Cabinet Office's e-Government Unit on research, monitoring of major government IT projects and investment decisions, management and career development for government IT professionals, and management and analysis of relationships with strategic government ICT suppliers. The council also enables partnership between IT professionals across government. (http://ec.europa.eu/idabc/servlets/Doc?id=21032; http://www.cio.gov.uk/about_the_council/the_cio_council.asp).
- **United States.** The Federal CIO Council's role includes developing recommendations for IT management policies, procedures, and standards, identifying opportunities to share information resources, and assessing and addressing the federal government's IT workforce needs. It also addresses cross-cutting issues—such as financial management and procurement—with other federal executive agencies. (http://www.cio.gov/index.cfm?function=aboutthecouncil)

Source: Hanna and Qiang (2009)

## *Making the Business Case*

e-Government is increasingly regarded as fundamental to reform, improvement, modernization, and ultimate transformation of government and the economy. Early in this chapter we discussed the broad objectives of e-government. Put slightly differently, the benefits to be expected from e-government can be categorized into four broad categories: (a) improved efficiency and financial management of public sector agencies and programs; (b) improved delivery of public services, in terms of availability, ease of use, and cost savings to the government, to businesses, and to individuals; (c) improved transparency, accountability and democracy, and reduced opportunities for corruption; and (d) broader economic and societal gains, such as improved business environment and empowering communities. Whichever framework is used, the definition of benefits should also inform the process of developing benchmarks for measuring progress.

In early phases of e-government, it is relatively easy to justify investing in major systems for improving efficiency and resource management to enable budget preparation, expenditure management, tax and customs administration, and government procurement. These applications tend to involve relatively large investments in large transaction systems, to implement mandated and fiduciary functions, often driven by the needs of powerful ministries like finance and planning. The benefits are relatively easy to measure in financial terms, particularly in terms of savings or increased revenues to the government. Not surprisingly, these applications tend to be top priorities for government and aid agencies.

Similarly, some early e-government applications such as putting common forms and basic information online (phase one of e-government) for key public services or targeting a few popular or "killer" applications for major target groups can proceed without or costly exercises in appraisal and prioritization or major cost-benefit analyses. Some of the improvements in the quality of services to citizens or business are so dramatic that initiating e-government investments in these services can be easily justified on economic and political grounds. Many examples can be provided in the context of developing countries (Box 6.6). These applications represent "low hanging fruit" and promising entry points for e-government and can help build coalitions for ICT-enabled reform and sustainable e-government transformation programs.

The business case of e-government projects has rarely been monitored and evaluated in its early phases, even in OECD countries, but the need for improvement is acknowledged (OECD, 2005a; and 2003b). Many OECD countries, and some middle income developing countries like Chile, are beginning to require that e-government projects or programs make a strong business case: that means incorporating evaluation and monitoring of costs and benefits into e-government investment planning. As e-government initiatives advance and involve services and solutions based on reengineering and joining up of business processes and aim for major transformations of government, it will require more costly investments. Moreover, such investments and transformations are likely to be more risky because of complexity and disruptions to established powers, structures, routines, and culture in the public sector. Benefits are also likely to be less measurable in financial terms or the short term for the government.

## Box 6.6 Making a Difference

| Country | Application | Before | After |
|---|---|---|---|
| Brazil | Registration of 29 documents | Several days | 20–30 min per document, 1 day for business licenses |
| Chile | Taxes online | 25 days | 12 h |
| Guatemala | Banca SAT | 30 days | 6 h |
| | e-Procurement | 5 hours | Online |
| China | Online application for 32 business services | 2–3 months for business license | 10–15 days for business license |
| | | Several visits to multiple offices for filings | Several seconds for routine filing for companies |
| India, Andhra Pradesh | Valuation of property | Few days | 10 min |
| | Land registration | 7–15 days | 5 min |
| India, Karnataka | Updating land registration | 1–2 years | 30 days for approval, request completed on demand |
| | Obtaining land title certificate | 3–30 days | 5–30 min |
| India, Gujarat | Interstate check posts for trucks | 30 min | 2 min |
| Jamaica | Customs online | 2–3 days for brokers to process entry | 3–4 h |
| Mexico | Access of public information | 60 days | 3 days |
| Philippines | Customs online | 8 days to release cargo | 4 h–2 days to release cargo |
| Singapore | Issue of tax assessments | 12–18 months | 3–5 months |
| Venezuela | Judicial case management system | 800 days in debt collection | 250 days—initiation to termination |
| | Speed up commercial cases | 400 days in Leasing | 150 days |

Source: Subhash Bhatnagar and Arsala Deane (World Bank, 2003)

Because of the above dynamics, the need to clarify the case for ICT-enabled transformation of government and continued investment in e-government is increasing. This includes the need to improve identification and measurement of anticipated costs and benefits, then monitoring and evaluation of post-investment impacts. Making the case is increasingly essential to obtain and sustain public and political support. This will enable decision makers to prioritize e-government investment proposals, hold implementers accountable for managing costs and benefits, and capture opportunities for future improvements.

The OECD developed the following model, which includes direct and indirect benefits to both government and nongovernment (citizens and businesses) stakeholders. Direct benefits include reduced costs to the government and reduced burden

on users in complying with government regulations. Direct nonfinancial benefits and indirect benefits range from better management tools for government and increased accountability and public trust to the promotion of the information society in general.

| Type of benefit | Government beneficiaries | Nongovernment beneficiaries (citizens & business) |
|---|---|---|
| Direct financial benefits | **(1) Reducing costs**: freeing resources for public and private innovation; increasing value of products and services | **(2) Reducing burden**: administrative simplification; providing higher valued and faster services; saving time and money and improving equity |
| Direct nonfinancial benefits | **(3) Capturing total benefits of investment**: achieving synergies across service delivery channels; enabling the sharing and reuse of data for more proactive service delivery; promoting access as part of channel management strategy | **(4) Increasing user satisfaction**: 24/7 service; improving personalization and service quality; improving access and equity; addressing security and privacy concerns; transparency and choice |
| Indirect benefits: "Good Governance" as a public good | **(5) Supporting legitimacy**: supporting security and trust at an aggregate level; modernization and transformation of the public sector; ensuring equity; increasing responsiveness, accountability, and participation | **(6) Supporting growth**: improving the business environment; creating an information society; establishing an infrastructure for secure and reliable transactions |

Source: OECD e-government project, "Proposed Outline for Assessing e-Government Benefits" (2006).

## *Financing and Budgeting*

Studies of e-government programs in OECD countries suggest a number of features of budgetary practices work against effective planning and management of e-government programs: short-time horizon (single-year expenditure horizon) for projects that require long-term commitments; agency by agency budgeting that prevents shared funding for common systems and shared infrastructure; lack of profit sharing among agencies that could eliminate redundant systems; and the difficulty of measuring costs and benefits for e-government projects compared to other traditional infrastructure investments (OECD, 2003b). Government budgetary practices are inflexible and tend to reinforce the silo mentality of sectoral ministries—not amenable to capturing the synergies among investments or cross-cutting dimensions

of e-transformation. Financing mechanisms have to be created for the integration of ICT into the different sectors and socio-economic structures.

A key challenge to funding coherent e-government programs, and in particular the horizontal building blocks and shared infrastructures required for a whole-of-government approach, is the agency-by-agency appropriation of public expenditure. The USA provides a case in point. In the early 2000s, the US's Office of Management and Budget managed to secure significant funding for major projects of cross-agency nature, to develop the necessary building blocks for integrated government, back-office modernization, and information infrastructure consolidation. The majority of ICT funding in the US Government remained under the line agencies, following the traditional approach of appropriation by Congress and in line with vertical accountability. Despite the breakthrough of authorizing a central fund for key interagency projects, much of the authorized resources were not requested by the lead implementing agencies, and thus remained unutilized. Clearly, the budgetary incentives were not strong enough and the political economy for e-government was not supportive for cross-agency collaboration.

Financing e-government investments is particularly challenging for developing countries, given the scarce local resources and pressing and competing development priorities. Time horizons are particularly short, in view of political and economic uncertainties. One major difference why e-government program progress in developed and developing countries cannot be measured with the same yardstick is that in the former quite often the challenge is how to reallocate existing budgetary resources to the e-government program (otherwise to be spent on silo-type ICT investments) while in developing countries the challenge is most of the time to find new resources.

Financing, except in the case of PPP funding, is invariably the fiscal budgeting process for both capital and operating expenditure. Given the political nature of this process as well as its fiscal-year orientation, various mechanisms such as earmarks, outsourcing, and special purpose institutional vehicles need to be considered to create the window of reliability and autonomy needed for project success. This is of course more difficult at the level of e-government program, where leading agencies need to marshal political support every year for adequate funding.

Accordingly, governments often rely on ad hoc injections of public funding or donor support to launch e-government initiatives. While external funding from agencies such as the World Bank carries with them some protection against the instabilities of the budgetary process, program and project design must always consider these possible instabilities to minimize their impact.

Mexico is a case in point (Box 6.7). Time horizons are particularly short, in view of political and economic uncertainties. Budgetary practices are also more inflexible than in OECD countries. Government budget provides financing mostly for individual projects. It does not account for the shared responsibility inherent in many e-government investments. Accordingly, governments often rely on ad hoc injections of public funding or donor support to launch e-government initiatives.

### Box 6.7 Mexico's Budgetary Practices as a Constraint to e-Government

A survey of budgetary barriers in Mexico suggests several barriers and inflexibilities to effective adoption of e-government. Underfunding is a universal complaint, in part due to lack of understanding among officials as to how IT can improve government. Many public administrators as well as e-government investors also believe that IT investment is stand-alone issue, not linked to other investments in and contributions to improved public sector. Funding is also limited regardless of revenue potential.

Mexico neither has a medium-term expenditure framework nor allows agencies to carry over some funds. It also lacks mechanisms for shared funding across agencies. Public administration reform and the state budget are the responsibilities of different ministries, leading to further disconnect. The politicization of the budget process also makes funding more uncertain. Measures to resolve the multiyear e-government projects have been introduced. But the process for multiyear IT budget approval is time consuming, done only on a case-by-case basis, and the majority of government agencies are still struggling to find long-term budgetary solutions.

Source: OECD (2005b)

Developing countries are moreover sensitive and vulnerable to worldwide economic downturns and financial cycles and these can have disastrous effects on FDI flows, venture capital, private participation in infrastructure, and investments in telecommunications and e-transformation. But some government transformation programs require more upfront investment and steady and predictable funding over the medium term, as in e-government programs.

The relative scarcity or abundance of budget support makes a large difference to the ability of the government to innovate and transform. Finding appropriate ways to transfer these upfront development costs to the private sector, through public–private partnerships, is one way to reduce the burden on taxpayers. Some governments have engaged in PPPs, for example, for their portals, particularly at the state and local levels.

The budget remains a powerful tool for implementation coordination, and innovation, and integration of new technologies in the public sector. Budgeting for ICT and e-development more broadly should be institutionalized and adapted to technological requirements. Some countries have ignored the need to create umbrella agencies to coordinate highly interdependent e-government and e-society investments. Others have lacked a clear division of responsibilities between various government agencies and other partners, creating political and bureaucratic obstacles for e-transformation and inhibiting the proper allocation of resources and policy coordination across stakeholders. Yet others have overcentralized e-government

investments under single agencies or ministries, contributing to a separation between ICT investment decisions and mainstream development issues.

Poor developing countries rely heavily on external financing through International Finance Institutions (IFIs) as a primary funding source. In such cases, two important points should be kept in mind: (i) the fact that the cycle of externally financed projects is multiyear—usually 5 years—can facilitate proper planning, design, and implementation of projects at the same time. (ii) The cycle of procurement transactions within those projects can be longer and thus requires advance planning.[2]

Governments, supported by donors, have often resorted to creating project implementation units to control new investment programs, including e-government and e-society projects. The underlying assumption is that these are one-off projects that can be designed by consultants, and subsequently implemented by a temporary project implementation unit created specifically to follow the accountability and governance requirements of the donor. Lacking a vision of the leadership and institutional capabilities required for sustainable development, such project implementation units often suck capacity out of or crowd out (rather than complement) weak state capacity (Fukuyama, 2004). The new entities may also duplicate the functions of existing donors. Different aid agencies may work with different ministries and place their funding and project implementation units within those ministries—reinforcing isolation, fragmentation, and duplication of information infrastructures and e-government applications. To reinforce a perception of control and accountability, aid agencies have also sought to design e-development programs in details, very much as a straightjacket or blueprint to be implemented by the newly created project implementation units.

But e-transformation is a process, not a onetime event or a rigid blueprint. It is a continuous process of policy development, investment planning, innovation, learning, and change management (Ramsey, 2004; Fountain, 2001). This process must fit with and respond to a dynamic development strategy that supports evolving national goals and creates sustained governance reforms and public service improvements. The challenge is to build effective governance and institutional frameworks for ICT-enabled modernization and make the new competencies part of the country's human and institutional resources. Rather than seeking agreements on rigid plans and multiyear investments in separate systems and infrastructures, the focus should shift to institutionalizing budgetary process improvements and financing frameworks. e-Development funding would be integrated into the medium-term budgetary framework of the public sector. A funding strategy for e-transformation would also integrate other sources of funding, from the private sector, NGOs, and aid agencies.

[2]It could be argued that the procurement practices of the IFIs themselves should be adapted in terms of speed and flexibility to the fast moving needs of e-government programs.

## *Strategic and Flexible Approaches to Funding*

Governments are using a growing range of mechanisms for funding e-government projects, including a range of nontraditional funding mechanisms such as cost sharing with the private sector and/or service fees. According to a study commissioned by SIDA, primary mechanisms for funding include:

- Central funding—appropriate for initiatives relating to cross-cutting program objectives or priorities such as interoperability, openness, transparency, and democracy, and value-added services such as security.
- Ministry-level financing through normal budget allocation processes—best for projects aimed at service process redesign and capacity building.
- Budget guidelines or requirements—central government mandates to ministries and departments to allocate a certain percentage of their budgets to e-government.
- Budget offsets through cost saving brought on by greater efficiency; assuming that the computerization of manual processes can save money, it can free up resources that can be reallocated and used to fund additional e-government projects.

Some countries, such as New Zealand, the UK, and USA, have set up special central innovation funds for e-government or incentive funds to support cross-organizational integration. New Zealand, for example, utilizes accrual accounting, performance-based budgeting, and quantitative risk analysis as financing and management mechanisms for ICT investments. The UK relies on capital budgeting mixed with innovation funds and incentives for coordination. In the United States, the budget process is devised to provide incentive for using common business processes across agencies. Canada's experience has revealed that central or innovation funds can be effectively catalytic even if they account for only a small portion of total ICT budgets. In particular, such funding mechanisms can be used to fund innovative and high-risk demonstrations that otherwise would not receive funding.

Korea shows another example for strategic, yet flexible funding for e-transformation. It deployed a central fund to move relatively quickly toward e-transformation (Box 6.8). The Informatization Promotion Fund is a special vehicle to overcome the rigidities of the annual budget and promote multiyear, cross-agencies e-government programs. It included both public and private financing.

### Box 6.8 Korea's Flexible Financing for e-Development Initiatives

The promotion of ICT adoption in government and overall economy require large-scale and long-term investments and cooperation across government agencies. So, it is difficult to carry out these projects within the general

budget of Korea. The Informatization Promotion Fund (IPF) was established in 1996 as a special vehicle to overcome the budgetary rigidities and promote e-government projects across agencies. This provided a flexible financing mechanism for e-development initiatives.

The goals of the IPF are to roll out broadband networks, promote e-government projects, educate workers, and support R&D and standardization in ICT in a holistic approach to government and economic transformation. The fund, based on government budgetary and private sector contributions, promotes the use of profits from ICT fields to be rechanneled into the ICT sector. From 1993 to 2002, the IPF reached US$ 7.8 billion, with 40% coming from the government budget. A total of US$ 5.3 billion was invested in between 1994 and 2003. The fund is managed by the Ministry of Information and Communication (overall), the Institute of Information Technology Assessment (specific project management), and the Fund Management Council (evaluation). The chair of the council is the vice minister of the MIC, and its members are members and directors general of related ministries.

The IPF played a key role in the balanced and flexible promotion of e-development (informatization) policy to create demand for ICT and to promote supply through the ICT industry.

Adapted from Suh and Chen, 2007, p. 92.

## *Monitoring and Evaluating e-Government*

Policy makers and project managers can use benchmarks, key performance indicators (KPI), rates of take-up of electronic services, user satisfaction surveys, and other monitoring and evaluation (M&E) tools to track the performance of e-government programs and to determine whether adjustments are needed over time (InfoDev e-government toolkit, 2008). A KPI is a metric of progress toward or accomplishment of a partial or final objective. Monitoring and evaluation as a process helps measure progress and can create an internal feedback loop, which can help avoid failures and maximize the potential for success.

Monitoring and evaluation is different from assessment. e-Readiness assessments, discussed earlier, are performed to determine a country's capacity to use and apply ICT, and e-government readiness assessments are focused on the extent to which governments have the capacity to implement—and users have the capacity to take advantage of e-government applications. They help determine what types of services can realistically be provided, barriers are likely to be encountered, and what complementary initiatives are necessary to enhance impact and sustainability.

In contrast, M&E occurs throughout the implementation of a program or project, to measure progress, support mid-course corrections, and guide resource allocation decisions. Unfortunately, too often governments do not consider evaluation metrics until after project completion. Few governments in developing countries are investing in measuring demand for e-government. Understanding the interests and needs of users and continually taking them into account in the planning and implementation process will contribute to the success of e-government projects. A failure to measure benefits and costs and to compare them against desired outcomes will inhibit the capture of lessons learned and the identification of best practices that can be incorporated into program design. Without such a feedback loop, it will be difficult to overcome the high rate of failure of e-government projects.

Monitoring and evaluation may occur at various levels. On the national level, for example, in the United States, the US Office of Management and Budget (OMB) tracks agency by agency progress toward government-wide e-government goals. Program-level evaluations should be done throughout a program, so that findings can be acted upon and deficiencies corrected. Monitoring and evaluation should refer back to goals and metrics laid down at the planning phase. Therefore, it is important to invest time and resources in defining KPIs or other metrics at beginning of the program and to create a coherent plan for the monitoring and evaluation process. Too often, governments do not consider evaluation metrics until after program or project completion.

Institutionalizing evaluation of e-government can help in setting priorities among investment proposals within and between agencies. It leads to better understanding of factors influencing costs, benefits, and reach to beneficiaries and enhancing return on investment in e-government. It could also lead to leapfrogging to more transformational or advanced phases of e-government.

Evidence from both public and private sectors suggests that ICT investments have the highest payoffs when accompanied by organizational restructuring, business process reengineering, and human resource development investments. e-Government evaluation methods and practices raise several challenges in this regard. Evaluations that are narrowly focused on ICT investments, or what might be considered e-government proper, can discourage collaboration and coordination with other programs of public sector reform and capacity building. Another challenge concerns the evaluation of cross-agency projects to take account of costs borne by funding agencies and benefits shared across agencies. Consistently evaluating costs and benefits to take account of distributional aspects can create incentives for collaboration on cross-agency e-government projects.

Another challenge is to create incentives for longer term transformation programs, in view of budgetary and evaluation methods that reinforce short-term perspectives (Box 6.9). High up-front costs of transformational e-government projects may make them appear economically unattractive. Yet, some OECD studies suggest that transformational projects produced on average benefits more than three times greater for government and users than projects at any of informational, interaction, or transaction levels (OECD, 2005a, p. 111).

## Box 6.9 Mexico Experiences with Monitoring and Evaluation of e-Government Programs

In Mexico, monitoring and evaluation is linked to the annual budget cycle, and the President's Office monthly monitoring of good government. The most common e-government evaluation tool is the Presidential target system, a tool that compares outcomes to stated objectives and is done at the highest levels of government. On the positive side, this system puts the e-government program at the highest level of leadership and visibility. Specific performance targets are negotiated with the head of every ministry and agency. In addition, the Ministry of Public Administration keeps track of ministries' progress through a "traffic light system." Incentives are linked to performance through the annual budget and innovation awards. e-Government monitoring emphasizes user satisfaction, number of online services provided, contribution to public management reform and efficiency gains. Results are made available to the President's Office, the Ministry of Public Administration, other government organizations, and the public at large. Cost-benefit analyses of e-government projects are carried out on ad hoc basis and limited to financial benefits.

Mexico's goal-oriented evaluations pose the risk of making Mexican public agencies focus solely on meeting specific targets that were negotiated at the highest levels of government. It does not always lead to in-depth understanding of demand of e-government or of users' benefits. It does not necessarily lead to measuring transformation benefits or encourage broader goals such as organizational change, cross-agency collaboration, and customer focus. While the Mexican approach to M&E of e-government has the merits of simplicity and strong incentives to meet targets set the political leadership level, a more in-depth M&E framework is needed for more advanced analysis of e-government initiatives and understanding of demand and impact. Moreover, much of the results and lessons learned are not widely shared, among agencies and the public, as M&E is viewed primarily as a vertical exercise of goal achievement reporting.

Source: OECD (2005b)

Given the fast change in ICT and in the innovations needed to exploit them, traditional monitoring and evaluation systems will not be adequate for the task. National strategies should develop more agile learning systems to assess progress and adapt programs in time. Such learning systems should address the needs of all stakeholders at all levels, including intended beneficiaries. They should not be driven by donors' demands for accountability and data-intensive methodologies. Given the lag in producing development outcomes, participatory and continuous evaluation will be necessary. Measuring impact in the rural areas may include rapid rural appraisal and participatory rural appraisal and other related rapid assessment methodologies

designed to listen and learn from stakeholders and beneficiaries at the local level (Blackburn et al., 2002).

A focus on development outcomes or millennium development goals (MDGs) needs to be reflected in the monitoring and evaluation processes of national e-government and e-society strategies. This means increased focus of M&E systems on measuring development impact and progress on using ICT as enabler to realize these outcomes. This will pose methodological challenges to evaluators, since it would cover the impact on almost every sector, as well as the role of ICT in strengthening the enabling conditions to achieve the MDGs such as transparency, partnership, and broad participation. As many upstream linkages between ICT and development outcomes are either conditional on several factors or poorly understood, M&E frameworks may benefit from theory-based evaluation methods, that is, making explicit the causal chains then testing them empirically through comprehensive monitoring and evaluation. This approach can play a crucial role in educating policy makers about the potential role of ICT. It can also enhance international support for ICT role in development. This is one way for monitoring and evaluation practices to support learning and speed up the journey of e-transformation toward a truly global information society.

A common pitfall is to overdesign M&E systems and generate massive and expensive data collections and surveys that remain unutilized. Several factors may contribute to this. One is international aid practices which tend to orient M&E to external accountability and research, at the expense relevance to of local adaptation and learning. Aid agencies want to provide evidence of ICT impact and secure accountability for the increasing resources being allocated to ICT investments within development projects and for free-standing ICT projects. Second, e-strategies initiatives often have little precedent to go by, making it difficult for stakeholders to agree on indicators or to grasp the scale of required inputs and resources. Current national statistical systems do not capture much information of the ICT sector or e-readiness indictors, let alone possible linkages to development outcomes and impacts. Traditional enterprise and household surveys, among others, do little to cover ICT inputs or to inform the design of e-strategies. All these factors argue for massive efforts to improve M&E systems for e-strategies.

The pitfall of premature introduction of overly complex M&E systems can be costly as it would divert resources away from more practical and timely learning that comes from simple, homegrown, and locally owned solutions. It can also delay the design and introduction of M&E at early stages of the design or implementation of e-strategies. Alternative approaches should leverage the capacity of established M&E agencies and networks, including those of ICT-using sectors. They may also introduce e-strategy and ICT-related indicators into ongoing household and enterprise surveys and others being conducted by the National Statistical Offices. M&E instruments for e-strategies should be made as compatible as possible with existing M&E instruments for the whole development strategy of the country so as to reinforce linkages with national development objectives and avoid perception of ICT as a fad or a distraction from development. Simple and transparent M&E systems are also more comprehensible and useable by local stakeholders (including government agencies, NGOs, and academia) as well as external partners (investors, donors).

One strategic choice in institutionalizing monitoring and evaluation is whether to embed this capacity into the implementation structures for e-development, or to locate it at the highest policy levels, independent of the implementing agencies. A common pitfall is taking an either/or choice. Monitoring and evaluation capabilities are needed at many levels of e-development, strategy development, and implementation. Embedding M&E into implementation structures is important to leverage existing capacity, access to data, ownership, and learning. Having M&E capacity at the highest and independent levels is important to secure oversight and accountability, authority and influence to make course corrections, and perhaps promote more focus on development outcomes. A balance may be established between self-evaluation (internal to implementing agencies) and independent (external) evaluation systems. This should take account of the prevailing governance mechanisms, political culture, and best practices in the country.

Monitoring and evaluation systems should be viewed as strategic tools for the design, implementation, and adaptation of e-transformation strategies. To do so, monitoring and evaluation should be designed and incorporated into strategic thinking at the earliest stages of e-transformation. They may evolve over time in line with local capacity and the level of ICT advance and usage in the economy. Viewed accordingly, they can become powerful instruments for learning and adaptation. They make e-strategies more meaningful to all stakeholders.

## *Managing for Change*

Why is change management so critical to successful implementation of e-government programs? How can governments overcome inertia and be able to move from a culture of compliance and risk aversion, to one where innovation is celebrated and change is deemed necessary to superior performance? Can public agencies practice reengineering and "imagineering" of their processes and services? How should governments go about developing a clear change management strategy?

Effective ICT-enabled government transformation requires a holistic or sociotechnical approach to change. This should start with a clear vision of the goals and process of transformation and an explicit strategy that incorporates organizational and cultural change management processes. e-Transformation is often hindered by the poor and different understandings of the goals of e-government and the lack of ownership and widely shared strategy for change. A key challenge to leveraging government information to enhance market functioning and informed choice of services by citizens is the paternalistic, if not predatory attitudes of many government bureaucrats in developing countries.

There cannot be a single change management strategy for all, since there are many factors that facilitate or inhibit change. Factors include: political environment, influence, and support of stakeholders, users or target population, skill level of employees, leadership, degree of resistance, organizational culture, stakes involved in the project, time frame for implementation, among others. The changes required

range from technology and process level, to working habits, skills, and incentives of employees, to organizational level changes in structure and decision-making styles, to legal changes and, at the broadest level, socio-political changes involving policy reforms and empowerment issues.

There are a variety of change models and strategies that may be adopted and adapted to specific government transformation program or ICT application. As discussed earlier, stakeholder analysis and strategic communications are key tools in gaining understanding and buy-in. Various change management models are suggested by Gupta et al. (2004, Chapter 17). Examples may include the McKinsey 7S model, the e-business change model, and the eight-stage process of creating and leading major change (Box 6.10).

## Box 6.10 Models for Change Management

A relatively well-established model of organizational change is the 7S McKinsey model: developing a continuous fit among business strategy, systems and routines, structure, staffing, style of leadership, skills and capabilities, and shared values and aspirations (Waterman et al., 1980). A model specifically developed in the context of e-business, but is relevant to e-government, would involve: catalyzing a vision, communicating vision and sense of urgency, motivating with appropriate incentives for change, educating and mentoring about new practices, marketing the change to external partners, structuring and defining roles, and staffing (Sawhney and Zabin, 2001).

A leadership- and business-oriented, big-change model has been also proposed by Kotter (1996). The eight-stage process of creating major change starts with creating a sense of urgency based on identifying crises and major opportunities. Next three steps are to create a guiding coalition, developing a vision and strategy to direct change, and communicating the new vision and strategy. The next three steps are to empower broad-based action, generating quick wins, and consolidating gains and scaling up to produce more change. Final stage is when the new approaches are anchored in the culture through better performance measures and leadership development.

Leaders and researchers in change management have also emphasized the need to involve people in change management (Beckhard and Harris, 1987). They refer to the need for a critical mass of people to actively participate in order to provide the initial energy for and reduce resistance to change. Stakeholder analysis and communication audit may guide the engagement of people from inside and outside the e-government organization and help shape stakeholder engagement depending on their degree of influence and support.

The biggest challenge for transformational change lies in getting organizational buy-in and dealing with the attendant change management issues. So beyond ensuring a clear political intention, there must be serious assessment of political and administrative mechanisms to ensure that they have the depth and maturity to manage the change that any process of implementing e-government will create. The system must also have the capacity to cope with the hard choices and trade-offs that it will encounter, such as skill change and staff redeployment. Moreover, both the political and the civil service leadership need to understand and accept all the hard trade-offs before they embark on the e-government journey.

Socio-technical change for e-government demands retraining of existing staff, hiring high-quality new staff, updating managerial skills, managing resistance to organizational change, cooperating with other agencies and sharing data, providing incentives for innovation and initiative, partnership and collaborative relationship with the private sector, and working with unions and staff associations. Managerial skills are often more critical than technical skills for managing change, since IT skills can be outsourced. Changing organizational culture may require recruiting new managers from the private sector, as some Mexican agencies did when introducing e-government (OECD, 2005b, p. 106). Leadership from the top may be combined with a bottom-up approach to help establish common interest, ensure staff buy-in, and deal with specific change requirements and working environments. Finding the right people to lead change in the civil service is a big challenge.

Managing organizational change is critical to overcoming resistance to changes in work practices and service delivery. During the pilot and initial rollout stages, it is advisable to retain duplicate delivery channels—the existing manual government counters as well as the online and single-window delivery of multiple services—to reduce resistance to change among both clients and civil servants. But once there is full-scale rollout, phasing out some of the existing government service centers would be preferable: it would lead to big cost savings by reducing the need for physical infrastructure and making better use of government staff by retraining them to work in other areas.

In developing multichannel service delivery, governments need to consider the implications for change management and human resources: developing new skills, changing roles, and changing organizational cultures. Apart from technical skills to manage interoperability and enterprise architectures, integrated service delivery channels call for higher levels of skills for coordination and collaboration across organizational boundaries. Changing roles, particularly on the front line, demand staff more familiar with wider range of services offered by a large number of agencies and adept at delivering services through a wider variety of channels. This is part of the shift from being a process workers or bureaucrats to becoming knowledge and client-centric workers. Coordinated multichannel service delivery also calls for collaborative management. It calls for devising strategies, incentives, and initiatives to promote innovative and collaborative skills, practices, and cultures.

During later phases of government integration and transformation, e-government programs begin large-scale change management. As more and more manual

databases are converted to an electronic format, the government also needs to begin training its vast cadre of employees in the use of e-government systems.[3] Training for public administrators needs to include competencies in change management. Training for middle managers should prepare them for a new culture involving electronic intermediation, information and knowledge management, and new ways of doing business. Public leaders should be prepared to engage employees and unions throughout all stages of the change process, and particularly in decisions regarding new roles and performance standards. Leaders should hold employees accountable for results rather than mere compliance, introduce incentives for employees to learn and change, and invest in training and retraining. These practices may necessitate civil service policy reforms.

Introduction of e-government services presents a difficult choice for policy makers. On the one hand, there are distinctive benefits in building on an existing business process, which can demonstrate significant savings if performed electronically. It is good for quick wins and learning on small projects. Many developing countries, for example, successfully digitized existing processes of renewing various simple business licenses and permits. In essence, nothing changes but the delivery channel. On the other hand, real impact comes from deep process reengineering rather than with putting existing processes online (Box 6.11). Such projects take time, but ultimately are more rewarding.

A national e-government strategy needs to balance the portfolio of quick-win approaches of automating existing administrative procedures without changing them with the more comprehensive approach of reengineering whole functions and core processes with ICT. This portfolio may include quick wins that prepare or sustain progress toward the long term. For example, efforts in digitizing information from existing paper records usually have high strategic payoffs even if associated with limited process change, because they are enablers of more fundamental change in service delivery in the future.

### Box 6.11 Business Process Reengineering (BPR) and Change Management

Business process reengineering (BPR) is a powerful tool for guiding process change and reaping dramatic benefits from ICT in both public and private organizations. Methodologies and practices in BPR have been first applied in business organizations and widely diffused by business consulting firms. BPR is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical measures of performance such as cost, quality, and speed.

[3]Providers of technology packages or solutions often include a training component, but this training needs to be complemented by general information literacy and IT skills.

Applied to the public sector, government process reengineering would start with the question: if a function, service, or department were to be designed today, how would it ideally look like, given the status of technology and best practices? Knowledgeable staff, outside experts, and key stakeholders must be involved in the entire BPR exercise. Decisions concerning hardware and software must be guided by the results of BPR. Regardless of whether to buy a standard software package, or develop a local solution, BPR is essential, not an add-on exercise. In its widest sense, it is not only just about process reforms, but also organizational reforms and increasingly, interorganizational reforms.

In many developing countries, business process reengineering (BPR) is a new practice even in the private sector, and inexperienced public agencies need much consultation and hand-holding to implement process reengineering. Most government agencies manage complex processes that have not been documented or examined for decades. Reengineering these processes often requires policy changes and, sometimes, legal changes. Local consultants are often inexperienced in process reengineering and change management, and the time and effort required for these activities are typically underestimated. Integrating processes that span several government agencies multiplies the challenges.

All these factors argue for setting realistic expectations and prudent planning for long gestation periods for large, complex e-government applications aiming at higher levels of integration or transformation. Often, downscaling the BPR effort and concentrating only on limited business process optimization is the only reasonable solution to political, time, resource, and organizational capacity constraints. Overly ambitious BPR is at the source of many white elephant application development projects, often prompted by the advanced functionality of commercial software platforms. This functionality thus becomes easy to acquire and hard or costly to implement.

Managing expectations is a critical aspect of managing change. Years can elapse between the time primary beneficiaries are first consulted for project design purposes and the time when first results are visible. Target groups may be different at each of those times. Over enthusiastic or wrongly targeted communications can breed discontent instead of support for e-government.

## *Managing for Innovation*

Managing for innovation involves exploring ways to bridge the innovation gap in the public sector. This includes measures to strengthen incentives for innovation in public sector organizations and to improve knowledge of what is feasible or promising practice. Brazil provides an example of promoting innovation through recognition, replication, and dissemination. A variety of public–NGO–academic institutions have been developed to research and recognize ICT-enabled innovations

and best practices in public administration. These organizations seek to disseminate ICT good practice in government by organizing annual conferences, annual awards, partnerships, research on e-government, and disseminating broadly the most successful experiences (Box 6.12).

## Box 6.12 Research and Dissemination of ICT-Enabled Innovation in Government: Brazil

Several Brazilian government agencies and NGOs have, for years, been involved in the promotion and diffusion of e-government practices through the distribution of national awards for innovative and effective projects and applications. These awards provide immediate media and political visibility to the initiatives' sponsors and internal legitimacy for the agencies' projects. However, the significant accumulated knowledge contained in reports of these initiatives complemented by analytical papers and references to related repositories and initiatives in other countries must be organized as a permanent repository in order to become a valuable resource for e-government practitioners and scholars.

This is the objective of the Observatory of Practices of Information and Communication Technology in Public Management (*Observatório de Práticas de Tecnologia da Informação e Comunicação na Gestão Pública*—Observe-gov), a joint initiative of the Foundation for Development of Management of São Paulo State—FUNDAP), the CONIP Institute, and the Institute for Management Foundation (FIA) of the University of São Paulo. Observ.gov was created to make public sector IT implementation cases available to the general public. FUNDAP is a public agency linked to the São Paulo state government that offers consulting and training programs to state agencies and public servants. It promotes a yearly award, the "Mário Covas Prize," named after a former governor who began a state-wide modernizing program in 1996. The award recognizes best practices in public administration in São Paulo.[4]

CONIP is an NGO that seeks to disseminate ICT good practice in government. It organizes an annual conference on the subject and also an annual award (the CONIP Award) for successful cases of ICT innovation in the government sector. Finally, FIA is a business school linked to the School of Economics, Administration and Accounting at the University of São Paulo (FEA/USP) that conducts research in many areas, including public administration and e-government. Observe.gov is, therefore, a partnership between government, academia, and the private sector. Observe-gov initially published

[4]São Paulo is the wealthiest state in Brazil, with a population of around 40 million (Brazil's total population is about 190 million) and accounts for approximately 32% of the Brazilian GDP.

only those innovation cases submitted for consideration for the Mario Covas Prize, the CONIP Award, and a third award offered by the Association of State ICT Entities (*Associação Brasileira de Entidades de TIC*—ABEP). More recently Observe-gov has been publishing cases nominated for the Ceará State Electronic Government Prize, awarded by the Government of the State of Ceará in the northeastern region of Brazil.

The observatory's goals include increasing the visibility of Brazilian e-government initiatives and studies to a larger national and international community and facilitating analytical studies on the subject, as well as serving as a resource center and meeting point for e-government policy makers, practitioners, and scholars. The web site should also provide local and international funding agencies with valuable information on the state of the art of Brazilian e-government practices. The portal itself was recently awarded a national prize for its contribution to the dissemination of e-government practices.

There are, of course, other channels for dissemination and sharing of knowledge. CONIP, for instance, organizes an annual national conference where best practices in ICT in the public area are presented and discussed. This is also the case of the Brazilian Association of State ICT Entitites (*Associação Brasileira de Entidades Estaduais de Tecnologia de Informação e Comunicação*—ABEP), an association of state-owned ICT companies and parastatals, which organizes a yearly conference and meetings for CIOs and ICT managers from the member organizations and their clients. Both conferences became a reference in the public sector in Brazil and are very important for networking among ICT professionals, besides being a channel for best practices dissemination.[5] In Brazil there are also magazines devoted to public ICT (like the magazine "*Informática Pública*"—ICT in Public Administration)

Source: Knight, in Hanna and Knight (forthcoming)

Despite these promising examples, many governments of large and small countries tend to "reinvent the wheel" and to invest repeatedly and separately in developing software applications and process reengineering designs for common services and administrative functions. Even within Brazil, many local governments are proceeding with developing their ICT applications and e-government portals for the same basic functions of local government. There are some islands of excellence, to be sure, but their promising practices and innovations are seldom identified and shared. India's national e-government program (NeGP, see later in this chapter)

[5]The e-Brasil Project was launched at the ABEP conference, known as SECOP, in October 2005, and has participated in presentations and/or book launchings in both SECOP and CONIP conferences each year since then.

is an attempt to identify key successful innovations in e-government, for nationwide scale-up. Much of the innovative ideas and successful initiatives have been lost to the rest of the federal, state, and local levels of government. Lacking effective search and independent evaluation, some of the pilot e-government innovations are also declared a success before ensuring sustainability, let alone replicability and scale-up.

Innovation funds to provide small grants or extra budgets to finance pilots and bottom-up innovations can be a powerful tool to promote micro reforms within government. Potential reformers and change agents at the lower rungs of government bureaucracy are often aware of opportunities to improve client services or empower frontline civil servants, but are stifled from acting or these opportunities for various reasons. Resources and power are concentrated at the top where governance reforms are targeted. Yet, institutional change and macro reforms often begin in specific locations or domains and spreads through micro-level changes that aggregate into large-scale transformation over time. Hence, there is a need for a flexible and decentralized framework that takes the diversity of conditions and opportunities into account and that empowers change agents at all levels to act on promising pilots and incremental change. The role of top leaders is to create the enabling environment to support grassroots innovators in the public sector, a budget process that resembles venture capital funds to support micro financing of a diversified portfolio of innovations, and knowledge sharing mechanisms and communities of practice to disseminate and scale-up innovations.

## Governing and Managing the Technology

In this section we touch on ICT governance frameworks to guide the evolution of technology architectures and ICT standards across government. We touch on the role of architectural frameworks in providing the set of standards and technologies that provide the foundation for the delivery of ICT-based solutions. We also show some of the emerging technologies most suited to deploying e-government in developing countries. The aim is not to delve into technical details. Technical mastery is not needed from policy makers to effectively harness the technology for development objectives. But it is imperative for policy makers and leaders to understand the trends, benefits, costs, and policy implications of these technological innovations for government transformation.

Tools and technologies relevant to e-government are undergoing intensive development and at times, paradigm shifts, as is the case with mobile phone, open standards, open source software, software as a service (SAAS), collaborative technologies, and utility and cloud computing (computing or common business applications provided as a service over the Internet). These technologies offer substantial possibilities for new service and business innovation models. They offer unprecedented levels of interaction between individuals, communities, and public agencies. They also offer significant opportunities to reduce investments in infrastructures and enhance options for service delivery.

The main policy advice for developing countries is to experiment and learn so as to tap into the new technologies and practices without taking undue risks and costs. Cutting-edge technologies and business models, like cloud computing, present challenges for governance, security, privacy, network reliability, data portability, and interoperability and transition from legacy systems. Developing countries can start experimenting with developing less critical applications and less risky activities first for cloud computing, for example, to start learning and build local capacity to work with the new model. As markets and technologies mature, developing governments can scale up or make full transitions.

For other technologies like mobile, adoption poses less strategic risks, and developing countries may leapfrog to the frontiers. Applications for mobile platforms leverage the benefits of the burgeoning wireless infrastructure that is being deployed in developing countries, forming a basis for m-Government projects. Mobile phone may thus be a form of affordable technology for e-government services delivery. Other useful tools and technologies include both proprietary and open source platforms and applications.[6] Extensive sources of information on the specific technologies are available from suppliers, and other neutral sources, such as the InfoDev Toolkit (2008).

The key challenge for policy makers and strategists is how to manage the growing diversity of information and communication technologies, to balance flexibility and control in a fast changing and increasingly diverse ICT environment. Should they strive for smooth and robust transitions in technologies? Should they seek to leapfrog to cutting-edge technologies? What kind of frameworks or standards do they need to underpin reliable and cost-effective delivery of e-government services and at the same time maximize flexibility to meet the changing needs of government as quickly and effectively as possible?

We focus here on two broad issues: the role of enterprise architecture and interoperability frameworks; and the potential of mobile government, open source software, and collaborative technologies (Web 2.0).

## *Enterprise Architecture, Interoperability Framework, and Open Standards*

Arrangements for governance of cross-agency and cross-service e-enabled government transformation call for interoperability through the adoption of common standards to help agencies standardize and integrate their data, business processes, and service delivery applications and channels, and through enterprise-wide architecture (EA).

[6]Many of the tools that governments are adopting were developed originally for commercial use and are available off-the-shelf or in open source format. These include customer relationship management (CRM) software, enterprise resource management (ERP) tools, and data or content management systems (DMS, CMS).

A government interoperability framework (GIF) is a set of standards and policies that a government uses to specify the preferred way that its agencies, partners, and clients should interact with each other (UNDP, 2007). The GIF is the building code, specifying the standards to be used to achieve interoperability, while enterprise architecture (EA) is the town plan, consisting of common resources and defined rules for their reuse. Standards address interoperability at the business process, information, and technical levels. Ensuring interoperability and thus integration in government agencies is the most critical aspect of implementing e-government. Interoperability and integration are desired within the various departments of a single organization as well as among various independent government agencies.

Governments are trying to find solutions for going about e-transformation in systematic, orderly, efficient, and cost-effective ways. EA can become a useful strategic planning framework or tool to guide their transformation efforts. It can be defined as the analysis and documentation of an enterprise in its current and future state from an integrated strategy, business, and technology perspective. It is a common framework that ensures strategic coherence between public sector functions and IT systems (Box 6.13).

## Box 6.13 Enterprise Architecture

Many advanced countries have embraced the concept of EA, and their experience presents valuable lessons for developing countries. In the case of USA, for example, the Federal Enterprise Architecture Framework was established in 1999, by the Federal Chief Information Officers (CIO), as instructed by the Clinger-Cohen Act (1996). This framework provides a road map for all government agencies to optimize their operations while creating an efficient IT environment. The objectives of this framework are to organize federal information on a federal-wide scale, promote information sharing among federal organizations, and help them develop their IT investment processes. The framework provides a structured mechanism for identifying, organizing, and managing the various components and activities of a federal enterprise. These EA components include business performance, processes, services, data, and technology.

In a typical government setting without EA, agencies tend to maintain multiple communication channels, customer interfaces, and applications, which lead to the duplication of IT infrastructure. To counter these challenges, e-government EA typically consists of: common set of customer interfaces; support for new and legacy applications with an integration layer; shared services to support applications; and tools that address management issues related to e-government architecture.

Implementation of an EA program essentially involves aligning an organization's business processes with its IT information systems and directing both toward the requirements of end stakeholders, that is, providing high-quality

e-government services to businesses and citizens. EA focuses on improving interoperability and integration in both front- and back-office operations. It involves focusing IT strategy and infrastructure on achieving complete interoperability and integration, which ultimately results in providing e-government services of the highest value. The implication here is twofold—providing e-government services with maximum financial efficiency and maintaining maximum business effectiveness.

While important and ultimately essential to achieve e-transformation, EA is an initiative that is prone to conceptual overreach, ivory-tower isolation, and even practical irrelevance. It must be synchronized at some level with the application development program and managed in view of overall e-government time, financial, and organizational constraints. This starts from the definition of the scope of "enterprise" which can seldom be the whole of government. Even within individual agencies the architecture effort must be highly selective for rarely if ever can organizations be rearchitected from scratch. Application developers and project managers must receive timely and useful inputs from the EA team to achieve compliance.

Following the service-oriented architecture (SOA), software is made available as services on the network to be used over and over again for different applications. These tools help agencies meet constituent needs while avoiding duplicate efforts and infrastructure. They aim to align and integrate ICT with government functions, reduce costs of ICT use to government, secure information sharing across public agencies and with clients, and help aggregate many public services across agencies into a single service window.

Many governments are moving toward adopting a service-oriented architecture (SOA). SOA is an enterprise-wide IT architecture that promotes loose coupling, reuse, and interoperability between systems. It breaks down processes, services, and applications into discrete parts then develops solutions for these parts which can then be used and shared widely. A service orientation defines the needs and outcomes of government in terms of services, independent of the technology that implements them. SOA implements a service platform consisting of many services that signify elements of business processes that can be recombined into different solutions for different business needs. This gives SOA the agility to respond quickly to new situations (UNDP, 2007).

An effective GIF/EA promotes open standards that are forward looking and supportive of the overall national e-government strategy. Open standards enable products to work together and achieve interoperability, and thus gives government choice among applications from a wide range of suppliers. Open standards avoid vendor lock-in and give governments more flexibility by widening technology choice. Public agencies can thus benefit from technology innovations and

cost reductions. Articulating the underlying framework that supports the standards selected, that is a standards-based architecture, should help interoperability, flexibility, and long-term stability.

In practice, it should be kept in mind that: (i) formulation and upgrading of GIF requires a core group of highly knowledgeable ICT professionals and a highly respected leader; (ii) compliance is likely to be achieved more from advisory, promotion, and support activities than from coercion; (iii) government should empowers the GIF group with financial resources for these activities; and (iv) ultimate accountability for compliance should be with line managers, not with the central group.

Achieving e-government interoperability is not easy and requires political commitment and leadership. Public leaders face numerous challenges in implementing EA/SOA:[7]

- Introducing new technologies without compromising on compliance and regulatory issues.
- Maintaining system security while introducing interoperability and integration into the IT architecture.
- Maintaining privacy and information sanctity in the systems.
- Maintaining "nondisruptive and affordable" dynamism in IT systems to keep pace with rapid technology changes and process reengineering.
- Designing a robust, yet dynamic architecture that protects, maintains, and propels the organization's productivity.
- Designing an architecture that quickly responds to external variations and opportunities while not introducing additional cost, complexity, or risk.
- Converting EA to knowledge architecture, such that it facilitates easy access and management of "information," rather than a "data" mine.
- Moving toward more open and independent architectures while conforming to organizational constraints.
- Introducing flexibility in the architecture to make it capable of dealing with exceptional or unexpected events.

Achieving interoperability is an "ongoing process," rather than a product or single event. By virtue of its modularity, SOA can be realized in stages and layers. No government achieves interoperability in one step. It involves setting up interagency organizations and engaging all concerned stakeholders in an open and inclusive process. This is not a purely technical process. It starts with the vision and goals of leaders for e-government: to enable close alignment to service and development objectives, lower costs of service integration, innovate new services, and enable agencies to be agile, flexible and integration ready.

[7] Draws on Evalueserve note to the World Bank, 2007, and www.evalueserve.com.

## *Mobile Government*

Mobile services are quickly emerging as the new frontier in transforming the delivery of public services due to fast-growing penetration of mobile phones even in the poorest and the most remote areas of the globe.[8] In addition, the relatively lower and declining cost of mobile telephony permits the expansion of mobile government services to the poorer segments of population in developing countries. This now constitutes the largest distribution and service delivery platform available for development.

m-Government is best suited for the developing world, which has low PC and Internet access, but rising mobile penetration. The question is how do we take full advantage of the mobile platform for transforming public service delivery as well as health, banking, and other sectors? A priority list of several high-impact m-services and a larger list of "quick wins" could be developed for rapid implementation by each government (especially at the municipal level). m-Government needs to be implemented as an integral part of e-government and government reform initiatives. Leadership from the private sector, as well as academia and NGOs, is essential to make this service delivery channel possible. Public–private and multi-stakeholder partnerships will be critical for successful and cost-effective delivery of m-services.

Since disseminating information to citizens serves as the foundation of citizen empowerment, mobile government offers several benefits. Citizens who are provided with access to relevant information at the right time are able to take informed decisions. Dissemination of information also promotes trust between government and citizens and imparts transparency and accountability to government functions. m-Government facilitates the speedy delivery of government services. It acts as an additional channel for interacting with all stakeholders, including policy makers, service providers, consumers, and other representatives of society. It also improves the productivity of public service personnel by providing them with the convenience of entering data and information even while they are out of the office and on the field. The time that is thus saved by them can be directed toward other service-related activities. Further, they can also speed up information analysis, thereby facilitating citizens to take better-informed decisions.

Many countries are moving to leverage this new delivery channel for public service delivery. In Singapore, citizens enjoy a variety of services, which are available through wireless technologies, with text messaging the most popular way of sharing information between the government and its citizens. The government uses SMS (short messaging service) alerts for a variety of e-services, such as renewal of road tax, medical examinations for domestic workers, passport renewal notifications, parking reminders, and parliament notices and alerts. In Dubai, mobile government initiative includes SMS services to various departments of the government as well as services to some private organizations, nongovernment organizations, and schools

[8] Draws on Evalueserve note for World Bank, June 2007.

on a nonprofit basis. In the Philippines, short-text messaging services (SMS) are extensively used by the government in internal communication at all levels. The office of the president sends instructions to members of the cabinet and other subordinates via SMS. Farmers get a variety of agriculture-related information through SMS services. In State of Parana, Brazil, SMS is used to send frost alerts to farmers among others.

Mobile government may further transcend the traditional e-government service delivery model, by bringing personalized, localized, and context-aware services close to its citizens. Mobile technology makes it feasible to move information work away from the fixed desk to support the service work engaged with the customers where they are located. It takes work close to the public to be served. In the process, it transforms government organization to make it more fluid, context aware, and capable of providing responsive and localized services in an increasingly service economy. Government staff is becoming more mobile, much like the users of e-government services, and mobile and wireless communications enable a fluid cooperation and interaction among government departments, public facilities, service business, and citizens in large urban settings. The case is demonstrated by the early results of the mobile government in Beijing (Box 6.14).

### Box 6.14 The Case of Mobile Government in Beijing

Beijing, the capital of China, is growing rapidly, with a population of 15 million. Mobile phone penetration stood at 91% in 2005, when this pilot was initiated. The high penetration attracted many government departments to leverage this platform for better service, mainly focused on SMS to citizens to deliver information such as tax, emergencies, and results of exams. The pilot case reported here deals with the mobility of the government itself and focuses on Beijing employees using the mobile technology.

City Government of Beijing is highly bureaucratic, hierarchical, and inefficient, so city leadership decided to take advantage of ICT to reinvent the municipal administration. Using a gridding technology and a survey of public facilities, locations of facilities were mapped in a geographic information system (GIS). The supervision function was organized so that supervisors patrol their responsible areas for monitor and report problems and ensure problems are properly solved. Each supervisor is equipped with a bicycle and a smart mobile phone. The location and working status of all supervisors can be located and monitored through a radio service network. With this network connection to a supervision center through the mobile phones, supervisors can receive instructions from or make calls to the center. They can also receive complaints and take photos with the mobile and send these back with the GIS position. With accurate information and location of the problem, the center can facilitate the solution quickly, and the supervisor can visit and confirm that the problem is solved with another photo.

The success of the pilot attracted wide attention in China and has since 2005 been scaled up. The system connects all public facilities and public service companies (such as transport, power supply, water supply, waste management) and different governmental departments at the municipal level to enable a fluid cooperation and interaction among the departments, public facilities, and service businesses and citizens. Mobile technology enables a real-time response enterprise. With the process reengineering and mobile connectivity, government staff no long stays in the office to process information, but are in the field, interacting with citizens while remaining connected to the center. Organizational change has been aligned with organizational strategic goals and enabling tools and processes. The emphasis has been on being local to provide highly personalized, localized, context-aware service to local citizens, thus bridging the virtual and physical.

The mobile government initiative in Beijing was in its initial stages when this study was carried out (2006). But the outcomes have been promising and the pilot was expanded to all urban districts of Beijing. Mobile government is already reshaping the municipal government itself as well as its interactions with its citizens.

Source: Song and Cornford (2006)

At both the national and local levels, m-government could benefit form considering the overall vision, tackling it in stages, and jointly addressing the key concerns of e-government and m-government. Although much is expected from mobile technology-based public services, governments have to proceed with caution. At times, it may be necessary to proceed incrementally through bottom-up initiative and user experimentation and learning before scaling up. But the major policy concerns of e-government and m-government are similar—security, interoperability, privacy, and information quality, and these policy issues are best addressed at the national or government-wide level.

The security of wireless communication is crucial both in times of emergency and for other security operations. Moreover, wireless communications are more vulnerable to hacking and unauthorized access. This can only be avoided through concrete planning at various stages of deployment including mobile authentication through the application of encryption technologies and public key infrastructure (PKI). A strong legal system is another mandatory requirement for the successful implementation of m-government. Other issues must be addressed: interoperability across mobile technology platforms, and legal and regulatory issues concerning transactions and information sharing. Ensuring the integration of new technologies in the established e-government system is also challenge in implementing m-government, particularly for those countries that are in advanced stages of e-government development. Finally, the usefulness of mobile and wireless technology essentially depends on the quality of information generated and accessed and this would depend on the integration in the back-end systems and processes.

### *Open Source Software*

While governments are using both commercial off-the-shelf software (COTS, or proprietary software) and open source software (OSS) to launch e-government applications, OSS offerings have received a significant amount of attention in recent years, due to OSS's perceived benefits in terms of costs, security, and flexibility.[9] Some argue that the use of open source in developing countries may also speed the growth of local peer-to-peer open source communities and associated service industries. An EU-commissioned study explored both the spillover benefits of OSS and how governments can better support the development of open source industries.

It is important to note, however, that OSS is never "free." While there may not be an initial fee associated with an open source license, there are long-term costs associated with support and management. Given that many OSS products are continually evolving, specialized knowledge is needed for ongoing maintenance and support. In comparison, proprietary software has higher initial licensing, software support, and update fees, but support is generally more stable for such products. In practice, however, the problems of maintenance, support, and premature obsolescence affect also COTS (maintenance and support licenses can cost 20% annually and software vendors drop product support according to their international priorities and cycles, irrespective of local needs). Thus, just as much as for COTS, in considering OSS for use by government, it is necessary to assess not just functionality but product maturity, staying power, strength of support community, and interoperability.

The use of OSS poses a technical capacity development challenge for governments which is different and much larger than for COTS. Use of OSS as structural component of e-government (i.e., beyond experimentation and demonstration) requires highly specialized software engineering capacity in-house and in-country. Similar capacity is also needed for COTS, but the private sector market usually creates this capacity given the monopoly or oligopoly structure of the market for the key categories of system and applications software.

Thus, governments wanting to use OSS of the same categories, particularly in small and poor economies, need to support the development and maintenance of associated capacities. Even for categories such as office software which are strongly supported and well established internationally, wholesale use of an OSS package would require in-country development of a specialist support capacity both to interact with the international community of developers and to promote proper configuration and often localization of the software.

The InfoDev Toolkit (www.egov.infodev, 2008) puts several sources of information on OSS, key among them: South African government web site on OSS policy; UNDP primer on OSS in e-government in the developing world; infoDev study outlining the use of OSS in developing countries; Open Source Initiative; Source Forge; a repository for approximately 130,000 open source projects, Free Software

[9] One unanticipated big benefit of adopting open source software in government is to avoid the long and slow procurement process altogether.

Foundation (FSF); and European Union inventory of Free, Libre and Open Source Software (FLOSS) applications, covering a range of areas including e-Learning, workflow and workload management, health care, middleware, e-Justice, and human resources.

Several governments, including China, Costa Rica, Malaysia, Philippines, and South Africa, now have a stated policy preference for OSS. Others, including Brazil, Argentina, Venezuela, Peru, and Bulgaria, have gone a step further and mandated the use of OSS. A 2004 survey by the Center for Strategic and International Studies outlined the use of OSS in more than 20 developed and developing countries. In 2005, the EU conducted a survey of OSS use in e-government. The Brazil case indicates some of the trade-offs involved (Box 6.15).

## Box 6.15 Open Source Software in Government: The Brazil Case

A major thrust of e-government in Brazil is the encouragement of the free and open source software (FOSS) in the country in general, and in the federal government in particular. That movement got a big boost in 2003 when one of its most vocal advocates was appointed President of the National Information Technology Institute (*Instituto Nacional de Tecnologia da Informação*—ITI), an organ of the Presidency of Brazil's political advisory unit. Since, the Technical Committee on Implementing Free Software of the Federal Government approved 18 directives for implementing free software in the federal government. Though not mandatory, they included giving priority to solutions, programs, and services based on free software to optimize resources and investments in IT; adopting open standards for developing ICT and developing multi-platform services and applications; popularization of free software; expanding services offered to citizens through free software; using free software digital inclusion programs; and training federal civil servants in the use of free software.[10]

At the World Summit on the Information Society of 2003, Brazil's chancellor stated the federal government's position: "In a society increasingly integrated by the Internet, the universal language that allows the production and sharing of knowledge is called software. Brazil sees the free software as emblematical of the Information Society and of a new culture of solidarity and sharing, an instrument to guarantee the access and domain by every one of this universal language" (Amadeu da Silveira, 2003). The federal government continues to promote FOSS.

[10]The full list of directives can be found at www.softwarelivre.gov.br/documentos-oficiais/DiretrizesPlanejamento/.

But government policies in favor of the software industry and its incipient efforts at promoting exports are potentially at odds with the policy in favor of FOSS. A major study of on the impact of FS/OS on the Brazilian software industry was conducted by Softex (Stefanuto and Salles-Filho, 2005) and reached several conclusions. First, free software/open source (FS/OS) has the power to change competitive standards within the industry itself. Its main impact is on segments in which the importance of appropriability (keeping codes closed) is a critical competitive factor and application specificity is lower (more or less specific products. Second, FS/OS threatens the package model (platforms and operating systems), software components and customizable products, exactly because appropriability is an essential competitive factor for these models. FS/OS, by definition, speeds up the transition of the software industry from products to services. Third, the government—a key player in the free software field—needs to examine more carefully the implications that an open encouragement of FS/OS might cause in the industry and for Brazilian companies. There are opportunities, but also threats. The government actions and policies associated with them need to be more grounded on information and analysis than on voluntary adherence. Free software may be good for Brazilian society for a number of reasons and it is good to explain them in a convincing way. This study—which is far from conclusive, in part because it is the first survey of its kind—suggests a need for caution for better monitoring of these developments. (Stefanuto and Sales-Filho, 2005, p. 74).

In any case, FOSS is increasingly used in Brazil's private as well as the public sectors. In December 2007, the Institute without Borders (*Instituto Sem Fronteiras*—ISF)—with support from IBM, among others—carried out a study on the adoption of free software with thousands of users in Brazil. Among the conclusions of the study is that free software is used to a much greater extent in the largest enterprises than in smaller firms. The principal reason for this appears to be the need to have experienced professionals to install, adapt, and service this software. Among the enterprises using free software, 48% reported using it on mission critical applications (ITData Consultoria, 2008).

Source: Hanna and Knight (forthcoming).

## *Collaborative Government (Web 2.0)*

Leveraging Web 2.0 in government, and broadly in development, promises a networked world supporting individual users creating content individually and collectively. Web 2.0 is a network platform that offers users' diverse sharing devices and tools, sharing and updating information and knowledge, remixing and improving on content created by each other, and allowing richer levels of user interactions.

It is changing the face of the Internet and can change the face of government, enabling collaborative, participative, and creative government–user relationships, and leading to an environment of "collective intelligence." Web 2.0 technologies have the potential to deliver enhanced customer service experience, to allow high levels of interactions and the cocreation of services, and to deliver self-service through a variety of devices, wired and wireless (Change and Kannan, 2008).

With the development of Web 2.0, collaborative governance webs are emerging. One example is the Networked Knowledge Los Angles, a diverse partnership of public and private organizations (the municipality, FrannieMae Foundation, Microsoft, among others) that is empowering residents to improve their communities by using web-based tools to transform data into meaningful formats for community and local policy makers and help them detect decaying neighborhoods and develop well-targeted public programs and private sector investment. Another promising area is medical services, where singular, top-down, provider–patient relationship is being challenged by a multiplicity of information providers, aggregators, and communities of like-minded users that join to provide medical services and information. Citizens can also become coproducers of the public good. Initiatives such as www.fixmystreet.org in the UK, for example, enable residents to submit concerns about safety, vandalism and other local issues directly to their municipal council. Emerging Web 2.0 technologies to support online forums make the process of engaging citizens in policy creation easier by providing tools to support knowledge creation and community building (Tapscott et al., 2008).

How can government and its partners harness the potential of this technology and the collective intelligence it can mobilize? The challenge will not only involve technology, but also social and organizational transformations. It will involve a shift in control and cocreation of services to users. Governments will be challenged to let go of industrial-age command-and-control hierarchies. Users and external organizations may act as intermediaries to service other customers. The design and delivery of content will have to be transformed. The framework and processes to create customer relationships, to strengthen citizen trust, and to enrich citizen engagements will have to be reinvented.

The implications are far reaching. Engaging citizens and communities will enable government to harness the collective intelligence of citizens, such as feedback on services and ways to customize and distribute content and services. Governments will need to increase their coverage and reach to deliver information and services. They will need to rely on emerging intermediaries to enhance content, customize services, create "mashups," and develop alternative delivery channels. These tools will raise key issues: sense of loss of control, informality of interaction, privacy, and security. These practices will also demand a new environment of collaborative culture within government. They require a learning attitude toward the initiative they launch in the social computing environment, starting with pilot projects to understand and experiment with social computing (Change and Kannan, 2008).

### *Building Technical Competencies Within Country for e-Government*

Governments will inevitably invest heavily in public sector ICT systems and operations and rely on such infrastructure for running government operations. Public managers have to rely selectively on private sector ICT services providers to run this critical aspect of the modern state. But governments cannot afford to blindly invest in systems or outsource such services. Nor can they rely on private providers to define their transformational needs and consequent changes in managerial practices. They must develop adequate policy and acquire necessary competency for the government to be savvy and effective user of this critical technology. Core competencies within government are needed to set and manage service-level agreements, to hold powerful global ICT service providers accountable, maintain well-contested markets for ICT services, and to leverage the new technologies for innovation and transformation.

e-Government programs cannot proceed very far without a minimal core group of staff with specialized skills in areas like enterprise architecture, interoperability, data standards, data centers, cyber security, etc. These skills are scarce in developing countries and are unlikely to be available or acquired by governments without special measures and incentives. Such talent should be encouraged to stay in the country, perhaps in the universities and be contracted to guide and advise the local governments on these highly complex systems and technical issues.

Such core technical competency and local expertise are also needed to alert policy makers on technological trends and cutting-edge practices and their implications for pubic policy and technology adoption. This is a fast-changing technology. Paradigm shifts like mobile government, open source, and cloud computing have far reaching implications for e-government and e-society programs.

## Managing e-Sector: the Cases of ICT in Education and Health

There are several rationales for leveraging and mainstreaming ICT in general education and training. The most important is the pedagogical rationale. Information technology offers enormous potential for enhancing access and quality of education and training systems, and tapping this potential for education should be a critical element of any national ICT strategy or education sector strategy. The use of ICT for education can shift the focus from teaching to learning, from teacher-centered education to learner-centered and learner-paced systems. There is also a social or equity rationale, as ICT is becoming increasingly pervasive in everyday life, and integrating ICT in basic education would level the playing field, familiarize young students early on with ICT tools and digital networks, and initiate them on a lifelong journey of learning and discovery. The employment and vocational rationale is also important: ICT-based employment skills such as networking skills, IT-enabled services, desktop publishing, etc. Finally, there is the catalytic rationale, as ICT

can accelerate reforms in teaching methods as well as in educational management institutions.

The knowledge revolution places further demands on educational institutions to modernize the curriculum at all levels, to integrate computer and Internet tools into learning and professional development, and to prepare young people for lifelong learning. East Asia has shown that technology orientation and content are as important as resources in improving educational outcomes. ICT tools and skills must be mainstreamed into all levels of education, including professional schools and management education. Industry leaders, business and public managers, and policy makers should understand the organizational and learning requirements to lead this technological transformation. This understanding is essential to educational reforms to integrate ICT tools into learning processes, curricula and teacher training as well as the management of educational programs and institutions.

Universal primary education and literacy remain a fundamental condition for participating in dynamic and information-intensive economies. Literacy cannot be leapfrogged. Increasingly, this now includes digital literacy. Pilot approaches should be encouraged; comprehensive reforms should be built on what worked. Countries are experimenting with promising approaches (UNDP, 2001). In Brazil, an NGO is helping communities to develop sustainable "information technology and citizenship schools." Communities who apply and meet sustainability criteria are provided with technical assistance and training for instructors as well as help to procure and install initial donation of hardware. As a result of the NGO work with community associations, more than 35,000 school children in over 200 schools and 30 cities have been trained in basic computer literacy. In Chile, 5,000 basic and secondary schools received computers, training, education software, and ongoing support from a technical assistance network of 35 universities organized by the ministry of education. In South Africa, School Net provides Internet services to local schools, including connectivity and technical support. The challenges of scaling up the impact of such pilots have been substantial, but a national ICT strategy must build on such experiences and help increase their coverage and effectiveness.

Interest in and use of ICT in education is growing and substantial resources are being invested in this technological transformation. Yet, a growing body of experience in developing countries points to an apparent disconnect between the rationales most often presented to advance the use of ICT and their actual use (Turcano, 2005). The formal rationales are to introduce learning and teaching practices and to foster 21st century thinking and learning skills. Much of the rhetoric is about changing the teaching–learning paradigm: this represents the potential of ICT for transforming educational systems (see Chapter 2). But actual programs of ICT in education are predominantly for use of ICT in computer literacy and dissemination of digital learning materials. In practice, ICT is used to support existing teaching and learning practices (with new and often expensive tools). A key challenge is to bridge this disconnect.

An e-education strategy must be guided by a holistic vision of the priority needs and reforms of the education sector for a competitive knowledge economy and inclusive information society. It is not enough that ICT in education is aligned with the

national ICT strategy. It should be driven by a coherent education sector strategy. It should be driven by clear pedagogical philosophies. Currently, this is an important tension between traditional and new pedagogies: ICT can serve both traditional, transmission-type pedagogies (more effective in preparation for standardized testing) as well as more learner-centered, constructivist pedagogies and measures of progress may be linked accordingly.

An ICT-enabled transformation of the education sector demands a holistic and coherent e-education strategy. It demands a variety of enabling factors and raises important equity issues. Many elements of educational reforms should be considered where ICT could make a fundamental difference or impact: teacher training, curriculum development, local content, reaching rural and remote areas, lifelong learning, as well as funding, decentralization, and accountability.

But a holistic approach to e-education is challenged by the fact that different parts of government are responsible for ICT in education policies in developing countries, with no effective mechanisms for consultation and coordination. In some countries, ICT in education is the purview of the Ministry of Education, while in others it is handled by the Ministry of Science and Technology, Ministry of Communication and Information Technology, etc. Regardless of the locus, problems of coordination among the many stakeholders abound. Yet, successful ICT-enabled transformation of the education sector demands the inputs of many players: ministries of education, labor, ICT, science and technology, finance, and rural development, as well as academics institutions, NGOs, civil society, media, and the private sector.

Best practices and lessons learned are emerging, but with a few exceptions, they have not been widely disseminated nor packaged into formats easily accessible for policy makers in developing countries. Little documentation exists about scaling up of pilots and innovative uses of ICT in education. There are many pitfalls involved in e-education strategy implementation. An enduring problem is putting technology before education. A typical bias is toward hardware and connectivity issues, and little attention to relevant content and teacher training. Lessons and best practices are emerging, and should be systematically sought (Box 6.16).

### Box 6.16 Integrating ICT into General Education: Lessons Learned

Lessons of experience and best practices are emerging, suggesting the following guidelines:

- Promote a comprehensive approach. Access alone is not enough to create a cultural shift toward ICT use. All the elements—hardware, software, Internet access, teacher incentives and training, improved pedagogy, high-quality online content, and educational software—have to come together, in the same school at the same time, to be effective.

- Build a critical mass of trained teachers to develop sustainable changes in attitude toward ICT. The challenge of teacher training and support cannot be underestimated. ICT can enable teachers to transform their practices, given a set of enabling conditions. Providing incentives to teachers and administrations is necessary to integrate ICT into learning systems. In Chile, it was found at least 60% of the teachers in the same school have to receive training at the same time to create a cultural shift in the school toward ICT use. Training one teacher per school all over the country as was done in some other countries was a waste of money.
- Train teachers to move to new pedagogical practices and to create more learner-centric pedagogical environment, enabled by ICT. Teacher technical mastery of ICT skills is a necessary but not a sufficient condition for successful integration of ICT into teaching. The development of appropriate pedagogical practices is more important than technical mastery of ICT.
- Expose teachers (on an ongoing basis) to ICT and fast emerging educational applications to be able to remain current and select the most appropriate resources. Experience indicates that even in the advanced OECD countries, few teachers typically have a comprehensive knowledge of the wide range of ICT tools and resources that are applicable to education.
- Create an unavoidable ICT environment. ICT has to be used in administration functions such that teachers and principal cannot avoid learning the new tools. ICT literacy should be linked to future promotion for teachers.
- Seek cost-effective and sustainable solutions for the deployment of ICT. Long-term maintenance, operational support, and constant upgrading of ICT in the classroom and educational institutions can be costly. Even in developed countries, educational institutions seek private sector funding and in-kind contributions. However, public–private partnerships should be researched and evaluated to enhance their effectiveness and sustainability. Alternatives such as free and open source software (FOSS) may greatly reduce the cost of software procurement.
- Seek innovative approaches to content development. Digitizing and adapting digital content for access via ICT is a lengthy and expensive process. This is especially true for educational television and video production. This may have equity implications for using minority languages to disseminate content via the Internet. Despite the growing educational resources available on the Internet, experience shows that there is dearth of such resources in a format that is easily accessible and relevant to most teachers and learners in developing countries. Lack of digital educational resources that are directly related to curriculum and assessment of educational outcomes can be an important barrier to ICT use in education
- Build partnerships with the private sector and academia. Private sector engagement allows for development of effective educational software packages, relevant content, and training programs that are well tailored to the

local needs. University–schools partnerships help to improve teachers' education and develop network of teacher trainers. Private sector and academia can also promote accountability of government programs to promote ICT use in education by administering an independent Information Literacy Test for teachers.

Source: Turcano (2005)

Chapter 2 provided some examples of e-health and m-health applications, suggesting that pilots are spreading all over the world to leverage the ICT and mobile platforms for improving health systems. These pilots have so far pursued specific health problems or targets of opportunities. But m-health and e-health programs must be viewed and aligned within the broader contexts of national healthcare and e-government programs—the sustainability and scalability of m-health and e-health programs ultimately depend on common building blocks. The targets of opportunity will vary among developed and developing countries.

Rethinking health strategy with ICT in mind can optimize the use of scarce resources and help bridge the urban–rural divide in health care, for example, by leveraging specialist doctors and expensive MRI machines using remote analysis and diagnosis. While m-health applications may have focused on tele-monitoring of patients at home in developed countries, they should address problems of access to scarce resources such as doctors and medicine in developing countries. ICT connectivity opens new options for redesigning health delivery systems that would be less facilities-intensive than traditional ones.

e-Health strategies should build on pilots and experiments that target pressing problems and prevalent diseases in developing countries while demonstrating feasibility and measurable results. They should also aim for scalability and sustainability and for strengthening health systems across programs. Such sector or system-wide changes require major changes in institutions and individual behavior. They require understanding and monitoring the behavior of patients and service providers, to devise appropriate incentives for change, and to learn from implementation. They require frameworks, protocols, and standards to scale up successful pilots and integrate bottom-up initiatives. They also call for partnerships between government agencies, private sector, and civil society. Above all, they demand transformational leadership and change management.

## Summing up: Starting, Sequencing, Piloting, and Scaling up

In the preceding discussion I focused on the key phases of an evolving e-government process, the milestones of a long journey, and the tools that may guide and accelerate progress. This chapter is concluded with a stylized road map of initial steps or activities to start and move along this journey. Many governments have

already started on this journey and have gone through one cycle of successful pilots and scaling up. But the cycle is expected to be repeated along a long-term journey.

Developing a common vision is a logical starting point in introducing e-government. Beyond that, resource constraints and learning requirements call for proceeding in a sequence of steps. In practice, these steps will overlap. They will combine both top-down direction and bottom-up initiatives. Not all agencies can or should move in lockstep—some may lead others, and the program will inevitably consist of a portfolio of projects in different phases. Work to create the basic building blocks of e-government could proceed in parallel with pilots for some services and scaling up for others in response to demand.

The process of piloting and scaling up an e-government program can be conceptualized in four steps (Fig. 6.3):

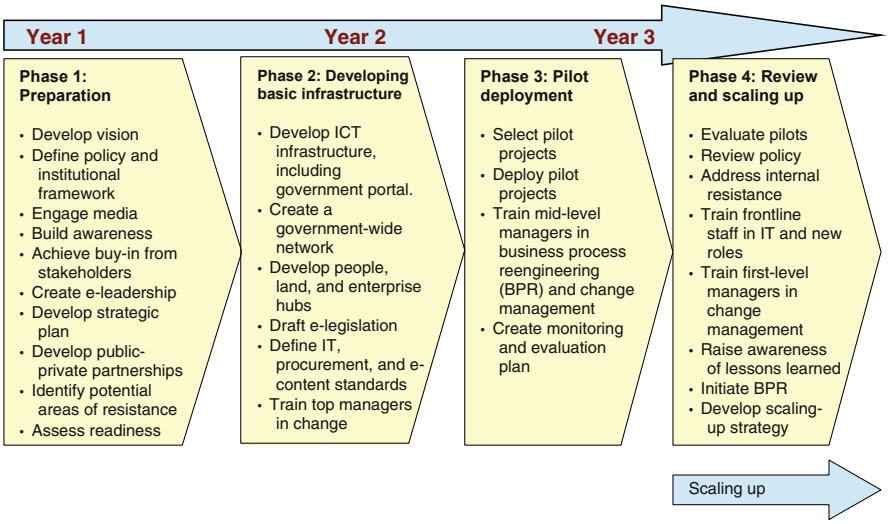



**Fig. 6.3** A road map for developing e-government. Source: Author

## *Step 1: Developing the Vision, Policy Framework, and e-Leadership*

The first step centers on developing a clear vision of the role of e-government in reinventing the public sector and crafting a detailed strategy and plan for implementation. An e-government policy framework should clarify why the country is pursuing e-government, what its aims and priorities are for transforming government, and what kind of e-government it is ready for. It should define the policy planning process and the institutional framework for implementing e-government initiatives. And it should formulate government objectives for the medium term.

This policy framework should be put into the public domain and disseminated to as many stakeholders and interest groups as possible. This should be followed by

national consultations seeking detailed feedback. Once the government has achieved broad buy-in from key stakeholders, it can conduct a study to identify services that could be modernized and taken online. This study may cover both the front end (service delivery) and the back end (internal infrastructure and business process). It could start by assessing the e-readiness of the country: taking stock of government leadership assets and its information, infrastructural, and human resources to determine whether the country is ready to begin the journey and at what pace it should progress.

The strategic plan emerging from this exercise provides the basic road map that defines the roles and responsibilities of all the key actors. It contains the aspirations of public leaders and other stakeholders—and time frames for implementing e-government. The strategy should be coherent, cover the potential impact, and prioritization of different services, phase, and sequence major investments within likely resource constraints, promote partnerships among stakeholders, and develop tools for mobilizing resources. At this stage, the plan should be at a strategic level, not a detailed blueprint. It should reflect initial consensus on priorities. Once completed, the road map, along with an ICT policy, should be formally adopted by the government.

This step also involves building the necessary e-leadership to manage the profound changes that must accompany e-government. If not already in place, this involves developing a cadre of chief information officers, a council of such officers from key agencies, and other mechanisms for coordination and change management. This leadership should be involved from the start in developing common frameworks for ICT investment and governance, setting priorities, and creating the enabling environment and human resources for implementation. Building e-leadership capacity requires a long lead time, so it has to start as early as possible.

### *Step 2: Creating Basic Information Infrastructure and Networks*

This step centers on creating the building blocks for implementing e-government. It is about creating the required digital infrastructure—the wide area network and "last mile" options; the people, land, and enterprise databases (hubs); and other shared information infrastructure within government. It includes the development of a common interface—a country or government portal, allowing individual web sites for government agencies. It also involves setting common standards, designing government-wide technology and application architectures, and developing governance of ICT investment and management. In advanced stages of e-government, this step may involve developing a government-wide broadband communication infrastructure, consolidating data centers, and/or retooling the infrastructure to accommodate mobile communications, social networking, and, where appropriate, cloud computing.

A government portal provides a quick win and also helps set longer term directions for the e-government architecture. It can serve as a framework for identifying

gaps and opportunities for collaboration. And it can engage citizens and businesses in providing user feedback and promoting citizen-centric government. In these ways the portal can help drive the transformation toward an integrated government. Technological advances are enabling governments to revamp their earlier versions of government portals to make them more citizen centric, or even extremely personalized and citizen-driven.

A wide area network may be established through a public–private joint venture. In such a case the government should secure open access to the network to ensure a level playing field for any telecommunications firm wishing to lay fiber or explore alternatives for last-mile connectivity.

Creating a master database on all citizens and their socio-economic data, though not essential for delivering e-services, should provide efficient technical solution for doing so. This is the approach used in many countries, such as Korea and Singapore.[11] But gathering and sharing such information in one database may be controversial and even illegal in some countries. It requires addressing issues relating to privacy and use of information about individual citizens by the government, along with drafting the enabling laws.

Systems will need to be put into place to continually update the data and ensure the highest security for the databases. A land hub, created on a geographic information system (GIS) platform, could then be integrated with the people hub, making all information relating to a household available at one click. An enterprise hub can complete the key basic information hubs in support of a wide range of applications and information sharing. Technological advances make this integration or "mashups" increasingly straightforward.

### *Step 3: Identifying, Prioritizing, and Developing Key Pilot Projects*

This involves rolling out pilots as proof of concepts in selected citizen services. Pilots are usually conducted in geographically compact areas under relatively controlled conditions so as to learn from mistakes in implementation before full-scale rollout of services. Pilots can also reveal weaknesses in back-end systems that should be addressed before the full-scale rollout.

The selection of pilots should favor programs that can both deliver results rapidly and showcase benefits. To help identify the pilots most closely aligned with an agency's mission or overall government reform goals, the government may define criteria to guide the assessment of potential benefits of pilots in terms that correspond the overarching reform goals and objectives outlined in Chapter 4.

Pilot projects should be prioritized and deployed in phases to accommodate financial and implementation constraints and allow time for learning. Once appropriate, mission-aligned pilot projects have been selected, the government should

[11] See, for example, Singapore One (http://www.ecitizen.gov.sg), which maps a citizen's life from the cradle to the grave and offers services along each step of this journey.

rank them by priority and outline a phased implementation strategy targeting those that can deliver the highest values within a short time. Countries may consider one application of e-government a priority due to its high development impact potential, but opt to implement it in pilots and phases, due to implementation challenges. For example, procurement is one of the most complex and often corrupt systems in government. Some countries, such as Mexico, with its *Compranet*, have chosen to initiate e-government programs with e-procurement applications because of the huge potential gains possible. Others, such as India, have deliberately gone slow, coming to e-procurement relatively late because of complexity and institutional resistance. Even when considered a priority, e-procurement may be implemented in pilots and phases, starting with areas that hold the least complexity and biggest gains that are bulk purchases.

### *Step 4: Scaling Up, Learning, and Deepening the Transformation*

This step is a time of consolidation of experience and of planning next steps toward scaling up and transformation through evaluation, learning, capacity building, resource mobilization, and public–private partnerships. The government needs to develop a strategy for expanding beyond simple pilots into a broad rollout program—and to evaluate sustainability, secure momentum, and plan to learn. Evaluating the pilots should provide an opportunity to look at the strengths and weaknesses of each and identify common issues arising in implementation before moving ahead with full-scale rollout.

If a pilot is successfully implemented, the application can be expanded in both reach and functionality. Meanwhile, the rollout of a new phase of e-government would continue to initiate new pilot applications to transform other government services. e-Government would thus grow in reach, functionality, and areas of application. While pilots may be funded by either the government or the private sector, full-scale rollouts should fully leverage potential public–private partnerships. This is where a government's project management abilities would be put to the test. The government would need to develop requests for proposals and service-level agreements governing the large-scale rollout of services, taking into account the lessons learned from the pilots and early phases of e-government. Creative partnership-building skills and incentive frameworks would be needed to balance the demands of government accountability with the need to attract the private sector.

This is also the time for the government to deepen and broaden transformation—to start exploring new services, process innovations, common business processes, and shared infrastructure services such as electronic identification cards, payment systems, or smart cards for citizens. As part of this stage, the government could initiate a public debate on e-participation, privacy rights, and security. It is at this stage that a connected, client-centered government should be pursued. As value-added services expand—in applications for serving citizens, businesses, and government agencies—the government can move ever closer to the goal of "anytime, anywhere" services, based on networks of providers.

### Learning to Pilot and Scale Up

For mainly political reasons, governments tend to favor large and expensive ICT projects with high visibility and profile. This leads to frequent failures, since risk is usually proportional to the size of the project and the degree of change—technical, organizational, and cultural—that it brings. Large and complex projects often fail, particularly when initiated ahead of learning and capacity building (Hanna and Piccioto, 2002; Heeks, 2002).

The high visibility of ICT projects, especially in the area of e-government, is a double-edged sword. A success story is a powerful testimony of leadership and competent government. On the other hand, large-scale failure may cast doubt on the credibility of the government. Policy makers should anticipate and manage publicity effects as well as initial teething problems that will inevitably arise. Starting small in addressing high-profile problems and bringing early results through pilots can boost the chances of success on a larger scale (Box 6.17). Pilots can also allow for innovation and risk taking on a manageable scale while building confidence and demonstration effects.[12] So, a robust implementation approach for e-government is to think big (vision), start small (pilots, smart projects), and scale fast (strategy).

## Box 6.17 Guidelines for Selecting and Designing Pilots

Pilots should be initially introduced in the high priority areas, be technologically rather simple, quickly deliver results and demonstration effects and integrate efforts of various donor agencies. Pilot projects also should:

- Fit into the broader government policies to gain support for e-development.
- Rely on permissive, if not favorable, legal and regulatory framework.
- Be accessible for the target audience. While it is crucial to provide services for all, in order to "try and learn," some services may be initially introduced for professions already believed to have Internet access, such as lawyers, large companies engaged in foreign trade, etc.
- Have distinctive benefits for the owner of the project (in the most cases—a particular government agency or ministry) to be sustainable in the long run. Otherwise, sabotage and bureaucratic resistance is inevitable.
- Be demand-driven; ICT should simplify services for the end user. Entrepreneurs and citizens will use e-services only if doing so is quicker, easier, or cheaper than going through traditional channels.

[12] "Pilot projects allow the service concept to be tested with limited risk and avoiding high-profile disasters that can shake public confidence in the service. Piloting projects also enable higher risk, innovative projects to get off the ground. Those that work should then be rapidly scaled up" (office of the e-Envoy, 2000).

- Rely on a stable institutional base, i.e., whenever possible, pilot implementation should not require major institutional reforms and involve a small number of agencies since in many developing countries interaction between various ministries and agencies is notoriously poor.
- Build the business case, including cost/benefit analysis. Technology choices affect the bottom line and this is increasingly as relevant for the public sector as it is for the private sector.

Incremental and iterative approaches may include both piloting and prototyping. Piloting would implement the project in a single site, observe, learn, and revise the system. It may involve identifying and experimenting with many critical success factors other than system development. Once successful testing of project concepts and systems at a real-life site is completed, the project is scaled up or rolled out to other sites. Prototyping offers an opportunity for testing the use of a working model of the final system, which users can view, comment on, and revise before the final version is produced. Prototyping can raise project success by making the design match user needs and by making the users more realistic in their expectations (Gupta et al., 2004). Advanced prototyping technologies now enable substantial reduction in time and costs of systems development.

To be successful and have long-term impact, e-services rollout should be guided by the strategic priority areas outlined in a comprehensive e-government strategy. At the same time, e-government strategies must rely on pilots and local initiatives to build national and local support, resolve key issues, and show quick results to boost the morale of those involved, and "launch and learn." Where large-scale projects are unavoidable, they should be divided into self-contained and sequenced modules that can be easily evaluated and adjusted to changes in technological, cultural, and organizational environments.

### Scaling up from States to National Levels

In the preceding discussion, I laid down a simplified process for a government on the road toward introducing and learning e-government. But what about large countries that have been experimenting with e-government at the city and state levels, and now aspires to scale up and mainstream this process on a large scale to the national or federal level?

India presents such a case of a massive scaling up of e-government that builds up on bottom-up successes and best practices. Unlike other countries that started with relatively top-down and comprehensive national strategy for e-government, such as Korea and Singapore, India's strategy emerged bottom-up, building on the demonstration effects of leading states like Andhra Pradesh and Karnataka. India has also been the graveyard of many pilots that were never sustained or scaled up.

Starting in 2004, the Indian government aimed to move beyond islands of success and scale up e-government to an ambitious national program, in a consultative manner with the states. This process involved the development of guiding principles, institutions, architectures, and frameworks to promote shared infrastructures and services, exploit economies of scale, develop critical human resources, and address other common success factors. The guiding principles include: emphasis on governance goals; focus on service delivery; process reengineering; public–private partnership; building local capacity; and integrated services through standardization of best practices. Although well conceived, NeGP implementation has been uneven, and the challenges for scaling up remain high (Box 6.18).

## Box 6.18 India's National e-Governance Plan (NeGP)

India's achievements in the ICT-BPO sector are recognized globally. In the public sector, however, no commensurate progress in leveraging of ICT has occurred. The Government of India (GoI) is often inefficient and inequitable in the way it provides public services. While rural coverage of public services has grown significantly, quality of services remains low. Payment of bribes for public services is widespread, sometimes doubling the cost to the citizen. Transaction times that could take minutes often take days and effective grievance mechanisms are often lacking. Deficiencies in public service provision bear disproportionately on the poor and solutions to these deficiencies have, therefore, a high potential equity payoff.

Several Indian states have made strides in using ICT to solve public service delivery problems (e-Governance), even providing global benchmarks for good practice in some areas. Thus Andhra Pradesh (AP), Karnataka, Tamil Nadu (TN), and Maharashtra have either experimented with or already rely on ICT for provision of numerous public services, such as land titles, certificates, licenses, food distribution, social pensions, etc.

The NeGP is the strategic program created in response to the needs, opportunities, and issues of improving public service delivery in India. It is an ambitious, long-term, nationwide program endorsed by Cabinet approval in May 2006 to move the whole country from a government-centric to a citizen-centric paradigm in service provision; to treat citizens as clients rather than beneficiaries of government services; and to empower those citizens to demand and receive convenient, cost–effective, and transparent services from government. It involves partnerships, strategic coordination, and division of labor between the central and the local governments.

NeGP encompasses shared infrastructure, core components, and mission mode projects (MMPs). The shared infrastructure consists of data centers, statewide area networks, and common service centers (delivery infrastructure for e-services to 600,000 villages). The core components intend to facilitate

the MMPs in providing e-services through policies on security, PPPs, open standards, local language interface, enterprise architecture, etc.

The heart of NeGP lies in the 27 mission mode projects (MMPs), as shown below in table. MMPs are umbrella projects to be implemented in all states and union territories or in some cases centrally for the whole country. Their purpose is to transform the provision of services in a specified sector (agriculture, transport) or level of government (state, municipality, district, Panchayati Raj). They include integrated services MMPs that cut across departments such as providing all government-to-business through a single portal. They also cover e-services offered by the federal ministries such as e-passport and e-tax. They also cover centrally planned but state and locally implemented e-services, such as e-agriculture, land records, e-district. All MMPs must meet service-level standards of transparency, efficiency, accessibility, and reliability determined by an Apex committee for the whole country.

**Table 6.1** NeGP Mission Mode Projects and Program Components. (Highlighted components may be supported by external financing)

| MMPs | | |
|---|---|---|
| **CENTRAL (7)** | **STATE-LEVEL (9)** | **INTEGRATED (9)** |
| Income tax | Agriculture | e-Biz |
| Central Excise | Comprehensive Modernization of Land Records | EDI |
| Passport, visa & immigration | Transport | India Portal |
| MCA 21 | Treasuries | Common Service Centers (CSCs) |
| Unique ID | Commercial Taxes | e-Gateway |
| Pensions | Panchayati Raj Institutions | e-Courts |
| Industry Initiative: | Municipalities | e-Office |
| Banking | Police | e-Government Procurement |
| Insurance | Employment Exchange | e-Districts |
| | Public Distribution System (PDS) – State-defined. | |
| **CORE PROGRAM COMPONENTS (8)** | | |
| Core Technology Policies and Standards | Technical Assistance | |
| Core Infrastructure: | HRD & Training | |
| State Wide Area Networks (SWANs) | Awareness & Assessment | |
| State Data Centers (SDCs) | Program Management Structures | |
| | R&D | |

Source: World Bank, December 2008c.

# Chapter 7
# Grassroots Innovation for the Information Society

Some of the most promising uses of ICT for development are to empower poor communities through assess to local and global knowledge, building local capacity and partnerships, and enabling broad participation, grassroots innovation, social learning, and social accountability. I call ICT applications that are targeted for poor communities and poverty reduction, e-society, or e-transformation at the grassroots and among poor communities.

This chapter and the next are about e-society and shared access to ICT tools, or empowering communities to use ICT to solve their development problems. The distribution of the communicative and information resources in society is a central issue to empowerment, social justice, governance, democracy, and development more generally. Widely shared public information and e-literacy are also essential to participation in the digital economy and having access to digitally mediated public services. The design and delivery of e-government services often produce new forms of exclusion. ICT networks give rise to new patterns of dialog, information flows, and political power. New ICTs can support a two-way dialog between citizens and their government. But as much as ICT can enable new forms of participatory development and democracy, it raises the issue of whether citizens should be entitled to acquire capabilities that would enable them to be informed and heard (Mansel et al., 2007).

e-Society is concerned with these distributional issues and with helping poor communities to appropriate ICT to enhance their abilities to solve local development problems, to mobilize their local information and knowledge, to innovate new ICT applications, and to adapt these general-purpose technologies to local conditions.

The chapter first discusses why ICT should be used to solve poverty and social problems through both bottom-up innovation mechanisms and top-down mainstreaming programs. It first examines e-society as a new paradigm in applying ICT for development, the promise of grassroots-driven, ICT-enabled innovation and problem solving, and the significant size of the market (including that of ICT) at the base of the pyramid. Second, it explores some of the new approaches to innovation and the ICT tools available to support them: the collaborative and user-led innovation approaches, and the promise of the participative web and collaborative technologies. Third, promising mechanisms are outlined to promote

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_7,

innovative ways to apply ICT for poverty reduction. Finally, a balanced approach is recommended between bottom-up, specialized mechanisms to promote pro-poor innovation and application of ICT, and top-down approaches to integrate ICT into social development and poverty eradication programs.

## Why e-Society?

There are several motivations to promote innovation and capacity building for broad-based economic growth and inclusive information society. In developed countries, e-society is synonymous with information society programs and e-inclusion or avoiding a digital divide. It may include applications for e-participation and e-democracy. At times it is associated with redefining the role of the state, to rely on partnerships with civil society organizations and the private sector as service providers. It is reinforced by other trends and movements: citizen empowerment, participatory democracy, open source, and user-driven innovation.

In 2006, the EU acknowledged the importance of e-inclusion and committed resources accordingly. Some progress was made toward halving the digital divide by 2010. Lessons learned so far are relevant for developing countries: (1) know your audience: even the best technology will fail if the audience's needs are not properly addressed; (2) develop infrastructure and ensure access; (3) innovate new sources of funding for e-inclusion, such as from auctioning telecommunications licenses; (4) invest in raising awareness of ICT benefits and in building capacity; (5) partner with local groups and make use of their knowledge of the target audience, and coordinate across sectors and actors; (6) measure progress and benefits to make the case for more funding and effective use of such funds; and (7) look ahead to ensure adaptation to emerging trends such as the rapid uptake of mobile Internet (OECD, 2008).

But for developing countries, e-society is even more critical for government transformation and for building an inclusive information society. e-Inclusion for developing countries is challenging due to limited local capabilities among poor communities and highly inequitable income distribution. Without special efforts to build e-literacy and local capacity for innovation and content development, and to provide local centers for shared access to Internet and ICT tools, there is the real danger of digital exclusion for the majority of the population. Inclusive and sustainable e-government would not be possible with ubiquitous access and e-literate information society. On the other hand, promoting affordable connectivity, relevant content, and adequate capacity can build a broad base for e-government and e-business services and thus support a virtuous cycle. e-Society can be also viewed an enabler of economic transformation and a necessary step toward the knowledge economy. Moreover, the state's capacity in developing countries is inadequate to deliver on its roles, so government has no option but to rely on partnerships with other organizations—largely civil society and community organizations—to provide services.

Efforts to bring ICT to the forefront of thinking about social development and poverty reduction are still very recent. The early debate of the 1990s about choosing between ICT and other pressing development imperatives has evolved but not resolved. The Millennium Development Goals (MDGs) cover ICT targets, but mainly in terms of access to telephony and Internet connectivity. Much of the early innovations and demonstration projects are initiated by NGOs and external donors but seldom integrated into poverty reduction strategies, ICT-enabled development strategies, or priority social and human development programs. Evidence of successful large-scale use of ICT for poverty reduction is scarce.

However, there is increasing awareness of the crucial potential role of ICT for expanding choice, empowering communities, and reducing poverty. Some of these efforts are beginning to bear fruit at the policy and strategic level. There is growing consensus that the digital divide is less about ICT equipment and connectivity than about relevant content, social applications, and the ability of local communities to create and derive value from ICT use. Digital inclusion is about using ICT to increase the efficiency with which development communities will pursue all the MDGs through social, economic, and political empowerment. An ICT-enabled development strategy cannot leave this link to chance.

A perquisite of successful appropriation of ICT for socio-economic development is that stakeholders be aware of the possibilities that ICT offers in all development sectors: education, health, environment, etc. ICT can also address poverty reduction through off-farm employment, small enterprise development, microfinance, and other means to leverage the resources and improve livelihood opportunities. But the locus for awareness and capabilities must be primarily located at the grassroots levels to enable communities and NGOs to discover and innovate with ICT and to integrate the new tools into local development efforts.

ICT has the potential of bringing ideas, information, and knowledge to even the most isolated, opening them to the world outside their village. Much of the relevant development experience, best practices and practical innovations reside locally, but are seldom shared within the country or even within a community. ICT allows people to share their experience with the rest of the country, if not the world. It also empowers citizens and communities to participate in political institutions and policy making of their communities and to aggregate their voices at the national level.

ICT is proving to be a vital tool for mobilizing people for reforms. Through SMS, thousands of demonstrators organized in the Philippines against President Estrada and drove him from office. Videos of demonstrations and abuses are instantly transmitted around the world from Iran (2009). The Nobel prize-winning anti-landmine campaign was organized by one individual form a cabin in rural Vermont largely through e-mail. The NGO Global Witness gives video cameras to environmental and human rights activists to chronicle abuses and put them online. In many countries, such tactics have been a major deterrent of flagrant abuses. Reform efforts could target key audiences through the media and ICT audiences, the connectors and influencers: youth, journalists, media people, NGOs, business associations, etc. (Odugbemi and Jacobson, 2008).

A key modality for promoting e-society and for promoting ICT-enabled innovations for and by the poor is through the empowerment of the NGOs, and the development of partnerships between public agencies, ICT enterprises, and civil society organizations or NGOs. Civil society organizations are in strong demand during times of great structural change, such as the emergence of the information society and knowledge economy. Access to digital content and ICT tools are critical to NGOs for their own functioning as coordination, mobilization, and service delivery tools. They are also help NGOs promote social policies, open up the debate about citizens' rights to communicate and participate, and empower the poor with the relevant information and knowledge to produce and consume. e-Society funds and other mechanisms can also promote partnerships between local NGOs, who are more intimately familiar with local conditions of the poor, and local government, national agencies, educational institutions, ICT service providers, and other potential partners.

## e-Society as a New Phase in ICT for Development

e-Society is about e-transformation at the grassroots or community level. It represents a new phase of applying ICT for development, an "ICT4D 2.0" (Heeks, 2009). e-Society shifts attention from invention to innovation, from preoccupation with technical novelty to technological mastery and contextual understanding of how existing technologies can be used effectively to solve problems of poor communities. It is technology neutral in the sense it blends traditional ICTs such as community radio and community video with the relatively recent tools of mobile communications. It draws on new innovation models and innovation intermediaries, including NGOs, social entrepreneurs, community information centers, and telecenters. It shifts the locus of innovation from supply-driven and centrally pushed solutions to collaborative innovation that emerges from working with poor communities, and even more radically, to grassroots innovation, by empowering communities to mobilize and partner to innovate by, and for themselves. It develops systematic means to identify, harvest, and replicate grassroots innovations.

The new strategic thrust in using ICT in development programs for poverty reduction requires a new view of the poor, both as producers and consumers. Information poverty is pervasive in developing countries and the poor suffer the most from the lack of access to local content, relevant services, and local networks. The poor often pay more for their basic needs and receive less for their produce than more informed producers and consumers. The poor are also potential adaptors, innovators, and problem solvers, particularly of issues most central to their livelihood. Digital technologies can draw on the capacities of 80% of the world's population to solve global poverty. Information is power, and ICT is generating new tools and novel ways to reach, mobilize, and empower the poor to help themselves. With increasing affordability, portability, miniaturization, and user-friendliness of ICT tools, it becomes easier to share information and develop relevant applications

for and with the poor. e-Society aims to design programs around the poor's specific needs, resources, capacities, and livelihoods.

e-Society also shifts ICT initiatives from an exclusive focus on investing in physical access to ICT, to taking a holistic approach that invests in local competency development to use knowledge and create content. It generates constraint-driven innovations—innovations that deliver appropriate solutions which match local resources: adaptable, affordable, lower in cost, and lower in skill intensity (Prahalad, 2005). It helps close the design-reality gap, most pronounced in the design of information systems for developing countries (Heeks, 2009). It shifts emphasis from designing top-down blueprint plans to developing innovation mechanisms, local processes and grassroots institutions that enable flexibility and beneficiary participation, and draw on local leadership, and local innovation, and learning capabilities.

## *Demand-Driven ICT-Enabled Grassroots Transformation*

Information technology is a new and general-purpose technology that must be "rediscovered," enacted and adapted to different social contexts (Fountain, 2001; Mansell et al., 2007). Despite substantial anecdotal literature on ICT for development, there is little practical and codified knowledge available about how to use ICT effectively for poverty reduction and economic growth. Investment in local learning and experimentation is needed for this practical knowledge to be accessible and relevant the local level. Financing grassroots innovation and adaptation at the local level can help fill this gap and empower NGOs and communities to initiate such innovation and learning about the uses of ICT for development.

Mainstreaming ICT in development assistance requires subordinating the technology to more fundamental development objectives. National ICT strategies must be integrally linked to comprehensive development strategies. Similarly, ICT components in development projects must be in support of the broader objectives of these projects. A major barrier and source of failures of ICT for poverty reduction stems from the dominant techno-centric approach to ICT projects in developing countries. Much of the emphasis has been on advances in the technology and the next new "new" thing, and much less on leveraging existing infrastructures and tools through relevant content and applications. Mechanisms should be developed to reflect the voice and priorities of potential users, particularly the poor in developing countries. Development practitioners may also blend with ICT specialists in multidisciplinary teams to provide a broader view of possibilities and constraints.

Meaningful integration of ICT into local development requires local capabilities to link ICT potential to local resources and development priorities. Local institutions have to "discover" ICT potential and harness this potential to address specific local conditions and challenges. The potential contribution of ICT cannot be identified

and realized through sole reliance on top-down mechanisms. Financing mechanisms should aim to build awareness, knowledge, and capabilities at the grassroots levels to use ICT for empowerment and social development.

Support for pro-poor innovations is urgently needed to complement market-based approaches and to reach the very poor. ICT markets are highly imperfect, particularly in responding to the needs of the poor. The incentives for ICT multinationals to meet information and communication needs of the bottom of the pyramid are relatively week—although many large companies are learning to reach down to the relatively poor (see below). Innovation and adaptation are highly constrained by the lack of resources and partners. Scaling up and diffusion of innovations relevant to the poor and rural areas are similarly constrained. Financing of innovations for ICT use for poverty reduction must empower users and local NGOs to address these constraints and market failures.

Public funding for R&D in the ICT sector in developing countries has been primarily driven by the priorities of the ICT industry—by the suppliers and exporters of ICT. Yet, most developing countries stand to benefit more from the effective use and wide diffusion of ICT among its key sectors than from mere production and export of ICT products.[1] R&D efforts and resources should be redirected to maximize the exploitation of ICT as enabler for the whole economy. Public funds for R&D in ICT should be driven by local adaptation needs in the user sectors of most promise or importance to national development. They should also empower local users and communities to enact and adapt the new technologies to meet their local priorities for development.

Taking advantage of ICT applications and realizing the potential benefits are not automatic. They require substantial R&D for adaptation, experimentation, and localization. Mainstream ICT systems have been designed almost wholly for the OECD markets, which are better endowed with physical capital and educated human capital than in developing countries. These designs do not generally reflect the capital mix of lower income groups in such markets, and so present major barriers to adoption of such applications as e-business for small enterprises and local NGOs. R&D can play a critical role in lowering the ICT complexity barrier and increase affordability and sustainability of ICT uses for SMEs, educational institutions, local governments, NGOs, and community-based organizations. Such adaptive R&D is also essential for improving access and use by the poor and rural population.

The conventional approach to technology diffusion is built around infrastructure provision. In contrast, a demand-driven pro-poor approach to technological diffusion and adaptation would start with creating the capacity to demand the needed services from a given infrastructure. Accordingly, innovations, content development, and demand-creating and aggregating measures would come first, followed by infrastructure, followed by the remaining elements of the process.

There are also strong arguments for subsidies to encourage digital inclusion and bridge the digital divide. One is pump priming—there appear to be positive returns

[1] See, for example, Hanna (2003). World Bank.

to scale for early investments in ICT infrastructure and ICT applications, so that the initial returns are less than the average returns over time. Subsidies for start-up costs can speed the initial learning phases of the institutionalization process. It is also the case that many applications of ICT benefiting the poor help meet basic human needs more fully and more efficiently, and equity concerns suggest subsidies are appropriate for such applications. There are strong externalities for the pilot and demonstration projects, as the beneficiaries of the lessons learned through such projects are not only the direct beneficiaries of the project, but the beneficiaries of other projects improved by the findings. Grant-funded, relatively small projects, therefore, have a potentially important role in promoting ICT diffusion and applications for the poor.

Incremental innovation—continuous improvement of products and processes—is critical to national competitiveness. The cumulative and pervasive impact of incremental innovation in ICT use and adaptation is likely to outweigh major "disruptive" innovations or ICT inventions. Although disruptive innovation stimulates demand for the highest engineering skills and world class talent, it is risky and costly for most developing countries. It may divert scarce research resources and talents away from the challenges of ICT adaptation that address the pressing needs of the majority of population. Government role should be primarily aimed at incremental innovations to adapt ICT to local needs.

Bottom-up and demand-driven approaches to ICT application are particularly suited for developing local content. The web is world wide, but the evidence suggests that people are primarily interested in access to locally relevant information. Content and networking remain highly local or context specific, particularly in rural areas and in countries whose population does not master other languages but native. As developing local content is expensive, innovative mechanisms are needed to develop specifically tailored content for farmers, small and medium enterprises, and rural populations. Beneficiaries may be mobilized and organized to develop and update content, thus reducing costs, and ensuring relevance and sustainability. Information and communication needs assessments may be carried out, with the help of sociologists and rural development specialists to set priorities for funding and to empower intermediaries and local partnerships to provide such content.

## *The Next Four Billion—a Market Approach*

A majority of the world's population—four billion low-income people—constitute the base of the economic pyramid (BOP). New empirical measures of their aggregate purchasing power suggest significant opportunities for market-based approaches to meet their needs and improve their productivity and incomes.[2] It is

[2]For an excellent treatment of this topic, see: International Finance Corporation and World Resource Institute. 2007. *The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid.* World Resource Institute: Washington, DC.

the entire BOP and not just the very poor who constitute the low-income market. Most BOP population segments are not integrated into or benefit from the global market economy. They have significant unmet needs. They lack access to markets and depend on subsistence livelihood. They pay higher prices for basic goods and services than wealthier consumers. These needs and the entire low-income market should be analyzed and addressed for opportunities for market-based solutions to be realized.

A market-based approach focuses on people as consumers and producers and on solutions that make markets more competitive, efficient, and inclusive—so that the BOP can benefit. Such solutions may involve market development, consumer education, consumer finance, microloans, cross-subsidies among different income groups. They may also involve partnerships with NGOs and public sector, and franchise and local agent strategies that create jobs and incomes. Yet, these solutions are ultimately market-oriented and demand-driven. Most important, these solutions emphasize sustainability as key to meet the needs of four billion people.

The information and communication market represents a major BOP market. It is estimated at US$ 51 billion (2006), but probably more than twice that now because of rapid growth of this market, mainly due to mobile phone. Except in the very lowest income segment of the BOP, ICT spending per household exceeds spending on water (IFC and WRI, 2007). In the upper BOP segments, ICT spending sometimes exceeds spending on health. Continuing rapid growth in the ICT sector in developing countries, the decline in ICT cost/performance ratio, and the emergence of new business models that enhance affordability—all suggest ample untapped demand. Business models in ICT services have been adapted to serve the BOP population and make ICT affordable in developing countries: recent approaches of prepaid mobile telephony in small units, Internet access by the quarter hour in cybercafés, etc.

The biggest challenge to serve the BOP population is to develop business models that bridge the urban–rural divide in developing countries. For example, in Brazil, the BOP market for ICT is 97% urban and average annual spending by urban BOP households is seven times that by rural households. However, despite the general lower levels of ICT spending in rural areas, the size of the rural population in some countries still aggregates the demand into a sizable market. For example, Thailand rural BOP market for ICT is $ 1.5 billion, and India's is $ 3.8 billion. Clearly, some forms of shared access to ICT are necessary to aggregate demand and increase affordability to the BOP in rural areas. Mobile phones also present a new platform most particularly suitable for delivering services via the Internet to the BOP populations in the rural areas.

The lack of access to ICT services in rural areas can be a significant penalty for BOP population—one that keeps rural people disconnected from markets and broader information resources and thus reinforces rural isolation and poverty. ICT represents a general-purpose enabler to meeting many other needs of the BOP population. Not only are the poor deprived of access to ICT, but they also lack ICT products, services, and applications suited to their needs and to empower them to meet many non-ICT needs such as access to microfinance, learning opportunities, agricultural extension, market information, and remittance transfers (Chapter 2).

There are many pilot projects that demonstrate the utility of ICT in many fields. But more concerted efforts and effective mechanisms are needed to innovate new ICT tools, apply them to diverse socio-economic contexts and problems, and create relevant digital content to meet social needs. Equally important is to seek sustainable solutions to scale up and diffuse such applications more widely.

## *Strategies to Serve the Base of the Pyramid*

Promoting ICT use and adaptation to address development and poverty challenges can draw on the emerging literature and practice in serving the potentially huge market of poor populations in developing countries. Prahalad (2005) presents a leading example of business thinkers and strategists who are exploring ways to partner with the poor to innovate and market products that effectively serve the needs of the majority of populations in developing countries. This literature challenges the dominant business logic of multinationals that the four billion people at the bottom of the pyramid do not constitute an attractive market for their products and services. Serving this large market, however, requires different modalities for product creation, marketing, distribution, and services.

The emerging business strategies to serve these populations provide many parallels and lessons for developing and applying ICT for development and poverty reduction. These strategies include: focusing on the BOP by adapting or reinventing products and services to enable access or make such services affordable and suitable to BOP needs; localizing value creation through franchising and agent strategies that involve building local ecosystems of suppliers or vendors, or by treating the community as the customer; and building diverse partnerships. The spread of wireless devices among the poor through such schemes as prepaid cards and the Grameenphone is one example. The use of telecenters such as e-Choupal allowed farmers to check prices and improve their margins. Innovative microfinancing and purchasing schemes have expanded the capacity of the poor to consume. These innovations required substantial experimentation and engagement of the poor and their representative organizations.

Many of the guiding principles of innovation for the bottom of the pyramid can be transferred and adapted to promote community-driven ICT application and adaptation for poverty reduction.[3] Large producers can engage NGOs and local community-based organizations to cocreate new products and services. Serving this market requires focus on price performance. It requires hybrid solutions—blending advanced technologies with existing traditional ones. To serve large markets of poor populations solutions must be scalable, adaptable, and transferable. Innovations must conserve on resources and build on local advantages. They must take account of skill levels, poor infrastructure, and access to service. Investing in educating consumers on product usage is also important.

[3]These guiding principles are adapted from Prahalad (2005).

## *The User Innovation Revolution*

Recent business experience points to a user innovation revolution (Leadbeater, 2006). There is a rising recognition of the role of customers in product innovation and adaptation. Traditionally, consumers are viewed as the final link in the value chain; they can choose between products but have little say over their design or creation. Innovation is assumed to come only from companies. Recent literature suggests changes in consumer and company behaviors. Once passive, consumers are becoming adaptors, inventors, and innovators. They are contributing to the way products and services are developed and produced. Companies are learning to identify and work with groups of lead users, to remove barriers to user innovation, provide user innovators with easy-to-use tools and incentives to innovate, build user capacity to adapt and innovate, create settings for prototypes to be tested, and create supporting communities for user innovators to share ideas.

This experience is particularly relevant to community-driven application and adaptation of ICT in developing countries. ICT producers and suppliers have yet to understand the special communication and information needs of the poor and rural communities in developing countries. Mechanisms to engage these target groups as coproducers and coinventors in ICT application are needed to overcome the cultural, institutional, and skill barriers to realize the potential of this user innovation revolution. These mechanisms must start with respect for the poor as cocreators. The process of cocreation treats local NGOs and poor communities as equally important partners and joint problem solvers.

A new innovation paradigm is needed—a pro-poor user-driven innovation paradigm that democratizes innovation.[4] Innovation funds, research institutions, and national innovation systems have primarily focused on advancing the technology, not understanding user needs, and particularly the poor and small enterprises. The ICT revolution opens promises similar to those delivered by the green revolution for the poor and small farmers. Like agricultural technology, information technology must be adapted to the many and varied ecological and social contexts of application. Partnerships are needed among government, business, academic institutions, and community organizations to cocreate value and services to the poor.

User engagement and innovation lessons can be extended to the design and delivery of e-government services. Advanced e-government programs have learned to engage the leading users in codesigning new e-services and providing continuous feedback on these services. Moreover, the adoption of online services is critically dependent on the widespread of e-literacy and the creation of information culture. e-Government programs are thus dependent on parallel advance in promoting digital awareness and literacy among a large segment of the population.

[4]Eric Von Hippel (2005). *Democratizing Innovation*. MIT Press.

## e-Society for Pro-Poor Innovation

Policies and institutions can be created to support R&D on the use of ICT to solve development problems facing the poor. Digital platforms are emerging as social enablers, resource mobilizers, and community organizers. National and local governments can encourage universities and the private sector to use ICT to expand opportunities for the poor. They can allocate R&D funds or create inclusive innovation funds to innovate ICT applications that address the challenges facing poor communities. Pro-poor public policies may also promote partnerships among NGOs, MNCs, universities, and local and state government agencies to understand the potential role of ICT in empowering the poor, delivering appropriately tailored services, and supporting their livelihood strategies. There are substantial unrealized synergies among these actors that can help innovate for the base of the pyramid. Public policies may promote grassroots innovation networks, pro-poor innovation foundations, and rural telecenter networks. Some of these mechanisms will be discussed later in this chapter and the next.

Widespread access to mobile phones in poor countries, for example, presents a great opportunity to serve poor communities with an expanding array of services. The Grameen (village) phone program provides mobile phones to very poor women who use them to operate business. A "village phone lady" purchases a phone with a small loan from the Grameen Bank and then sells use on a per call basis, generating an average income three times the national average in Bangladesh. Phone users in these poor rural communities can then bypass middlemen and connect to buyers and get better prices for their produce. This institutional innovation is now being replicated in many African countries and elsewhere. Services conducted using the mobile platform are being diversified, in partnership with finance institutions, telecom operators, and application providers.

Recognizing the potential role of mobile phones in pro-poor innovations and solutions, e-society policies would enhance access to basic mobile telephony, by encouraging competition in telecommunications and reducing taxes on mobile handsets and connection fees. In Bangladesh, new mobile subscriptions fell from 11% to 7% after a US$ 14 connection tax was imposed. In contrast, India saw penetration increase from 1% to 5% following a reduction in handset import duties (World Bank, 2007a).

## Social Knowledge Creation and Participation

e-Society programs can promote bottom-up knowledge creation and content development through community involvement and social interactions, facilitated by small grants or cofinancing. Small grants to communities and NGOs may also finance social and network infrastructure to facilitate social knowledge creation. New knowledge is increasingly created through interactions among members in a network. It is enhanced socially as people build on each other's contributions. This

approach may take advantage of the social networking and collaborative tools (Web 2.0) as well as partnerships between community organizations, local governments, small businesses, and NGOs.

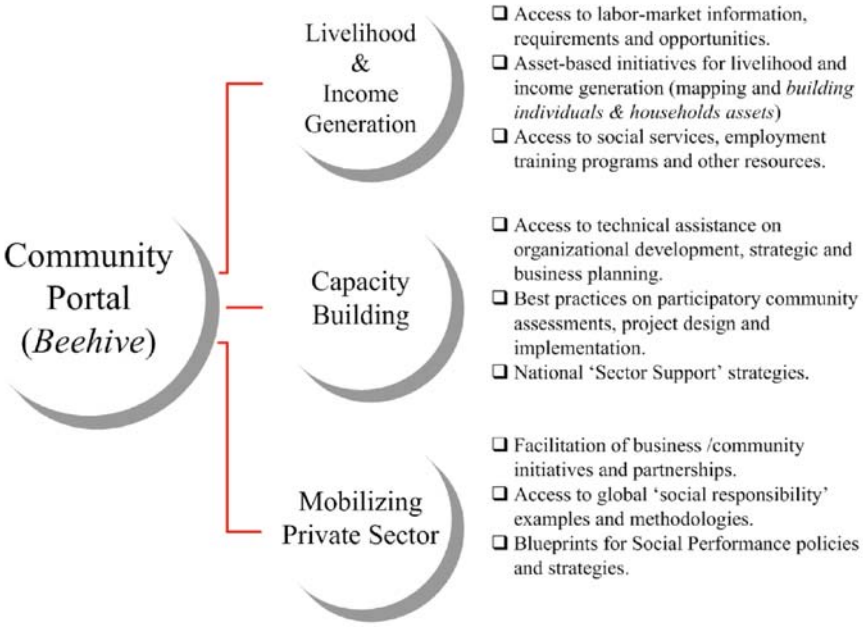
e-Society can also finance platforms and content for sharing municipality, community, or neighborhood knowledge. A pioneering example, Neighborhood Knowledge California (NKCA), is empowering residents to improve their communities (Tapscott and Williams, 2006). It provides easy access to web-based tools to transform raw public data into formats that are useful to community residents and local government policy makers. Among others, it integrates data from all levels of government and private sector (e.g., investment, toxic release notices) activities that can be tracked at the local level to develop an interactive monitoring system. Such grassroots projects show how platforms for participation that empower and involve people in identifying and resolving problems in their communities can improve public sector governance and enrich democracy. Such interactive platforms can track information on issues such as employment and public health.

Promising approaches are also emerging to engage local stakeholders and communities to develop local content and to localize global best practices in relevant fields of knowledge. These approaches blend the traditional methods of community development with the use of technology to build community portals and to capture local and global knowledge in ways that would support livelihood and income generation. These approaches integrate content development with access to a comprehensive web portal and targeted training. These initiatives also develop methodologies and tools to help communities build capacity to develop local content and localize global knowledge in areas deemed most relevant to the community and thus help scale up community-driven effort to blend and access global and local knowledge. When combined with community-driven development (CDD) approaches, community-driven portals and ICT-enabled networks could scale up access to relevant knowledge and best practices, procurement of inputs, and markets for local products. One Economy (www.one-economy.com) is a promising example of a nonprofit organization that is creating community-driven approaches to content development and access in an expanding number of countries (Box 7.1).

## Box 7.1 One Economy: Building Capacity for Community-Driven Portals and Content

One Economy (www.one-economy.com), a nonprofit organization, adopts such a promising approach. Its cornerstone is a comprehensive web portal (www.thebeehive.org) that provides information on topics that matter most to the poor: jobs, money, health, and education. One Economy engages communities and community-based NGOs in developing community portals to provide contextually and culturally relevant and user-friendly content

written in local languages. It engages stakeholders in a participatory process to design and implement community portals. The community portals serve three functions: increasing livelihood and income generation for low-income individuals, building capacity of NGOs, and fostering private sector investment in low-income communities.




In an effort to scale up, reduce costs and shorten time-to-market of community portals, One Economy has developed a toolkit that utilizes: a global content system which contains all of One Economy's universally applicable content; stakeholders engagement tools to engage partners in providing specific content; a site building wizard to allow partners to create their own site more easily; and a comprehensive training manual to support partners with examples to create their own site. In partnership with others, such as CISCO and teachers without borders, One Economy is also developing a curriculum for young people and for telecenter managers that will equip them with the tools to help them serve their communities and make sustainable IT solutions a reality.

## Networks for Inclusive and Grassroots Innovation

Cross-cutting strategies are typically needed to make the country's innovation system responsive to the needs of the poor and common people and to open up the national innovation system to mobilize and tap poor people's innovative abilities and assets. As a general-purpose technology, ICT is particularly suited to access many of the problems of poor people: isolation, information poverty, insufficiently developed skills, and inability to access markets, and assets on fair terms.

Harnessing this new technology for social inclusion can be pursued through bottom-up grassroots initiatives as well as formal, centrally directed programs to diffuse promising ICT-enabled solutions, much like the extension programs of the green revolution. We first illustrate the bottom-up approach with the grassroots innovation networks and grassroots innovation funds. Later, we illustrate the programmatic approach to diffuse and mainstream ICT into thematic development programs for poverty reduction and social inclusion.

How can we harness and scale up grassroots pro-poor innovations? One approach is to develop grassroots networks that support innovative products and mobilize local knowledge at the individual and community level. These networks would focus on innovation and adaptation—largely initiated at the grassroots level, and based on local people's knowledge and practices. Because such grassroots innovations are simple, low cost, and easy to apply, and replicate, such products have large social impacts on the livelihood of the marginalized. While such networks are not limited to ICT innovations, they are typically about ICT-enabled innovation, information sharing, and knowledge capturing. They may involve documentation and dissemination of traditional knowledge and innovations.

Known examples from India include the Honey Bee Network and Society for Sustainable Technologies and Institutions—two largest nongovernment programs. The two largest Indian government network programs are the Grassroots Innovation Augmentation Network and the National Innovation Foundation. These networks attempt to capture and document knowledge from informal innovators (individuals, farmers, and entrepreneurs) who accumulated such knowledge from years of trial and error or incremental innovations embedded in tools and agricultural practices. They connect innovators to academics, NGOs, and policy makers. They seek to protect the intellectual property rights of knowledge holders and provide financial and institutional backing. The Society for Sustainable Technologies has also organized international scouting contexts with awards given to grassroots innovators form China, Vietnam, and India. Major products with successful value addition from this network include botanical pesticides and growth promoters, and health healing treatments.

There has not been much assessment of how such programs have contributed to improving the livelihood of the people. Grassroots innovations face several challenges in India and elsewhere but these challenges can be systematically addressed (Dutz, 2007). High transaction costs of scouting and documentation are inevitable in programs that support a large number of scattered innovators. Most grassroots innovations require much more analysis and testing to improve the value of the

innovation. Diffusion and dissemination efforts are also required for commercialization and a fund may be needed to acquire rights to such innovations. Even for innovations sufficiently developed to be commercialized, their scaling up and distribution need financing. These networks can, therefore, be complemented by, and in turn support grassroots innovation funds.

## Dedicated Funds for Grassroots Innovation

A powerful tool for promoting development of local content and applications is so-called e-Society, or grassroots innovation funds. They are specially created to support rollout of innovative ICT applications and pilot projects to develop real-life skills and knowledge, promote grassroot innovation and participation. Small grants and cost-sharing finance are based on bottom-up proposals from NGOs, communities, and small enterprises with potentially broad replicability and high impact on poverty reduction. Malaysia has established a demonstrator Application Grant Scheme to stimulate innovative use of ICT (Box 7.2).

### Box 7.2 Malaysia—Demonstrator Application Grant Scheme

The National IT Council introduced the Demonstrator Application Grant Scheme, which provides funding support to projects that facilitate the social and economic progress of Malaysians through the innovative use of ICT. It also promotes closer cooperation and collaboration between public agencies, private corporations, and nonprofit organizations through joint ventures and institutional linkages.

Demonstrator applications projects (DAs) are small and focused projects with clearly defined objectives and a short implementation cycle of less than 12 months. They emphasize community inclusion and local content creation, providing a model of sustainable development. This scheme provides grant support of up to 70% of the total project cost. There are three types of DA:

- *Perdana DA*. has the key aim of enhancing cooperation between companies or consortia of companies, or joint ventures between the public and private sectors, and community-based organizations for the development of national level projects of strategic importance for realizing the national ICT strategy. To be accredited as Perdana DAs, projects have to be scalable to national level, with strategic importance, and can be undertaken by companies or joint ventures between public and community-based organizations.

- *Public Sector DA* refers to value creation projects supported by federal ministries or state governments, with the joint participation of the private sector, institutes of higher learning and nonprofit organizations. Encourage the active involvement and participation of society in the creation of an efficient public service.
- *People DA* aims to grant opportunities to individuals, societies, the private sector, nongovernmental and nonprofit organizations to create ICT projects that can reengineer and provide solutions to problems specific to a society. People DAs are "smart solutions" to age-old problems.

Source: Government of Malaysia.

## *e-Society Fund: The Case of Sri Lanka*

The e-society fund, a key part of the e-Sri Lanka program, is a promising example of an innovation fund that focuses on promoting societal applications of ICT in support of poverty reduction, vulnerable groups, and rural development (Box 7.3). It provides small grants to catalyze innovation in ICT applications for economic development and poverty reduction.[5] Its overarching goal is to facilitate access to ICT and ensure that the benefits of ICT for development flows to the most vulnerable groups—the rural poor, women, displaced persons, persons with disabilities, other minorities and marginalized groups, and those living in conflict-affected areas. By promoting more balanced access and building the capacity of poor communities to appropriate the technology, the fund is expected to assist in closing the development divide between urban and rural areas, and between rich and poor communities. As telecenters spread throughout the country, the fund will leverage this new infrastructure to create and deliver local content, build partnerships, and establish a network of communities of practice.

The program was designed to take a bottom-up, collaborative approach to ICT4D, harnessing private, public, and nongovernmental organizations' expertise and infrastructure and community-based organizations grassroots knowledge and presence to accomplish the country's vision of taking the benefits of ICT to every citizen. It aimed to encourage ownership of the national e-Sri Lanka program and promote initiatives that reflect the priorities of the poor.

The emerging thematic areas for small grants to communities included: ICT training and capacity building, e-education, ICT for the disabled, income

[5]For a full picture of the e-Sri Lanka program and the role of the e-society fund within it, see Hanna (2008).

## Box 7.3 The e-Society Fund: Sri Lanka Experience

The e-society fund is a competitive grant program, providing both community and partnership grants. The community assistance program (CAP) gives community groups an opportunity to develop proposals for funding based on priority needs identified by their community. Community grants—and the responsibility for implementing them—go directly to communities. Initially the program targeted communities where some implementation capacity and access to ICT infrastructure (especially telecenters) exists or is being established. Most recipients of community grants are rural communities.

Drawing on the experience of small grant programs, like *infoDev*, the fund gives special attention to evaluation, scaling up, replication, and dissemination and, consequently, to adequate funding for such activities. At the conclusion of a grant, an independent review, coordinated by the managing agent, evaluates the implementation and impact of the grant. This review includes a recommendation to the fund's board as to whether it should consider expanding the scope of the initial grant in the recipient community or determine whether the grant constitutes "a good-practice model" that could be transposed to other communities. Both these cases imply additional funding.

Community grants average US$ 5,000 each and may be no more than US$ 10,000. Matching funds from a community are considered an indicator not only of its "ownership" of the grant-funded initiative but also of its ability to absorb and sustain the investment. Finding the right level for such contributions—high enough to provide a significant indication of ownership and capacity to sustain the investment but not so high as to discriminate against the poorest communities—is a challenge. The fund is unlikely to finance the expansion of the scope of an initial grant, but is expected to assist the community in seeking funding from bilateral or multilateral donors. And if a successful grant is determined to be a good-practice model, the fund is expected to finance costs associated with disseminating best practices to other communities.

The partnership assistance program (PAP) aimed at helping to involve public and private entities and NGOs as partners in providing ICT-enabled development opportunities to the targeted beneficiaries. Partnership grants are intended to: facilitate access to ICT among the most vulnerable groups, assist in closing the urban–rural development divide, develop social capital, promote greater local content in the Sinhalese and Tamil languages, help integrate post-conflict regions, and pilot innovative ICT applications to improve the quality of life among the target beneficiaries. The grants are intended for situations in which communities in the target beneficiary population do not wish to undertake direct responsibility for implementing an ICT project or lack the capacity to do so. Grants may also be awarded for an ICT project that benefits more than a single community or is not specific to a location—for example, development of

Sinhalese or Tamil web sites and local language content, or applications for handicapped communities. Partnership grants average US$ 50,000.[6]

The e-society fund is tapping into synergies between the two grants types—community assistance program (CAP) and partnership assistance program (PAP). A good case in point is the applications for the visually and aurally handicapped. The e-society fund, through its PAP, has initiated several applications that benefit the deaf and the blind—for the blind software for reading local language online newspapers via Braille display: text-to Braille and Braille-to text software which enables local language e-mail communication; Braille Typing Tutor, and listening to local language DAISY talking books. For the deaf—software for building local language vocabulary and teaching sign language to deaf children via a video sign language dictionary and curriculum. These applications are being piloted through CAP projects that address the needs of specific disabled communities.

To ensure a balance between bottom-up innovation, to mobilize local resources and creativity, and top-down direction, to maximize replicability and strategic impact, the e-society fund sets thematic priorities and targets in consultation with representatives of beneficiaries and other stakeholders. The aim is ensure some balance in the distribution of grants among development priorities and among target groups. The thematic areas targeted for the PAP, for example, include access to learning, income generation, access to services, capacity building, ICT for the disabled and elderly, ICT for peace, indigenous knowledge, and the environment.

The processes used by the fund in soliciting and funding proposals are designed to ensure transparency, fairness, and integrity as well as to support the fund's broad development objectives, including community-driven development, local entrepreneurship, and capacity building in using ICT to solve local problems. These processes are modeled on those of *info*Dev and other successful small grants programs.

Similarly, the design of the institutional arrangements for managing the fund is aimed at ensuring transparency, fairness, and accountability; clarifying and separating the administrative and executive functions; developing effective partnerships; promoting coordination with all concerned donors to exploit synergies and economies of scale; and ensuring effective monitoring and evaluation to enhance development impact—all consistent with lessons from bottom-up approaches to development and innovation.

[6]Contrast this with *info*Dev grants, at that time averaging at US$ 250,000.

generation, environment and conservation management, capturing and disseminating indigenous knowledge, and promoting peace and nation building. Larger grants were designed to promote partnerships among NGOs, businesses, and government agencies to address development challenges that are shared across communities and are beyond the capacity any single community to implement. The emerging thematic areas covered local content development in local languages, capacity building, developing content, and e-services for health and education for rural areas, and innovative communication.

The response to the e-society program has been substantial, from villages and grassroots organizations, as well as the President and Cabinet of Sri Lanka. Female beneficiaries account for more than half, and children and youth also accounted for the majority of beneficiaries.

Several grassroots projects considered for financing through community grants are developing web sites to promote local economic development. One web site, a "gateway to Hambantota," provides information for tourists, such as on where to stay and what to do in the district. Another will document the rich heritage of Tantirimale village, a remote rural location of archeological significance. Other sites are developing a web presence for marketing the products of farmers and rural entrepreneurs.

In one e-society project, a foundation helped create an information exchange place for cows' artificial insemination and also information on wholesale prices at milk collection centers. In several projects, the grants were used to create business opportunities, for example, by marketing women's products on the Internet, producing a "Cyber Agriculture Wikipedia" to be deployed at telecenters and rural agriculture knowledge centers, and by creating fishing information center that captures satellite images online to identify potential grounds for fishing. Another e-society project empowered SMEs by developing digital self-learning solutions in the local languages in subject areas like business accounting, and legal, and tax advice.

Other grants aimed to promote e-literacy and ICT-related jobs. One pilot produced cartoon animations in local language and in the process also helped students learn how to use cartoon creation software and get job opportunities. In another district, the grant helped create an e-leadership computer center and increased e-literacy in the village from 2 to 30%.

Other partnership-driven innovative ICT applications are also being piloted with an eye on scaling up: developing trilingual disaster alert system capable of delivering information to the most remote locations and quickly reaching a wider audience than is generally accessible by traditional media; developing English and computer competency applications for children; localizing FOSS for Sri Lankan in local language; and piloting the use of standard Sinhala Unicode fonts to facilitate the creation of high-quality web content at telecenters.

Many other innovation grants helped develop content (in three languages, to be offered online and offline) targeted at vulnerable groups. One targeted historically marginalized estate workers, especially women and children, concerning maternal health and child nutrition. Another developed a web-based

e-learning solution for science students in rural areas, where science tutors and learning materials are scarce. A prominent innovation utilized a partnership grant to develop an interactive and audiovisual educational content to facilitate self-learning, following the school curriculum in local language, again targeted at students in rural areas, and deployed via the rural telecenter network. Some grants sought to develop ICT applications to assist people with disabilities. Examples include working with schools on assistive technology for blind students, assisting hearing-impaired children and their caregivers, combating violence against women and addressing the special information and communication needs of women suffering abuse (targeting conflict areas in the Northeast).

As of early 2009, many of these initiatives are beginning to bear fruit and have received international recognition at events in India (i4d 2007), Malaysia (Global Knowledge Partnership Award, 2008) and Sweden (Stockholm Challenge, 2008). Among those shortlisted for the Manthan Awards 2008 are: pilots to capture indigenous knowledge and cultural heritage, combating violence against women by providing discrete ways to report cases for relevant agencies and informing women of their rights, legal options, and ways to get help (http://www.vawjaffna.org); university consultations with patients in rural areas, with the use of videoconferencing at a telecenter located in a provincial hospital; and using ICT to enhance the learning and communications abilities of persons with disabilities.

## *Creating e-Society Funds: Lessons Learned*

Many lessons have emerged from e-society fund in Sri Lanka, and a few other ICT innovation funds in developing countries to promote grassroots innovation in applying ICT. Such funds demonstrate that, with appropriate governance and transparency mechanisms, grassroots innovation funding can become an effective, sustainable institution for innovation and empowerment. They are also relevant to national initiatives aimed at adapting ICT to community needs, local conditions, and national development priorities. The example of e-society in Sri Lanka indicates that there is no shortage on opportunities to innovate solutions to development challenges facing vulnerable and poor communities, and in partnership with the beneficiaries.

But such innovation funds should focus on ICT and innovation not as an end but as a means—a tool that can transform the capabilities of communities, the performance of institutions, the functioning of markets, the potential for partnerships, and the livelihoods of the poor. They are not likely to generate breakthrough technological innovations or major ICT applications. The experience of e-society fund of Sri Lanka shows the importance of such bottom-up mechanisms in mobilizing local communities, businesses, and NGOs, to cocreate ICT solutions that are particularly responsive to these target groups and their diverse local contexts, and to identify opportunities for scaling up. It also points to a social and institutional learning process where stakeholders can engage in a bottom-up process to generate increasingly innovative applications of ICT to promote socio-economic development.

*Mechanisms to fund grassroots initiatives can complement centrally led national ICT for development programs.* Through Sri Lanka's e-society fund, a small amount of seed money has been generating excitement and a sense of participation, particularly among the rural population. The fund provided inputs to the centrally led national program, supporting grassroots initiatives that are developing local capacity and content for e-government programs and the regional connectivity and telecenter networks. It is building awareness and capacity at the user's end, including community capacity to partner with local and national institutions and to make effective use of e-services, when made available. And it is capturing promising innovations, organically initiated without fund assistance, for adaptation and scaling up.

The e-society fund is also helping to identify and bridge gaps through quick rounds of mobilizing proposals and making grants. One example of an identified constraint to ICT application to solve local development challenges is the weak incentives and undeveloped capacity for partnership at the grassroots level. Exploring ways to increase participation by universities and the private sector could help generate truly innovative proposals and increase the chances for scaling up and replicating successful pilots and locally proven innovations.

*Strategic communications and awareness-raising campaigns play a critical part in mobilizing demand and empowering the disadvantaged.* Taking ICT to the rural people and disadvantaged members of society—who are among those least likely to be familiar with the new technologies—presents many challenges. In the case of Sri Lanka, early and multimedia campaign—including street dramas and local community meetings—proved effective in familiarizing target communities and stakeholders with the fund. Other means of mobilizing demand may involve engaging international and local NGOs active at the grassroots and using a process consultant to facilitate communication and work with community-based organizations.

*Innovation grants to communities require much capacity development and technical assistance to the vulnerable and poor communities it intends to engage in innovative applications.* Grants to poor community organizations in particular tend to depend on lone project leader with little institutional support or business planning expertise. Such funds may therefore benefit from creating a business planning advisory body to improve capacity and sustainability of e-society initiatives, beyond grant proceeds. Such advisory body could provide both mass-scale workshops and training as well as tailored consultations to each implementing grassroots organization. This would resemble the practices of venture capitalists in coaching commercial entrepreneurs or the business planning support that telecom.org provides to improve the capacity and sustainability of telecenters.

*Concerns about ensuring innovation and accountability in grant making should be balanced with concerns about reaching the poor and building the capacity of their organizations.* Where innovation funds receive simple, small-scale community proposals, there is a need to strike a balance between compliance with rigid procurement procedures—to maintain transparency—and flexibility in adapting these procedures to match the capacity of grant applicants. There is also a need to strike a balance between approving truly innovative and high-quality

proposals and achieving broad participation from vulnerable communities and grassroots organizations.

Accountability is addressed somewhat through the fact all grants are disbursed in tranches on completion of specified milestones–although this has its own set of associated challenges as communities often lack the capacity required for reporting. They are also often hampered by their limited understanding of technical issues. The e-society fund has dealt with this problem through the introduction of a grassroots technical support program in which selected telecenter operators are assigned the oversight of a group of CAP Projects. It has also introduced focus group discussions to assess the impact of grassroots projects.

Generating truly innovative proposals from relatively unsophisticated rural and vulnerable communities requires mutual, cumulative learning by the grant program and recipients. In addition, the innovation process needs to be interactive—engaging those who know about local social conditions and capabilities with those who know about the potential of new technologies. The CAP has been able to capitalize on the grassroots presence of the community-based organizations and their understanding of the communities themselves.

*Sustainability, scalability, and replicability should be primary concerns of innovation funds.* Innovation funds should ask grant applicants to explain how they plan to sustain and scale up their pilots, including possible partnerships and funding sources. Where pilots are promising, potential partners could be engaged early on in sharing knowledge and providing in-kind inputs. National e-leadership institutions could play a catalytic role in mainstreaming innovations and attracting financing from government agencies, private companies, aid agencies, and foundations.

As of 2009, financial sustainability of grassroots initiatives remains a key challenge of the Sri Lanka e-society fund. Some ICT-related community-level development initiatives are likely to shut down after the grant is fully used. Establishing revenue-earning may be necessary to secure recurrent costs for otherwise proven social innovations, for example, to pay for telecommunications, periodic maintenance, and staff salaries. At times, end user charges may be appropriately introduced and phased, once users become familiar with the new services. A business planning advisory body may help with options for revenue-generating schemes. In some cases, concerned government departments should become the home for sustaining and scaling up proven innovations.

Financial sustainability for the e-society fund itself is also a concern. Often such innovation funding schemes are initiated by a single donor, like the UNDP, a bilateral aid agency, a foundation, or an ICT multinational. In the case of e-Sri Lanka, the e-society program was initially funded by the World Bank, but was intended to emerge as a multidonor fund, with the most successful projects selected for replication or long-term sustainability financing by other donors and government agencies. Bank funding was intentionally very small, in view of initial skepticism of Bank management about such innovative program and its risks, and in view of large-scale financial requirements for the rest of e-Sri Lanka program (Hanna, 2008). But donor assistance to ICT for development and innovation within Sri Lanka, as

in most developing countries, remains fragmented. Pooling funds has the merit of leveraging the institutional infrastructure and learning invested in the e-society fund, as well as promoting sustainability of such funds and the scaling up of successful innovations.

In the case of e-society development fund of Sri Lanka, it became clear that much potential benefit can be realized by harvesting successful initiatives and replicating them beyond the original sites or communities. A replication assistance program (RAP) was thus instituted later in the e-Sri Lanka program to help organizations who wish to replicate or scale up selected applications already tested under the CAP or PAP grants. One example is the developed e-education curriculum that has provided local communities with improved educational content, involving local school teachers and delivered via rural telecenters. Since the platform software was developed under a PAP grant, it would not cost much to add more educational content or to scale up to the national telecenter network.

*Knowledge capturing and sharing should be a core function of e-society funds.* If widely known, both the products (software application, content, etc.) produced and learning generated from e-society initiatives can be utilized by more agencies and beneficiaries. Telecenter programs could become a key vehicle for such dissemination and diffusion. Advertising campaigns are also useful, through mass media and other means of strategic communications. Such campaigns may also help generate new funding sources for replicating successful pilots and augmenting the national e-society fund.

Effective use and diffusion of ICT for development is essentially a social learning process. It requires a knowledge management system to capture, augment, and complement the tacit local knowledge being mobilized or created. Sharing the lessons of experience is perhaps both the greatest challenge for innovation funds and the biggest determinant of their development impact.

*Innovation funds can help identify policy constraints to adoption of ICT at the grassroots.* The e-society fund of Sri Lanka proved to be a good forum for identifying policy and regulatory constraints to bottom-up, ICT-enabled development initiatives. Through its links with grassroots initiatives, the fund can provide powerful feedback to policy makers on the impact of policies and on ways to reduce the regulatory burden, particularly among the most vulnerable. For example, several proposals for funding community radio could not be funded due to policy constraints to licensing local radio broadcasting.

Proposals for funding ICT applications that promote local content helped indentify the need to address policies and practices that constrain access to content from government agencies, and to develop policies to promote the local content industry. The e-society fund has been coordinated with the country's rural telecenter program. e-Society has played a major role in contributing to the sustainability of the telecenters network. It addresses the need to develop innovative applications, interactive local language content to meet needs of our rural/disadvantaged communities which can then be deployed through a wide network of rural telecenters. So e-society, coupled with the telecenters infrastructure can be very effective in reaching remote rural population with relevant content. But it also underlined the need

for national policies, strategies, and institutional support infrastructure to promote the local content.

Similarly, potential ICT applications involving small- and medium- size enterprises are likely to point to policy constraints relating to security, privacy, and consumer protection. Through its links with the grassroots, the e-society fund can also influence the culture of central e-leadership institutions—by bringing new perspectives to the centrally directed e-development strategy and pointing to the crucial role of partnerships between the public sector, the private sector, civil society, and research institutions.

One promising grassroots application of ICT is to develop community-driven networks to provide telephony, media, content, and ICT services through cooperative enterprises owned by the communities. This grassroots innovation takes advantage of low-cost IP technologies and aims to mobilize and maximize the value of community resources. It could build on partnerships with local governments and local institutions. It may incorporate community radio and video and other community-empowering activities. But for these local networks to function effectively, they will require regulatory frameworks that allow for community-driven networks and that guarantee their interconnection with the national telecommunications infrastructure.

*Demand-driven innovation mechanisms that support grassroots initiatives can complement and help reorient the national innovation system.* Research institutions in many developing countries focus on complex technology applications, serve large enterprises, or pursue the interests of their own scientists. e-Society and other similar innovation funds can fill a critical gap in this national innovation system, creating an enabling institutional mechanism for grassroots application of ICT. The fund may also help show how to reorient these institutions to promote demand-driven incremental innovation and adaptation, particularly to serve rural people and the poor.

The e-society fund and its processes are likely to be continually adapted and improved as technology applications at the grassroots are shaped by community needs and social contexts and as quick rounds of grant making are completed, providing feedback from demand and results. Over time this experience should provide lessons for making the long-established national innovation institutions responsive to local demand and grassroots needs.

*Government can play a catalytic role in promoting ICT-enabled grassroots innovation and subsidizing e-society applications.* In supporting e-society funds for grassroots innovation, the government plays a role in supporting R&D for social innovation similar to that of supporting R&D for improving the innovation and competitiveness of SMEs. The role of the state in a national innovation system has been increasingly recognized as necessary to promote competitive, innovation-driven economy. Even a more convincing case can be made for the government to promote social innovation, learning, and empowerment with the help of ICT. This role fits well with the government's public good mandate. In particular, the government will play a catalyst role to help marginalized groups in society to appropriate the new technologies and create their own ICT-enabled development innovations.

## *New Actors and Funding Sources*

e-Society funds represent one key mechanism to induce and fund various forms of ICT-enabled societal innovations: a laboratory for pro-poor and collaborative innovation (Heeks, 2009). e-Society funds have been financed by central and local governments, the UNDP, some bilaterals, and the World Bank (e-Sri Lanka).

But there are many new sources for such financing, via pooled e-society funds or directly to communities from ICT multinationals, national business enterprises and associations, international and national NGOs, and ICT multinationals and their foundations. For example, Microsoft Research India has developed relations with selected poor communities through which innovations in ICT for development can be piloted, and learning can be fed back to various parts of Microsoft. Other multinationals like Nokia, Cisco, HP, and Intel have also begun to see the poor as bottom of the pyramid consumers. New aid donors like South Korea and India are now particularly active in funding ICT applications to development, providing relevant expertise and partnerships, in addition to funding. These new innovation intermediaries come with different perspectives and competencies and may thus enrich the variety of services, innovations models, and partnerships possible with the poor communities.

But as new actors enter such funding, past mistakes are likely to be repeated. One possible advantage of pooling e-society funds is to facilitate learning by new entrants and simplify preparation of proposals for competitive grants and other funding processes. Perhaps even more important, such pooling of innovation funds should be to provide more systematic means to harvest grassroots innovations, and evolve methods to capture, assess and scale up innovations from poor communities.

Mobile phones have sprung up new possibilities for grassroots innovations where the actors are small entrepreneurs or where the poor become their own business model innovators. For example, phone owners in poor communities have been able to turn phones into “mobile wallets” by using them for payments or for receipt of remittances from relatives abroad. Poor rural women in Bangladesh have been selling call time on their mobiles for their communities, thanks to microfinancing and support from Grameenphone. Microfinancing can be a major source for such innovations by the poor.

Much of the innovation possibilities will require partnerships among the communities and local NGOs, small ICT enterprises, government agencies like agriculture and rural development, and other actors to augment the knowledge and resources of the poor. NGOs in developing countries are appropriating ICT as integral part of their innovation and service toolkit to assist rural and poor communities.

The Byrraiu Foundation of India, for example, plans (as of 2009) to use mobiles to delivery services to rural people, from teleservices to teleconsultations and telemedicine. With the widespread availability of mobile phones in villages, the VASTRAM project, implemented by Byrraju Foundation proposes to make use of mobile technology to deliver services to rural people. Teleservices using video-conferencing on the existing mobile—network, and voice-assisted services using mobile phones will be piloted in the project. The project has two components. First, the project will provide teleservices: villagers will be able to connect to

various types of professionals on subjects like Right to Information Act, Women Empowerment, AIDS counseling, livelihoods, education, and agricultural advisories. Second, the project activities will make use of the health centers of the Byrraju Foundation established in the adopted villages to provide telemedicine services throughout the day. On offer will be teleconsultation, telecardiology, and teleophthalmology, all these are services with very high perceived value in India.

## Mainstreaming ICT for Poverty Reduction

Piloting ICT use for poverty reduction or creating e-society innovation funds would not stand alone as an effective approach to ICT-enabled development. Some development practitioners have argued for the exclusive reliance on grassroots initiatives to ensure ICT can address the social and economic divides—in response to frequent and major failures of large-scale ICT projects, excessive reliance on imported and centrally driven solutions, promising pilots and performance of local NGOs, and the often poor understanding of and responsiveness to poor communities by large and distant government and business bureaucracies. While these are understandable reactions to the disappointing results from exclusive reliance on top-down approaches to ICT for development programs, such arguments are misleading. They could deprive ICT-enabled development from creating the enabling policy environment, the tools, the resources, and the partnerships needed to scale up grassroots innovations and have major impact on poverty reduction.

Centrally directed national programs would involve harnessing and directing ICT research, development, application, and diffusion to better meet the needs rural population, the disadvantaged and the poor. The high-yield variety or green revolution in food grains provides an inspiring example of such programs. Over the past four decades, a set of integrated packages, inputs, and practices were developed and diffused through an extensive network of agricultural R&D and extension institutions. This revolution has significantly improved food security and reduced rural poverty in many parts of the world, and in Asia in particular. While new challenges are precipitating a recent food crisis in several developing countries, much can be learned from these early technology development and diffusion programs. In this current phase, ICT is likely to play a key role in increasing agricultural productivity, and improving value chains and increasing incomes in the rural areas.

The most critical lesson from the green revolution is the need to create incentives for pro-poor early-stage technology development and commercialization by the formal sector. This would include reorienting the incentives in public R&D and universities to develop and adapt technology for the service of the poor and harnessing the research capacity of the private sector to work on the technological and developmental problems of the poor. Sectoral ministries and national agencies play a key role in mainstreaming and diffusing the new technologies. In the case of the green revolution, this involved partnerships among ministries of agriculture and their research institutions, private sector, local government and at times, community organizations like the irrigation associations. Traditional, supply-driven

public extension systems in agriculture have been changing or replaced by more flexible, market-responsive support mechanisms, involving public-private partnerships and farmer organizations. In the case of ICT, its diffusion should involve even more stakeholders as ICT cuts across all economic sectors, requires a flexible package of services and not just a fixed technology solution, and is relevant to both rural and urban areas.

Lessons learned from financing social funds over the last decade add more insights into the role of grassroots innovation networks and funds in development and the need to align them with sectoral programs.[7] Such funds channel resources to local communities for small-scale subprojects proposed by stakeholders and screened for eligibility criteria. These funds were initially set up as emergency response mechanisms, but have increasingly shifted focus to longer term development impact and institutional development. They were often created and operated as attractive alternatives to overly centralized and slow government sectoral agencies and as a vehicle to decentralize development and empower communities. Although social fund projects proved effective in delivering small-scale infrastructure projects and reaching the relatively poor, they were limited in supporting new sectors or applying technologies not familiar to traditional and isolated rural communities, such as ICT. Sustainability of the new assets required engagement of local governments and alignment of these initiatives with decentralization and fund coordination with relevant line ministries. Similarly, fund impact on institutional development depended on alignment of these bottom-up mechanisms with national programs. The key lesson is to integrate social funds into the country's sectoral and overall development strategies.

Mechanisms for financing grassroots initiatives to apply ICT to socio-economic problems can complement and help adapt centrally driven national initiatives to meet diverse local socio-economic conditions. e-Society funds or other similar innovation funds can fill a critical gap in creating an enabling institutional mechanism for grassroots innovation, adaption, and learning. Such funds may also promote demand-driven incremental innovation and adaptation, particularly to serve rural people and the poor. National e-leadership institutions are then expected to focus on the policy environment, lumpy infrastructure investments, complex technology applications, and serving government enterprise-wide needs. National e-government programs and institutions can also tap promising grassroots innovations and ICT applications for scaling up. Various government agencies and ministries can integrate the new ICT applications, local contents, homegrown best practices and local capabilities into their ICT-enabled services and sector-wide development programs. They can use their own extension networks or partner with others to scale up and diffuse locally generated content and innovations (Box 7.4).

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[7] World Bank (2002). *Social Funds: Assessing Effectiveness.* World Bank Operations Evaluation Department. World Bank: Washington, D.C.

## Box 7.4 Partnerships to Enhance the Livelihoods of the Poor

Enabling the livelihood of the rural poor with ICT needs to overcome multiple challenges: little understanding of the needs and livelihood strategies of the rural poor; weak collaboration among local stakeholders and local institutions; limited capacity at the service delivery level; and service affordability and sustainability. These challenges are interdependent, as weak partnerships affect the demand, value–added, and the sustainability of services, among others.

Organizations with extension networks like the ministries of agriculture and rural development may use ICT to leverage these networks for more effective and less costly extension or service delivery. Their field workers and relevant community-based organizations may be trained in developing and using digital materials and enabled by ICT infrastructure such as community-based knowledge centers, IT-based microcredit systems, and mobile phone-based messaging market information updates. They may be also engaged in reviewing ICT interventions to ensure they meet the requirements of potential users and poor communities. Organizations without networks available for livelihoods development need to collaborate with intermediating institutions that rely on extension networks.

Striking a balance between top-down mechanisms for mainstreaming ICT in development and bottom-up mechanism to seek innovative applications and adaptations is a key strategic decision in designing such programs. This balance must take account of central and local capabilities, the scale and diversity of socio-economic conditions in the country, the existing e-readiness at the national and regional levels, and the existing level of fiscal and administrative decentralization, among others. Mechanisms to promote grassroots initiatives must be a key component of a balanced and inclusive e-development. Equally important is for national e-leadership institutions to create the enabling conditions and broad capabilities for grassroots adoption and adaptation of ICT to solve local development issues.

# Chapter 8
# Shared Access for the Networked Society

Many developing countries must rely on shared-access models to ensure affordable connectivity and use of ICT tools (UNCTAD, 2003; Fillip and Foote, 2007). Community telecenters (also known as public Internet access points or PIAP, information centers, kiosks, cybercafé, and multipurpose telecenters) have increasingly become critical components of broader strategies to deliver universal access and extend connectivity to rural, disadvantaged, and remote areas in developing and transitional countries. Even more importantly, telecenters are emerging as vital development and poverty reduction platforms. They can serve as means to deliver government services to poor and rural regions, provide vital information and new business opportunities for SMEs, and enable community-driven development through enhancing participation and capacity building at the grassroots level.

There are several business models of telecenters: commercial (cybercafé, mainly offering Internet access), NGO-run community telecenter, school-based telecenters, library-based telecenters, local government or municipal-based telecenters, cooperative telecenters (as in Philippines's B2B Price Now, and India's Wired Village in Maharashtra), multipurpose telecenters, and the franchise model. The range of telecenter models and hybrids continues to expand to fit into various niches and contexts, with rich lessons to be drawn for sustainability and scaling up.

The record of telecenter development, however, has been mixed. Many telecenters, especially donor-supported ones, struggle to financially sustain their operations and demonstrate impact on the development of the target regions. Increasing impact and scaling up from pilot projects for specific locations to national or regional coverage also proved problematic. Several interrelated challenges need to be addressed if telecenters are truly to become agents of social development and economic growth: developing of sustainable business models, providing of the right mix of services, and using cost-effective technologies. Emerging lessons are both rich and encouraging. Scaling telecenters for development is emerging as a national and international movement whereby consumers and communities are cocreating the telecenters as institutions that will enable them to pursue their own ICT-enabled development (Fillip and Foote, 2007).

This chapter first articulates why shared access to ICT through telecenters remains relevant, despite the fast diffusion of mobile phones. Second, the

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_8,

chapter points to the need to understand the local context in order to plan for impact, scale, and sustainability of telecenters. Third, the range of organizational options is identified—reflecting various roles for government, private sector, and civil society to match the local context and e-readiness. Fourth, we examine the mix of services and content needed to be delivered through the telecenters to ensure impact and sustainability. Fifth, technology options are touched on briefly to emphasize the need for affordable and replicable solutions. Sixth, the role of developing national and international networks among telecenters is examined in order to build capacity, share services, and engage other partners. Finally, the chapter concludes by drawing on lessons learned, with the telecenters viewed as part of a bigger ecosystem of e-development. A strategic approach to scale up and accelerate learning is recommended.

## Why Telecenters Are Needed for a Networked Society?

Telecenters are an institutional or business model innovation to enable shared and affordable access to the Internet, ICT tools, digital content, and applications though public or private service centers. Although this model has been pioneered in some advanced countries like Canada and the USA (in community centers and public libraries), it is most suitable to the conditions of developing countries and promises to serve much wider purposes. In many developing countries, ownership and use of ICT has been a community-based model and this has helped ensure far greater reach per device or Internet connection. It has also been helped form or strengthen community groups, and enabled knowledge creation and dissemination via "infomediaries" trained from within the community.

The concept of telecenter as a means of connectivity, shared access to Internet and ICT applications, and a variety of value-added services is relatively new. The concept is evolving. It is a flexible approach to provide affordable access to content and ICT tools that can be adapted to a wide range of local needs and circumstances. It can be viewed as part of the national communication infrastructure. In a number of Indian states, kiosks or telecenters became a main delivery channel for e-government services. In several Latin American countries, telecenters have become microenterprises and a locus of local entrepreneurial development and the delivery of services ranging from photocopying and printing, to Internet-based services, videoconferencing, e-learning, e-literacy, e-commerce services, and local content development. When blended with community radio or mobile phones, telecenters have been used to help farmers seek answers to their questions and broadcast the response. With shared access to broadband, the services of multipurpose telecenters can be further improved and diversified at affordable costs. More than just providing shared facilities and services, telecenters can play a major role in developing human capital, social learning, local entrepreneurship, and rural development.

What is the likely impact of mobile phones on the role of telecenters? Would the fast growth of individual ownership of mobile phones make the telecenter model

obsolete? Would mobiles substitute for community-owned or publicly shared access to ICTs and also eliminate the need for developing groups or infomediaries? It is clear that some substitutions is inevitable; voice communication services have already ceased to be a primary source of income for telecenters in many countries. Mobile phones have become the most widely distributed ICT platform, and their ubiquity is sparking many applications and entrepreneurial uses of ICT for development such as delivering microfinance and banking services.

But telecenters have increasingly diversified their services and become multipurpose. They are likely to coexist with the mobile platform, and to evolve as community development and information society tools. Telecenters can increasingly add value and specialization to their services, help build community cohesion and social networks, broaden e-literacy, mobilize community input and local content, become a laboratory for e-society initiatives, and address intracommunity inequalities.

With growing literacy, and particularly e-literacy among young people, communities will have at least some members who can act as infomediaries, thus multiplying the accessibility to local and global knowledge. Telecenters can also play an increasing role in creating employment through the outsourcing of IT services to social enterprises based in poor communities, or what may be called "social outsourcing"(Heeks, 2009). Telecenters and their networks can also franchise their services and aggregate their learning to national levels. As the rest of this chapter demonstrates, many lessons have been learned, and continue to be learned and shared across the national and global networks of telecenters. For the foreseeable future, it is unlikely that their role will be diminished in building a networked and inclusive information society.

## Socio-Economic Context for Telecenters

A key lesson of past pilots is the need to design telecenter programs based on good understanding of local needs and resources, to engage communities in the process, and to partner with outside organizations such as agricultural extension services and educational institutions. Data on community needs and readiness can help shape decisions regarding types of services and a possible pricing structure. Scaling up telecenters from pilots to national programs requires engaging both local communities and national-level institutions that may become part of the telecenter ecosystem.

A host of methodologies exists to capture rural realities: rapid rural appraisal, participatory rural appraisal (PRA), and market analysis, among others. PRA can be very useful since it involves social mobilization—a cortical success factor in telecenter programs. These methodologies have been adapted from the work of the World Bank with community-driven development (CDD), UNESCO's Community Multimedia Centers, and others. Drishtee, an Indian ICT enterprise, evolved an entrepreneurial network of kiosks, offering a variety of services targeted to local

contexts. It adopted a simple rural segmentation methodology that takes account of poverty level (rural economics); population, literacy, and role of local actors (rural dynamics); and state of rural infrastructure.

Scaling up to national programs requires a typology of zones for which telecenter models can be designed. It looks beyond scanning individual communities and toward assessing broader geographic units for potential synergies, for example, to assign larger centers to centrally located communities to serve as hubs for small centers. Local scanning also helps connect local- and national-level institutions—to become clients, service providers, or support agencies.

## Business Models and Financial Sustainability

The key factor for success is to understand the local context and overall objectives of the telecenter program to decide on an organizational approach that fits local realities. Is the current context one in which the market is undeveloped? Is there a strong base of NGOs to lead and scale up along a social enterprise model? Can the private sector play a leading role? What kind of an evolutionary path can be taken to move from the present situation to a desired future for the nation, for different geographic regions and particularly for the underserved and the poor? What institutional resources are available or could be developed and what are the strengths and weaknesses of available candidates? Given the dynamics of information and communication technologies and emerging markets, any telecenter program must be designed to evolve and adapt its organizational models and services to take advantage of this dynamism.

Sustainability is a key concern about telecenter initiatives. The majority of telecenters that have been launched in the first wave of donor-driven initiatives have not been financially sustainable without continuous outside funding. (Stoll, 2003). This many not be a problem in itself if public support is affordable and justifiable in view of other development priorities, and if institutional and social sustainability are secured. Telecenters influence social, political, and cultural aspects of comprehensive community development. In this light, they can be viewed as a public good, similar to education, health, water, and transportation systems and may have legitimate claim for continuous government or donor support. Governments can raise money for developing public access centers by creating special universal access funds that channel a percentage of telecommunications operators' income. (UNCTAD, 2003). For example, Canada's community access program helped establish 8,000 telecenters by mobilizing civil society and awarding grants to individual telecenter initiatives led by NGOs that agree to provide certain levels of service and to "match" grant funding with local resources (Proenza, 2001).

The problem with the "public goods" approach is that it is often used as an excuse for poor management and planning. Lacking financial incentives to perform, telecenter management can become unresponsive to the needs of the community. Subsidized telecenters may also create market distortions and prevent commercial

enterprises from entering the field. Thus, many countries have recently opted for increased private sector participation in telecenter development.

In some Latin American countries, for example, the state intervened in closing the access gap by providing so-called "smart subsidies" to the privately owned telecenters through the universal access funds. Since the level of sustained commercial demand for telecenter services in rural and disadvantaged communities is in many circumstances lower than that required for financial sustainability of the telecenter, the smart subsidy concept strives to cover the difference while still encouraging private investment, competition, and entrepreneurship in service provision. In this scenario, government specifies minimum service requirements for a certain period of time and allocates the subsidy to the lowest bidder. Actual disbursement of the subsidy is linked to the prespecified performance indicators. Smart subsidies have been applied in Chile, Guatemala, Peru, and a number of other Latin American countries. The full evaluation is still pending, but early results are encouraging. Smart subsidies have shown to be a very cost-efficient way to encourage the provision of basic ICT services in disadvantage communities.

The state should provide some capacity building support to the telecenters as many of them are small enterprises that lack customer service and marketing experience. It may also provide relevant content and channel its services through the telecenters. It can stimulate the development of Internet content providers. However, the telecenters should be expected to run as commercial enterprises and should be free to change the service package beyond the minimum agreed requirements for the smart subsidy.

The commercial model, however, also has its downside. It focuses on commercial services alone and tends to ignore other services, even if they have a significant social and developmental impact. ICT education and vocational training, e-health and similar services may have low commercial appeal for entrepreneurs in poor countries. One of the biggest challenges for the telecenter movement is to find a management/ownership structure that would combine the benefits of the both worlds: the social impact and development focus of the government or NGO-run telecenter, and the flexibility and financial viability of a commercial enterprise.

Grassroots organizations and NGOs are good at reaching the poor, women, and the disabled, at developing community-learning centers, and at building social capital. But because they rely on external fund raising, financial sustainability and accountability remain in question. NGO-led models may reflect the current state of low access and high connectivity costs which has forced many groups with social development agenda (NGOs) to become providers of shared access in order to deliver their services through telecenters. In the longer term, however, it is likely that most NGOs and local governments will be users of shared ICT infrastructure to deliver their development services and serve their beneficiaries.

Commercial telecenters promise financial sustainability and accountability as they meet a market need, but their development impact and reach may be limited. Telecenter models must adapt to context and target groups. As target population moves from the educated, urban and young, capacity building and user training becomes critical, and pure commercial models become less feasible. To reach a

large mass of low-income people will require social marketing, start-up investment, training, and demand support, at least during the learning stages. Various approaches appear promising to augment the sustainability of either the commercial or NGO-led model. One scheme is to provide vouchers to stimulate demand from target groups such as women, students, or poor farmers.

Franchise approaches appear most promising for augmenting the sustainability of the government- and NGO-led model, as well as the development impact of the commercial model. In this approach the umbrella organization or support institution (franchiser) may be a public or private organization or a public–private partnership. The franchiser's role is to set standards for technology and services. Franchisees—private companies or community organizations operating public access centers—comply with those standards as part of their licensing agreements with the franchiser. Support from the franchiser can take many forms, including training, content and service development, technical support, special telecommunications access rates, and revenue-sharing arrangements for provision of e-government and e-business services. For public-led franchise programs, this support may be in the form of smart subsidies. Most notably, this approach has been successfully used in a number of Indian states.

Whatever the business model chosen, evidence from past experience suggests that telecenters are most effective when they are run and managed by local entrepreneurs and communities, as opposed to donor agencies and central state agencies (Proenza, 2001). One variation is to combine NGO or government ownership with the private sector day-to-day management of the telecenters. This organizational structure has been applied for Hungarian telecottages, many of which have the owner as a civil organization, the host as the local government, and the operator as a private company (Wormland and Gaspar, 2003). The primary role of governments and aid organizations should be to help create an enabling policy and institutional environment for various telecenter models to become sustainable.

In the context of scaling up to national programs, covering a broad range of geographic areas with varying e-readiness and market maturity, a flexible approach or multiple models may be needed, as was adopted in the case of e-Sri Lanka and the Gyandoot program (Box 8.1). Many programs are moving to a middle ground between purely commercial and purely subsidized models, or to hybrid organizational models—social enterprise approaches that combine social objectives with a market approach. The social enterprise model tries to balance social needs and economic realities to maximize both sustainability and development impact.

## Box 8.1 Business Models from Brazil, Egypt, and India

In Brazil, the Committee for Democratization of Information Technology (CDI), an NGO, has pioneered a social franchise approach to provide access to ICT and develop marketable skills and community leaders among poor urban youth. CDI partners with the community to develop Information Technology

and Citizenship schools that are managed by community members and focuses on ICT themes important to the community. CDI obtains financial resources from partnerships with government and the private sector. CDI provides schools with necessary start-up resources, but schools must generate resources to sustain their activities through fees. This is in essence a *social franchise* model that targets disadvantaged urban youth. It has proven to be replicable.

In Egypt, the Ministry of Communications and Information Technology (MCIT) has launched the technology club initiative. MCIT partnered with Microsoft and UNDP in 2003 to train the trainers so IT clubs have qualified trainers and standardized curricula. Focus of clubs is to reach the poor youth, rural areas and women—thus clubs are often located in schools, youth centers, and universities. Small businesses are also able to use the clubs at designated times for a nominal fee. Currently, MCIT manages the IT clubs and provides the trained managers. This is a *government-led* model with a strong learning component.

In India, the Gyandoot program is a government-to-citizen service delivery portal and multipurpose telekiosk that brings ICT-enabled services to poor rural areas. It is a *hybrid* model, but involves significant government leadership, local government involvement, and participation of the private sector through local entrepreneurs. There are two organizational models: one led by village committee and the other by a local entrepreneur. In the village model, the committee invests in providing the physical space and hardware. The kiosk operator is selected from three nominees proposed by the community. He is not paid a salary, but gives 10% of his earnings to the village. The district council trains the nominees. In the entrepreneur model, the local entrepreneur registers as owner, assumes all expenses and pays a licensing fee.

The top-down approach used in this model has led to limited fit of the services offered and limited involvement from NGOs and community-based organizations. Services did not attract popular demand among rural poor—leading to sustainability problems.

*Drishtee*—a private sector-led initiative is attempting to scale up Gyandoot to the national level, adding and adapting services and transforming this model in the process. *Drishtee* shows encouraging results. The main difference may be the more flexible approach to service provision. *Drishtee* positions itself "not as a rural service provider but as a platform for integrating and delivering a wide range of services to the Indian villager. . . . *Drishtee* would offer its network platform to any service provider who wishes to market its range of services to rural India" (Drishtee.com). Currently, the localized Intranet between villages and a district center provides access to various services, including online land records, registration and applications of income and domicile certificates, market-related information of cereal crops, and government health and education benefits.

## Mix of Services, Impact, and Sustainability

Telecenters can significantly enhance their financial viability, as well as their potential for social impact by delivering value-added services that are tailored specifically to the communities' needs and demand. Telecenters can be powerful mediators between users and service providers. Value-added mediation can be simple yet vital, and can range from provision of information about how to do it and where to go to get services, to the provision of e-health, e-education, or other e-government services.

The service choice for telecenters can be boiled down to two basic options: to focus on "Access to the ICT" (Internet, etc.) or "Access to Services" (e-Gov, e-Biz, etc.). The first option is simpler, cheaper, and arguably more demand-driven. Such "generic" telecenters would provide access just to the medium of interaction—Internet and other basic ICTs such as telephone, fax, computer. Thus, they would stimulate the demand for ICT-based services, but service and content creation would be largely left to the market and/or government. Business-run telecenters often go for this option.

The other approach strives to provide access not so much to the "generic" ICT per se, but to a certain set of ICT-based services believed to have significant overall social and economic impact, such as e-government and e-business services. Such multipurpose telecenters require more elaborate project design and management schemes. It is often deployed by the government-run telecenters, public–private partnerships, or NGOs.

Telecenters may be thought as composite centers, part technology center, part community center, part learning center, and part business center. The appropriate mix with vary for different context. Services may also increase in diversity and complexity over time, with increased management competency, number of partnerships, and local e-literacy and market maturity. For example, basic communications, some popular information services like land records and computer training services can be provided on a for-profit basis, and then start building demand for more advanced services. Some services may need to be supported initially to build demand for other IT-based services, for example, e-literacy.

The choice between the two options—"simple" or multipurpose telecenters—very much depends on the local environment. Single purpose telecenters are simpler to launch and manage at low costs. Many government agencies are motivated to initiate their own telecenters to deliver their own sectoral services. But the rural markets are very thin and a strategy of a series of vertically organized providers of shared-access centers would be costly in the aggregate. Various value-added services potentially increase demand for telecenters. Multipurpose telecenters ultimately add more value since they can be more directly linked to wider development and poverty reduction efforts. The cost efficiencies of a single, general-purpose center, with government services as part of the mix, are compelling. In the final analysis, telecenters are about empowering people and social inclusion, which simple access to ICT without relevant local content and services may not be able to provide.

Some services cannot be developed without higher-level network or franchise support, as in e-government and e-learning. A franchise model may be cost-effective for expansion and diversification into high value-added services. In India and Bangladesh, franchising schemes are attempting to leverage infrastructure and network economies with a large network of franchisees and a comprehensive service package. In India, some states have encouraged commercially driven information kiosks that proved popular in providing access to basic government forms and transactions. Milk cooperative societies have aggregated the demands of small dairy farmers into self-financing multiservice kiosks. They started with simple automating of quality measurement of milk and payment for milk producers, and then they built databases from such information to support producers, developed diary information services, and then expanded to provide a portal for other valued services and for sharing local innovations. The Grameen Bank has extended the highly successful microcredit for mobile phones to cyber kiosks in rural Bangladesh.

To successfully implement multipurpose telecenter projects, it is crucial to analyze local needs and service deficiencies and to establish strong partnerships with service and content providers. Experience shows that the biggest gap in developing countries is in local content and government-related services. In remote and rural communities, such services are often missing altogether or delivered very inefficiently. Many telecenter programs have underestimated the challenges of content development and assumed that individual telecenters needed to create content that would be needed in their context. But content development is expensive. Telecenter movements may mobilize other information producers and domain experts to adapt those sources' existing resources through localization. Local and central governments may sign revenue-sharing agreements with telecenter networks on provision of e-government services. Educational institutions can deliver credible course offerings. Telecenters can add considerable value by organizing pointers to relevant content on the web, rather than trying to offer unique local content.

Social services such as education and health are also increasingly popular choice for telecenters. For example, clinical e-health applications (including veterinary services) have the most direct impact on the quality of services to the poor. There are a growing number of success stories with the use of low-cost applications, such as e-mail and simple digital cameras to diagnose and deliver timely health services.

Public funding may essential to build demand and ensure equity of access and achieve a balance between telecenters' social and economic goals. Vouchers may be used for a limited time to increase awareness of and demand for services by target groups and to increase the capacity of users to buy other services in the future. Government and aid agencies may finance the delivery of certain extension services and other development programs through the existing telecenters' infrastructure.

One recent trend of service development is financial services, (insurance, microcredit, and banking) and business services for rural enterprises as well as agricultural logistics and marketing. Rural information and advisory system and e-business applications help to improve business environment and bridge gaps between

market demands and supplies, thus enabling rural enterprises to conquer many inherent disadvantages. e-Choupal is an interesting example of creating a vast network of rural kiosks that currently reaches 3.5 million farmers in 31,000 villages in 6 Indian states. It provides access to agricultural information, aggregates demand for farm inputs, helps sell farm produce from the farmer's doorsteps, and reduces transaction costs and wasteful intermediation to farmers, among others. Future generations of e-Choupals are expected to evolve into a two-way exchange of goods and services between rural India and the world.

Overall, the key to substantial developmental impact and long-term sustainability of telecenter programs is flexibility, scalability, and phased development. An e-development strategy should examine various business models and mix of services, pilot them in a few representative locations and only then expend it to include new geographic and service areas. Value-added services should be piloted and phased and should be part of a continuous process of business development, not a one-shot event or a fully engineered and centrally driven package.

## Cost-Effective and Affordable Technologies

To be cost-efficient, a telecenter program has to be technology neutral, allowing for a choice in technology solutions, for example, among fixed or wireless technologies. Given the fast change in information and communications technologies, bridging the digital divide will demand remaining flexible and agile to take advantage of new technologies that are most appropriate to rural areas and low-income economies. Latest technological advances show great promise for reducing costs for shared access at the community level. There are growing options for affordable and user-friendly solutions, such as low-cost and open source software; low-cost, ruggedized, and power-efficient computers; and wireless fidelity.[1]

Connectivity is essential for telecenter viability, and more importantly for the effective integration with and contribution of the telecenter program to overall e-development. Mutually supportive strategies can speed the process of scaling up broadband connectivity for telecenters. Extending the reach of networks to rural areas often requires creative combinations of technologies to address the specific

[1] For example, in the past, telecenters in rural areas relied either on fixed-line or VSAT technology, which implied significant connectivity costs for these telecenters. Emergence of wireless fidelity (WiFi) provided a potentially powerful tool to narrow the digital divide and bolster economic development in rural areas. WiFi provides broadband Internet access to specially outfitted PCs within certain distance from the transmitter. WiFi presents many advantages that make it a suitable solution to support connectivity. WiFi is comparatively cheap (less than US$ 250 for a small installation), fast and reliable, easy to install and has low maintenance requirements. With the use of WiFi, it is possible to share the VSAT link among several telecenters in a region, thereby achieving economies of scale and reducing cost per telecenter. It operates on unlicensed airwave spectrum, so there are no extra monthly costs on top of the charge for a broadband connection that is shared among the users.

needs of diverse areas. Scaling up development impacts will also require attention to appropriate end-user technologies such as providing Internet connectivity to radio stations to extend the reach of Internet to the least literate population. New high-broadband wireless solutions open up significant opportunities to provide affordable broadband access to rural telecenters.

The challenge remains to find cost-effective solutions that are appropriate for different uses, geographies, and socio-economic environments. A carefully chosen mix of technologies and software is often the most appropriate option for addressing local needs. Appropriate technology should be more easily appropriated. A hybrid approach that mixes old and new technologies, such as broadcasting and Internet technologies, may also provide the most benefit for rural communities. Software with user-friendly interfaces, local language versions, and wide distribution is often the easiest for users to master and to find appropriate training, maintenance, and local support. This again points to the link between telecenters and the healthy development of a local ICT industry to support cost-effective telecenter technology maintenance, software application, and local adaptation.

## Capacity Building to Manage Shared Access

As a mass movement, based on entrepreneurship and new skills, telecenters are dependent on people for success and sustainability. Telecenter managers, local ICT champions, infomediaries, play key roles in promoting the effective use of telecenters. But such entrepreneurship and skills are scarce, particularly among rural populations and the poor. Telecenter managers should be first and foremost entrepreneurs, as they are not necessarily the ones with advanced computing skills. They require a mix of business and technical skills, and an understanding of the communities in which they serve. The local champion help make a telecenter project become more locally driven and can play a key role in communication with the community, be an advisor to the initiative, and act as catalyst to help the initiative introduce innovation (Bridges.org).

Scaling up telecenters to a national program presents special human resources challenges. Such scaling up is risky because of the lead time needed to develop these resources, which are often neglected in favor of investment in hardware and facilities. Innovative methods must be found to accelerate the process of developing and supporting the appropriate cadre of qualified local managers and operators in areas as diverse as business management, technical maintenance, and community development. Networks, associations, telecenter support institutions, and franchise models can provide mentoring, marketing, operational guidelines, and ongoing support to these pioneers. Networks can deliver capacity building programs, work closely with established training and distance education providers, and/or identify and catalog existing training materials and curricula. The Indian Mission 2007 Training Commons present an interesting case of using networks for a major scaling up (Box 8.2).

### Box 8.2 The Indian Mission 2007 Training Commons

Mission 2007 Training Commons is piloting a shared curriculum for rural telecenters. The scaling task is huge, as Mission 2007 aims to establish 100,000 kiosks throughout the country. The curriculum will be used by the National Virtual Academy, among others. The academy seeks to train one million "grassroots fellows" by 2010. Training will cover the basic skills needed to run a telecenter, including entrepreneurship, community development, grassroots marketing, information gathering, and information technology.

Training Commons activities have included mapping out existing curricula and conducting workshops with leading telecenter programs such as e-Choupal and n-Logue. These train-the-trainers workshops were held with local partners and helped identify the priorities for curriculum development. In late 2006, a consortium of Mission 2007 partners, including NASSCOM and WorldCorps, began developing modules in the priority areas. Each module is going through an iterative, community-driven participatory development process to ensure that the material is access and relevant. Over time, the Training Commons curriculum should form the foundation for offerings at the ongoing telecenter academy.

Source: (Fillip and Foote, 2007)

## Collaborating for Community and Shared Services

Individual telecenter managers and operators face common challenges but are geographically isolated from their peers. They need national networks or associations to act as a peer support group and gain access to technical support, shared services and content, coaching on management issues, training courses, and economies of scale (Fillip and Foote, 2007). Networks can help monitor and evaluate ongoing initiatives and help synthesize and share lessons across initiatives. They help exploit "network externalities" among the increasing number of telecenters managers and users. They can provide advocacy- and policy-related activities to support and accelerate the development of a national telecenter movement. They thus play an essential role in the telecenter ecosystem by providing the connecting points between telecenters and all other players and partners.

Sustainability cannot be achieved without efficient networking among telecenters. In order for telecenters to share costs, develop local content, achieve economies of scale as well as effectively perform their functions, they need to be organized in overlapping national, regional, and international networks. In the last few years, national-level telecenter networks have emerged in several countries where the telecenter movement has reached a critical mass. In a few cases, the creation of such networks has been explicitly considered at the program design stage, as has been the case in Hungary (Box 8.3).

### Box 8.3 The Hungarian Telecottage Association

The Hungarian Telecottage Association was created with a focus on building a sense of community among people working on telecenters across the country. The association grew from community organizing to presenting telecottages and building relationships with other parties such as central government, business organizations, and working with them to organize network services (Fillip and Foote, 2007). Over time, the association extended its activities to lobbying for financial support and operating the telecenters' internal information system.

As the telecenter movement in Hungary evolved, the association was divided up into seven regions with approximately 35 telecottages each (Wormland and Gaspar, 2003). The regional resource center makes technological equipment available to telecottages and users that would otherwise be too expensive or complicated to place in individual telecottages. The resource centers provide training, monitoring, mentoring, e-mail access, and other supports. Through its engagement with telecottage managers over a decade, the association gained intimate knowledge of the capacity building needs of telecenter mangers and staff.

Scaling up telecenters into a national program should explore how to integrate existing telecenters into new networks and leverage past experience for scaling up. Telecenter networking and working on the overall telecenter ecosystem should not be an afterthought. In Sri Lanka, for example, Sri Lanka's largest NGO, Saravodya drew on its 50 years of community organizing and its shorter but significant experience with NGO-run telecenters to build bridges among different kinds of telecenter managers including the entrepreneurial and community-run models, temple-based and library-based models, and various NGO models. This helped build a national telecenter family—encouraging peer learning and knowledge sharing, and increasingly, providing content and marketing support.

Transnational franchises are a new source for scaling up telecenter programs, and for transferring know-how in developing business models and social entrepreneurs as franchisees. OneRoof, is a pioneering model of such franchise, with a focus on the needs of those at the bottom of the pyramid. It is a not-for-profit organization that is moving a business or for-profit enterprise to secure scale and self-sustainability. It works as an honest broker and collaborates with local partners that have met rigorous criteria for content, local quality, and business integrity. It started in Mexico and since has offered telecenter franchise in India and is expected to extend to other countries and services. Its role is to help local partners to scale good programs and/or reach more serious impact in changing the way essential services are delivered to the world's rural poor. It develops and shares a delivery platform that provides rural communities with essential services and embeds the telecenter into a comprehensive rural development strategy.

## A Holistic Approach to Telecenters

The development stage for telecenters has changed; they cannot continue to be donor-driven pilots as they have been in the 1990s. Telecenter programs should become locally driven national movements that can exploit network economies and build a vibrant telecenter ecosystem. A telecenter ecosystem would encompass the local telecenters, the networks and support institutions that provide technical services and training, and the organizations and social enterprises that can provide content and services via the telecenters such as rural health care, e-government, and remittances. It includes the local investors and international NGOs who fund the centers. A simplified presentation of the ecosystem for telecenters shows some of the key partner institutions that have been engaged in the development and support of telecenters in the e-Sri Lanka program (Fig. 8.1).

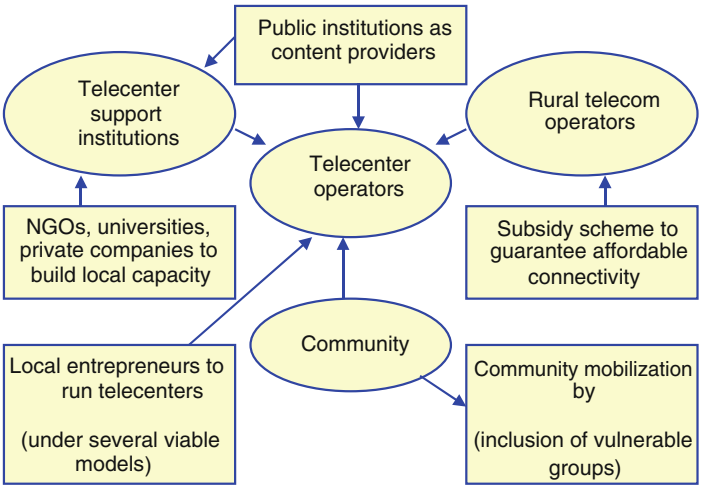


**Fig. 8.1** Key institutional roles and links in the telecenter program (Hanna, 2007a)

Building a vibrant telecenter ecosystem is really about a transformation of the environment within which individual telecenters operate. National policies and public programs for ICT-enabled development do matter for the viability and impact of the telecenters and the creation of a vibrant telecenter ecosystem. They can influence where these telecenters will be located, what they will be used for and what incentives government agencies face in using this new infrastructure for delivering their own services most effectively.

Policy makers shaping e-development strategies need to help the evolution of a balanced and vibrant telecenter ecosystem. This means influencing a host of stakeholders and institutions: those providing connectivity and access, schools and universities, central agencies concerned with rural and SME development, local

governments, private sector associations, technical support institutions, banks, and microfinance institutions, among others.

Although there are no blueprints for scaling up or building a vibrant telecenter ecosystem, substantial experience is accumulating within and among countries. Each country has its own history of telecenter development which should influence the path and pace of its development. But a common lesson is to build on what exists, on the experience in building partnerships across stakeholders, on realistic assessment of the country's readiness, and on learning from the pioneers. A phased approach is necessary to link the telecenter program to the e-readiness of diverse geographic regions in a country, to the development of other elements of e-development such as the telecommunications infrastructure and e-government, and to other socio-economic development goals.

Countries have adopted a variety of approaches for scaling up, ranging from an emergent strategy or organic approach, to a deliberate or programmatic approach (Box 8.4). The main difference between the two approaches is the degree of deliberate planning and central government leadership. An organic approach was adopted by default in many countries where governments viewed the telecenters as private, NGO and donor-driven initiatives, with no role for governments. Telecenters were viewed as individual initiatives and many were bound to fail. No ecosystem view or coordination was necessary. This approach was viewed as necessary in view of the dependency of telecenters on their micro environment and the socio-economic conditions of the community they aim to serve. It was considered an inevitable course of action for large and very diverse countries like India and Brazil. But many small and medium countries have also taken this approach by default, leaving the telecenters purely dependent on isolated local initiatives. As a first order of business, the role of government is to create the right enabling environment or the right set of incentives in place for an organic scale up to happen.

A deliberate strategy or programmatic approach aims to accelerate the process of scaling up through a government leadership. This leadership goes beyond creating the enabling environment to support capacity building and partnership building. It helps build networks of interested parties. It may also involve smart subsidized schemes for connectivity to rural telecenters, microfinance schemes for telecenter operators, and encouraging government agencies to use the telecenters as a delivery infrastructure for government services. In addition to creating a momentum, this approach takes account of the underdeveloped state of the information and rural markets, and the undersupply of capital. It attempts to address the development and digital divides between the urban and rural areas and to reduce the risk that the private will limit the high margin elite markets in urban areas.

But a purely programmatic strategy carries some risks as government may exert inappropriate top-down controls and politicize the program and thus end up with high-cost, low-impact investment. A programmatic approach where a decisive center asserts prescriptive guidance may be attractive, but it does not guarantee success. Programmatic approaches can be self-defeating if motivated by central government's need to control the process. Top-down direction must be complemented by bottom-up initiative and adaptation. Lower levels of government may be close

allies to local actors. The grassroots beginnings of the telecenter movement in many countries can be both a catalyst for broader government involvement and the source of creativity and dynamism of a balanced and sustainable program.

## Box 8.4 India and Sri Lanka: From Organic to Deliberate Strategies

The scene is changing and countries, small and large, are shifting to a deliberate strategy for scaling up. India is an example of a large country in transition from an organic approach to a programmatic one. India's Mission 2007 is a loosely coordinated, multi-stakeholder framework to scaling up (Fillip and Foote, 2007). After national-level consultations in 2004, a national alliance on ICT for basic needs was created; it is a consortium of 240 organizations representing the public and private sectors and civil society. Government is recognizing its essential role including: improving regulation, particularly concerning wireless frequencies for rural areas; subsidizing rural service providers for connectivity for rural information centers; providing small loans to rural entrepreneurs; and promoting partnerships between local government institutions and grassroots organizations.

More recently, government increased its involvement through the National e-Governance Plan and its associated community services centers (Telecenter Magazine, Vol II, Issue 2, June 2008, pp. 40–44 on Community Service Centers). The aim is to establish 100,000 rural kiosks connecting all 700 million people who live in rural India. The CSC program has an approved budget of US$ 1 billion, of which about US$ 200 million come from central government and about US$ 200 million from the state governments and the balance to be mobilized form the private sector. The benchmarks for progress are first the physical rollout. Another benchmark is to provide minimum kinds of non-government services like IT training and agriculture-related market prices. Then next benchmark is to provide government information services such as certificates. This should progressively lead to more end-to-end services and entire application processing via the telecenters.

This program is coordinated with a complementary program to roll out broadband connectivity to rural areas through fiber optics, although most of the telecenters will begin certain services that can be provided even with such connectivity. The program further deploys and experiments with different approaches to power and connectivity shortages. To address rural e-literacy, the CSC hires and trains people from the village to act as information intermediaries.

India's case is still relatively a decentralized approach, but since 2008, it has been shifting toward a more deliberate central orchestration that builds on a decentralized and rich local experience. This deliberate scaling up strategy is at

early stage of implementation. It is in part enabled by a high interest in ICT in both government and society at large. It is also made possible by the widespread availability of technical expertise, a substantial pool of telecenter pilots and organizational models to build on, a vibrant ICT services industry, and a strong civil society. A national consensus is emerging for more scripted programmatic approach. Creating a momentum for telecenter programs is very difficult under a pure organic approach and in the absence of a vibrant ecosystem.

Creating a national consensus on the CSC strategy required about 2 years of consultations among the different agencies involved and which could potentially be involved. One key issue for consultation has been to arrive at a balance between commercially driven entities socially motivated organizations, people outside the system, and the government with its own policies and priorities. In this context, the CSC program is viewed in part as a rural entrepreneurship program that would progressively engage rural entrepreneurs in knowledge-based services. It is also viewed as a strategy for empowering rural communities. The program aims to engage in a more inclusive dialog with the civil society and commercial entities, for example, by partnering with financial institutions for microfinance and support to SMEs.

Sri Lanka presents a case of a deliberate strategy for scaling up and creating a telecenter ecosystem. This coordinated approach is guided by an e-development strategy, including linking the telecenters to other programs for e-literacy, telecommunications development, content development, and e-government. The plan is to cover the country with an initial 1,000 telecenters of various types: rural knowledge centers, e-libraries, e-learning, tsunami camps computer kiosks, and temple-based telecenters. Initially connectivity was planned to be extended to the poorest regions through a smart subsidy scheme, with VSAT as an interim quick solution. Alternatives are now being explored. Subsidies for connectivity to the telecenters are expected to be phased out over time. A number of telecenter support institutions, including Saravodya, are providing support to groups of telecenters and the overall program.

Strong government leadership always needs to be balanced with continued stakeholder involvement in both design and implementation. The Sri Lanka program is an example of a deliberate strategy with strong government leadership that was intended to be balanced by grassroots involvement and entrepreneurial-based business models. With changes in government, top political leadership was increasingly identified with the program. This political involvement has led to fast expansion of the telecenters to include many with do clear business model and often ahead of content development and other elements of the e-development program. It remains to be seen whether a balance will be restored to ensure that scaling and sustainability will continue to go together (Hanna, 2007a).

Policy makers should also ensure the effective insertion of the telecenter program into the overall national e-development strategy and thus strengthen all elements of the e-development ecosystem. Telecenters constitute a core component of the e-development ecosystem. As indicated above, telecenters can be a key channel for delivering all kinds of e-government, and e-business services. They can help the promotion of e-literacy, distance education, and lifelong learning. They should be linked to poverty reduction programs, and sector-specific strategies in health, education, and agriculture. On the other hand, e-government services are increasingly seen as a key driver and critical success factor for the sustainability and impact of multipurpose telecenters. e-Policies are a key to enabling telecenters to engage in e-finance and e-commerce services. A dynamic telecommunications infrastructure and an effective regulatory framework can help secure affordable connectivity for telecenters, among other users. In a sense, the telecenters can act as the connecting point for many of the synergies of the e-development program.

A telecenter program is always a risky undertaking and often linked to political imperatives. Its success depends on (a) other critical parts of the e-development program, (b) the extent to which large numbers of people adopt a new technology and learn new skills, (c) major changes in governmental attitudes and the way that public services are delivered, and (d) extensive multi-sector and interinstitutional coordination and collaboration. Because of its visibility and importance, a telecenter program is also visible and susceptible to political interventions that could undermine effectiveness. Caution is warranted during both planning and implementation. Lessons of experience indicate many examples of countries where the telecenters were built and scaled up far ahead of reforming the telecommunications policies to reduce connectivity charges to affordable levels, ahead of the human resources necessary to manage the new telecenters as viable enterprises, ahead of developing networks and institutions to facilitate learning and mutual support, and ahead of the development of relevant content and services to ensure the sustainability and impact of this infrastructure.

Important trends and lessons are accumulating. A general trend is toward moving from purely bottom-up pilots and organic models to the use of programmatic approaches and intermediary institutions for scaling up. These programmatic approaches aim to be flexible and adaptive enough to take account of the diverse local contexts, and to leverage the diverse local experiences, models, partnerships, capabilities, and resources. Countries are moving from single, government-driven models to public–private partnerships and multiple business models. Countries are learning that different models could serve different contexts and different developmental needs. They are also learning how critical is monitoring and evaluation in the effective selection and use of various business and institutional models so as to adapt or innovate these models to fit changing priorities, changing socio-economic contexts, and changing communication technologies. They are planning and learning to learn.

# Chapter 9
# Toward a Holistic Approach to Government and Social Transformation

This chapter proposes policies and programs to use e-government and e-society for public sector transformation and social inclusion that provide maximum impact only when integrated with other elements of e-development. A holistic approach to e-government and e-society develops the enabling policies and institutions that promote ICT adoption and diffusion. It raises public awareness and e-literacy at large, while investing in the specialized technical and leadership skills for a knowledge society. It also promotes local competencies and ICT services to support user-producer linkages and mutual learning for e-government and e-society. Additionally, it induces investment in extending and upgrading the information infrastructure for a competitive knowledge economy and an inclusive information society.

This chapter is organized as follows: First, a holistic approach for government and social transformation called e-transformation (or e-development) is proposed. Next, e-government and e-society programs are linked to the other components of e-transformation, suggesting key interdependencies that should be taken into account to secure scaling up and sustainability of these programs. Next, three elements of e-transformation are examined in some depth for their critical links to government transformation and social inclusion: e-policies, e-leadership institutions, and human resources. A more detailed examination of the e-transformation framework and of its components (including other elements of the e-transformation not discussed here: information infrastructure and ICT technological competencies and services industry) is covered in Hanna, 2009b,c.

## A Holistic Framework

A holistic approach to integrate ICT into government transformation and grassroots development can accelerate, deepen, and sustain the transformation. I call this holistic approach e-transformation or e-development. Accordingly, the transformation process is conceived as composed of key, interdependent elements: an

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_9,

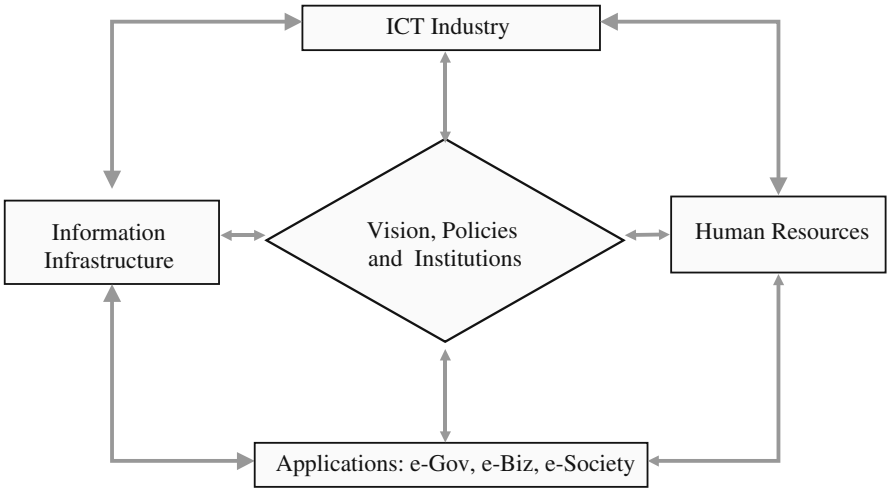


**Fig. 9.1** Elements of e-transformation process

enabling policy and institutional environment; an affordable and competitive information infrastructure; a dynamic and innovative ICT industry: broad ICT literacy, education, and entrepreneurship; a coherent investment program to apply ICT to modernizing the public sector; and incentives to promote the effective use of ICT for developing the private sector and empowering civil society (Fig. 9.1).[1] The first four elements are the pillars or enablers to the effective use and mainstreaming of ICT in government, business, and grassroots community organizations (e-government, e-society, and e-business). The focus here is on enabling government and social transformation.

The e-transformation process can be conceptualized in terms of key elements (Fig. 9.1):

(a) *Vision, policies, institutions, and leadership.* Stakeholder participation and effective leadership, have to be manifested in the well-defined vision and functional institutional framework, and supporting policies for ICT use and production. Policies and institutions constitute the enabling environment which either enhance or obstruct the interactions among all other elements of e-development.
(b) *Human resources.* Skilled human resources are at the heart of the ICT revolution, both as users and producers. Designing effective human development programs for fueling this revolution is at the heart of successful e-development.

[1]The figure is a highly simplified representation of the key enablers and application areas of ICT and the many possible interdependencies among them.

(c) *ICT sector development or production.* ICT is a global, dynamic, and high-value-added industry, and thus often targeted for promotion. Moreover, the key segment of application software represents a core competency that can serve both ICT production (and exports) and its wide and effective domestic use.
(d) *Information infrastructure.* Without nationwide telecom infrastructure and affordable access to the Internet and ICT tools, ICT and e-government services will benefit only a small fraction of the population, most likely urban, affluent, and educated. This element covers policies and innovative interventions to insure connectivity and access to the vast majority of population in developing countries.
(e) *Application or usage of ICT in* government, society, and business. National strategies set priorities and broad directions for the use of ICT in key sectors of the economy, for public sector modernization and strategic applications that cut across sectors, for promoting e-commerce, for priority user sectors, and for programs to target and diffuse ICT to SMEs, NGOs, disadvantaged groups, and lagging regions. Initially, ICT applications reduce transaction costs and improve transactional capabilities, and then stimulate the transformation of government agencies, markets, industries, and social organizations.

These elements are interdependent. The scope of each element and the nature of such interdependencies are likely to vary across countries and over time. For example, introduction of e-government services is impossible without accessible infrastructure, while sustainable demand for information infrastructure, in turn, depends on the availability of relevant local content and e-government services.

Collectively, these elements or pillars of e-transformation cover the package of policies, investments, and institutions that enable an economy to apply and leverage ICT for social and economic development. At the heart of e-development are e-leaders and e-leadership institutions—individuals, networks, and institutions that develop a vision of a knowledge society, set policies and priorities, forge national consensus on reforms, and coordinate and create synergies among the elements of e-development. To succeed, leaders should rethink and act simultaneously on the ICT infrastructure, human resources, ICT innovation system, policy and institutional regime, and ICT use, and diffusion throughout the economy.

## *Role of a Holistic Framework*

Adopting a holistic approach to e-government and e-society transformation is a key to establishing a balance between investment in the right technology, information, and connectivity infrastructure (the hard infrastructure) on the one hand, and the human resources and institutional capabilities, policy and regulatory environment, R&D, and technological learning and innovation (the soft infrastructure), on the other. The soft infrastructure constitutes the ecosystem that allows ICT investment to yield its transformative power. Experience suggests that many countries

tend to overinvest in the hard infrastructure and underinvest in the soft infrastructure. Experience also shows that the greatest payoff will come from balanced improvements to both the soft and hard dimensions.

A holistic approach avoids deterministic views and adopts emergent perspectives. Technological determinism sees organizational change as driven by the intrinsic properties of the deployed technologies, while social determinism views organizational change as driven by social forces upon which the technology has no influence (Jones and Orlikowski, 2007, in Mansel et al., 2007, pp. 294–295). Instead, the emergent perspective assumes that organizational change emerges from dynamic interactions of technological capacities, social context, and human choices. This perspective is supported by classic studies of the effects of technology on work organizations, socio-technical systems, and organizations as open systems (Emery and Trist, 1960; Emery, 1969). These studies conceptualize organizations as open systems, in continuous interaction with their environment, and as reflecting the mutual influences of social and technological factors.

A holistic approach is about embedding issues of e-transformation within a coherent and dynamic ecosystem or socio-technical system. Understanding the interactions and interdependencies among key elements of e-development can help in diagnosing imbalances and gaps on ICT-enabled development and in managing a balanced course between the hard and soft infrastructure.[2]

A holistic approach takes account of the interdependencies among e-development components. These interactions are significant in advanced knowledge economies and even greater in developing and emerging economies. Studies in OECD countries indicate a strong link between ICT investment, productivity growth, and competitiveness (OECD 2004a). Moreover, they show the significance of "interaction effects"—for example, interactions between ICT investment, infrastructure, skill levels, and the policy environment. A critical mass or minimum threshold of ICT deployment can have a significant positive impact on a country's economy. In a network economy, network effects and externalities are substantial. All communication technologies are subject to strong network effects network externalities, positive feedback, critical mass, and/or economies of scale of ICT supply and demand (Shapiro and Varian, 1999). A holistic approach should enable policy makers and strategists to tap and harness these synergies and interaction effects.

For developing countries in particular, with multiple "cumulative causations" for information poverty (Myrdal, 1971), the impact of one element of e-development

[2] A 2D approach to ICT in development is advanced in Chapter 12 of the GITR 2007–2008. It covers some key elements of the e-development framework, and shows how useful this would be as a diagnostic approach to secure a balanced course between the ICT infrastructure (including capabilities to support infrastructure) and ICT ecosystem (policies and institutions). Our proposed framework is more comprehensive and detailed, and includes ICT systems as part of the hard infrastructure, and human resources and technological capabilities as part of the ecosystem or soft infrastructure. Yet, the GITR shows that the 2D model can help manage a balanced course and take account of interactions among these composite dimensions.

is heavily dependent on, and reinforcing to progress in others. Investments in ICT must be accompanied by investments in human resources, process innovations, institutional changes, and policy reforms to fully realize the potential benefits. This is consistent with a key lesson of development experience in general, that is, the need for a holistic approach to development (Hanna and Picciotto, 2002).

Consider e-government and e-business. Making e-government and e-business services broadly available to citizens and enterprises requires accelerating Internet penetration and affordable connectivity. The take-up of online services depends critically on the development of digital literacy and an information culture. Education and the policy environment are keys to making technology work. Moreover, when governments tap domestic firms to act as partners in providing e-government solutions, they support private sector development in ways that can broaden e-development and create competitive domestic markets and learning opportunities for developing the local ICT services industry.

Consider the links between the IT industry and IT use in government, business, and society at large. By developing the IT industry, more and better IT products and services would be available to businesses, raising their productivity and competitiveness. A competitive IT sector and a large pool of competent IT manpower could also attract leading multinationals—both IT producers and intensive IT users—with increasing prospects for inducing virtuous dynamics and strengthening global innovation networks. A dynamic local IT sector would also facilitate the learning of government transformation and PPPs for e-government services. e-Society applications are also easier to seek and exploit when communities and local governments have access to local IT companies and low-cost IT-enabled solutions.

Also consider the virtuous cycle or positive feedback between infrastructure, skills, and content. Digital content is increasingly important part of OECD economies as they shift from manufacturing to high-value intangibles and services. It is becoming the basic creative infrastructure for the knowledge economy. OECD analysis suggests a positive feedback between information infrastructure, e-literacy and skills, and digital content (OECD, 2006a). Compelling and relevant digital content is the main driver for investment in broadband infrastructure and associated platforms. This infrastructure can in turn be shared for the delivery of many e-government and e-business services and further diffuse e-literacy and societal applications. By extending access to convergent broadband infrastructure to businesses, government, households and civil society, the investment costs per consumer falls dramatically.

Governments can play a critical role in guiding all these interactions and creating positive feedback or critical mass of users. One tool for creating critical mass of users is standards setting. Over time e-leadership institutions should be able to identify more and more synergies among applications in e-government, e-business, and e-society and among ICT suppliers and users.

Although integration offers many opportunities for tapping synergies among the elements of e-development, an integrated approach to ICT poses a challenge for aid agencies and developing country governments alike. Both face incentives that militate against collaboration and integration. Aid funding and public budgets

follow sectoral lines, and it can be hard to get new money for centralized, cross-sectoral initiatives. Whatever the source of funding, ICT efforts—e-government investments, telecommunications reforms, connectivity programs, ICT industry promotion, human resource development, content development, sectoral applications—are typically pursued in isolation. Even within a single element of e-development, such as an e-government program, ICT investments are typically pursued agency by agency or system by system (see Fountain, 2001).

## *Integrating ICT into Broader Transformation Strategies*

A holistic approach to ICT for development gives primary attention to the organic links between information, communication, and knowledge and the broader national development goals. It articulates the information, communication and knowledge dimensions of development challenges and priorities of a country and thus the way ICT can help address them. It goes beyond the traditional preoccupation of ICT (and science and technology) ministries with technology, innovation, research. It goes beyond organizational "silos" reflected in ministries' isolated information and communication systems. And it goes beyond aid agencies' common approach of focusing on ad hoc ICT applications in development projects while neglecting shared information infrastructure, systemic constraints, and sustainability.

Creating an inclusive information society requires direction from a national ICT-enabled development strategy. Such a strategy, based on an e-development framework, provides a guide to policies, investments, and implementation mechanisms for developing ICT capability and using it to achieve a country's development objectives.[3] It focuses the actions and resources of different stakeholders—but especially the government—on national priorities for harnessing ICT for development and social inclusion. It taps the interdependencies among these actions and investments over the medium term to realize a shared vision of ICT-enabled transformation. And it explains how institutions will collaborate and share responsibilities for this development.

A coherent e-development strategy has other advantages over current practices of governments and aid agencies in developing and applying ICT. By tightly linking national ICT strategies to broader development visions and reform strategies, it engages policy makers in driving the ICT agenda in response to national development priorities—rather than the other way around. It helps focus the attention of policy makers and program managers on ICT-enabled development results. ICT becomes an enabling force for pursuing policy reforms, transforming institutions, and improving governance and transparency. It can catalyze reforms in education and mobilize knowledge and other resources for social inclusion. Enlightened leaders become engaged in shaping this vision and in using it to build consensus on institutional change and economic transformation.

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[3] For a review of many national e-strategies, see World Bank (2006, 87–124).

## A Holistic Approach to Government Transformation

A holistic approach to integrate ICT into government reform and grassroots development can accelerate, deepen, and sustain the transformation. Figure 9.2 below recast the various elements of e-development (Fig. 9.1, shown early in this chapter) to focus on the various inputs or infrastructures involved in inducing and sustaining the transformation process. The following illustrates some of the key links between government transformation and other elements of e-development, reinforcing the importance of a holistic approach.

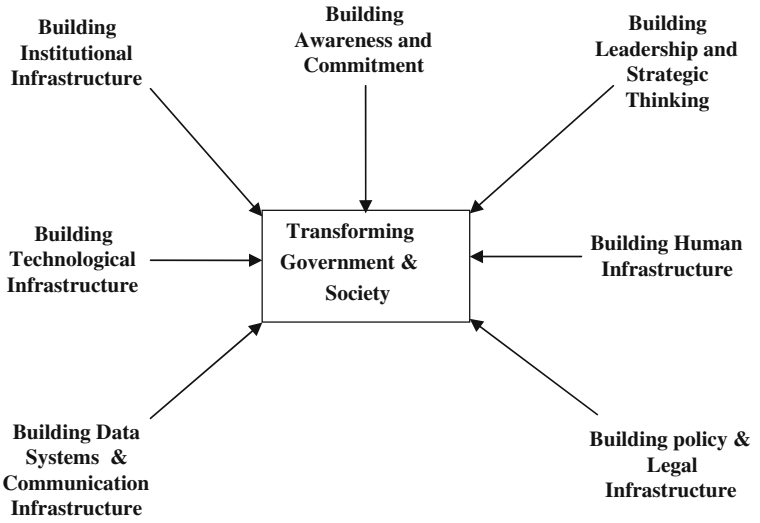


**Fig. 9.2** A holistic approach to ICT-enabled transformation of government and society

e-Government will not achieve its full potential unless ICT is widely adopted, made affordable and accessible. Until usage levels rise significantly, it will remain a major challenge to use technology to spearhead deep transformation in the public sector. Wide citizen adoption of online services is necessary to achieve economies of scale and lower the unit cost of providing these services. This in turn can broaden adoption and help governments realize the potential cost savings and transformation effects hoped for. There are direct connections between lowering the digital divide, e-services usage patterns, budget savings and ultimately, government-wide transformation.

The success of e-government depends to a significant degree on the broader ICT policy and regulatory framework, which can facilitate the development of communications services. In many countries, the legal establishment of a competitive ICT market has been a key factor in expanding the information and communications infrastructures. The reform includes, among other policies: the introduction and enforcement of competition and interconnection rules; the establishment of

strong, independent regulatory agencies; the elimination or simplification of individual licensing requirements; and the reform of spectrum management to promote wireless Internet access. The legal framework for e-commerce, such as the rules supporting e-payments, laws recognizing the validity of e-documents, and laws covering cybercrime and data protection, also facilitate e-government.

Many policies and practices being adopted by e-government programs concerning information sharing within government and with citizens, as well as e-policies concerning privacy, security, and electronic transactions have wide impact on e-literacy, e-business, the development of the local information services industry and the overall health of information society ecosystem. China is a case in point, where secrecy considerations are important, and the delivery of public information services is heavily dependent on top-down, vertically oriented government agencies—contributing factors to slow development in the information services industry and rural informatization, despite the vast investments in information infrastructure.

Strategic decisions concerning enterprise architecture, interoperability frameworks, and technology standards for e-government have wide impact on the ecosystem of e-development. For example, the adoption of open source as the preferred software standard for e-government systems and applications can have wide ramifications on all other elements of the e-development ecosystem: the competitiveness of the local ICT industry in exporting services, the development of local competency in open source in support of applications beyond government, intellectual property and other e-policies, local content, affordable grassroots applications, e-literacy, and so on.

Investing in civil servants and public managers must move in level and pace with investing in ICT application in the public sector. Many developing countries seeking to harness ICT for public sector transformation face a shortage of policy makers and civil servants familiar with ICT policy and management practices, with e-government potential and requirements, and with their roles in leading and practicing ICT-enabled change and innovation processes. Senior officials are more likely to support e-government initiatives if they understand the role of e-government, and their own roles in leading change. Equally important is for public managers to improve their understanding of the ways ICT can improve government relationship with its clients, what services can be provided online, what best managerial practices may be adopted to implement e-government projects.

Preparing, empowering, and motivating civil servants to engage in major change is critical, but relatively neglected when compared to investing in hardware and basic infrastructure. To adopt and benefit from e-services, users, citizens, and small businesses, must be e-literate. Preparing users must be sequenced in line with the roll out of e-services. Investing in human resources in support of e-government is often the weakest link in the chain.

To improve accessibility of e-services on a macro level, e-government programs in the countries with poor information infrastructure should be developed in sync with programs to improve public access, for example, through telecenters and/or citizen service centers. Different delivery models should be explored, piloted,

and sequenced. Piloting and scaling up of e-applications must be coordinated and sequenced with that of connectivity solutions and delivery channels. The pillar of communication infrastructure and connectivity is essential to inclusive and sustainable government transformation programs, and must be sequenced so as to lead or go in parallel with e-government investments.

e-Literacy among citizens, developed around the telecenters, may be also sequenced with the rollout of e-government services. The Akshaya project in rural Kerala, India provides an interesting example. The project is centered around multipurpose community technology centers, equipped with high bandwidth wireless connectivity and run by private entrepreneurs. The centers have a strong e-literacy program, which allows every household to send one member to the local center to acquire training in the basics of computing. By increasing e-literacy among citizens, the project supports the rollout of other services in e-government, e-health, e-commerce, and e-education.

Many elements of e-development can reinforce e-government. As shown in preceding examples, effectiveness of e-government programs is heavily dependent on developments in the legal and regulatory environment, e-policies, connectivity, information infrastructure, local ICT industry, relevant content in local language, and the e-literacy of citizens, business, civil servants, and public managers. In short, many of the prerequisites of ICT-enabled government transformation also happen to be necessary conditions for successful e-development strategies more broadly.

The adoption of ICT applications in some sectors may also help advance e-government and the digital economy more broadly. For example, the use of ICT in banking, travel, and customer relationship management in business leads to changes in user skills, behaviors, and expectations and places direct demands for government information and transaction practices to change in parallel ways. Reciprocally, e-government information and services may boost interest in all other kinds of ICT-enabled services in a networked economy. They may augment demand for digital content, telecenters services and broadband connectivity. Investing in the skills and technology necessary to make e-government relevant also builds a foundation for an information society.

Timing and sequencing of various elements of e-government (and e-development) are critical. Recurrent themes of the e-government Chapters (3, 4, 5, and 6) are the need to invest in advanced network infrastructure, the need to develop multichannel service delivery and standardize on common business processes, the need to reengineer business processes prior to systems deployment, the need orient organizational culture toward process improvement and client service, and the need to measure and track performance. Net impact of investment in e-government depends on people, policies, processes, and technology. Although this combination may seam to be a simple formula for e-government design and implementation, it takes many variations with significant differences in productivity. As with baking a cake, simply combining butter, sugar, eggs, and flour does not guarantee positive outcome. For example, on average, organizations that reengineer after the deployment of a network-based application can experience almost 50%

smaller improvement in cost containment than organizations that reengineer prior to ICT deployment (Frosst, Brown and Elder, 2005, p. 33).

Issues of equitable assess to e-services cannot be addressed effectively without putting e-government in a broader context and working on all elements of e-development. Otherwise, putting public services online may even reinforce the disparities in delivering public services and in making basic services work for everyone. e-Government efforts must act on a variety of fronts to overcome barriers facing the poor and disadvantaged groups: secure multiple service delivery channels; secure affordable, sustainable and widely shared access to the Internet; prioritize services most relevant to the target groups; develop appropriate local content in local languages, invest in digital literacy and awareness campaigns to mobilize demand for e-channels; creatively address disability and gender barriers to access; and engage NGOs in defining and mobilizing demand and in providing feedback on e-government services.

## A Holistic Approach to Build Information Society

Building an information society is a desirable end in itself. But e-society applications cannot be sustained or widely diffused without pursuing a holistic approach. Reciprocally, e-society can provide a broad user base and foundation for e-government, e-business, and the ICT and knowledge industries.

It could be argued that it is in applying ICT to the problems of poverty at the local or community level that all elements of e-development can be integrated and synchronized. Successes in applying ICT to solve social problems and enabling the poor and local communities to derive social and economic value are dependent on many complementary factors and investments. e-Society faces mutually reinforcing constraints to sustainable local development. Bottom-up initiatives, enabled by e-society innovation funds, can systematically test the local market and local communities in terms of potential demand, constraints, and capacity to use ICT for solving local development problems before mainstreaming such applications or adoption of complementary investments in a scaled-up program. They can also help test, tailor, and integrate ICT-enabled services to meet the unarticulated needs of the poor and underdeveloped regions.

e-Society calls for holistic e-development at the grassroots level. This implies a key role for strategic partnerships to provide integrated solutions to local socioeconomic problems. In the case of Sri Lanka, for example, the fund has financed local initiatives to catalyze local knowledge and digitize relevant content for delivery through locally owned telecenters. Meanwhile, telecenter operators trained in content development and management under the e-Sri Lanka program have partnered in seeking e-society partnership grants to jointly develop local content and services. Innovative proposals are also seeking to promote e-literacy and popularize ICT for development, in collaboration with universities and NGOs. All these grassroots initiatives are filling gaps in local capacity, services, and content development

for the telecenters and e-government programs. Another initiative funded through a partnership grant is e-curriculum development, designed to enable rural children grades 6–11 to access school curriculum in local languages through the telecenters. This partnership involved the Ministry of Education, the e-society fund, and NGOs.

e-Society programs can complement national and regional public service broadcasting by developing content for community-level broadcasting. Community broadcasting provides bottom-up information on development most relevant to communities as well as lateral communications of shared interests such as farmers, women, or children. Community radio is very cost-effective in the Philippines: the cost of community radio per thousand audience members is $1.6–3.1 compared with $86.7 for local print and $32.8 for television (Lucas, 1999). Community broadcasting has also proved effective in supporting behavioral changes necessary for community-driven development projects. The recent combination of Internet access and community broadcasting facilities is further transforming their relevance and reach as demand-responsive knowledge banks. But in many developing countries, the absence of enabling legislation has been a major obstacle to community broadcasting, including in Sri Lanka.

e-Society, combined with the new social networking tools, may engage citizens as coproducers of the public good and further the evolution of e-government. As discussed earlier, user-driven innovation and user-created content turn formerly passive customers into active participants in the cocreation of contents and services. This new model of innovation can be adopted for e-government, and citizens or communities would do more to customize or personalize government services. Financing local content development and the innovation of locally relevant services can be designed to reinforce and facilitate centrally produced e-government services.

Innovating and appropriating ICT for social use can be facilitated by building local capacity and communities to adopt open source software and practices. The potential of "open source" software to provide low-cost tools for generating local content and innovation is substantial and should be promoted and integrated into e-development strategies. Open source is a fast-growing movement, especially in e-education, e-government, and e-society. However, contrary to the popular belief, it is not about getting something for no charge. The idea is to allow free redistribution and modification of the software for it to successfully evolve and adapt to various specific conditions and uses. Financial and developmental benefits for the end user are significant and therefore building local capabilities for open source software may be linked to e-society programs.

Telecenters or community information centers can play important roles: provide access to ICT tools including the Internet; extend and customize public services, including those offered through e-government; provide access to information in support of local economic activities and learning opportunities; and connect and network people. Telecenters may be used to open channels for villagers to submit grievances about government services and abuses and thus improve accountability and provide feedback to government agencies on performance problems and opportunities for service innovation. Community centers can also promote gender equality by providing women with a medium to participate as producers, consumers,

and counselors clients. In South Africa, women's organizations are linked to various resource web sites that aim to mobilize women around common concerns (Fontiane, 2000). Government can provide support and incentives for partnerships between universities to develop innovative social applications and relevant local content and to disseminate them through telecenters and other delivery channels.

In conclusion, the involvement of civil society and local communities in e-society funds and grassroots innovation programs can have broader impact beyond specific e-society applications and ensure an inclusive e-development process. It can provide a countervailing force to those forces that contribute to the growing social and digital divides. It can mobilize a key constituency in support of greater resource allocation of ICT as a means of achieving broad economic and social development objectives. It can also generate a continuous feedback on current e-government services. It can promote syndications and partnerships to integrate and customize public, private, and civil society services for various target groups.

## Policies for the Knowledge Economy and Information Society

ICT-enabled transformation of government and society must be founded on policies and institutions that are appropriate for the information society and knowledge-based economy. Development experience shows that the design and functioning of regulatory institutions strongly influence economic performance. Moreover, as experience has repeatedly shown, the long-term efficacy of the regulatory system in telecommunications and broadcasting depends on the avoidance of politicization and industry capture of the regulators, the acquisition and maintenance of high-quality management, and the continuous evolution of the institutions so as to accommodate fast-changing conditions and technological and market innovations (Kay, 2002).

A lack of the policy and regulatory governance for the knowledge economy and information society leads to underdeveloped markets, expensive investments, untapped synergies, unsustainable ICT programs and ultimately, poor development outcomes. Conversely, national consensus on policies and plans can create the enabling environment for all components of the e-transformation process. Many governments have yet to develop a dynamic regulatory regime and effective regulatory institutions that can create and sustain competitive ICT markets, protect ICT consumers, promote ICT industry development, and take advantage of the convergence process.

Government can be a lead service sector in demonstrating the use of ICT as well as in setting standards and promoting a competitive domestic market for ICT through its purchasing policies. The public sector is a large part of the "modern" economy in developing countries, and can play a leading role in developing the domestic market for ICT through policies and practices governing public procurement, such as outsourcing, competitive bidding, and emphasizing quality in procuring software and support services.

Policies and strategies for ICT should also address the special constraints that the public sector faces as an effective user of ICT. First, there is a need for regulations governing citizens' access to government information and services. This is a powerful tool, both a "stick" and a "carrot," to encourage public agencies to go online. Asserting citizens' right to access public information can be promoted through legislation, advocacy, and proactive changes in public sector culture. Second, there is a strong need for setting ICT interoperability standards and transparent ICT procurement guidelines and processes. In many developing countries, substantial and growing investments in ICT systems in government bodies are carried out on largely autonomous basis. Aid agencies and ICT multinationals tend to reinforce this fragmentation and technological "lock in," to the detriment of both local suppliers and users. Setting appropriate standards could both advance government-wide service improvement and accelerate the development of the domestic market for a competitive ICT industry.

But policy and regulatory governance for the information society and knowledge economy extends beyond access and use of ICT applications and ICT infrastructure (including telecommunications). It is also concerned with the development of information and knowledge markets, information content, consumer trust, and intellectual property rights.

## *A Multilayered Enabling Environment*

In developing the policy, legal and regulatory conditions to advance e-development, it may be useful to think in terms of a three-layered approach to the enabling environment and reforms (Guermazi and Satola, 2005). Such environment should enable:

- Access to ICT infrastructure and tools
- Access to ICT applications; effective usage and wide diffusion
- Citizen (consumer) trust, content development and intellectual property protection

The most basic layer is polices and regulations to improve access to ICT infrastructure and tools. Creating a clear and certain policy and legal environment is crucial to attracting investors, particularly foreign direct investment (FDI). Improvements in the enabling investment climate over the last decade have attracted substantial FDI for the telecommunications sector in developing countries. Attracting such capital remains an extremely competitive endeavor. Meantime, involving community investment in and ownership of local infrastructure through public-private partnerships have proven effective in developing rural telecommunication infrastructure.

Access to ICT applications, effective usage and wide diffusion requires coherent policies to create the enabling environment. Many countries have not yet moved

their legal frameworks from ones designed for physical commercial transactions to ones designed to enable transactions over electronic platforms. Electronic transactions raise legal issues that are unique to the digital or virtual world. These range from acceptance of digital signature to the admissibility of electronic evidence. A holistic approach to regulatory reform should benefit from international best practices and harmonization of international and regional standards, but also adapt these models to local conditions and dynamics.

The third layer is to create the enabling environment for improved user or citizen confidence and trust. As whole economies move toward increasing reliance on digital transactions, information sharing and strategic information systems, privacy and security concerns take a prominent position in the enabling environment. The development of a digital economy is predicated on the security of electronic networks and protecting the privacy of users and consumers. Securing the integrity of data and infrastructure is imperative to user confidence.

Key policy issues that determine the trust and confidence in digital networks include: network security, consumer protection, privacy, cybercrime, intellectual property protection (IPR), and dispute revolution (Guermazi and Satola, 2005). Many countries are developing cybersecurity policies and local capacity to assess and manage cybersecurity risks. This may involve the creation of national Computer Emergency Response Teams and related Computer Incident Response Teams. To provide emergency alert and response services as well as risk analysis and protection of critical information infrastructure and critical government systems. Data privacy protection frameworks need to strike a balance between protecting privacy of individuals and preserving a government's right to protect the public interest from illegal and criminal use of data. Cybercrime laws are also needed to protect data, computers, and networks. As the Internet enables low-cost, global dissemination of information, intellectual property becomes more vulnerable to unauthorized use. Finally, dispute resolution mechanisms need to be as speedy as the communication networks they serve.

The economic characteristics of information, knowledge, and digital content raise fundamental issues of public policy concerning IPR and competition (Melody, 2003). The economic characteristics of the relatively high costs of establishing databases and knowledge services, and the low costs of extending the markets for services already created underlie a powerful tendency toward centralization and monopoly at the national and international levels. Yet, the value of the stock of knowledge in society depends upon how pervasively it is diffused. The economics of replicating, using, and sharing knowledge are extremely favorable for its widespread distribution.

This raises a central issue for the knowledge economy governance: how to reconcile maximizing profit in quasi-monopoly information and knowledge markets with the social efficiency of societal distribution at very low marginal costs (Melody in Mansell et al., 2007, pp. 55–72). The current application of IPR in software, publishing, pharmaceuticals, and all digital infotainment is directed to increasing monopoly protection and limiting distribution. Unless appropriate policies are shaped for the knowledge economy and the opportunities being opened by ICT advances,

information and knowledge markets will thus continue to function inefficiently. This would lead to increases in gaps between rich and poor, within and between countries.

In this context of liberalized markets, government needs to mark out the domain of the public interest in public information and the digital economy (Melody, in Mansell et al., 2007). This may include Internet neutrality and universal access to Internet services. In addition, it would recognize the universal information needs of the public in the knowledge economy. As information and knowledge take on increasing significance, some definable set of information or "public information commons" would be essential to participatory development, inclusive knowledge economy, and effective democracy.

## *Improving the Policy Making Process*

All these policy frameworks require institutional mechanisms to formulate the frameworks, regulate compliance and monitor impact. Policy makers must prioritize the development of these policies and regulations and address these issues progressively in line with the growth of their digital networks and capabilities. They should recognize that prevention is at least as important as resolution of dispute or quick recovery from system failure.

Beyond setting the substantive rules of the game, effective implementation of policies requires strong institutional capacity and independent regulatory institutions. A transparent and participatory process guards against regulatory capture. It also acts as a guarantee for private investors. The roles and core competencies of regulatory agencies should be clearly defined.

In leading the policy and regulatory change process, governments should engage the ICT industry, ICT users and other stakeholders. Laws and regulations that were designed for an earlier and different environment now must be reviewed to ensure they remained relevant and did not impede the development of new and innovative services for the digital economy. Governments should seek the views, concerns, and expertise of stakeholders, and when needed, be guided by international expertise, standards, and best practices. Greater consultation can impart greater stability to sector policy development and at the same time generate confidence in the ability of regulators to act fairly and predictably.

Attention should be extended to the structural weaknesses of ICT policy making. Several factors contribute to these weaknesses. First is the low awareness among public leaders and legislators of the potential of ICT and its implications for all types of transactions and economic activities. Second, ICT policy making is not integrated into core public agencies such as the Ministries of Finance and Economy. As a new and fast-changing area, expertise in policy dimensions of ICT is scarce, particularly in the public sector. This is compounded by the lack of engagement of the expertise of the private sector and civil society. International ICT policy making can help by providing model laws, standards and best practices, but

international bodies are also often biased by the louder voices and interests of advanced countries and ICT multinationals, as in setting the IPR regimes (MacLean et al., 2002).

Priorities must be set for developing and enforcing these laws—in line with national priorities and in support of the overall e-development strategy. Typically, the ICT industry has a strong local voice in setting ICT policies. NASSCOM of India is a good example. But the complementary and at times countervailing voices of local ICT users are not adequately represented in ICT policy making in most developing countries. Yet, priority should be given to those policies that focus on using ICT to increase productivity of established sectors in which the country has a competitive advantage. Effective ICT policies may not be on those which are directly focused on ICT production, but those which address the complementary factors facilitating use and diffusion. In addition, ICT policies may focus on supporting ICT innovation and local production capacity close local ICT-using sectors—such as the development of local content, tailored and low-cost software, systems integration, Internet services, and local support services.

## Institutional Frameworks

e-Transformation in general and e-government in particular depend on effective institutional leadership and coordination across many agencies spanning public, private, and civil society organizations. It is important to institutionalize the engagement of stakeholders in vision and policy development. The role of government in leading e-transformation is also expanding, beyond e-government programs. These and other broad considerations are shaping the institutional models and coordination mechanisms being developed to transform government and build the information society. Lessons are emerging about the efficacy of these leadership and coordination arrangements, which are essential to pursuing a holistic approach to transformation.

### *Institutionalizing Stakeholder Engagement*

A broad vision of ICT-enabled development could help build coalitions and energize the process of reforming the laws and regulations necessary to promote access to ICT tools, support electronic transactions, and create the digital economy. In Sri Lanka, for example, the e-development strategy that was initiated in 2002 has mobilized the policy reform process and helped passing into laws many of the e-policies that languished for years prior to the broad sharing of this vision (Hanna, 2007a). Similarly, NASSCOM of India has been a key player in promoting legal and regulatory reforms that improved a range of policies that supports ICT innovation and diffusion. As India's vision of ICT-development has been broadened and deepened,

and more stakeholders from civil society and government have participated in shaping this vision, policy reforms have also accelerated and deepened to unleash the innovation potential of India and move it toward a globally integrated knowledge economy.

In turn, stakeholder engagement helps to broaden and deepen a holistic vision of e-transformation. It can support a balanced approach to the major elements of e-development strategy for transforming government and building an inclusive information society. It ensures that the e-strategy is realistic, sustainable, flexible, and responsive to the ever-changing environment and local needs. It also eases the implementation of e-transformation by providing opportunities for new partnerships, exploring innovative business models, building commitment to implementation strategies, mobilizing local resources and communities for change, and strengthening accountability for the efficient use of financial, human, and technology resources. Last but not the least, engagement of the civil society ensures the responsiveness of e-transformation to a country's social needs and cultural diversity. Visionary and capable leadership, when broadly shared, secures the necessary resources and government's commitment and ability to deliver on the adopted strategy and necessary reforms. Overall, mobilization of stakeholders, supported by dedicated and institutionalized leadership, builds momentum and continuity for e-development in a fast changing and uncertain environment.

e-Leaders engage major stakeholders in framing a national ICT agenda and building a broad-based consensus on an e-transformation strategy. Successful countries have established some sort of "Information Society Council," a high-level consultative body for development of the overall ICT vision, strategy and policies, action plans, and other ICT-related issues of significant public interest. Such council consists of all major stakeholders within and outside of the government, including representatives of ministries and agencies, civil society, the private sector, and academia. It usually plays an advisory role to the government on major policy issues. Also, it may perform promotional, benchmarking, monitoring, and evaluation functions.

To succeed, such councils should enjoy high-level political support. For example, the Information Society Commission is an independent advisory body to Government of Ireland. The commission draws on high-level representation from the business community, the social partners and government itself, and reports directly to the Prime Minister. Korea presents an excellent example of political will and engagement, combined with national priority setting, stakeholder coordination, and long-term perspective.

A shared vision of government transformation should go beyond the confines of the central government and public sector. Most successful countries have used ICT-enabled development as a theme that unified central programs and at the same time promoted bottom-up and locally driven initiatives. An effective vision is developed and shared jointly by leaders from the public sector, private business, civil society, and academia. To the extent this vision is responsive to the millennium development goals or a pro-poor growth strategy, it should articulate those areas where ICT can make significant differences such as employment, basic health and education, rural

development, or targeted groups. Engaging stakeholders and coalitions for reforms and broad-based distribution of ICT resources is a key to selecting and balancing options in favor of equitable development and broad diffusion (Wilson, 2004).

A nationally shared vision should be further linked to the development priorities and visions of various regions, to excite and engage local leadership. In large countries like India, China, Brazil, and Russia, it should reflect local priorities, resources, and capabilities. It should help stimulate and engage local leadership in creating its own visions and initiatives of ICT-enabled development, and in linking and adapting national programs to local ICT-enabled development initiatives. In some countries, like Brazil and India, state leadership and vision preceded the articulation of a national vision and the scaling up of connectivity and e-government programs.

## *Leadership Role of Government*

The role of government in creating the knowledge economy is also evolving and shifting, from a diminishing role as major producer to an increasing role as facilitator, partner, strategist, and leader (Fig. 9.3; Lanvin, 2003). Governments are taking leading roles in providing a society-wide vision of ICT-enabled development,

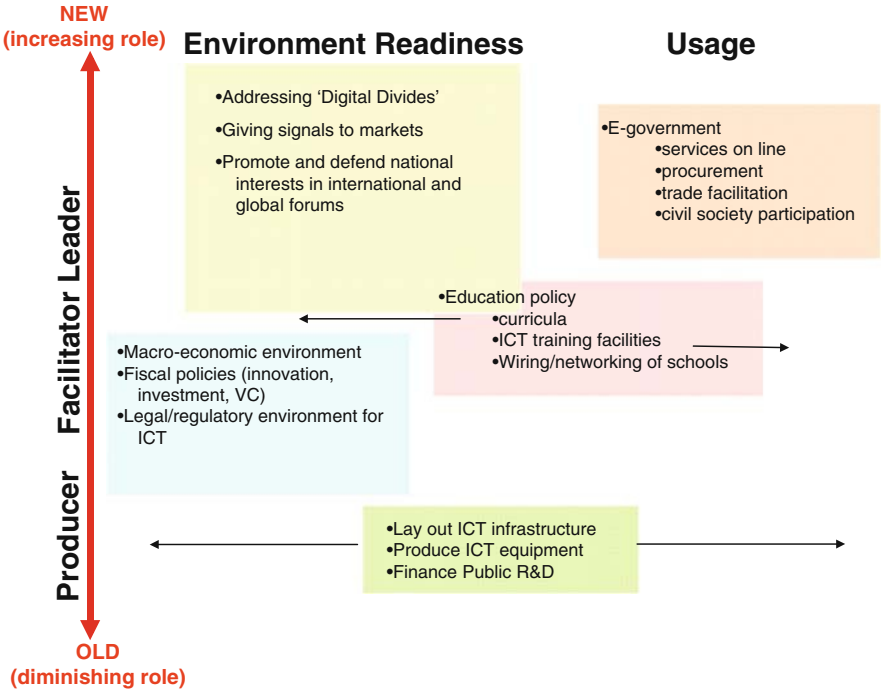


**Fig. 9.3** Leadership roles for government

addressing the digital divide and creating the enabling environment, as well as user and innovator in applying ICT to public services. Governments are also assuming a strong facilitating role in promoting overall societal e-readiness through education policy and e-education.

Leadership—political, institutional, and technical—is essential to development, including ICT-enabled development. Stable and informed political leadership is especially important to the quality of e-development implementation and to adopting long-term solutions and sustainable policies essential for economic and social transformation. The quality of leadership that resides in all the institutions of governance is equally important. Leaders should be also the agents of change. They should anticipate and be aware of the potential of ICT for change and be quipped to lead this ICT-enabled change and transformation.

## *Alternative Models*

Many advanced countries attempt to bring together senior administrators and CIOs or heads of ICT agencies for joint decision making for overall IT policies, major investments and prioritization. The challenge for integrating IT decisions with sectoral or business decisions goes beyond any specific institutional arrangement and may be sought through the blend of staffing e-leadership institutions with development and sector professionals besides IT specialists, creating policy councils and interministerial committees, and creating a cadre of CIOs within the sectoral ministries. In a sense, all IT decisions are business, sector, or development decisions as well.

Different institutional leadership models are emerging to coordinate e-government and information society programs, and secure a holistic approach to ICT-enabled government and social transformation: shared responsibility, cross-cutting core ministry, lead technical or administrative ministry, and designated e-development agency (Hanna and Qiang, 2009; Hanna, 2007b).[4] The shared-responsibility model would divide the e-transformation agenda among a number of ministries, for example, Ministry of Economy takes care of information society and e-business promotion, Ministry of Telecommunications develops information infrastructure policies, and the Ministry of the State or Public Services or Administrative Reform focuses on the e-government agenda, Ministry of Science and Technology or Industry or Trade promotes ICT entrepreneurship and innovation, and the Ministry of Education integrates ICT in education and promotes ICT education and the appropriate skills for an information society. In the core ministry model, a powerful cross-cutting ministry may take the overall lead on the

[4]For a significantly more detailed analysis of these institutional models and institutional innovations and their strengths and weaknesses, see Hanna and Qiang chapter "Trends in National E-Government Institutions" in *Information and Communications for Development 2009: Extending Reach and Increasing Impact*; and a more expanded version in Hanna (2007b) *e-Leadership Institutions for the Knowledge Economy*.

e-development agenda: the Ministry of Finance (USA, Israel, Australia) or Planning or Economy (China, Brazil). In another model, the concerned sector ministry leads overall coordination: the Information and Communication Technology Ministry (South Korea, India, Thailand), or the Ministry of Public Administration or State or Interior (Mexico, Egypt, South Africa). An emerging institutional innovation is the independent and holistic e-development agency model (Korea, Singapore, Sri Lanka).

These institutional models, countries that comes close to represent these models and the advantages and disadvantages of each are summarized in Table 9.1. Each governance model has its advantages and disadvantages and points to strategic trade-offs that should be addressed early on is developing leadership and coordination capabilities for transforming governments and building an inclusive information society.

## *Trends and Lessons in e-Leadership Institutions*

A review of e-leadership institutions in over 40 countries discerns some broad trends and emerging lessons in the evolution of e-development institutions (Hanna, 2007b; Hanna and Qiang, 2009).

First, there is a shift toward direct engagement of the president, prime minister, CEO, or a powerful coordinating ministry like finance or economy. This is done, for example, through the placement of e-development unit within the office of the CEO or cabinet secretariat or establishing a policy coordinating committee chaired by the president.

Second, countries have moved from ad hoc responses, informal processes, and temporary relationships to institutionalized structures to respond to the challenges of the knowledge economy and ICT-enabled development. At the outset of the ICT revolution, or when national awareness was nascent, governments convened special task forces, commissions, and panels to advise them on the new directions to take. Typically these ad hoc bodies made their recommendations to relevant ministers or heads of state.[5] At that stage, the central message was to raise attention to the enabling role of ICT across the bureaucracy and society. Ad hoc processes were often used to reach out to key leaders and constituencies beyond government and to identify potential e-leaders and stakeholders for the subsequent institutions. Over time, these temporary bodies and ad hoc processes were transformed into permanent institutions and formal coordination mechanisms.

Third, the locus of institutional leadership and coordination responsibility for e-government programs has been shifting from the ministries of ICT to the ministries of public administration or interior. This reflects a shift in emphasis

[5]The number of nations who turned to such task forces is notable: Singapore in 1992, USA in 1993; followed by Japan, Korea, China, and Brazil, among others. See Wilson (2004).

**Table 9.1** Models of governance and coordination for e-development

| Models | Countries | Advantages | Disadvantages |
|---|---|---|---|
| **Shared-responsibility model** | | | |
| Distributed sectoral responsibility complemented with high-level policy coordination mechanism | Finland, Sweden, France, Germany | Integrates ICT agenda with relevant sectoral ministries with least disruption to current structures of government | Functions well only in countries with strong traditions of political consensus, collaborative culture and decentralized government. Does not provide for central push to overcome stovepipe mentality and build common infrastructures |
| **Core ministry model: investment coordination** | | | |
| Led by a cross-cutting ministry such as Finance, Treasury, Economy, office of Management and Budget, or Planning Commission | Australia, Brazil, Canada (pre-2007), Chile, China, Israel, Japan, Rwanda, UK, USA | Has direct access to funding to enable control over funds that are required by other ministries to implement e-government and other e-development programs. Helps integrate e-development with the overall economic management agenda | May lack the necessary focus and technical knowledge/skills required for coordinating e-development and facilitating implementation |
| **Lead ministry model: technical coordination** | | | |
| Led by technical sectoral ministry: communication and information technology ministry, science and technology or industry | India, Jordan, Kenya, Pakistan, Romania, Ghana, Singapore, Thailand, Vietnam | Ensures that technical staff is available; eases access to nongovernment stakeholders (firms, NGOs, academia) | Ministry may be too focused on technology, telecommunications, or industry, and disconnected from administrative reform processes |

**Table 9.1** (continued)

| Models | Countries | Advantages | Disadvantages |
|---|---|---|---|
| **Administrative and technical coordination** | | | |
| Led by Ministry of Public Administration, Services, Affairs, Interior, State or Administrative Reform for e-government, and by Ministry of ICT for connectivity and ICT industry development | Bulgaria, Egypt, Mexico, South Africa, Slovenia | Facilitates integration of e-government with administrative simplification and reform, particularly when admin reform is driven by political commitment at high level | May lack technology skills if exclusively led by administrative reform. Needs to share leadership with Ministry of ICT and perhaps others |
| **Designated e-development agency model: holistic coordination** | | | |
| Led by autonomous dedicated ICT agency | South Korea, Singapore, Ireland, Sri Lanka, Canada (2007) | Creates skilled, agile, business-like, and high-performing entity that is relatively free of civil service constraints. Not dominated by the turf of sectorally established ministries | Vulnerable to changes in the authorizing environment and rivalry from the public sector |

from technology management to institutional change and process innovation management. This shift has the potential of deepening the transformational role of e-government.

Fourth, many countries are opting for creating an independent and strong national ICT agency that reports directly to the head of state. These agencies tend to focus on policy development, governance mechanisms like "whole-of-government" enterprise architecture, and strategic investments that cut across many agencies. They often operate under a special act or civil service framework that allows them to provide competitive compensation and attractive career structure and to operate in a business-like manner—yet enjoy the legitimacy and authority of top political leadership. The shift to this model is driven by a growing recognition that e-development is a cross-sectoral, cross-hierarchical, cross-industry process. e-Government in particular is a major transformational process that requires political leadership, a holistic view of government, and ability to partner with nongovernment actors.

Fifth, as e-government programs take hold and mature, countries move beyond concern about the central agency and common information infrastructure to start organizing and rationalizing at deeper levels of government so as to fully integrate e-government into the governance framework and activity of each sector and agency. In the process, the role of central agencies also changes from top-down solutions and common infrastructure issues to playing catalytic roles and leading scale-up processes. The aim is to facilitate e-government innovation at the sectoral, state, and municipality levels; institutionalize innovation and process reengineering; promote collaboration across boundaries; engage more stakeholders; and disseminate best practices.

Finally e-institutions should evolve in line with the phases of e-transformation. As the basic level of readiness and connectivity is established, the emphasis shifts to innovation, human resource development, business process transformation, public-private partnerships, a holistically supportive environment, bottom-up participation, and other soft factors. e-Leadership institutions have to evolve to meet the challenges of these new phases.

In sum, there is no single model, no "one size fits all" solution for governments looking to create an institutional framework for their national e-transformation agendas. Different solutions have been successful in some countries yet unsuccessful in others. Broadly, however, the institutional setup should meet several challenges:

- Engaging key stakeholders to develop and implement a national ICT vision, strategy, and action plans.
- Developing a policy framework, laws, regulations, and standards to enable e-government, e-business, and e-society, and other applications.
- Building high-level "executive" ICT function, responsible for the overall e-development process and coordinating multilevel (national, regional, and local) and cross-sectoral strategies and programs.
- Developing effective division of labor and coordination of e-development activities across various government agencies, including interdepartmental framework

for collective decision making on policy issues of common concern and development of common ICT standards and guidelines.
- Creating special task forces and funding arrangements for implementation of high priority e-development programs that involve various cabinet departments and administration bodies, most notably e-business and e-government.
- Creating mechanisms for monitoring and evaluation of e-development projects across different government bodies and insuring accountability and learning for the whole e-transformation program.

## *Mobilizing Demand for e-Leadership Institutions*

As a demanding transformational task, e-transformation requires mobilizing policy makers to lead policy reforms and institutional changes, and mobilizing potential communities of ICT users to innovate and press for change. Leadership is perhaps the most critical but scarce resource of development. Yet, is should be viewed as a given or immutable constraint. Visions of e-transformation can persuade and influence leaders. Policies and incentives can engender and empower leaders. Institutions can develop and multiply leaders.

Development experience strongly suggests that local demand and pressure from key stakeholders are necessary to create sustainable institutions (Box 9.1). As a relatively new dimension or option for development, e-transformation should be institutionalized. But new institutions cannot become effective with adequate demand and pressure from key stakeholders. Strategies to mobilize and sustain this demand are therefore critical to enabling transformation.

### Box 9.1 The Need to Build Demand for e-Leadership Institutions

Most successful institutional reforms have occurred when societies have generated strong domestic demand for institutions. In developing countries insufficient demand for institutions is the most important obstacle to institutional development (Fukuyama, 2004).

Effective demand for e-leadership institutions can be created by building business and civil society pressure for improving public services, generating employment, and bridging the digital divide. It can be nurtured by raising awareness among societal leaders and exposing them to international best practices. Citizens should be made owners of e-development programs. They should be engaged—through political leaders and e-government institutions—in shaping the kind of government, information society, and knowledge economy they should have and in realizing their shared vision (Stiglitz et al., 2000). The media

can play a critical role here, as it did in the Republic of Korea and several other East Asian countries (Jeong, 2006).

Demand for new institutions or for reforms to existing ones is often time sensitive. When such demand emerges, it is usually the product of crisis or a major change in the political environment that creates more than a brief window for reform. There are serious limitations to the ability of external partners or donors to create demand for institutions and so to transfer knowledge about building new institutions. Thus such windows of opportunities should be anticipated and quickly captured.

## *e-Leadership Institutions at Local Levels*

Strengthening governance and strategic coordination at the local level to promote e-development is on the rise. Subnational economies—particularly cities—are playing a central role in economic growth, competitiveness, and globalization, and hence efforts are increasingly directed at improving institutions and governance of the local knowledge economy. In many cases, local governments and local institutions take the initiative to improve their position in the knowledge economy. They help create shared visions, strategic networks, and integrated policies for knowledge-based or ICT-enabled development. They convene all concerned partners (public and private, internal and external) to jointly generate integrated policies and local initiatives to respond to the challenges of the global knowledge economy. They cooperate to create knowledge clusters, to improve their human resources and knowledge base, to modernize their digital infrastructure, and to build on their comparative advantages. This is increasingly the case among cities or regions within the EU.

Joined-up approaches of national and local/regional governments to e-leadership are also on the rise. Examples include the UK with the "Core Cities" program, the Netherland with the "Peaks in the Delta" program, and Finland with the regional "Center of Expertise Programme". Similar joined-up or federated approaches have been recently adopted for e-government programs, as is the case with the National e-Government Program of India.[6]

Leading states and cities have greater agility to pilot e-government services and seize opportunities in rapidly changing environments (Lanvin and Lewin, 2006). Accordingly, e-government program's success will depend on institutional arrangements at the state and city levels, where most government services are delivered, pilots and innovations are conducted, and partnerships with central governments

[6]India provides an example of the services provided by the central department of IT at the federal level. The department diffuses and scales up successful priority e-government applications at the state level and adapts and matches central support to local state priorities.

are forged.[7] The movement to decentralize government functions tends to favor the administrative coordination model of e-government, where e-government functions are assigned to the ministry of public administration and local government (or services, affairs, interior, state, or administrative reform). Central e-government institutions then become engaged in disseminating best practices across states and cities, providing matching funds for innovation in local e-government services, addressing common human and infrastructure constraints to local e-government efforts, and leveraging economies of scale across local jurisdictions, among other activities.

## Human Resources

While ICT provides efficient tools for building a modern state and inclusive information society, it is the quality of the human capital that will ultimately determine success or failure. Skilled human resources are a necessary condition for leveraging available ICTs and for reinventing them to closer to the realities and needs of developing countries. As discussed in Chapter 2, the implications of the ongoing ICT revolution for education and learning are pervasive and profound, both in terms of the demand for new knowledge and skills, and the capacity and modes of supplying such knowledge and skills. These are not limited to ICT specialists and technology managers, or just the ICT sector. Rather they span all specializations and sectors. They cover all kinds of economic activities in which innovation, collaboration, competition, productivity, and learning are enabled or enhanced by ICT. And the development of information society-related skills has to pervade all channels of education, learning, and knowledge sharing. Yet, surprisingly, e-skills tend to be the missing link in many national ICT strategies.

The emerging global knowledge economy and ICT-enabled and advanced development strategies will significantly increase the demand for e-skills. These skills will be needed in various ways in both the public and private sector. They must reach policy makers and corporate leaders as well as knowledge workers and the population at large. They will be of central importance to worker mobility, employability and inclusion as well as growth, competitiveness and innovation. Among advanced economies, the gap is growing between the demands for e-skilled workers and leaders and the ability of educational institutions to supply them. Understanding the projected demand for e-skills, the current and potential channels of supply of such skills, the role of labor policies and markets, and the external factors likely to shape this demand–supply equation is critical to designing the human resource pillar for an ICT-enabled development strategy.

[7]The same arguments can be made for other knowledge economy institutions (Hanna, 2007b). Much of the experimentation, support services, and partnerships must be forged at the regional, city, and cluster levels where cooperation, competition, and institutional partnerships occur.

An e-government and information society strategy should address four broad human resources development challenges:

(i) *e-Literacy*, that is, developing the capacity of the population at large to apply and use ICT in their roles as knowledge workers and consumers;
(ii) *e-Leadership*, that is, raising the awareness and competencies of policy makers and business executives to set policies and governance mechanisms for ICT deployment in their organizations and the economy at large and to manage the consequent transformation toward networked organizations and economies;
(iii) *ICT education*, that is, strengthening specialized technology management education for ICT practitioners to plan, design, manage, and support ICT systems; and
(iv) *Lifelong learning* to accommodate the imperatives of transformation and fast-changing technologies, and broaden participation in the information society.

## *e-Literacy: Public Awareness and User Skills*

e-Literacy may be viewed in the context of building human capacity for development and building inclusive information society. This means considering basic e-literacy as a key component of human resources development for the masses and education for all.

Public awareness of ICT potential and the widespread of e-literacy are critical to mobilizing the public's interest in reforming policies and institutions in support of ICT access, diffusion, and education. They help build support for the country's ICT policies and ICT-enabled development strategies. Broad basic e-literacy is also essential to creating a critical mass of demand for public and private e-services. It determines the adoption rate and effective use of ICT and the Internet. On the supply side, ICT awareness should help mobilize financial resources and entrepreneurial talents to invest in ICT access, telecenters, ICT ventures, and local content. This broad-based e-literacy was a core element of Singapore's national IT strategy: to create an IT culture. A strong IT culture provided for dynamic investment in information infrastructure and advanced applications in government and business, moving the country toward the vision of an intelligent island.

The demand for e-literacy is enormous, particularly for latecomers and large countries. Should e-literacy campaigns focus first on the poor and rural areas where the private sector is unlikely to meet the demand without active policies and incentives? Should public efforts target or extend to the disabled and disadvantaged groups and those unlikely to be exposed to ICT through work or formal education? Should schools or telecenters be used as primary channels to promote e-literacy? Should broadband Internet access be subsidized to mobilize demand and build public awareness? Which popular public services and information needs should be

prioritized and delivered online so as to promote broad-based demand for online services? What role should the mass media play?

These are difficult issues and must be addressed so as to prioritize and phase initiatives to build e-awareness and e-literacy quickly and effectively. Fortunately, most developing countries have a large percentage of young people who are quick to adopt ICT tools, to navigate the digital world, and be part of the net generation. This target group can also be used to reach the more disadvantaged groups such as rural people, the aged, and women.

A new category of information intermediaries (infomediaries) and social entrepreneurs should be developed to build the capacity of the poor and rural areas to take advantage of the Internet, the media, e-government services, local content, and e-society innovations. As mentioned earlier (Chapter 8), managers of telecenters or community information centers play an increasing role in promoting e-literacy and information literacy, and programs to build their capacity as grassroots leaders, entrepreneurs and infomediaries are already underway in several countries. A new breed of library scientists and community developers may become the new evangelists of Internet, knowledge management, information society, and ICT for the poor.

Often civil society organizations, grassroots initiatives, business organizations and other nongovernment entities are the leaders in experimenting and introducing ICT into decentralized educational systems. These contributions are typically not on a mass scale. But they can experiment and create new approaches and, at times, best practices from which governments can draw on for scaling up. The mass media can also play a key role in disseminating promising practices and mobilizing resources for scaling up.

## *e-Leadership: ICT Policy and Strategy Leadership*

Key actors in transforming government are political leadership, senior public managers, ICT professionals and the mainstream civil servants. Each of these groups has its own skills and culture and bridging the gaps among them is critical to sustainable transformation. A broad characterization of their conditions in most developing countries is as follows (Heeks, 2006; Hanna, 2008). Politicians have limited understanding of ICT and want quick and visible results. Senior public managers have limited appreciation of the potential role of ICT for their agencies and either delegate the ICT function to low-level technical staff or resist any ICT-enabled transformational initiatives as they fear what they cannot understand or control. Meantime, ICT professionals, often few and at low level in the government hierarchy, do not understand the business objectives of their public agencies and remain disconnected from the core business and policy making. A large number of civil servants feel threatened by the jargon of e-government and the associated change and uncertainties. The growing number of ICT specialists wants to pursue their own agenda without seeing the need for coordination of e-government initiatives.

These gaps are expected as they often arise because of the change management issues related to introducing new technologies. The fast pace of change and the enormous potential for transformation arising from ICT render such gaps more challenging and consequential. A basic level of awareness and e-literacy is needed for policy makers, legislators, opinion makers, and other public and business leaders. As e-government brings massive changes to civil servants, preventive measures are needed to avoid resistance to change, such as retraining and employment assistance. As e-government programs have long implementation cycle, policy makers also need to balance active promotion of ICT investments with absorptive capacity and retraining programs.

New qualities are required from public leaders, in the context of globalization and innovation-driven economies. e-Leaders should have deep understanding of the policy, political, organizational, and social impact of ICT and of network-based competiveness. They have to become adept at managing knowledge workers, learning organizations, local and global networks, intellectual assets, and open innovation systems. More collaborative style of leadership will be needed. Change and transformational leadership is in increasing demand.

As e-government applications continue to diffuse, managerial understanding of ICT potential and governance has to be deepened. Leaders must shape the enabling environment for ICT applications and ensure the requisites and complementary investments in skills and process changes are in place to turn ICT investments and innovations into productivity gains. Lack of such broad managerial understanding of the potential and prerequisites of the new technologies has been the key reason for failed ICT investments in both public and private organizations, in both developed and developing countries. But the problem is particularly acute in the public sector and in developing countries and for many reasons. On the demand side, executives tend to isolate and delegate ICT leadership to technologists and ICT managers and are not aware of the critical role they must play to integrate ICT into their development strategies. On the supply side, e-leadership training tends to focus on narrow technological and technical issues, to the neglect of ICT-enabled strategic and institutional change and human resources issues.

A special cadre of e-leaders is the Chief Information Officers (CIOs). These business technology leaders have been recognized in advanced countries as executives in their own right and increasingly on par with other business executives or CXOs. The roles, functions, and profiles of the CIO have become more strategic and less technology-focused. The public sectors in same countries are catching up in recognizing and advancing the function and profile of these leaders. That is not the case in most developing countries and particularly in the public sector.

e-Leadership requires a blend of core competencies, one broad categorization of e-leadership roles and corresponding competencies is illustrated for the public sector, ranging from the strategic to the technical (Box 9.2). This blend will vary, depending on the level of a leader's power and responsibility in the organization. The blend and content will also change in view of the rapidly changing ICT. For e-leadership to be forward looking, current, and flexible, formal education needs to be complemented with lifelong learning and just-in-time peer support.

## Box 9.2 Core Competencies for Public e-Leaders

As *top executives and business strategists*, e-leaders should be able to visualize the destination of information society, the results of an ICT-enabled development strategy and/or the possibilities opened by ICT for their agencies and countries. They should be able to build an inspiring vision of how ICT will improve mission performance and build organizational success. They should be able to interact with other executives and stakeholders to shape this ICT-enabled future and then communicate it to the rest of the organization or sector for which they are responsible. They should possess competencies in strategic thinking, strategic communications, and foresight. They should have a broad appreciation and domain knowledge of the business they are in—beyond technology. They should understand the big picture.

Also as business leaders and strategists, e-leaders should define the broad directions for the ICT road map and provide managers and staff with the tools and governance to travel and learn on their way. They should be concerned with mobilizing demand for change and for realizing the developmental results of ICT investments. They should shape and inform expectations for ICT-enabled enterprise. They should also understand the needs of their clients. They should be capable of inventing frameworks and creating environments that bring forth ICT-enabled possibilities in line with business strategy, national aspirations and/or agency missions.[8] They should strive to bridge the digital divide and to build an inclusive information society.

As *change leaders*, the e-leaders are chief innovation officers of new business processes and new forms of organizations. They are also the chief relationship officers who enable the creating of new networks and work teams within organizations as well as new partnerships and supply chains across organizations. Working with other executives, they lead institutional change and inspire managerial innovation. They should have the competencies to facilitate the evolution of current hierarchies into agile, adaptive, networked, client-centered, and learning organizations. They should lead process innovation and client-centered service integration and facilitate the corresponding changes in skills, attitudes, and culture. They should be able to create sufficient trust to break silos, build partnerships, and engage process innovators, change agents and organizational development practitioners. They must have competencies in organizational development, process innovation, team building, network design and management, partnership and coalition building, and culture change management.

A user-focused e-government and seamless joined-up services can be very challenging and costly. Client-focus means changing organizational structures and processes and reallocating resources, and this requires change leadership.

[8] For such leadership qualities, in general, see Zander and Zander, 2000.

It also means changes in attitudes and behavior among civil servants. It can be a great challenge to achieve customer satisfaction while reducing the cost of services and making them affordable. It is up to e-leaders to strike the appropriate balance through process and service innovation and effective change leadership.

As *technology leaders*, CIOs are the suppliers and custodians of ICT resources. This remains an essential role of e-leaders and the traditional domain for Chief Information Officers and Chief Technology Officers. Public service constraints often limit access to technical talent with cutting-edge knowledge of new technologies, project management methodologies, and new approaches to systems development such as rapid prototyping. Also in strong demand are skills to engage policy makers and business leaders in defining systems requirements and process transformation.

Public CIOs are called upon to manage networks of ICT service providers and to engage in increasingly complex partnerships and contractual arrangements that demand current knowledge of the ICT industry and best practices. They should have competencies in outsourcing, portfolio management, project management, business case development, and information resources management. They should have broad understanding of the technological environment—the trends, the new wave of technologies, and the imperatives and the ways and means to secure open standards and avoid the risks of technological lock-ins.

Given the pace of ICT spending in developing economies and the huge bet being made by governments in this area, the lack of a defined executive leadership role and competency roadmap presents unacceptable risks of massive ICT policy and investment failure (Hanna, 2009). The high rates of failure of e-government projects are essentially due to a failure of leadership that can inspire a holistic and transformative vision. Failure is also manifested in missed opportunities to realize the potential benefits of ICT for development, and to contain the costs and secure the sustainability of e-government and e-society programs. It is also reflected in weak and slow market response to the growing gap in supplying public CIO and e-leadership education.

Conversely, the formalization of such a role—a new CIO or e-leader—and the creation and delivery of key competency building training can create a cadre of global development-oriented ICT executives with the requisite capabilities to lead ICT initiatives, infuse ICT into economic development strategies and programs, and continue to generate significant market opportunities for the ICT industries. This new breed of leaders would become the organizational architects and city planners of the information society.

CIOs, where a cadre has been established, fall far short of their role and required competencies, even among developed countries. There is a need to provide a vision

of what public CIO should look like in developing countries. This vision should cover relevance of such position, core competencies and accountabilities, and the enabling policies, tools, and processes. Future e-leaders and the new CIO leaders should be recognized as members of the most senior leadership teams. They must acquire political, leadership, and policy skills in addition to the necessary program, project and technology management skills. They should be viewed as visionaries and strategist. They should have deep understanding of the mission, business, and clients of their agencies. They should master the demand side as well as the supply side of IT leadership.

Global and local partnerships are urgently needed to build a cadre of e-leaders in every aspiring nation. The core competencies needed should be defined locally but benefit from the emerging best practices among leading nations. Experimentation with content is essential in view of current knowledge of e-leadership roles and competencies. Multiple delivery modalities should be also explored since practicing CIOs and potential e-leaders are short on time and conceptual frameworks, yet have substantial experiences on which to draw, reflect, critique, and systematize.

## *ICT Professionals: Education and Training*

A key component of e-strategies is the specialized ICT education and training necessary to deploy the new technology for improving public services and private sector competitiveness. Skilled human capital is key factor in applying ICT to both public and private sectors and in exploiting the information that ICT makes available. Moreover, education and training in ICT and ICT-enabled services has proven to be a significant generator of employment and economic growth in countries like India, China, Korea, and the Philippines.

As discussed in Chapter 1, there are three basic disconnects between ICT for development specialists and: (1) the providers of complementary assets; (2) public sector reformers; and (3) community developers and their grassroots organizations. Such disconnects and communication gaps have serious consequences for realizing the potential benefits from ICT investment and for opening up options for governance reform and broad-based development.

Bridging these disconnects requires significant changes in the education of public servants and social entrepreneurs. However, higher educational systems in developing countries are slow to respond to the ever-changing demands of the modern government and information society. For example, educational programs should increasingly blend ICT and information systems programs with public administration and public policy programs. Governments may also specify the core competencies needed from ICT professionals and CIOs in the public sector, as the US Federal Government has done.

Much of the bridging between technical and business aspects of ICT professionals must come from career development within the civil service. ICT professionals need to become hybrids, to be able to recognize opportunities to introduce new government applications, make the business case for these applications, fit these

systems into existing organizations and anticipate and comanage the corresponding institutional changes. But the bridging may also come from creating hybrids from mainstream civil services. The Maltese government, for example, has found that it is more effective to take public servants who are interested in IT and turn them into e-government hybrids (Heeks, 2006). Similarly, in Sri Lanka, the government appointed e-government CIOs and champions from senior civil servant, based on their influence and interest in transforming government, not necessarily their technical ICT competencies.

Still, governments must seek to acquire, retain, and develop technical competencies and ICT professionals, at a minimum to define its information needs, define its ICT-enabled opportunities for transformation, set its investment priorities, and negotiate its major requirements with ICT suppliers. To do so, government need to professionalize and organize its ICT cadre. In most countries, government ICT professionals are split into small packets among public agencies, with no leading organization of their own or any powerful cross-cutting mechanisms (unlike other occupational groups like government accountants, statisticians, lawyers, scientists). With outsourcing taking hold in many OECD countries, governments have lost their ability to acquire or retain key ICT expertise, compared to large companies. Many governments, such as Japan have even lost their ability to retain an "intelligent customer" capability in ICT. In contrast, some governments, such as Canada and The Netherlands have followed countervailing practices designed to maintain a strong capacity to develop ICT systems in-house and to create competitive tension between government provision and outsourcing to strong diversity of suppliers (Mansell et al., 2007, pp. 419–420).

## *e-Learning and Lifelong Learning*

Digitization of knowledge, distance learning and other ICT tools enable lifelong learning systems to function and reach across the country and beyond. A national distance education strategy should be integrated with a lifelong learning strategy.

An open, dynamic, and nationwide lifelong learning system is a key building block for an ICT-enabled development and inclusive information society. Such a system should replace textbook-based rote learning with practices that develop a learner's capacity to learn, create and apply knowledge. Key policy actions should guide a lifelong learning strategy: ensuring foundation skills for all; improving access to formal education; recognizing all forms of learning; optimizing resource allocation across sectors and over the life cycle; and ensuring collaboration among a wide range of partners (World Bank, 2005b; 2007b). In addition, this system may adopt a modular approach, to codify and segment knowledge into modules or credit hours so as to favor the earning of qualifications at different stages in life.

In formulating a human resource strategy as a key pillar of holistic e-transformation, governments may adopt specific policies to enhance the development impact of youth use of ICT. Priority may be given to ICT education in schools as well as the promotion and use of multipurpose telecenters for

promoting e-literacy among youth. Government regulation can have dramatic effects on the incentives for private entrepreneurs (often youths) to set up telecenters (Internet cafés) and thus determine youth access. A key priority for governments is to ensure an investment climate (easy entry and competition) that allows the private sector to serve the growing demand for ICT services. Moreover, governments can reach youth through the media they use, and stimulate demand for e-literacy by supporting local content development and providing public service content online. Experimentation to provide youth with the skills needed to take advantage of the new technologies will be necessary.

## *A Holistic View of Human Resources*

The above discussion underlines the need for a comprehensive view of the human resource needs and the strategic implications for a national e-transformation strategy. Human resources are a key pillar that spans the skills need to supply a dynamic ICT infrastructure and industry, and those needed to establish effective demand for ICT use and diffusion across all sectors of the economy. Moreover, ICT human resources and skills span all levels of education in increasingly knowledge-intensive and innovation-driven economies. Prioritizing, sequencing, selecting entry points, and making other difficult choices concerning human resources will need to be based on the logic and dynamics of the overall ICT-enabled development strategy. An e-skills strategy has to be based on sound understanding of the domestic as well as the global market for ICT skills. It requires understanding and monitoring current supply and demand and potential partnerships among public and private sources to bridge current and potential gaps.

For example, in India, ICT-related human resource development focused early and primarily on technical education and specialized ICT training, mainly to exploit ICT potential for exporting software and ICT-enabled services. Until recently, the promotion of e-literacy for digital and knowledge inclusion took a back seat. Similarly, an e-development strategy with a primary focus on an export-driven ICT services industry did not put much emphasis on developing e-leaders or educating potential domestic users of the new technology for competiveness and globalization. Also only recently did India give much attention to the use of ICT to improve access, quality, and learning at all levels of education, for similar reasons. ICT in education has been primarily focused on preparing the technical skills needed for the ICT industry. The overall logic of an export-driven and an ICT industry-focused e-transformation strategy provided the rational and entry points for the ICT-related human resources programs. A holistic e-development strategy, one that promotes social and digital inclusion, would have provided a different set of priorities and choices for human resource development.

Human resources issues interact with other elements of e-transformation to create either positive or negative cycles, and unless addressed, would reinforce the digital divide among regions within a country. For example, brain drain is a major issue in China as trained and skilled ICT professionals tend to migrate to the urban centers

and the more developed eastern regions of China. Successful integration of ICT in development requires a trained and skilled workforce—precisely the types of workers who tend to emigrate. Not only are residents of more developed regions unwilling to work in underdeveloped areas, but also few graduates return to rural areas once they get urban residency. One reason for the migration of skilled labor from China's rural areas is low awareness of the significance of ICT for economic development in the underdeveloped areas. Low awareness leads to low investment in ICT infrastructure, impeding further investment in ICT programs. All these factors drive away educated, technologically savvy residents from underdeveloped areas.

A key issue for a human resources strategy for e-development is e-inclusion. As e-skills take center stage in enhancing employability and lifelong learning, so does equal access to acquire such skills. This is a cross-cutting issue for an e-skills strategy and should be linked to all key elements of e-development. For example, rural telecenters can play a key role in promoting e-inclusion through special emphasis on e-literacy. Integrating ICT into education, particularly at the basic level, is another channel to promote equal access to e-skills. e-Government services primarily targeted to the common man may also stimulate demand for e-skills. Similarly, e-trade, e-customs, e-taxes, and other ICT applications to induce transaction costs between business and government could also be used to induce SMEs to adopt ICT and e-commerce, as was the case with Singapore's introduction of e-trade net.

Targeted programs to introduce e-skills to women can enhance employability and promote e-inclusion. A growing body of research indicates that social and cultural factors limit women's access to ICT, including access to shared ICT facilities such as telecenters and cybercafés (Melhem et al., 2009). Training in ICT skills is rarely gender sensitive or tailored to women's needs. Moreover, much of the content of Internet has not been developed to address the needs of women and girls in developing countries. On the positive side, there is growing evidence that women's use of Internet and cell phones has a powerful impact on their participation in the information society—from connecting to medical experts for health case, to tele-working, to securing income for family with e-banking and mobile-based services. ICT can open options to enable gender equity, rather than reinforce gender divide. These special needs and opportunities for women and girls should be taken into account in developing holistic human resources development programs for the information society. Having women in leadership positions such as public CIOs may help shape more equitable and gender-sensitive e-government programs.

Similarly, targeted ICT literacy programs for youth and people with disabilities warrant special attention. Demographics present unprecedented opportunities and challenges that must be integrated into strategic thinking about ICT for development. In 2007, about 1.5 billion people are of ages 12–24 worldwide, 1.3 billion of them in developing countries, the most ever in history (World Bank, 2007b). Young people are the main users of the new ICTs, especially the Internet and more advanced features of mobile phones and participative Internet (social networking). Youth use of ICT will increasingly matter for development outcomes and will have wide-ranging effects on youth transitions. ICT offers unprecedented opportunities to youth: harvesting worldwide knowledge, informing and educating inside and

outside schools, changing the environment for learning, and encouraging peer-to-peer learning. ICT also broadens employment opportunities for youth and provides second chances for work for youth with disabilities. Many ICT jobs do not require mobility and, coupled with possibilities for telecommuting, this opens options for young people with disabilities.

In formulating a human resource strategy as a key pillar of transforming government and building an inclusive information society, governments may adopt specific policies to enhance the development impact of youth use of ICT. Priority may be given to ICT education in schools as well as the promotion and use of multipurpose telecenters for promoting e-literacy among youth. A key priority for governments is to ensure an investment climate that allows young entrepreneurs to serve the growing demand for ICT services. This may include easy entry and competition policies. Moreover, governments can reach youth through the media they use and stimulate demand for e-literacy by supporting local content development and providing public service content online.

At a more micro level, ICT-related human resources development investments should be linked and sequenced to support the broad thrusts of ICT applications in government, communities, and the economy. Structural changes to public administration and business enterprises should be anticipated to guide the deployment of ICT as a strategic function and enabler of structural transformation. Sectoral priorities may also guide phasing and sequencing of public investments and incentives to develop ICT-related human resources, for example, to promote the use of ICT in education, agriculture and rural development, social inclusion, or to improve the business environment and promote the export-oriented sectors in the economy.

Finally, an integrated e-skills strategy requires a multi-stakeholder approach, a shared vision, and a determined leadership. The preceding requirements cut across all sectors and levels of society. They imply many policy and institutional reforms. Educational reforms in particular tend to be demanding and highly contentious, as they engage many stakeholders and vested interests. These are unlikely to be enacted by decree or top-down programs alone. Leadership must be able to engage all major stakeholders around a set of shared objectives and strategic thrusts. Business and civil society must play key and complementary roles. Many ICT multinationals such as Microsoft, Cisco, IBM, HP, Oracle, and Intel are also interested in playing a role in promoting e-skills. The excitement about ICT and its potential to transform educational and learning systems may help accelerate such needed reforms, not only to rapidly develop e-skills, but also the capacity to learn in a fast-changing information society.

# Chapter 10
# Lessons for Managing Implementation

e-Transformation is a long-term challenge for all developing countries—a profound reform and change process that countries must undergo to both exploit the new opportunities arising form the ongoing technological revolution and cope with the imperatives of competing in an increasingly fast-paced, innovation-driven global economy. All countries are still at early stages of mastering this new techno-economic paradigm. Emerging experience in the design and implementation of national e-strategies shows that the development impact of ICT investments has varied as a function of many factors, and these factors should guide future directions.

Like all bold ideas, e-transformation of government and society faces many challenges. In earlier chapters, various approaches, frameworks, and tools have been proposed to facilitate implementation of such complex transformation. But these tools will not by any means eliminate the risks, complexities, and challenges. Transformations associated with a new techno-economic paradigm are poorly understood processes, involving disruptive technologies, and complex political, social and institutional changes. Transforming government and building an inclusive information society also involve equity issues. There is a real temptation to limit e-government investments to superficial improvements and window dressing, rather than pursuing sustainable improvements and deep change. International experience points to some key challenges that may be kept in mind as policy makers and reformers start along their transformative journey.

The focus of this concluding chapter is on ICT-enabled innovation and transformation at the macro-institutional and societal levels. Implementation challenges and lessons are aimed at development strategists and policy makers and are drawn from the experience of both developed and developing countries (mainly in case studies) and the direct engagement of the author as advisor to many governments. They are informed by and consistent with, but not limited to, published research on information systems in developing countries. They may be viewed as demand-driven research topics and working hypotheses for researchers to examine and further advance. Research in information systems (IS), technology transfer, innovation policy, and information society can enrich and further deepen these lessons.

Published research and empirical findings of IS and ICT have yet to catch up with the many emerging challenges facing development strategists and policy makers

N.K. Hanna, *Transforming Government and Building the Information Society*, Innovation, Technology, and Knowledge Management, DOI 10.1007/978-1-4419-1506-1_10,

in developing countries. Academic research has tended to be mono-discipline and to focus technology or micro-organizational change. The transformative discourse has not attracted much attention in research, thus missing the strategic issues of ICT-enabled innovation associated with the development struggle. Moreover, this research remains inaccessible to policy makers as they are published in specialist journals and are not communicated effectively to policy makers and development practitioners (Avgerou, 2008).[1]

## Implementation Challenges

Using e-government to reform governance and transform the public service involves and many challenges and risks. Key among them are: opting for superficial change and window dressing rather than deep and sustained change; frequent failures of e-government projects due to vision implementation or design-reality gaps; political risks and uncertainty of social demand for change; continual priority setting and balancing short- and long-term objectives; the long time needed to develop e-leaders; and absence of public–private–NGO partnership culture.

### *Window Dressing*

e-Government is likely to lead to window dressing or superficial change, unless political and societal leaders choose to use it as a tool for reform and transformation. After content analysis of 84 e-government papers, Heeks and Bailur (2006, p. 18) found "A strong theme of overoptimism, even hype, and a consequent lack of balance in considering the impact of e-government". This does not bode well for the future of e-government as its enormous potential for improving the internal processes of government as well as for transforming relationships with clients and providing seamless public service delivery remains largely unrealized. Unless explicitly leveraged as a transformative tool, e-government may end up as

[1]Current literature on information systems (IS) and ICT in developing countries has several discourses. The basic themes or discourses are on IS implementation as a process of technology and knowledge transfer, of catching up with the rich economies, and of diffusing IS knowledge and adapting it to local conditions; IS as a process of socially embedded action involving construction of new techno-organizational structures for a given social context; and IS as an innovation and transformative intervention that leverages large-scale and deep socio-economic change. Other recurrent themes of research of most relevance to this chapter are the high rates of implementation failures (especially scalability and sustainability failures in e-government under prevailing political, institutional, and managerial conditions in developing countries, e.g., Heeks, 2006); the dependence of developing countries on global ICT services vendors; the strategic role of ICT as a source of growth and for improvement of governance and social services (e.g., UNDP, 2001); and the development of community ICT resources (e-society, telecenters). For a good review of this research literature see Avgerou (2008).

yet another channel of public service delivery and not as an instrument of transformation, or even revolution in government as many public leaders would like to see.

Many governments have advanced e-government along the lines of reengineering the front-office functions (interacting with customers) and placing their public information and services online, but have done little to reengineer their back-office government processes to make them lean and integrated. While front-office changes can be a visible and logical starting point to driving deeper changes in the internal structures and processes of government, pursuing these deeper changes involves much more political commitment, power shifts, breaking of administrative silos, and change management. A vision of a fully transformed government would lead to a leaner, smarter, and integrated back-office administration that is oriented mainly to make the front-office work to deliver high-quality and accessible public services (Chapter 5; Millard, 2003).

The EC benchmarking has shown the diverse attitudes of member countries toward e-government as a transformational tool (EC, 2009). Mature e-government countries no longer view technology in isolation, but as a business technology, hardwired into mainstream operations and embedded into institutions. Mature e-government countries (e.g., Sweden, Spain, Germany, France) have also reached some saturation in e-service adoption and now opt for deep change—attempting to either use e-government to transform the public sector or fully maximize the potential of e-government for service. Another group of EC countries, the new member countries, is seeking to close the gap and use e-government to leapfrog some of their entrenched disadvantages (e.g., Latvia, Romania, and Bulgaria).

Another study of Latin American countries (Rubino-Hallman and Hanna, 2006) concluded that e-government investments in the region have not lived up to the potential or promise, limited for the most part to "window dressing" rather than fundamental change in internal processes, external relationships, and service delivery. Despite outstanding exceptions, e-government initiatives throughout the region have focused on front-end service transactions but little on process innovation and institutional transformation. Lack of political will, inadequate budgets and short-term perspectives did not permit consistent and cumulative change or true transformation.

The Latin America region is no exception among developing countries. Recognizing the political and institutional change nature of e-government provides the key to moving e-government beyond "window dressing" and toward realizing the transformational potential of ICTs for governance and public service performance (Box 10.1).

## Box 10.1 Incremental versus Transformational: Can these poles be reconciled?

Scholars of public bureaucracy and of technological change in government continue to debate the scope and pace of ICT-enabled transformation (see, for example, West, 2005). Transformation and incrementalism are the two major

poles of the debate over the pace and scope of technological change in government. Many have argued that only incremental change is possible, as public sector decision making and policy formation are political processes characterized by small-scale shifts constrained by budgetary and institutional processes and coalition formation (Lindblom, 1959; Wildavsky, 1984). Evolution, not revolution is the norm. This limits the speed of change and how quickly new technologies get incorporated in governmental processes. IT research in the 1970s and 1980s found considerable evidence of incremental change in public agencies (Kraemer and Dedrick, 1997). Given that financial resources are limited, and decisions are made in fragmented and decentralized ways across public institutions, it may be difficult to produce large-scale or system-level transformation, even with the benefit of new technologies. Major political and economic interests slow the pace of technical innovation until they can figure out how to make sure their own vested interests are well protected (West, 2005, p. 6).

One way to reconcile these two poles is "logical incrementalism," that is, pursuing incremental but cumulative and consistent change over time. Logical incrementalism suggests that significant change can take place in the public sector such that the cumulative impact of steady incremental change over a long period of time becomes major (Quinn, 1992). As technology is appropriated and enacted over time, substantial change occurs, even if it trails proponents' projections (Fountain, 2001). Moreover, it is difficult to predict when a particular technological innovation, applied within a political process, will produce large-scale societal change. Lessons of experience and good practices are emerging to suggest ways to pursue steady ICT-enabled change toward deep transformation. This change is not determined solely by technological change and the transforming power of the Internet, but by sustained political commitment, social demand, and democratic pressures.

e-Government can enable reform and accelerate transformation, but it cannot cause them. Key measures to harness ICT potential for reform include: informed and committed leadership, national consensus on the priorities and objectives of reforms, incentives for sustained institutional change and process innovation, institutional framework for interagency coordination, partnership and collaborative approaches with business and civil society, and linking the vision of government transformation to implementation mechanisms. Reform, enabled by ICT, requires coherent policies and investments over a long time horizon to transform and integrate back-end processes. It demands a holistic approach that combines leadership, vision, guiding coalition, managed expectations, and external pressures from organized users, business, and civil society.

Using ICT to transform government is inherently a political and managerial leadership function. It demands leadership for change, innovation, and integration. This leadership needs to come from senior executive and legislative officials. Dealing with the challenges of implementing e-government calls for a mandate from the

chief executive to support organizational and process change, a managerial culture to promote innovation and client-focused service, a new cadre of chief information officers, and leadership networks to cut across public agencies, private entities, and civil society organizations. To overcome organizational silos, it is often necessary to anchor ownership at the highest levels, in a dynamic, proactive executive leadership team.

## *Vision Implementation Gap*

Many countries have developed national ICT strategies or e-development strategies, but few have been successful in following through with effective implementation (Heeks, 2006). Visions and aspirations often result in ambitious e-government and information society strategies. But there is a growing gap between strategy statements and results. Excessive optimism is often followed by excessive pessimism. What is at the heart of this gap? Several factors tend to contribute to this gap.

First is weak ownership. As developing countries and aid agencies have given increasing attention to preparing and financing national and regional e-development strategies, these strategies were often developed by outside consultants, with little local ownership or local capacity to implement. They lacked a locally-driven and owned process that develops a shared vision, builds reform coalitions, commit the necessary human and financial resources, and secure the authorizing environment for ICT use throughout government and the economy. A locally owned process would continually learn from practice. It would also appreciate and test local constraints, and thus set more realistic expectations for the pace of transformation.

Second factor is scarce e-leadership. The common failure to scale up successful pilots is typically due to scarce e-leadership. Replicability and sustainability of local and donor initiatives demand substantial e-leadership resources, not blueprints. e-Leadership is needed at all levels, to integrate ICT as a cross-cutting enabler of development strategies, to set investment priorities for e-government services, and to lead bottom-up initiatives and innovations. The gap between the demand and supply of such leaders may be increasing. This gap is not only quantitative. It is also qualitative, involving managerial skills and capacities to think beyond the technology. It is also attitudinal, as leadership for transformation calls for openness to innovation, collaboration, and learning.

A third implementation problem is the failure to focus and prioritize. This often leads to overly complex projects, with high risks of failure, and of tackling investments that are all long gestating, with little quick wins to sustain political commitment. Implementing organizations are often faced with a long laundry list of ambitious projects, far beyond the human and financial resources likely to be available.

A fourth factor is weak articulation of program implementation tools and processes such as the annual national budget. e-Strategies should be designed for implementability. e-Government programs in particular should be integrated into the country's medium-term expenditure framework.

A fifth factor is weak monitoring and implementation systems. A review of current e-strategies of many developing countries confirms that monitoring and evaluation functions are often missing (World Bank, 2006). Given the novelty and fast pace of change of ICT in developing countries, adaptive planning and learning processes are essential. Monitoring and evaluation systems are essential to learn quickly from pilots, focus on results and progress, and continuously negotiate and build coalitions for reforms.

A final contributor to the vision-reality gap is the lagging institutional capacity for change. Technological change continues to leap far ahead of capacity development and institutional adjustment. Procurement procedures of aid agencies have not adjusted to this pace. The most binding constraint to take advantage of advancing technological capabilities is the relative neglect of investing in skills and organizational change.

## *Politics of e-Transformation*

e-Government programs are inevitably political. The developmental promise of e-government and the concurrent administrative reforms and institutional changes needed to deliver on this promise have become a part of high-level national politics and an important political currency (UN, 2003). The modernity that ICT represents has its public and political appeal. But it also calls for political support to bring about difficult changes and power shifts.

The high profile of e-government programs, and the implied shifts in power within government and with clients, have important consequences (UN, 2003). First, e-government programs tend to adopt ambitious goals. While this is not entirely negative as it could lead to innovations and reforms of significant magnitudes, it could also lead to overly complex projects, and complex projects often fail, particularly in developing countries. According to OECD, "Public sector budgeting systems can encourage the funding of large and highly visible projects. . . .Very large projects, i.e., expensive, long-term, and complex initiatives, often fail."[2] Some analysts estimate the rate of failure of e-government projects in developing countries to be as high as 60% (particularly for Africa).[3] While outsourcing may reduce the risks of government failure, it should not be viewed as a magic bullet, as failure rates of PPPs are also high.

Second, there is the politics of unrealistic expectations. Many of early-declared successes and failures of e-government projects proved to be premature. It takes significant durations to embed and appropriate the technology within organizations and communities, to prepare the ground, build local capacity, and to set

[2]"Information Technology as an Instrument of Public Management Reform: A Study of Five OECD Countries," PUMA (98) 14, December4, 1998, p. 14.

[3]UN (2003); Richard Heeks (2002).

the enabling conditions. Adopting short-time horizons for evaluating results and impacts tends to miss out on social and organizational learning and on the transformative processes being triggered by the new technologies. The pressure for quick and visible successes militates against sustainable investments in capacity development and organizational capital, and leads to premature declarations of success.

Third, e-government programs often fail to build the necessary systems to pursue results and measure impact, due to political sensitivities. The political sensitivity of failure in these high-visibility programs often lead to delays in designing-transparent monitoring and evaluation systems, and suppression of data and lessons from failed pilots.

Fourth, there is the risk of slow and limited uptake of e-government services. Many factors are involved, including affordable connectivity, and the transaction costs of alternative service channels (Chapter 6). Other factors include ICT awareness, Internet literacy, the reliability and security of e-government channels, and trust in government and government information. Many countries have rushed to deploy government online services without adequate demand mobilization, content development, privacy laws, or trust building. Many failed to nurture a culture of openness and information sharing.

Fifth, e-government and information society imply power shifts within and outside the civil service, and consequently the adoption of new values and behaviors. e-Government empowers citizens and small businesses with information on public services and performance. It shifts power within public administration through flatter structures, outsourcing of public services to business and NGOs, reduction of intermediary levels of management, and sharing of information across departments. While such power shifts have been anticipated since early phases of the ICT revolution, managing them remains a key leadership challenge (Toffler, 1990). As governments move to deploy ICT in all their activities, they must define the new value propositions and the new ways and behaviors by which their customers (citizens, businesses) will be served. e-Government programs also require the engagement of private participants, including businesses and civil society organizations, and this raises many political issues concerning transparency and the respective public and private roles.

Finally, as governments are inspired by the possibilities demonstrated by e-business, the specificity and politics of the public sector are often ignored or underestimated. Government agencies are typically averse to risk and information sharing. They are likely to adapt to new processes and business models at a slower pace than private organizations. In many developing countries, it is not only the consumer of digital content (student, patient, citizen) who feels uncomfortable with ICT, but also the service provider—teacher, physician, public official (Hilbert and Katz, 2003). Re-engineering government and moving it online involves uncertainties, discontinuities, and profound changes in roles, skills, and daily routines. There are few incentive mechanisms and training opportunities to foster the integration of ICTs into the daily routine of teachers, physicians, lawyers, and other civil servants (ECLAC, 2003).

Fortunately, tools and frameworks have been developed to reduce the risks and manage the socio-political context of change. These tools range from stakeholder analysis, to user engagement and feedback, strategic communications and participatory approaches (Chapter 6).

## *Continual Priority Setting*

Increasingly, governments are using methodologies to identify and prioritize e-government services, and these methodologies are growing in diversity and sophistication.[4] Major donor-financed studies are being undertaken to measure and prioritize investments in e-services.

Such prioritization studies are often carried out upfront and relatively quickly so as to provide a final investment plan to the funding agency. Prioritization exercises would be more valuable if also used to institutionalize a process to generate deep understanding and consensus among stakeholders and greater ownership of priorities among the implementing agencies.

Experience points to the need to institutionalize the priority-setting process for e-government services (Hanna, 2007a). It is tempting to bypass this process to save time and costs—when a strong political leader is confident about which important services to proceed with, and quickly, based on local knowledge or a standard list. Once a major study is undertaken, however, it is tempting to view prioritization as a one-time event, or a blueprint plan that can remain unchanged for the medium term.

Local capacity to manage the prioritization process, and to repeat it as needed, is more critical than the sophistication of the technique or optimizing the initial prioritized list of services. Governments and aid agencies tend to focus on the techniques to produce a rigorously prioritized investment plan—regardless of who leads or owns the process and in what institutional setting it is applied. Yet priority setting is likely to recur in response to changes in the political environment, to new champions and opponents, and to learning from the piloting and testing of capabilities and commitments. It is therefore important to develop the institutional arrangements for priority setting up front, to clarify the leadership and ownership of the prioritization process, and then to use the process on an regular basis to build constituencies, commitments, and ownership.

Priority setting should lead to a balanced portfolio of projects that takes account of development goals and constituency support. Prioritization of e-government projects should be aligned with long-term administrative reform goals, such as clean government, efficient resource management, decentralization, or making public services work for the poor. To build broad political and citizen support, government may also identify early wins and start piloting a small number of high-impact e-services.

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[4]Examples include the value-measuring methodology applied by the USA, the demand and value assessment framework applied by Australia, the economic efficiency assessment applied by Germany, and the European Union's e-Government Economics Project.

Priorities in introducing e-services may also take account of the availability of appropriate e-leadership. Typically, prioritization schemes do not anticipate or measure the availability of champions and leaders at the agency or service level. Leaders of government agencies are often reshuffled or replaced as the government changes and new political coalitions emerge. Prioritized e-government services and plans must deal with the realities of such changes and their effects on implementation capability and agency initiative.

## *Lead Time and Tailored Programs to Develop e-Leaders*

Developing public e-leaders is a challenge that takes long lead time to overcome. Most public sector leaders (including CIOs) need specialized training and institutional base before they can provide the leadership that transformational e-government requires. Prevailing practices of vendors and consulting firms tend to focus on narrow technical training—hardly appropriate for these officers in their new roles as innovators, boundary spanners, and change managers. Moreover, different competencies are needed for different levels of e-leaders, and developing such leaders requires different training modules (Chapter 9).

Developing CIOs requires more than training. CIOs must have appropriate status, authority, and influence within their agency to fulfill their new role. They need appropriate tools and processes (including budgets and standards) and forums (such as a CIO council) to collaborate and share knowledge, and ultimately, to ensure coherence and consistency in implementation across government. They also need adequate incentives and career structures.

e-Leaders need not be technology-savvy. The focus of e-government is better government, not better technology. Yet this principle is often forgotten in practice. e-Government programs are traditionally led by technical specialists and technology-focused agencies, not political leaders, policy makers, and business managers. But the hallmark of many effective e-government programs has been public sector reformers with no specialized technical education.

Special programs are needed for developing top-level e-leaders—the equivalent of secretaries or deputy ministers, who often chair the steering committees for complex e-government projects, act as CIOs, and define where ICT could be strategically used in their agency and across government. Such programs would emphasize building the skills, attitudes, knowledge and experience (SAKE) necessary to support collaborative leadership and strategic change management. Awareness of technological trend, promises and pitfalls, and of tools to govern the technology, should be a plus, but can be imparted relatively quickly.

## *Weak Partnership Culture*

Practicing public–private partnership and managing network organizations require a different kind of capacity and outlook in government than has been the case in traditional public service (Goldsmith and Eggers, 2004). This partnership is not limited

to investing in e-government applications, but extends to all forms of delivery of public services by third parties, as increasingly enabled by ICT. As government relies increasingly on third parties to deliver services, its performance will depend on its ability to manage partnerships and to hold its partners accountable (Kettl, 2002).

Although a partnership approach to governing can produce more public value than a hierarchical, public-centered methods, enormous challenges are associated with implementing this new model. Delivering public services through partnerships is not as simple as privatization, as it recognizes that for many high-quality citizen services, such as health care and child welfare, a variety of organizations will be necessary. While attracting private finance, public officials must ensure that the public interest is protected. Achieving goal congruence in the public sector, however, is not easy as alignment should be on outcomes, not processes, and public service outcomes tend to be unclear, difficult to measure and may take years to realize.

Managing a portfolio of partner or provider networks also requires a form of public management quite different from what governments and citizens have become accustomed over the past 100 years (Goldsmith and Eggers, 2004). Government has to play the role of integrator, choose the right partners, decide what should be integrated, establish communication channels and collaboration practices, develop a single view of the client, and secure its oversight. Officials cannot, through partnerships, avoid their ultimate responsibility to the public for both the quality of service and whether it is justly delivered. Getting results from networks requires a sound accountability framework including setting clear goals, aligning values, building trust, structuring incentives for all partners and tie them to results, measuring performance and outcomes, sharing risks and managing change.

Public employees with the right skills to manage contractors and networks of providers are scarce, even in advanced countries. Recruitment, training and career paths in the civil service do not encourage the development of such skills-identifying public value and core competencies, understanding external partners, developing relationships, managing cross-agency teams, understanding customer needs, and developing effective knowledge-sharing practices across the network. Most public managers are used to exercise hierarchical control over employees and would be uncomfortable with the negotiated control and continuous change so characteristic of networks. Civil service systems and culture have to be made compatible with the movement to networked government and collaborative governance. Supportive leadership is essential for this major transition.

## Lessons and Guiding Principles

The focus of this concluding section is on emerging lessons concerning ICT-enabled government transformation and community empowerment. Inevitably, this is a selective list, limited to 10 broad lessons that should guide future thrusts of e-strategies for transforming government and building the information society:

1. Integrating ICT into governance reform and information society strategies
2. Pursuing a holistic approach
3. Addressing the soft aspects of transformation
4. Adopting coherent and tailored approaches to equity
5. Taking a political economy perspective
6. Adopting participatory approaches
7. Seeking quick wins within long-term perspectives
8. Building strategic partnerships
9. Balancing strategic direction with local initiative
10. Building capabilities for innovation and learning

## *Integrating ICT into Governance Reform and Information Society Strategies*

e-Government should be driven by a vision of a future government in the context a knowledge economy and information society (Chapter 3). e-Government is not about a technology-determined environment, but about economically, socially, politically and culturally constructed one. The pace and scope of technological change have been unprecedented, and the possible paths and options for transformation are likely to be varied and broad. National debate about options may consider issues beyond economic competitiveness, such as open information society, participatory development, and national identity. Public sector reformers may ask: e-Government for what? What kind of a future state and society would be possible and desirable in a globally-connected economy?

Answers to these questions should guide how governments should integrate ICT into governance reforms and information society strategies. Some insights may come from private sector experience with integrating ICT into corporate or business strategy. This integration has enabled some business leaders to use ICT to innovate new business models. In similar ways, effective integration of ICT and public sector development strategies promises to create new development models.

Much can be learned from leading corporations about bridging the gap between business and technology leaders. According to best practices, ICT strategy and governance flow from strategic intent and competitive stance (or in the case of not-for-profit sector, the mission and positioning of services). Many enterprises have been developing clear ICT governance mechanisms to synchronize ICT strategy and business strategy, and their corresponding investments. These governance mechanisms define the various ICT domains in which decisions need to be made, who makes these decisions, and the institutional mechanisms used to implement these joint ICT-business decisions (Broadbent and Kitzis, 2005, pp 111–127).

This integration is not a one-time event. Rather, public leaders need to shape expectations and set the governance mechanisms (through budgets, ICT investment decision rights) to continuously weave ICT strategies into governance and information society strategies. In Korea and Singapore, for example, the head

of government, the ministry of finance, and all key sectoral ministries are fully engaged in the shaping of the governance and information society strategies. Similarly, the national agency orchestrating e-government and information society programs should engage the whole government in shaping their cross-sectoral transformation.

Integrating ICT into governance reform is primarily a process of social learning, and thus requiring intensive communication of vision shared, progress on development outcomes and lessons learned—to broad and varied audiences. Reviews of e-strategies show that communication processes are often neglected in e-strategy development and implementation (World Bank, 2006). Awareness building and communication campaigns among all concerned stakeholders are essential to organic mainstreaming and decentralized integration of ICT into development. They are also necessary to develop the competencies of change agents to appropriate the new technologies and do their own ICT-enabled transformation of their own roles and functions, as managers, teachers, or local leaders (Chapter 6).

Experience with community-driven development also points to ways for integrating ICT into local development. Such integration should be easier at the local level, where bureaucratic silos can be bridged and practical needs of information and communication can be made more concrete and specific. The challenge here is that most communities do not yet have experience with the new technology. Policies, institutions, innovation funds, and other e-development mechanisms should allow for sufficient flexibility, experimentation, social learning, and socio-technical adaptation at the local level to facilitate ICT-enabled, locally driven development. New breeds of barefoot infomediaries, local e-champions, telecenter managers, and ICT-savvy NGOs need to be integrated into the local development leadership teams (Chapters 7 and 8).

## *Pursuing a Holistic Approach*

Holistic approaches exploit the systems and network effects by partnering among stakeholders and coinvesting in complementary resources. Holistic approaches address the institutional and regulatory adjustments to realize ICT potential in transforming public services and empowering poor communities. Proceeding with e-government and e-society applications in isolation fails to set priorities, identify cross-sectoral linkages, reuse applications across agencies, share multipurpose access centers, and sequence interdependent investments. They also miss on developing and utilizing scarce human, financial, and infrastructural resources across agencies.

e-Government cannot be inclusive and sustainable without a critical mass of users, and in turn, unless e-literacy, relevant content, and affordable connectivity and delivery channels are developed at the same time. Improving rural access attracts content developers and service providers, which, in turn, increases the demand for infrastructure solutions and helps secure the financial sustainability of rural

telecenters (Chapters 8 and 9). Synergies create virtuous cycles in which initial government and private investments attract significant investments by other interested parties.

Understanding the economies of scale on the supply and demand sides is essential to practicing a holistic approach to e-transformation. Economies of scale on the supply-side offer opportunities to share access to communication infrastructure and ICT tools, consolidate data centers, share information systems development, develop a critical mass of skilled human resources, and expand local capacity to produce and adapt ICT products and services.

The information economy is also driven by network effects (Shapiro and Varian, 1999). The value of connecting to a network depends on the number of people already connected to it. This fundamental value proposition goes under many names: network effects, network externalities, positive feedback, and demand-side economies of scale. Technologies subject to strong network effects tend to exhibit long lead times followed by explosive growth: as the installed base of users grows, the benefit for the users increases, and more and more users find adoption worthwhile. Once a critical mass of customer base is achieved, the market builds on itself with positive feedback and demonstration effects. Adoption dynamics point to the importance of pooling demand, forming demand alliances, promoting open networks and standards, and investing in e-literacy to create significant user base and positive feedback as early as possible.

There are many examples where supply-side and demand-side economies of scale combine to make positive feedback in e-transformation especially strong. Collaboration across public agencies help realize economies of scale in ICT procurement and skills development, and at the same time augment demand for local ICT industry services (Chapter 9). Government e-procurement, e-trade networks, and customs modernization can promote broad adoption of ICT-enabled business practices and thus create core competencies for a networked economy. Integrating service delivery channels and promoting multi-purpose telecenters can consolidate demand for broadband infrastructure, last mile connectivity, and content development to offer a broader range of value-added services to clients (Chapters 8 and 9).

Unfortunately, holistic approaches do not come naturally to governments, politicians, policy makers, business actors, or aid agencies. Short-term political cycles and government budgetary practices tend to reinforce the short term and thus miss the interdependencies whose impact become evident only over the longer term. Turf and silo mentality often dominate the behavior of public bureaucracies. Policy makers' understanding of systems-wide interactions and of opportunities to realize supply- and demand-side economies of scale are generally low. Leadership, policies, and institutions to bring about integration are often missing.

A holistic approach, calling for the inclusion of all the key actors and factors necessary for transformation, would likely add more complexity and coordination requirements and impose more "implementation assistance" demands than most aid agencies would like to take on. Aid agencies inevitably aim for administrative simplicity. For aid bureaucracies, "errors of omission" are seldom visible.

A holistic approach would expand the scope of an e-government program over time, to sequence interdependencies and take account of evolving local capabilities. Striking the right balance between holistic intervention and incremental progress toward true transformation would be guided by local capacity and sustained commitment to a long term vision.

Some promising approaches to pursue the holistic approach include: developing local leadership capabilities, nurturing a shared vision, and building coordinating institutions; engaging stakeholders, forming coalitions and promoting cross-sectoral collaboration; using the budget, M&E systems and other incentives to manage key interdependencies among investments in e-transformation; and/or pursuing integrated e-transformation at the local level.

Leaders and institutions are essential to integrating and orchestrating the various elements of e-transformation. Most advanced e-transformation programs have been initiated by presidential commissions, led by central cross-sectoral ministries such as finance, planning or economy, or powerful coordinating agencies for ICT and information society. Public-private councils and CIO councils provide a critical link in integrating ICT across sectors and sharing best practices on a continuous basis.

Leadership and coordination mechanisms must be institutionalized to capture emerging interdependencies and tap synergistic opportunities on a continuing basis. Some interdependencies can be anticipated, planned for and leveraged upfront in well integrated polices and investment programs. Others cannot be anticipated and would emerge or be discovered and tapped over time. The quality and competency of these leaders, institutions, and networks determine the capacity to leverage synergies and manage interdependencies for e-transformation over time.

Political, public, and business leaders may engage stakeholders in leveraging their complementary assets and competencies to further compete in the global knowledge economy and bridge the digital divide. Government may signal its commitment to transforming the public sector and building the information society, prime the pump with its demand as lead user of ICT, and invite stakeholders to coinvest in national information infrastructures and human resources. Various agencies may collaborate on developing common strategies for shared information infrastructures, integrated citizen services channels, common training programs, and frameworks for interoperability.

Government budgetary practices can be a powerful tool for integration and collaboration. In countries like Mexico, budget inflexibility and the lack of mechanisms for joint funding across organizations were considered an important barrier to collaboration in e-government programs (OECD, 2005). Other OECD governments have created budgetary mechanisms and other incentives for collaboration, including the provision of special funds for cross-agency projects (Chapter 6).

Monitoring and evaluation systems are important means to detect gaps and linkages during the implementation of e-strategies. These systems should extend their coverage to capture the potential interdependencies and exploit supply- and demand-side economies of scale. Focusing on results and developing complementary channels for feedback from various stakeholders can improve understanding of and acting on these linkages.

The government can play a lead role in promoting holistic transformation through e-government infrastructures and standards. Development of common government-citizen-business portals, for example, can create advanced forms of coordination and identify gaps in delivering public information and services. By setting standards and adopting service-oriented architectures and other common platforms, government also develops ecosystems for collaboration.

## Addressing the Soft Aspects of Transformation

e-Government is essentially about transformational change; this change is initiated and sustained by enabling policy environment, energizing vision, transformational leadership, new skills and attitudes, and strong incentives and culture for innovation. Effective use and diffusion of ICT involves a techno-economic paradigm shift that demands profound changes to the socio-institutional context and optimizing the technical and social–institutional aspects of transformation at the same time.

Many national ICT strategies adopt metaphors and models of change that convey technological determinism. The concept of an information "highway" is one. In some countries this has meant giving exclusive attention to heavy investment in telecommunications (and recently, high-speed Internet) as the enabler of transformation. The bias for investing in the technological infrastructure is always present in ICT for development programs—as if e-transformation were an engineering program. The risk is that, once the connectivity infrastructure is developed far ahead of demand, government may view the process of transformation to an information society as completed and may thus cease to address other key drivers of change.

e-Government programs often under-invest in the soft but critical factors necessary for transformation. Yet, the overwhelming evidence from the successful transformation of leading enterprises and the frequent failures of e-government projects show that payoffs from ICT investments are significantly higher and sustainable when integrated with soft but critical ingredients of change: investing in policy change, new skills, organizational capital, and managerial and process innovation. Private sector experience in the USA indicates that, to realize highest productivity payoffs, investments in intangible assets and organizational capital would typically dwarf investments in ICT (75% in intangibles versus 25% in ICT; Brynjolfsson and Saunders, 2010).

The ICT revolution and the emerging information society are raising many novel policy and governance issues, such as security and privacy in the digital world. Enabling e-transformation in the health sector, for example, requires establishing new policies concerning information sharing of the electronic records of patients. The potential benefits from such sharing are substantial, but policies governing privacy, security, and sharing are essential determinants of success or failure to initiate this transformation and realize the potential benefits.

Privacy and security are two principal perils to e-government. Poorly designed or executed privacy and security policies could doom even the best ICT-enabled

transformation initiative (Egger, 2005). As ICT-enabled government transformation advances to make government more seamless and personalized, the potential risks to privacy become greater, and the need to build user trust becomes essential. And the more the information and communication infrastructures operate and run government and economy, the more catastrophic the consequences of a successful cyber attack. Preventive approaches are far effective than curative ones.

A transformative e-government strategy requires widely shared long-term vision and sustained institutional reform efforts. Government leaders must have the vision and political will to revamp their agencies and systems. This vision should be inserted into the nation's administrative reform agenda, public service improvement agenda, competitiveness agenda, and other forums and coalitions. Coalitions for reform should be developed and nurtured (Chapters 3 and 4).

Leadership is the key to manage change, mobilize key stakeholders, make strategies actionable and dynamic, and integrate ICT into various development domains. Adopting the right roles and attitudes is as critical as the building of appropriate knowledge and skills among these leaders. e-Transformation calls for changes in leadership models and management styles: from management by procedures to management by results; from leadership through hierarchy to leading through team and strategic support; from managing turfs and protecting silos to promoting cooperation and building partnerships within and outside government; and from management by control to management by nurturing an innovative culture.

The leadership needed for government transformation cannot come just from the top. It must also come from citizen leaders; tech-savvy teachers; socially minded entrepreneurs; and business, telecenter, and community-information-center leaders. Grassroots leaders could influence national leaders in their transformation efforts, and in turn, national leaders can inspire and support grassroots leaders and change agents. This suggests a virtuous cycle between e-society and e-government programs.

Overcoming resistance to change requires a cadre of change agents. At times, these change agents may be brought from outside the government or organization.[5] More often the change agents already exist within government—they just need to be identified, trained, and empowered. Change agents and project managers should be empowered with tools and funds to facilitate the necessary changes in roles, processes, and skills that accompany ICT-enabled transformation. Other rank-and-file local leaders may be inspired by locally tailored visions and stretch goals that would inspire people. These should be complemented by efforts to share successes and knowledge about best practices and secure channels for scaling up. Local and regional success stories are more powerful than abstract and often less relevant international best practices. Strategic communications can play an important role in sharing successes and sustaining reform.

[5] In the USA, a large number of the first cadre of public-sector CIOs came from the private sector.

Effective e-government implementation also requires changes to staff attitudes, skills, and skill acquisition processes (Chapters 6 and 9; Millard, 2003). The magnitude of changes is often underestimated by both public and private organizations. These changes go far beyond attitudes and skills concerning ICT. e-Government, particularly reengineering government processes, involves new ways of working that are often fundamentally different from prevailing civil service practices. It may involve more delegation of decision making, more teamwork, and increased autonomy and staff empowerment. Shifts in forms of skills and competence development may include moving from fixed lifelong skills to flexible adaptive skills, including interpersonal communications, customer relations management, and learning how to learn; moving from skills to competencies so as to apply learnt skills to new situations; and placing more responsibility on individual workers for developing their own skill profiles and long-term competencies.

Changes in such attitudes and practices call for profound changes in the human resource management and organizational learning functions in government, to reward change, innovation, and collaboration. Much can be learned and adapted from the experience of the private sector in managing change. The new requirements and opportunities of e-government and information society suggest that the notion of civil servant needs updating. The "public service ethic" remains vital and should incorporate customer relations management, performance measurement, and modern management techniques (Millard, 2003).

e-Government both requires and facilitates the transition to knowledge-based government. Apart from providing continuous learning for employees to match the fast changes in the new public management environment, government organizations also need to enhance the management of knowledge and learning within the organization. Skilled civil servants should be treated as knowledge workers, and their knowledge should be sought, shared, and rewarded through various channels such as portals, communities of practice, and other knowledge management systems and practices.

Incentives also matter. The budget is one critical lever for change in government (Chapter 6). The US Government's OMB used the Clinger-Cohen Act (that gave it the authority to transfer IT funds from one agency to another) to forge change and invest in shared infrastructure. Another tool that helped agencies to collaborate is the scorecard. Each federal agency was graded on its progress in meeting the president's management goals, including partnership on strategic interagency initiatives. The grades were made public and discussed by the president at meetings with his Cabinet secretaries (Eggers, 2005).

Cultural factors also play a significant role in ICT adoption, particularly among public agencies and traditional communities. Cultural and human factors, such as acceptance of change and people's attitude toward government, condition progress and impact of e-government programs. Even when population is rather well educated and technologically savvy, as in Russia, low trust has slowed the adoption of e-government and e-business practices. Public policies to build trust in electronic transactions and ensure their security will be paramount to secure progress on adoption and transformation.

Sequencing the soft and hard investments matters. Developing new technologies may be relatively fast, but the time needed for institutions and people to embrace the corresponding change cannot be compressed drastically. Fast changes in ICT enable nations to leapfrog generations of technologies, but countries are unlikely to leapfrog basic education, cultural change, or institutional learning. Like the new seeds of the green revolution, ICT must be part of an integrated package of complementary ingredients.[6]

Payoffs are higher when investments in these soft factors are done ahead of major investments in physical ICT assets (Dutta and Lopez-Claros, 2005). Visions, incentives, and strategic communication have also proven to be influential in shaping the culture and shared values necessary to support client-centered service. Early investments in the soft aspects and in preparing the grounds for transformation can secure and accelerate the institutional and social learning necessary for e-transformation.

## *Adopting Coherent and Tailored Approaches to Equity*

The ICT revolution is unleashing powerful forces that will shape income distribution and employment opportunities throughout the world. The risks of growing income and digital inequalities are growing. However, ICT also holds the potential for generating tremendous opportunities for growth, economic diversification, and extending public services and information to rural areas and the poor (Chapters 7 and 8).

An inclusive information society strategy has to take a more integrated and tailored approach to promote equity. Developing grassroots initiatives and pro-poor innovation mechanisms could be made integral to a national strategy. But these initiatives, by themselves, are unlikely to provide an adequate response to the powerful forces driving inequalities. The interdependent elements of e-transformation can generate virtuous cycles that support broad-based transformation and social inclusion.

Many policy makers have equated digital and social inclusion processes with supporting shared and affordable access to ICT and the Internet through schools, libraries, and community centers. Digital inclusion is viewed as a time-bound problem of access to technology or a ramp to the information highway. Even in some of the most connected nations like Canada, the move from access to inclusion has been difficult, particularly for the rural and isolated communities.

For most developing countries, inclusion must address multiple barriers: competency, connectivity, and content. Inclusion raises public policy issues concerning

[6]The best examples of World Bank-aided projects have been those where ICT was intentionally used to induce broader institutional and policy changes and capacity development and where investments in skills, process reengineering, organizational learning, and other complementary ingredients were phased and secured early on in ICT for development programs.

the role of government in complementing the market, in partnership with the private sector and NGOs. For example, developing local content and relevant applications can be costly, and thus requires upfront strategy, incentives, foundational support, training, and collaboration with sources of knowledge at the local and national levels (Chapters 7 and 8). What policies and incentives would enable low-cost development of content and local innovation of applications, and consequently encourage innovation sharing and scaling up? How could pro-poor applications be encouraged to leverage widely shared platforms like mobiles?

Experience suggests that ICT-enabled social inclusion requires both integration and localization of e-transformation. Integration and adaptation can be pursued at least at two levels: national and subnational. At the national level, inclusion requires partnering with, and making resources available to local institutions. National programs should secure complementary investments to enable local agents to use ICT as a tool for empowerment, social inclusion and the delivery of basic services. National programs may provide mass e-literacy and help build the skills of participants to shape their own local solutions. They could include special measure to reach the poor, disabled and disadvantaged groups. They may also identify local, home grown, low-cost solutions for potential knowledge sharing and scaling up to national levels.

Government may also engage the private sector and research institutions in working with the base of the pyramid, to customize existing products and services for the poor. Government may seek various ways to make markets work for poor. This role is most relevant when dealing with new technologies and markets such as innovating and diffusing ICT applications most relevant to the livelihood of the poor. For example, government may help aggregate potential demand for new ICT products and services that are most relevant to the poor. Government may support and complement market forces by promoting low-cost access devices, open source software applications development, and innovating societal applications through competitive grants and costsharing in product development and commercialization (Chapter 7).

Much of the adaptation will inevitably be carried out on a smaller scale at the subnational levels through local partnerships. e-Society programs may work with NGOs and local institutions that are particularly focused on helping poor communities, so they would collaborate and integrate ICT into local problem solving and learning (Chapter 7). They may seek multiple channels to promote equity, for example, by enabling access to government information and services of particular importance to the poor, networking rural and small enterprises, and promoting grassroots innovation and appropriation of ICT solutions. Multipurpose telecenters, appropriately supported and networked into associations, can become focal points for integrating and tailoring solutions at community levels (Chapter 8). Organizations with extension networks like the ministries of agriculture and rural development may use ICT to leverage these networks for more cost-effective extension and service delivery.

## *Taking a Political Economy Perspective*

A political economy perspective is key to develop effective ICT governance and sustain transformation at all levels. Implementation of e-government strategies is conditioned by the willingness of powerful leaders to share information and knowledge with their populations, the political culture of the country, and social demand for accountability and clean government. Specific applications such as e-procurement, are essentially about enabling public reforms, increased transparency, and the adoption of new relationships and practices. e-Procurement involves a host of stakeholders, with winners and losers. Similarly, using ICT to transform the health and education sectors usually encounter resistance from strong interest groups that currently benefit from poor transparency and accountability. Awareness campaigns through the mass media, and other measures to mobilize popular demand are therefore essential ingredients of sustainable e-transformation.

e-Transformation involves forming and sustaining coalitions. Stakeholder analysis should move beyond understanding, toward shaping the design of e-development and influencing stakeholders throughout strategy design and implementation (Chapter 6). It should provide a basis for action—influencing stakeholders, institutionalizing stakeholders' engagement, signaling commitment for reform, building broad ownership, and expanding opportunities for ICT-enabled reform and innovation. Coalitions may be inclusive of the diverse interests of all the key stakeholders including potential beneficiaries.

Effective networking and empowerment of such weak but potentially important stakeholders are essential to building an inclusive information society. This involves raising their awareness, augmenting their resources and engendering their commitment to action. It also involves mobilizing coalitions, including marginalized groups, to promote policy and institutional reforms, and providing opportunities for mutual learning and support for e-leaders at the grassroots (Chapters 7 and 8).

Mobilizing coalitions for e-transformation can be difficult in the absence of a sense of a crisis.[7] Raising awareness about the increasing demands for competing in global economy may help spur e-transformation, in the absence of an immediate crisis. This would require engaging different kinds of stakeholders with an emphasis on vision, opportunities, and sources of growth. Chile has been an interesting example of adopting a future-oriented and opportunity-seeking e-transformation strategy that built on recent successes and prepared the nation for a future with increased global competition.

In many developing countries, coalitions exist in favor of a sector-focused approach to e-government. These sectoral or agency-based coalitions are typically reinforced by sector-organized and turf-conscious aid agencies. Horizontal coalitions should be developed to complement sectoral coalitions. A shared vision of the role of ICT as enabler of development should help in mobilizing these

[7]The global financial crisis that started in 2008 may provide a spur for economy-wide e-transformation in the USA and OECD countries, and hopefully in developing countries.

cross-sectoral coalitions. User-centered coalitions (of farmers, SMEs, women, students, etc.) need to be mobilized to complement sectoral coalitions in support of broad-based e-transformation.

e-Transformation should be continuously aligned and timed in response or in anticipation to the changing political context. e-Government programs cannot be disconnected from political horizons or election cycles in the hope of allowing stable priorities and efficient resource management (Box 10.2). For example, changes in the governments of Sri Lanka and Andhra Pradesh, India, following elections in 2004, led to a new emphasis on rural development and social inclusion. Consequently, ongoing e-development programs had to shift their resources to support accelerated development of rural telecenters in Sri Lanka, and rural content and connectivity in Andhra Pradesh, India.

## Box 10.2 Continuity, Priority Setting, and the Election Cycle

Much has been written about why e-government projects often fail, even in developed countries (see, for example, Heeks, 2002). Best practices to avoid such failures are emerging, including properly analyzing requirements, involving users, fitting solutions to users' needs and local realities, ensuring transparent and realistic contract management, and striking a balance between centralized and decentralized management (Heeks, 2006a). Yet these good practices are often ignored. Why? Because the political or election cycle determines the horizon of attention: projects are pushed to deliver before the next election, without due attention to users' requirements or local realities. These political drivers influence the priorities for entire e-government programs as well as for single projects. Moreover, they apply with special force in developing countries with political uncertainties and with time horizons shorter than even a regular election cycle.

To deal with this political context, e-government programs need to synchronize short-term actions with the political cycle even while building the pipeline for medium-term, high-impact applications and long-term infrastructure for sustainable transformation. They need to plan a portfolio of projects with different time horizons so that they can pursue evolutionary steps and quick wins even while building the long-gestating foundational projects. Managing this portfolio requires continually rebalancing investment priorities in response to changes in the political economy, political actors, and key stakeholders.

Measures can be taken to "depoliticize" e-government programs and thus avoid major disruptions in complex multiyear investment programs. Such measures may include engendering cross-party ownership for e-transformation, phasing programs into incremental achievements in line with the election cycle, securing multiyear budget funding and donor financing, and keeping projects small and simple. A balancing act is often necessary to allow continual successes and steady progress toward a long-term vision.

An e-government strategy should manage expectations about what it takes to realize the benefits. ICT is not a substitute for painful but necessary policy and institutional reforms. Rather, it is a catalyst. The promise of the technology and the enthusiasm it generates can be channeled into reform and action. An e-transformation strategy should be grounded in objective analysis of needs and constraints, systematic benchmarking, assessments of e-readiness and skills, and learning from past initiatives. It should help set realistic targets and programs within likely resource availabilities within a medium-term expenditure framework.

It is also important to manage expectations about the time it takes for e-government to impact the life of ordinary citizens. Often there are "killer applications" that could have wide and powerful impact, such as computerizing and making land records available to the millions of small farmers in Karnataka state in India. But investments in e-government are primarily of institutional and infrastructural nature, and they take long gestation periods to show results. As e-government implementation inevitably encounter resistance and doubts, it is important to balance investments between "low hanging fruits", quick impact applications, and investments necessary to build the platforms for wider impact and transformation. Prioritization and phasing of investments should thus take account of the incentives and time horizon of various stakeholders to ensure adequate incentives for a sustained public sector reform process. A compelling long-term vision, one that excites political leaders, civil servants, and citizens is often an essential ingredient to overcoming painful transition costs and temporary setbacks.

Portfolio management of e-government investments has political economy dimensions. Lacking immediate and tangible results from foundational projects, political leaders press for visible quick wins. The need for quick wins is typically reinforced by the political imperatives of weak and embattled governments (Hanna, 2008). Empowering potential reformers and innovators to act on local initiatives is therefore important. Quick impact projects are necessary to build momentum and sustain political support. They may include high priority e-services that are technically simple, have high transaction volume, and involve a large clientele. Response to political pressures for quick results, however, should be gauged so as to avoid diverting substantial financial and technical resources away from fundamental but long-gestating projects.

## *Adopting Participatory Approaches*

Experience shows that consultative and participatory processes are critical to all stages of e-transformation as they help create shared vision and understanding; build consensus and coalitions; enable bottom-up initiatives and innovations, partnerships for scaling up; and societal learning.

Consultation, participation and communication plans should be anticipatory and integral to the process of e-trnasformation (Labelle, 2005). Typically, public consultations are not undertaken on an ongoing basis, and there are no institutional mechanisms that build consultation into the transformation process. Often, technocratic

leadership first develops fully-detailed strategies and then engages in selling them to constituents. Alternatively, political leadership engages in selling grandiose visions and vague ideas of investing in ICT, then turn to the technocrats to make this happen in isolation of the stakeholders. Neither approach is adequate. An institutionalized process should build various forms of consultation into all stages of e-strategy development and implementation.

Visioning and scenario-building can be engaging and energizing exercises. Visioning exercises can be effective communication and mobilization tools. Thinking about the future, particularly a desirable future, can captivate people's imagination and secure support for its implementation (Chapter 3).

e-Readiness assessment methodologies could be strengthened by becoming more inclusive and interactive. Assessment suffers major limitations as it is carried out in isolation from effective people-centered, participatory and consultative processes. As they reflect aggregate indicators of e-readiness at the national level, they rarely capture the digital divides within countries or between urban and rural areas. At the national level, assessments could be designed and used to raise awareness, engage stakeholders, form coalitions for reforms, and brainstorm about ICT-enabled futures. They could be complemented by local or community-level assessments (http://www.bridges.org). e-Government and e-society strategies may draw on a blend of assessments at the national, regional and community levels to capture diversity, regional disparities and the needs of special populations.

Consultative and participatory processes help build consensus and coalitions for policy and institutional reforms and secure governance for ICT investment strategies and action plans. Policy reforms and laws, by themselves, are not sufficient to bring about changes in government practices. Technocratic design of e-strategies is unlikely to induce innovation or overcome resistance to the massive changes that accompany these strategies. Rather, strategies and action plans should be used to communicate the intentions of national leaders and reformers. Consultation should be representative so as to include the marginalized groups such as women, youth, rural and poor populations.

Participatory processes should be also deployed to guide bottom-up initiatives and innovations and build partnerships for scaling up and diffusion. "Letting a thousands flower bloom" may be adequate for local learning and local innovation, but not a viable strategy for scaling up development impact. Governments may draw on trade and professional associations, community-based organizations, and other nongovernment organizations to engage in grassroots innovations, to diffuse best practices and to form partnerships for sharing lessons and scaling up successes.

Consultative approaches to strategy formulation run the risk of producing long wish lists with no priorities attached. Well-intentioned attempts to seek quick wins and make a difference can also absorb scarce institutional and implementation capacities and work against coherent programming and priority setting. Political pressures also support pet projects and reinforce the tendency to add, rather than prioritize (UNDP, 2003). Donors can further frustrate the prioritization process by adding their own priorities. ICT industry suppliers and vendors, local and global, may inform other stakeholders or, alternatively, distort and diffuse national priorities in deploying ICT for development.

To reduce such risks, stakeholders may be engaged in prioritization through participatory budgeting. They may be involved not only in identifying priorities but also in negotiating among priorities and trade-offs within hard budgetary constraints. They may also engage in developing solutions to mobilize additional resources. Consultation may also move beyond obtaining support for stand-alone initiatives and toward enhanced collaboration and partnerships to implement nationally prioritized programs and shared infrastructures and capabilities.

## *Seeking Quick Wins Within Long-Term Perspectives*

A uniform and even advance in integrating ICT across sectors can create a critical mass of users, but is not always possible, as public and private actors adapt to the new roles and processes at different paces. Change and innovation often arise in specific clusters, locations or sectors, enabled by a critical mass of leadership, talent, partnerships and resources. A comprehensive e-government program, applied evenly and rigidly across all sectors, may thus risk holding back initiatives and progress among the pioneers, and innovators while prematurely pushing for costly change among the lagers.

Holistic approaches to e-government and e-society need to tailor the ingredients of e-trnasformation to sectoral and institutional contexts. Special attention to the attitudes and incentives of physicians, teachers, and extension workers would be important to integrate ICT into their daily routines. Advance is likely to be relatively slow is such sectors as education and health, and targeting them for transformation will depend on clear national development priorities. The role of national leadership, public and private, is to support agents of change, leverage entry points, scale up success and diffuse best practices.

Focusing scarce resources on exploiting ICT for transforming government and building information society requires selectivity. Some sectors may be selected as leading ICT users and targeted for a holistic e-sector transformation strategy. The logic for such selectivity and sequencing should be explicit. For example, ICT in education has been a common sectoral entry point to IT usage in many countries, reflecting the popular belief that e-literacy and e-education offer significant opportunities for the emerging knowledge economy. Alternatively, sectors may be selected because they are advanced in terms of e-readiness and leadership, and can thus be used to demonstrate early wins and building political support for wider government transformation. National consensus and political commitment on reforming certain sectors may make them candidates for early e-transformation. Global imperatives to meet certain standards may drive e-transformation in certain functions of the economy, as in customs and trade facilitation. The challenge is to sequence and leverage these entry points for learning, diffusion, and network effects for the rest of the government and society.

A portfolio combining quick wins and foundational investments for e-government should strike a balance between short- and long-term priorities,

pursued within political, financial, and human resources constraints. For example, some quick-win proposals could be attractive because they promise to expose civil servants or the public to new technologies and information-sharing practices—and thus to mobilize demand and change the climate for participation and empowerment. Quick wins can build confidence and momentum. For example, giving early priority to public services with the largest number of potential users and beneficiaries can help sustain commitment to and demand for continual improvement. Also, small projects allow organizational learning at low cost and risk. Funding a variety of grassroots initiatives can further provide demonstration effects and tangible benefits and thus build and sustain coalitions for reform. But they should be pursued within a holistic and sustainable strategy.

Yet, an e-government strategy should also give due attention to major foundational projects as priorities for funding—projects focused on establishing the common infrastructure and architecture for the entire program. Foundational projects take long gestation periods to develop and implement—including the lead time to build relationships with and capabilities of the owners of the new information systems, to map and reengineer business processes, to analyze systems requirements, to design these systems, and to mange the change process. But these are building block for transformation.

## *Building Strategic Partnerships*

The potential of partnerships for e-transformation is enormous. Some e-government programs are moving toward new forms of coinvestments that involve public-private partnerships. Success relies on tapping the best elements of each partner and weaving them into a cogent strategy (Chapter 5). The Indian state of Andhra Pradesh has shown how these ingredients work together. Its e-strategy initiatives were driven by a small team of civil servants under a dynamic political leadership, and implemented in strategic partnership with the private sector.

Experience of leading nations indicates that it is possible to take advantage of the financial resources and competencies of private participants in all aspects of e-transformation. The participation of private enterprises and NGOs can augment implementation capabilities of government as a user of ICT and as a catalyst in promoting e-government and e-society. Furthermore, business and civil society participation can speed up the transformation process in government, draw on more advanced e-business practices, and open up the government to local parties outside government and thus make govnernment more inclusive and transparent.

For the short term, partnership schemes involving businesses and civil society in delivering e-government services may be phased and tailored to local and political contexts. Partnering with the private sector is emerging as a key accelerator of e-government program implementation, even among the poorest and least developed countries. In fact, given the poor conditions and capabilities of the civil service in

many developing countries, public-private partnerships may provide a channel to leapfrog the long learning process.

Countries may take an entrepreneurial approach to help build experience and confidence in involving local and foreign business in investing or managing e-government applications. Private participation in advancing e-government could benefit from a learning strategy that takes account of local conditions. Such a strategy would draw on experiments with different PPP models and be informed by the views of local business and by emerging international best practices. It would address common challenges and misconceptions, such as the fear of losing government control or diffusing accountability for public services. PPP should be viewed as a systematic shift in focus from providing public services directly to manage the service delivery process and the standards agreed with the private or third-party operator.

A wholesale outsourcing of government services without preconditions is unlikely and perhaps risky. A strategy that leverages PPPs for government transformation should be guided by strategic country considerations. These include the capabilities of the public and private sectors, the risks that the government may wish to share with the private sector, public financial needs and risks, government's capacity to design and enforce service-level agreements, likely business models and revenue streams and thus the attractiveness of services to the private sector, prevailing political view about the roles of the private and public sectors, and global technology trends and business practices. Some sectors or services may be more attractive to early PPPs, and these may be where to start.

Several governments have developed policy frameworks to guide public and private sector actors in initiating, planning, implementing, monitoring, and evaluating public-private partnerships. South Africa and Ghana have started by setting such a policy framework to support and guide a movement towards PPPs across sectors. This framework is expected to help mainstream the use of such partnerships to harness the strengths of both the public and the private sector in transforming government services. Such frameworks address the key requirements of PPPs: contracting guidelines, service level agreements, security standards, audit standards, and contract management guidelines, among others.

New models of public-private partnerships (PPPs) are opening options for developing countries to leapfrog in e-government services without committing substantial investments and taking excessive risks. One consequence of increasing reliance on partnerships is that policy makers will need to develop new governance structures and management practices. PPPs must be restructured carefully and managed effectively to ensure accountability, quality, and reliability of services. And capacity to partner has to be built over time, through experimentation and practice.

## *Balancing Strategic Direction with Local Initiative*

A critical issue in e-government programs is what are the different roles that can and should be played by different levels of policy and initiative. Strong central

leadership, consisting of an overall vision, strategies, frameworks, and roadmaps are important to success and scaling up e-government impact to the national level. However, this needs to be complemented by local initiatives, driven by local champions. This involves a difficult balancing act. Leaders and champions have to find the appropriate balance between, breaking down silos and undermining vested interests, on the one hand, and preserving local ownership and freedom to act in response to specific local needs, on the other. Different countries need to develop their own paths, as each has unique socio-political and institutional traditions, and at the same time, all can learn from the experience of others.

Local initiative is essential for several ICT-related reasons: versatility of ICT, uncertainties of the new digital world, context-specific complementary inputs, and localization of knowledge. Bottom-up initiatives are essential to generate local solutions, innovation and learning, and thus unlock the transformative power of ICT.

The versatility of ICT has to be matched by a willingness to understand the social and institutional contexts within which the technology is applied. e-Government involves joint investments in complementary factors. It deals with intangibles such as knowledge, innovation, learning, software and organizational change. e-Society is also linked to issues of communications, language, identity, control, and empowerment. Much of these intangibles and complementary factors are context-specific and subject to local understanding and decisions. They cannot be under the exclusive power of a central agency. Neither can it be bought as a blueprint plan nor turnkey solution.

Localization of knowledge and content is essential to e-development. Technology-driven visions of downloading global knowledge are misleading (Stiglitz, 1999b). The vast variety of human societies requires knowledge localization. Practical know-how is largely tacit knowledge, to be acquired through apprenticeship and social interactions. Each community should therefore take an active role in the local learning process and in the creation of local content and indigenous knowledge. The growth of community access to the Internet, community networks, digital literacy, and social networking tools helps this locally driven social production, adaptation and application of information and knowledge.

Developing countries thus need to build the capabilities to acquire, adapt, maintain, customize and re-invent existing "ICT solutions" to meet ICT needs under very diverse local conditions. Development experience shows that dirigist central planning fails in diverse and pluralistic environments. Local initiative is essential to effective appropriation and integration of ICT into development (Chapters 7 and 8).

Excessive reliance on a top-down strategy formulation process has its risks and limitations. Common pressures to produce plans do not allow time to develop robust data and research on users' needs, preferences, priorities, and capabilities, and plans inevitably start with many assumptions. Rather than emphasizing an iterative and adaptive process, top-down strategic exercises risk rarifying the final planning document and glossing over these assumptions, and thus undermining continued learning, strategic thinking, local initiative, and grassroots innovation.

These risks are magnified when aid agencies and poor countries end up hiring international consultants to carry out proforma strategic planning exercises and end

up buying national ICT strategy documents as standard recipes that are not grounded in local diagnosis or linked to local initiatives and aspirations.[8] Local e-leadership institutions end up being bypassed or underdeveloped.

Orchestrating top-down and bottom-up initiatives can create powerful and sustainable transformation dynamics. Top-down initiatives set the overall vision, create awareness, build coalitions, establish e-leadership institutions, invest in shared infrastructures and capabilities, and evaluate development outcomes. Bottom-up initiatives provide incentives and small grants in support of ICT-enabled community innovations, digital local content, local capacity building, local partnerships, e-literacy, telecenters, and connectivity initiatives (Chapter 7). A combination of bottom-up and top-down processes supports pilots and rapid-results projects, and mechanisms to scale up successful pilots into a critical mass of national initiatives. This combination would lead to the adoption of deeper and long-term reforms, and institutionalized monitoring and evaluation, and subsequently, a second generation of pilots, policies and programs.

Top-down and bottom-up initiatives may be sequenced to accelerate national learning. In India, for example, e-government projects started as isolated pilots and local initiatives, in response to local pressures, or to gain quick wins. As these initiatives gained visibility and built experiential base, the Indian Government began to face the challenge of achieving sustainable gains and economies of scale. This demanded top-down directions to consolidate demand, integrate systems, and share data, infrastructures, capabilities and solutions (Chapter 6).

Striking the right balance depends on political and administrative culture of the country. Countries with plural and decentralized traditions, and active and informed civil society, such as Canada and India, are likely to adopt more flexible e-government programs that are informed by local initiatives, put resources and capabilities at the local level, and support local experimentation and innovation. In other countries, such as Korea, the initial push for e-transformation has been top-down with clearly defined goals and foundational investments. Only later came the search for ways and means to induce innovation and deepen transformation in processes and services.

Pursuing e-government at the subnational or municipal level is also part of this balance. First generation e-government strategies focused on the national or central government level in most countries. Yet, most transactions between citizens and governments occur at the city or local level. Some innovative and promising initiatives of e-government have been pursued by transformational leaders at these levels. But most subnational governments lag behind national governments in e-services, with rural municipalities least likely to have the funding or expertise to provide e-services.

A balanced strategy would give increased attention to investing in e-municipalities and in replicating successful government transformation programs

[8]Similar arguments are made against adopting a standard recipe for growth strategies and institutions in Rodrik (2007).

at the local or subnational levels. Some countries, such as the UK, Scandenavia and Korea provide central funds to pump-prime local governments to innovate and mainstream e-services. Several central governments, like India and Mexico, are exploiting economies of scale to develop modular systems and open source solutions for common local government functions. An ambitious e-government strategy would aim to integrate three tiers: centrally-provided cross-agency facilities, federal or national agency's service provision, and state and local governments.

As countries progress towards connected governments and internet-literate communities, e-transformation programs tend to become more flexible, pluralistic, community-based and locally driven. Countries that started with some central plans like Korea,Vietnam, Indonesia and the Philippines, have since been moving towards more locally-integrated or decentralized e-government investment programs, enabled by selective and strategic central investments. In Korea, the central government continues to shape the framework conditions for e-government, but pressures are mounting from local governments to move faster to allow information sharing, local initiative and engagement, and e-participation (Kim, 2008). In China, local governments are active in e-government, with the central government focused on monitoring, benchmarking, responding to local government demand, and building forums for exchanging experience across localities. Leading countries are learning that reforms and innovations must be discovered and demonstrated at the local or micro level before conditions allow for a "second generation" national or macro strategy to emerge.

## *Building Capabilities for Innovation and Learning*

e-Government and e-society programs are essentially about innovation. They are not about spectacular innovation in "high technology" or ICT per se. They are about innovation in services to create new products—and in the management, production, and delivery of such services to add public value. However, innovation in services is generally less well understood than in manufacturing; it needs to be systematically researched, pursued, and institutionalized in support of public reform goals.

Innovation, experimentation, and piloting are unlikely to cease with the maturity of e-government and information society programs. The European Commission benchmarking of e-government (Chapter 6) shows that as the technology landscape continues to change fast, countries engage in continuous piloting or "beta testing," involving customers and experts in an ongoing dialogue to develop and improve the service and the enabling technologies (EC, 2009). Governments are moving away from large-scale projects and lumpy investments and tending toward pilots and phased investments that provide greater agility in execution. Some countries with decentralized federal environments, such as Germany, are using state and local governments to develop and test new services and thus use local diversity as a test bed for innovation in e-government.

Many lessons can be learned from research and evaluation of innovation policies and technology diffusion programs that have been traditionally targeted toward industries and enterprises (Chandra et al., 2009). Innovation policies and diffusion programs have typically focused on technological innovation, research, and development, but neglected the promotion of innovation in services in general and the public sector in particular. However, some countries like Norway have shown special interest in innovation in its comparatively large and high-quality public sector. Moreover, regular assessments of e-government programs are yielding new insights into the innovation process in the public sector (EC, 2009; Chapter 6).

What are the key lessons that would be applicable to innovation in government and social organizations? First, innovation policies have evolved a large set of policy instruments covering both supply and demand such as R&D, incentives, public–private partnership, innovation funds, diffusion programs, public procurement, and innovation capability development. But experience suggests that there is no one-size-fits-all policy mix. Innovation policies must evolve and be based on informed and contextualized learning from international and local practices. The focus of innovation policy instruments also changes over time, in line with cumulative institutional learning and capacity development. The need for adaptation of innovation policy instruments to local context is probably more critical for e-government and e-society than for e-business programs.

Second, openness to foreign technologies and innovations through trade, ICT multinationals, international management consulting firms, the diaspora, and other international networks is a critical condition for effective adoption, adaptation, and assimilation of ICT in government and society, as it has been in business. Multinational companies are the principal creators and disseminators of ICT knowledge and best practices. This knowledge can be leveraged through FDI, public–private partnerships, and developing the externalities that foreign investment can bring. But openness is not enough. Governments must build their own capacity to partner and become active innovators, strategic investors, and discriminating users.

Third, the principal challenge facing most governments and societies is not the country's access to technology, but absorptive capacity. Absorptive capacity includes leadership, human and institutional capacity, and the extent to which the civil service culture and political environment are supportive of change, transparency, user innovation, and grassroots participation. e-Government is not just a matter of investing in ICT; it is important to use it effectively. Attention to domestic absorptive capacity is essential. Attention should extend beyond the top-performing agencies (or urban centers or firms for that matter), to include capacity at local government level and dissemination channels within communities. Central governments should build the capacity of local NGOs and local governments to partner and become active co-innovators.

Fourth, the capacity of government agency, NGO, or a citizen to use ICT effectively and innovatively depends on the basic technological and information literacy of civil servants and customers, and this in turn depends on the capacity of government to deliver quality education, including e-literacy. Inclusive development

requires that these skills and capabilities be widely distributed. This has important implications for human resources development and management in the public sector. It has implications for training and empowering citizens to use ICT effectively and innovatively.

Fifth, by becoming a lead user of ICT, the government can stimulate widespread e-literacy, local content development, and ICT adoption by the society at large. The role of government as a leading user can also advance many of the framework conditions for the information society, such as security and privacy policies and the availability of public information resources.

Sixth, most innovation occurs incrementally, at the grassroots or frontline service delivery level, and thus incentives and resources should be made available to these levels. Innovation funds could provide small grants to finance pilots and micro-reforms, empowering change agents at the lower levels of government to experiment, demonstrate, and learn (Chapters 6 and 7). A flexible and decentralized framework for innovation is better suited to take account of diverse conditions and opportunities for innovation. e-Government programs can gather feedback from frontline service providers (and electronically) to close the customer feedback loop and engage customers in the innovation process. Local governments are better positioned to engage in collaborative innovation with their local business and community organizations. Governments can also exploit the new tools for communications (such as social networking technologies) and the new models of innovation (such as open innovation) to leverage the creativity of citizens and grassroots organizations to co-innovate e-government services (Chapters 2 and 7).

The seventh lesson is the importance of diffusion of ICT-enabled innovation within government and throughout society. The potential to increase national productivity is substantial, provided that ICT-enabled innovations are demonstrated and diffused widely within government and society. Specialized institutions to support innovation in government could play an important role in scanning global knowledge on e-government, assessing emerging technologies and trends, identifying and demonstrating home-grown innovations, and using various channels and forums to share locally tested and adapted e-government solutions. Such mechanisms for sharing knowledge and innovations should make effective use of local best practices and home-grown solutions. They should help governments to avoid reinvesting in the same systems solutions or "re-inventing the wheel." A good example is Brazil's Observatory of Practices of Information and Communication Technology in Public Management which was created to make innovative public sector IT applications publicly available (Chapter 6). Similar institutions have been created to promote ICT-enabled grassroots innovation and to widely diffuse promising innovations for the information society, as suggested in Chapters 7 and 8.

Finally, experience shows that e-government and information society programs that adopt a "learning process approach" to implementation are more effective. A learning process approach mobilizes and integrates local capacity building for learning and adaptation. A learning process approach is flexible, evolutionary, participatory and results-oriented. It builds on local capacity to adapt and learn, as it

combines top-down strategic approaches with vibrant and diverse bottom-up local initiatives (Hanna and Picciotto, 2002).

A learning process approach gives due attention to institutional experimentation learning capabilities. It relies on results-oriented monitoring and evaluation systems to enable timely adjustment, user feedback and adaptive planning. It requires relentless pursuit of citizen feedback about e-services so as to drive further government transformation.

Most essential to a learning process approach is to build capabilities and access to resources to enable adoption and adaptation of information and communication technologies at the local level. It invests early in areas such as e-literacy programs, shared access centers, and social innovation funds. It emphasizes local capacity building in support of community-driven, ICT-enabled solutions.

This book is about chasing a moving frontier. Lessons and practices for an information society continue to evolve at a rapid pace. Learning has become an essential tool to shaping the future. The best we can do is to share these lessons as early and widely as possible and to institutionalize and localize the necessary innovation and learning mechanisms.

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