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e-Leadership Institutions for the Knowledge Economy

Nagy K. Hanna

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Foreword

Leadership, institutions, and human capabilities are critical factors that determine if and how countries are able to transform their visions of information societies into concrete strategies that enable them to become competitive, innovative, and knowledge-based economies. Past and current research indicates that access to information and knowledge empowers citizens and allows them to improve their livelihoods through more informed choices and decisions related to nearly every aspect of their lives.

Governments are instrumental in helping to create such information societies, with policies and infrastructures to promote growth and affordable access, and with e-Government programs that are designed to provide single-window multi-channel access to government services and timely information to their citizens. Such activities, policies, and strategies fall under what is now increasingly referred to as "e-Development."

How can development agencies assist countries build the institutions and capabilities required to become a knowledge economy and to successfully implement e-development programs? What are the institutional options and innovations available to governments? How should countries and development agencies design and implement e-Government projects within current or new institutions, and sustain these through local capacity building?

This report, commissioned by the Global Information Communication Technologies' Policy Group of the World Bank (CITPO) and the World Bank Institute (WBI), and written by Nagy Hanna, a leading international expert in e-Development, points at an array of institutional leadership options available to countries at various development levels. Understanding these options and their respective strengths and weaknesses is a starting point for country leaders and other policymakers to fashion the institutional mechanisms and competencies that e-development requires. The report identifies five broad archetypes or basic institutional models and considers the experience of various countries in terms of these models. It provides a list of pros and cons of each model, based on recent country results. It also identifies the core capabilities that e-Development institutions should possess to achieve and sustain ICT-enabled economic and social transformation. It also suggests a research agenda to further our understanding of the governance and institutional mechanisms needed to guide e-Development.

We hope you enjoy reading this report, and we look forward to your feedback as the World Bank Group experiences a surge in demand for policy advice on e-Government. For feedback, you can contact the author directly at nagyhanna@comcast.net or contact the World Bank coordinators Ronald Kim, Randeep Sudan and Samia Melhem at respectively: rkim@worldbank.org, rsudan@worldbank.org or smelhem@worldbank.org

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Various drafts of this paper also benefited from thoughtful comments from e-leaders, CIO practitioners, and academics. In particular, I would like to thank Larry Meek, e-government expert and former CIO of the city of Vancouver, Canada for his thorough reviews of several drafts. I wish to also thank Professor Ernest Wilson III, Co-Director of the International Centre for e-Leadership of the University of Maryland; Professor Jean-Pierre Auffert, Director of the Technology Management Program at George Mason University; Dr. Peter Knight, President of Telematica e Desenvolvimento Ltda.; Tadao Takahashi, Director General of the Information Society Institute, Brazil; and V.K.Samaranyke, Chairman, National ICT Agency, Sri Lanka.

A first international workshop on e-Leadership, organized by the University of Maryland in collaboration with the World Bank Institute and USAID was held in June 2005. It indicated the urgent need for this research. I am indebted to those 40 participants (policy makers and national CIOs of 20 countries and senior executives of multinational ICT companies and aid agencies) who contributed to this international forum and stimulated my thinking about this critical area.

This study is a pioneering review in a relatively unexplored and neglected area of the emerging knowledge economy. Institutional issues in leading e-development and the knowledge economy are missing from the Bank's and other aid agencies' research agenda. Yet, this a pressing issue for policy makers and development practitioners. The study does not claim to provide a statistical cross-country comparison or an overarching academic framework within an established paradigm. The study did not have the resources to conduct field visits, primary research or in-depth country analysis. Rather, it aims to map out the issues and emerging patterns and raises awareness about the options and opportunities available to countries in devising their institutional architectures to lead ICT integration into their economies. At this stage of development of this new field, it is more important to respond to the policy agenda than the academic agenda.

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Executive Summary

Leadership, institutions and human capabilities are key to moving countries from visions of the potential of the ongoing information and communication technology revolution to real competitive, innovative and knowledge-based economies. ICT is best viewed as enabler; it empowers stakeholders to achieve their business or development goals. Value comes not from technology, but from changes in behavior, process and organization, enabled by technology. E-development present challenges in formulating, implementing, monitoring and evaluating ICT-related policies for social and economic development. E-government in particular presents unique challenges in using ICT for service delivery innovation. It cuts across all government departments and all sectors of the economy. Government agencies must act as regulators, facilitators and users of ICT, in close collaboration with other major stakeholders in private sector and civil society.

The general purpose nature of ICT requires institutional arrangements and coordination mechanisms that ensure the coherence of policies and investments across all relevant sectors. Moreover, the 'whole of government' or cross-cutting approach provides opportunities for shared infrastructure (such as government networks, dates centers.), shared applications and facilities (such as e-procurement, e-payment gateways, authentication systems, e-security), common business processes (such as financial, human resources management), integrated citizen-centric services, and service delivery platforms. Such an integrated approach is even more important for developing countries where financial resources and skills are scarce. It requires empowering existing or newly-created public or public-private entities to provide e-leadership and strategy (policy and advisory functions) and to implement, monitor and evaluate programs (operations function). A critical issue is the positioning of such an organization within the government and developing its enabling links to other stakeholders in the private sector and civil society.

There is no single model, no "one size fits all" institutional solution. However, there are common principles that should work across most countries and economies in translating ICT into a powerful tool of development. Emerging patterns and trends may be also discerned concerning the governance mechanisms, organizational structures, and core competencies of international bodies responsible for promoting and coordinating knowledge economy programs in general, and e-government programs in particular. Neither governments nor aid agencies should continue to repeat earlier mistakes.

Several key designated institutions - e-Development Councils, National Chief Information Officers, CIO Councils, central ICT agencies and e-Government Directorates - are being created to advance the national e-agenda and promote collaboration among key stakeholders within and outside the government. Their responsibilities and position vis-à-vis other government institutions vary significantly depending on the existing structure and business culture of public administration. Country institutional maps for the ICT sector, and more broadly for ICT-enabled development, are much more complex and may include ministries, regulatory agencies, specialized commissions, promotional agencies and consultative groups. The focus of this study is on the central or leading

institutions for e-development and e-government and emerging broad patterns of institutional arrangements, options and innovations, and lessons learned, rather than on drawing specific or comprehensive maps for each country.

This paper presents five basic models or archetypes of e-leadership institutions. They are used for comparative analysis and for detecting patterns and trends of an otherwise complex reality and rich institutional innovation and learning. They can serve as initial starting points or options for governments in creating or evolving their institutional framework for e-development. None of these basic models need necessarily be implemented as is. Mixes and matches among these models are increasingly innovated and tailored to the specific needs and conditions of each country. Governments may choose from and build upon these basic approaches, with full understanding of the advantages and disadvantages of each. The paper's diverse country case studies suggest that these models are evolving, hybrids are being created and rich lessons are being integrated into further innovations of e-leadership institutions.

We discern some broad trends in the evolution of e-leadership institutions:

- There is a shift towards direct and institutionalized engagement of the president, prime minister, CEO or a powerful coordinating ministry like finance or economy. This is done through the search for an overarching institutional framework for e-development or ICT in the knowledge economy and placing this capacity for orchestration and policy coordination under the highest authority. A common trend for e-government leadership is to place a coordinating unit within the office of the president, or establishing a policy coordinating committee chaired by the prime minister or the head of state. The head becomes the visible e-leader--using e-government as a core component of his management agenda and more broadly, using e-development as a key to the transformation of the country's economy to a knowledge-based and innovation-driven economy.

- 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 were 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 the head of state.[1] At that stage, the central message was to raise attention to the enabling role of ICT across the bureaucracy and society. Over time, these temporary bodies and ad-hoc processes were transformed into permanent institutions and formal coordination mechanisms. These 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.

[1] The number of nations who turned to such task forces is notable: Singapore in 1992, USA in 1993; followed by Japan, Korea, China, among others. See Wilson (2004).

- 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 focus and emphasis from technology management to public sector reform, institutional change and process innovation management.

- As a further evolution, many countries are opting for creating an independent and strong national ICT agency that reports directly to the president, prime minister or the equivalent. These agencies tend to focus on policy development, governance mechanisms, "whole of government" approach to public interaction, 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 and retain alignment with public service value creation. The shift to this model is driven by a growing recognition that e-development is a cross-sectoral, cross-industry, cross-agency, cross-hierarchical process. E-government in particular is a major transformational process that requires political leadership, a holistic view of government and ability to partner with non-government actors.

- As e-government programs take hold and mature, countries move beyond concern about the central agency and common information infrastructure and start organize and rationalize at deeper levels of government so as to fully integrate e-government into the governance framework and activity of each sector and agency. A parallel shift in emphasis is from computerization and technology management to service transformation and people management. It is also a mindset shift from inside-out, agency-bounded perspective to outside-in, client perspective of service delivery. In the process, the role of central agencies also change from top-down solutions and common infrastructure issues to playing catalytic roles for service reform and innovation. The aim is to facilitate public service innovation at all levels of government, institutionalize and scale up process innovation, promote collaboration across boundaries, engage more stakeholders and disseminate best practices.

- More broadly, the components of e-readiness and e-development are changing over time, and e-institutions evolve accordingly. As the basic level of readiness and information infrastructure are built, the emphasis shifts to innovation, human resource development, business process transformation, public-private partnerships, legal framework, a holistically supportive environment, bottom up participation, and other soft factors. E-leadership institutions have to evolve to meet these new balances and requirements.

An analysis of the degree of success that various countries have had with each of the models provides a list of pros and cons for each. On a broader level, this analysis helps identify the core capabilities that e-development institutions must possess in order to achieve ICT-enabled economic and social transformation. Developing these core

competencies should guide institutional development and capacity building efforts for better governance and coordination of e-development programs.

Observed key elements of success are: differentiating policy and operational functions; translating visions into specific programs; aligning with national development strategy and public sector reform, committing to a long-term perspective; linking the central e-leadership agency to the Ministry of Finance or providing it with authority over public ICT investments, staffing such agency with capable professionals; embracing nationwide e-strategies to avoid duplication and benefit from economies of scale; and making effective use of monitoring and evaluation mechanisms. Political leadership is critical in providing the authorizing environment and enabling linkages for the central ICT institutions.

Core capabilities that e-development institutions should possess are: human resources development (including a focus on capacity building and "on the job" training for staff); the mobilization of resources (obtaining and managing funds for specific programs); program management (including coordinating between stakeholders, the use of project and program management methodologies, and the utilization of reliable evaluation and monitoring tools); the forming of partnerships with key stakeholders (local communities, private enterprises, non-government organizations, multinational organizations, academia and government agencies); and the use of strategic communications (for raising awareness at all levels of society).

The country case studies suggest that the adopted models of e-leadership institutions tend to evolve with the maturity of e-development programs. The appropriate level of centralization versus decentralization is a key consideration in the design of national e-leadership institutions and the balance is often determined by the political and institutional architecture of the country as well as the current availability and distribution local capacity. Trust, effective interactions and tight networks that link policy makers, civic leaders, academics, businessmen and the media are critical to integrated e-development and knowledge sharing in society.

Finally, the findings indicate the urgent need to understand institutional options, promote institutional innovation, and design Project Implementation Units (PIUs) with a clear view of institutionalization. The basic institutional frameworks identified in this review suggest the range of possibilities open to governments. Understanding these institutional leadership options and the strengths and weaknesses they represent is a starting point for country leaders to fashion the necessary institutional mechanisms and competencies for e-development.

Research is urgently needed to further our understanding of the governance and institutional mechanisms needed to guide e-development; this survey is only a start. There is a lot to be learned from how large businesses and diversified global enterprises have organized themselves to develop their ICT organization, integrate the CIO function within their executive leadership, and adhere to common enterprise architecture. This survey focuses on the central e-leadership institutions at the national level, but much of

the potential of e-government for decentralization and much of the rich institutional experience at the sub-national levels (states and municipalities) remains to be tapped. The review also focuses on formal institutions, but does not cover CIOs, CIO councils or e-leadership development programs. A complementary research should address these programs in depth. Finally, this survey represents only a 'snap shot' of institutional arrangements for ICT-enabled development – a field that is fast changing as countries are continuously adapting and replacing their institutional models over time. A mechanism for monitoring, updating and evaluating country institutional arrangements on a regular basis is therefore needed.

Institutional and managerial innovation are at the heart of the development process, yet aid agencies often prescribe institutional designs and project implementation units as if "one size fits all" or as if institutions do not matter. Leadership models and implementation mechanisms should reflect our understanding of the specific institutional map and networks of the country and the national consensus on the role of the state. External assistance should nurture the enabling polices, institutions and capabilities necessary for success. It should mobilize the demand for e-leadership institutions and CIO cadres, when lacking.

1. The imperative for e-Leadership Institutions

Developing appropriate policies and institutions is at the heart of creating knowledge economies, nurturing information societies and leveraging the new technologies for integration and transformation. Institutional changes and innovations are necessary to manage the cross-cutting nature of knowledge, information and communication processes and the new technologies that are transforming these processes in fundamental and unprecedented ways. Specialized institutions and new competencies are required to create, acquire, adapt, diffuse and use these technologies and to synchronize with the associated policy reforms, intangible investments, managerial innovations and organizational changes. The information revolution is actually an institutional and political revolution facilitated by technology.[2]

Information and Communications technology (ICT) is a powerful tool for development and an essential infrastructure for the knowledge economy. It has pervasive impact on the full range of human activities, from personal life to business and government. ICT fosters dissemination of information and knowledge, defying geographical restrictions and making information and knowledge more accessible. And with the required initial investment in ICT being just a fraction of what was required in the more physical-asset intensive industrial economy, barriers to entry are significantly lowered, and competition increased.[3] The primary emerging barriers are institutional—lack of leadership and institutional capabilities that are necessary to leverage ICT for business (development) strategies and to integrate ICT investments with organizational, process and skill changes.

The fact that ICT can assist in development efforts does not mean that it will inevitably do so or that it is easy to realize the potential benefits. In order for ICT to foster significant development results, it must be employed effectively across a broad base of economic activities. A national strategy must be formulated to clearly define the national e-development goals and priorities as well as the means of achieving them. Government ministries must be designated or new agencies created and governance and coordination mechanisms developed to manage this strategy.

E-government--a core component of ICT-enabled development—is a major transformational leadership and change management exercise. Restructuring government bureaucracies and improving public services are key and urgent public policy issues. These are political and managerial issues, not technical issues. Competent leaders and empowered institutions are necessary to overcome resistance to process and organizational changes, to prioritize and manage complex investments, to change skills

[2] Ernest Wilson III, 2004. *The Information Revolution and Developing Countries*, The MIT Press, Cambridge, Mass. Also, S. Rubino-Hallman and Nagy Hanna, " New Technologies for Public Sector Transformation: A Critical Analysis of E-government Initiatives in Latin America and the Caribbean" in the *Journal for E-Government,* Haworth Political Press (forthcoming).

[3] UNDP. *Creating a Development Dynamic: Final Report of the Digital Opportunity Initiative*. UDNP, 2001, pp. 15-16.

and mindsets, to avoid duplication of efforts and economize on scarce resources, and to maintain a long term vision of transformation while insisting on concrete results in the short term. Information technology is a "disruptive technology"; it changes how bureaucracy organizes and works, how power is distributed or controlled, and how information is shared or protected. It also disrupts informal networks and enables new and extended networks, within and across formal organizations. ICT is enabling public agencies to change from inward administrative focus, routine-based, command-and-control organizations to external service focus, knowledge-based, networked, learning organizations.

Many countries have a history of unsuccessful attempts to deliver on their e-development strategies or ICT plans largely because they lacked adequate institutional mechanisms for their creative design, effective implementation and continual adaptation. Even though institutions play a decisive role in the formulation and implementation of e-development strategies and programs, they are often treated as an "after thought" in e-strategy documents. Some countries have ignored the need for a functioning umbrella agency to coordinate the highly interdependent e-development activities within the government. Others have lacked a clear division of responsibilities between different branches and agencies of the government; these have created political and bureaucratic obstacles for e-development and inhibited the proper allocation of resources and policy coordination across government. Yet others have centralized their e-development management under the wrong issues and wrong staffing—under a technically-focused ICT agency or ministry—thus isolating ICT policy and investment decisions from mainstream development issues.

Governments, reinforced by aid agencies have often resorted to creating project implementation units (PIUs) to carry out the implementation of the new investments in ICT infrastructures and public sector applications. The underlying assumption is that e-development is a one-off project or a blueprint that can be designed by international consultants then implemented by a temporary PIU especially created to follow the accountability and governance requirements of the aid agency. Lacking a vision of the leadership and institutional capabilities required for sustainable e-development, such PIUs often lead to sucking capacity out or crowding out rather than complementing weak state capacity. They are typically housed in the more established, politically connected ministries—at times the wrong agencies, such as placing e-government under the Ministry of ICT.[4] The new entities may also duplicate the functions of existing agencies. Different aid agencies may work with different ministries and place their PIUs within those ministries—thus reinforcing isolation, fragmentation and duplication within and among various elements of e-development.

Yet e-development is a process, not a product or a blueprint. It is a continuous process of policy development, investment planning, innovation, learning, and change management. This process must fit with and respond to a dynamic development strategy that supports evolving national goals and creates sustained competitive advantage over

[4] This misallocation of responsibility is also due to confusion about the nature of e-government as a technology issue rather than an institutional transformation issue.

time. The challenge is to optimally locate the PIUs and integrate the new competencies into the human and institutional resources of the country and to build effective governance and institutional frameworks for the knowledge economy.

Leadership is critical to economic and institutional transformation, including ICT-enabled transformation.[5] This leadership is partly exercised by individual leaders, including CIOs and CEOs, or public administrators and policy makers. It is critically determined by the attitudes, capabilities, knowledge and experience of these leaders. They must inspire and animate ICT investments and plans as well as ICT governance and business process transformation.

But individual leaders are not enough. Their vision must be institutionalized, and institutional mechanisms must be fashioned to make these visions implementable and sustainable. Potentially good leaders cannot operate effectively without appropriate governance and institutional structures. E-leadership institutions are critical to identifying, attracting, and developing potential leaders and to supporting and empowering them to build the enabling environment for all stakeholders for the knowledge economy. Building a core cadre of e-leaders, e-champions and e-institutions are essential measures for e-development to take hold.

There is a fundamental mismatch between the demands of e-development to transform economies and current institutional assets and governance frameworks—particularly in the public sector. Current arrangements emphasize stability, silo mentality, inward-focused bureaucracy, separation among public and private sectors, and the isolation of technology managers from mainstream public policy and business leadership. Yet, e-development and e-government in particular require process and institutional innovation, integration across sectors, partnerships among public and private actors, and participation by communities and businesses in the transformation process. Institutional innovations are needed to bridge this gap. This is a long term process that involves experimentation, adaptation and institutional learning.

Leadership institutions make it possible for economic and social systems to function effectively during periods of change. They provide guidance for agents and organizations operating under high levels of uncertainty. In effect, they provide the strategy, the implementation methods, the coordination tools and the monitoring and evaluation mechanisms for innovative efforts to take place and for scaled up programs to be successful. E-leadership institutions are the agents of ICT-enabled change and transformation.

There is currently no single model for a country to follow when creating their ICT agencies or ministries. Nor should there be one; the notion that "one size fits all" seems irrelevant when success hinges on a very wide range of factors, as it does in the case of e-development. However, there remains a lot to be learned from successful examples around the world and from international best practices, which can provide a set of

[5] "Perhaps the most important determinant for reducing poverty is leadership", quoted from the World Bank President's Annual Address to the Board of Governors, September 24, 2005, p. 6.

guidelines and options that any country would do wisely to take into account. Currently, little is known about the effectiveness and impact of alternative institutional arrangements for leading and coordinating e-development. However, given the critical challenge to move e-development from a set of aspirations to development results, this paper attempts to take stock of what we know and push the state of the art some steps towards the systematic assessment of institutional options and innovations. [6]

Country institutional maps for the ICT sector, and more broadly for information society and ICT-enabled development, are complex and in flux. They may include central ICT agencies, CIO cadres and councils, technical ministries, regulatory agencies, specialized commissions, national committees, promotional agencies, executing agencies, and consultative groups. The focus of this study is on the central or leading institutions for e-development (and particularly e-government) and the emerging broad patterns of institutional arrangements, options and innovations, and lessons learned--rather than on drawing detailed and comprehensive institutional maps for each country.

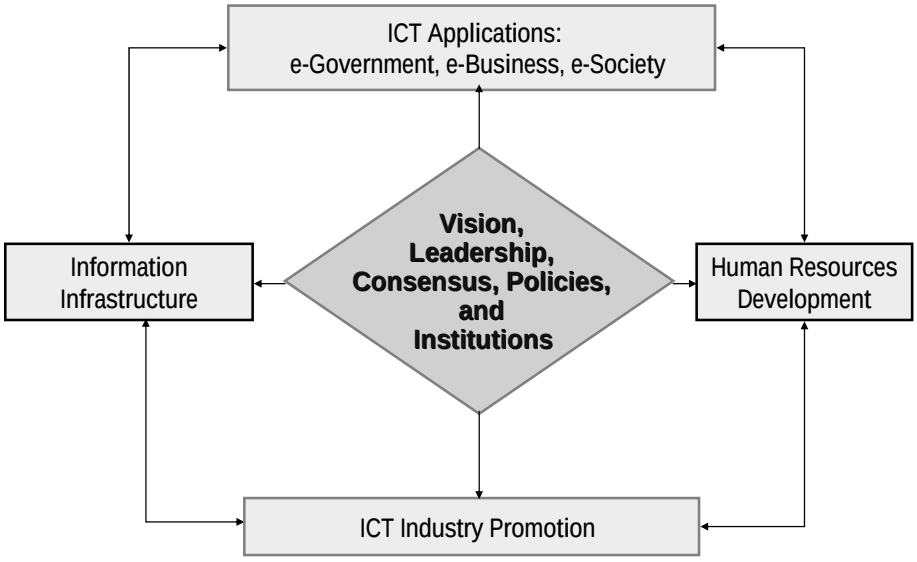
[6] The purpose of this paper is not to describe the particular institutional model in any given country, but to outline various approaches to institution building. Countries' snapshots for a given time are used just for conceptual analysis.

2. What is E-Development?

A national e-development strategy, or e-strategy, is a guide to policies, investments and implementation mechanisms on how ICT should be developed and used to achieve development objectives of the country.[7] It focuses the actions and resources of various stakeholders, and particularly the government, on national ICT-enabled development priorities. It explains the interdependencies and phasing among these actions and investments over the medium term. It specifies the multi-sectoral activities to be covered in a programmatic way and how the government, private sector, civic society and academia will be involved in such activities. It explains how institutions will collaborate and share responsibilities for ICT-enabled development.

E-development is composed of key and interdependent elements: an enabling policy and institutional environment, an affordable and competitive information infrastructure, a innovative and competitive ICT industry with core technological competencies, broad e-literacy and technical education, a coherent investment program to apply ICT to public sector modernization, and incentives to promote the effective use of ICT for private sector development and civil society empowerment (see Figure 1 below).

Figure 1: E-Development Framework



Collectively, e-development pillars cover the package of policies, investments and institutions that enables an economy to leverage ICT for overall economic and social

[7] For a review of many national e-strategies, see World Bank (2006). 2006 Information and Communications for Development. *Global Trends and Policies.* World Bank, Washington DC. pp. 87-124.

development. At the heart of e-development are e-leaders and e-leadership institutions—individuals, networks and institutions that develop visions of knowledge society, set policies and priorities, forge national consensus on reforms, and coordinate and synergize various e-development components.

A holistic vision of e-development stresses the synergy among these elements. Interdependencies among e-development components are many. Appropriately coordinated and sequenced, programs covering these pillars can exploit synergies and lead to substantial development impact and economic transformation. For example, e-government services cannot proceed very far without adequate connectivity, delivery channels, and affordable access to ICT, such as through telecenters. Conversely, telecenters are unlikely to be financially sustainable without income from the delivery of attractive and relevant local content and e-government services. Similarly, e-society programs could further enhance the development of local content and local capacity to innovate and use ICT to solve local community problems; these, in turn, could augment demand and make investments in rural connectivity and telecenters increasingly viable. Over time, e-leadership institutions should be able to identify more and more synergies among all components, and among applications in e-government, e-business, and e-society. The benefits of tapping these synergies and securing complementary investments should outweigh the cost of coordination.

The case for interdependencies or bridging these silos is greater for emerging and developing countries. In these countries, e-government, for example, is dependent on many elements of the information society or e-development programs. E-government cannot proceed very far without balancing and acting on the broader agenda of e-development or information society. Internet penetration and affordable connectivity must be accelerated to make e-government and e-business available to the majority of citizens and enterprises. E-government investments can create competitive domestic markets and necessary learning opportunities for developing the local ICT industries, and particularly software and ICT support services. E-government can influence --and be influenced by--the extent to which ICT has been adopted by the private sector and the depth of e-business transformation in enterprises. The uptake of online public services is also critically dependent on the development of digital literacy and information culture. Governments can play a critical role in shaping all these interdependencies—especially when acting in partnership with the private sector and civil society.

A number of countries have adopted terminologies such as Knowledge Economy or Information Society--as distinct from e-development or digital economy. Traditionally, the Knowledge Economy covers four pillars: an economic and institutional regime, educational system, national innovation system and information infrastructure to support a knowledge-based economy. The information society covers similar elements, but perhaps with special emphasis on social inclusion and the democratization of access to information.

This paper treats e-development or ICT for development as significantly overlapping with Knowledge Economy and Information Society so as to blur these

distinctions. It expands the concept of ICT (beyond that of an information infrastructure as traditionally treated under the knowledge economy) to one of a general purpose technology or a technological revolution that is sweeping and transforming whole economies.[8] Following the traditional knowledge economy concepts, some OECD countries have separated their information society programs from their e-government programs. Accordingly, e-government programs are typically led by public service or public administration departments, combined with a national CIO under the prime minister. The information society programs are led by one or more ministries, including trade and industry, science and technology, information technology and/or education. This artificial separation tends to miss out key synergies and complementarities among e-government, information infrastructure and information society programs. The enabling policy, legal, regulatory and institutional frameworks for e-government, e-development, information society and knowledge economy programs are so significantly overlapping as to call for common, coherent and closely interacting leadership networks and institutions.

[8] Nagy Hanna, 2003. *Why National Strategies are Needed for ICT-enabled Development.* World Bank.

3. Strategic Issues in Designing e-Leadership Institutions

The options and innovations for e-leadership institutions surveyed in this paper present different ways of coping with the core governance issues and coordination challenges of e-development. The research identifies the critical success factors for e-development and consequently the core competencies necessary for effective e-institutions to strategically lead the process. It seeks to answer the challenging question: what are the most important competencies and promising institutional arrangements for maximizing e-development successes and impact?

Countries have been developing various institutional arrangements for e-leadership, shifting from one model to another, experimenting with new hybrids and otherwise creating wholly new models. But the fundamental choices and considerations involved are common across countries:

- *Integration into development*: What kinds of institutional arrangements are necessary to promote integration of ICT into development strategy and management? What role should be played by the central ministries (Finance, Planning or Economy)? How should demand for the new institutions be mobilized and articulated so as to align and integrate ICT strategy with development policy and goals? What combination of policy makers (business executives) and e-leaders (ICT executives) are authorized to take decisions on ICT investments that would ensure congruence with the national development (business) strategy?

- *Synergies among e-development components*: What organizational frameworks should be sought to orchestrate the various elements of e-development? What kinds of institutional leaderships and networks would be needed to tap the synergies among e-policy, the telecommunications infrastructure, ICT literacy and human resources, ICT as a sector or core competency, and ICT as enabler and productivity driver for all sectors of the economy?

- *Coordination across e-government*: How should the government organize to lead its own ICT-enabled transformation and to deal with the cross-sectoral, cross-agency roles of ICT? How could the technological imperatives of building a common enterprise architecture be reconciled with the need to empower agencies and ministries to articulate their service priorities, implement their ICT-enabled service transformations, and integrate ICT into their own sectoral strategies? How should public leaders achieve client-centered public services that span ministries and agencies? Beyond coordination, what incentives and institutional frameworks may encourage collaboration?

- *Centralization and discretion*: How much should the government centralize or decentralize planning and decision making in e-development and ICT

investments? What institutional arrangements would be necessary to promote both bottom up innovation and top-down directions and enabling measures to scale up successes? Which elements of e-development are amenable to central direction and coordination and which are best left to bottom up initiatives and decentralized innovation? How can e-leadership institutions enforce this optimal level of e-governance?

- *Fit within the country's institutional architecture and capabilities*: How the new e-institutions and capabilities should be shaped to fit with (or perhaps transform) the existing political culture and institutional structures of the country? For example, what role should be played by the state in shaping the knowledge economy and promoting digital inclusion? What kinds of institutional arrangements and capabilities would be most conducive to building effective partnerships among central government, local governments, private sector and civil society? What role should the existing ministry of ICT play? What degree of authority and autonomy should a central coordinating ICT agency have? What links should be established between the core e-leadership institutions and others involved in the national innovation and education systems?

4. Functions of e-Leadership Institutions

E-leadership institutions should be able to perform several basic functions: (a) e-strategy formulation including integrating national ICT strategies into overall development strategies; (b) policy, legal and regulatory frameworks; (c) program implementation, coordination and partnership; (d) resource mobilization and allocation; (e) promotion of connectivity, digital literacy, and economy-wide diffusion; and (f) strategic communications, monitoring and evaluation.

4.1. E-Strategy Formulation

Developing National e-strategy requires rigorous analysis of country's development priorities with active participation of all major stakeholders. E-development is a very dynamic process in terms of constant innovations in technologies, applications, products and processes. It cannot be "pushed" or "defined" alone by the government. Instead, a pro-active government should act as a facilitator of an e-development process driven by the needs and aspirations of major stakeholders within and outside the government. It should ensure equal opportunities for a diverse society. Thus, institutional frameworks should provide opportunity for all the major stakeholders – government, private sector, knowledge industry, academia and civil society – to provide input into formulating e-strategy and programs. This is relevant for both broad e-development strategy, and for its major thematic applications such as e-Government and e-Business. E-government is especially important because of the sheer size and interdependencies of investments involved, demonstration effect, and crucial spill-over effects for all major stakeholders.

Connecting e-strategy to development requires interaction, collaboration and mutual understanding among government agencies as well as active participation from various stakeholders outside the government. E-strategies evolve along with the country's needs and implementation capabilities. Hence the strategy formulation process must be institutionalized to secure learning from experience, integrate monitoring and evaluation into future strategy formulation, to secure ownership and commitment to the adopted strategy, and to translate shared visions and strategy documents into concerted action and "a way of life". Development linkages can be forged only when the e-strategy process is driven by institutions that cut across sectors and by mechanisms that engage the potential users of ICT in all key sectors of the economy.

Governments need to find ways to reform, re-engineer and connect their islands of disconnected and redundant systems and processes that have been created as a result of decades of inwardly-focused stovepipe mentality. Government ministries and agencies have their own independent ICT programs. A degree of operational independence is certainly needed. However, when IT funds are invested on a largely autonomous basis, or when coordination is limited to single applications or donor by donor basis, the results are interoperability problems and substantial waste of resources and duplication in developing and maintaining datacenters, applications and networks. In countries with a

federal structure, these problems are repeated within and across states and at lower levels of governments.

4.2. Policy, Legal and Regulatory Framework

As the prime agent responsible for setting the national legislation and standardization regarding technology, the central government should create institutions responsible, amongst other things, for:

- Regulating the telecom sector to promote competition and universal access to ICT, especially for rural and disadvantaged communities;
- Developing e-commerce policies and legal and regulatory frameworks such as e-transactions and e-signatures;
- Setting and promoting national standards regarding ICT security and privacy, including cyber crime and e-surveillance issues;
- Creating and upholding intellectual property rights regimes and promoting commercialization of R&D activities;
- Adopting and promoting government-wide ICT frameworks, approaches and technology standards to ensure compatibility and interoperability;
- Setting the rules regarding privacy, access to information, records management, archives, and information management.
- Defining national ICT education needs and standards.

If the government decides to actively promote an ICT industry as a sector, then improving access to financial capital, facilitating access to global and local markets, and providing incentives for ICT research, development and adaptation would also be activities that fall under this function.

4.3. Program Implementation, Coordination and Partnerships

Comprehensive e-development is a process that requires interdependent interventions on various fronts-- policy making, ICT sector development, information infrastructure building, human capital development, and applications and content development for public, private and non-profit sectors. New institutions are needed that are capable of cutting across traditional department-centric silos. They should effectively coordinate the work of different government bodies at central and local levels and ensure key stakeholder engagement at all levels. They need to be empowered with authority, budgets and other means necessary to exercise governance and coordination of the implementation of e-development strategies, programs and initiatives.

E-development strategists have to think through the types of institutions and capabilities that must be developed or created to move e-strategies from conceptual plans to operational programs to results on the ground. They have to map the implementation challenges and coordination requirements to existing institutional arrangements and local capabilities and then define the capacity gaps and necessary institutional reforms and innovations. They must clarify or create the necessary implementation mechanisms and related roles and responsibilities. It is unlikely that the core competencies and resources required will be available in one central location or agency. Partnerships must be sought, collaboration institutionalized, knowledge sharing systems developed and capacity building programs put in place.

i. Government as a Facilitator

Government should facilitate the use of ICT among various sectors of the economy, primarily though investments in two major areas: ICT infrastructures and technology education. Developing a core ICT network infrastructure and achieving relative ubiquity of access will greatly increase affordability of ICT solutions for citizens and businesses. Effective use of this infrastructure and adoption of advanced ICT solutions requires substantial investment in the human resources. Building a critical mass of knowledge workers, increasing technical skills among users, and strengthening local entrepreneurial and managerial capabilities are therefore crucial. Government can also go one step further and provide direct financial, organizational and capacity building support to promote the adoption of new ICT applications and locally relevant content for small and medium enterprises (SMEs) and citizens.

ii. Government as a Lead Investor and Strategic User of ICT

The central government should also strive to be an effective user of ICTs in its own right (e-Government). The efficient and widespread use of ICTs in public sector will increase the efficiency of government operations, enable better provision of demand-driven information and services to citizens and businesses and help promote ICT adoption in other sectors. Government can be a major client and anchor tenant for ICT services. By procuring its ICT needs locally, the government can use its significant buying power to develop a competitive domestic ICT industry through local consortia and through partnerships with multinationals. This should be done in ways that would ensure that the local ICT industry can provide the government with the technical solutions it demands.

Government e-Procurement can significantly reduce the costs of services and products for the government and also promote participation of SMEs in public procurement opportunities. It can also play a major role in improving transparency and trust in government. Online public procurement can further induce the adoption of e-commerce practices among SMEs and drive other changes among its partners in the private sector and civil society.

Experience shows that citizens strongly prefer e-Government that is centered around their needs and seamlessly cuts across departmental boundaries. It makes e-Government a

highly complex process involving deep re-engineering of core government business functions and processes. Special institutional arrangements are needed to insure customer focus of e-Government programs, on the one hand, and respond to the unique needs of diverse government institutions, on the other.

ICT promises new ways to reinvent government, to enable and accelerate public sector reforms, and to promote efficiency, responsiveness, accountability and transparency. E-government is fundamentally about institutional reforms. It is about transforming an industrial age (or at times, feudal!) bureaucracy of inward focused "command and control" culture to a 21st century learning, innovation-driven economy. It is about engaging bureaucracies in relationships with clients and partners. It is about challenging the current bureaucratic culture and how the business of government is being conducted. It is about connecting government agencies to their clients and making them responsive and transparent to citizens.

But this promise has been slow to realize since such transformation is hard. It takes sustained leadership and targeted incentives to reshape relationships and create networked and adaptive institutions. It requires coalition building, effective coordination across agencies, sustained institutional change management, and the alignment of e-government programs with political objectives. Yet, e-leadership institutions and e-government agencies are seldom connected to administrative reform bodies; they tend to focus on technology management.

4.4. Resource Mobilization and Allocation

Government and private sector invest heavily in ICT and associated skills, process changes and leadership. Yet levels of investments are seldom a good yardstick of progress or results. In fact, failures to realize the potential from such substantial investments in technology infrastructure and systems development are relatively common[9]. Moreover, the requirements for establishing information infrastructure for modern economies and global competition seem unlimited. Rationalizing ICT investment, prioritizing needs and rationing scarce resources to meet national priorities, and mobilizing resources beyond the public budget—all call for new and rigorous frameworks. Such frameworks should aim to maximize developmental impact of such investments and ensure that the emerging infrastructure is affordable, scaleable and sustainable. Innovative financing schemes and partnerships with the private sector and civil society are also necessary.

In implementing public ICT strategies, governments will inevitably compete with the private sector for scarce ICT talent. This competition is no longer local—it is global. This highlights the challenge in hiring, training and retaining skilled staff for new e-leadership institutions and for ICT programs in existing ministries and agencies. This challenge goes beyond ICT specialists and includes people with broad understanding and talent for ICT-enabled business strategies, public sector reform, business process

[9] See two major references for examples: Richard Heeks (2003), *Reinventing Government for the Information Age*; and Jane E. Fountain (2001), *Building the Virtual State*.

reengineering, service innovation, supply chain management, public-private partnership, change management, knowledge management, and transformational leadership.

4.5. Connectivity, Literacy, and Diffusion

Infrastructure development, particularly local connectivity is essential to social inclusion and the development of a critical mass of users of e-government services. Global connectivity is a prerequisite to leveraging the benefits of the global economy. Different institutional frameworks will have different options for doing so, but succeeding in this will be a major step towards improving domestic productivity and attracting foreign investment.

A related and key prerequisite to ICT diffusion is the development of a technology aware and information literate population capable of utilizing ICTs in their everyday lives. Digital literacy is fundamental for the 21st century. While this may be a primary responsibility of the ministries of education, e-leadership institutions must enable the ministries of education to address this priority (through connectivity, awareness raising, etc.) and partner with the private sector and NGOs to participate in digital literacy training (through incentives, multipurpose telecenters, media campaigns, etc.). A more specific challenge is the development of technology managers and engineers, who are crucial for both the production and use of ICTs in the economy.

Creating a favorable environment for the business sector is another prerequisite or challenge to ICT promotion and diffusion, particularly among local SMEs. Clear strategies should enable government and private sector actors to focus on promising segments of the ICT industry where there are likely to have or build competitive advantages. Such strategies could also help in attracting foreign and local investors and providing them with appropriate incentives to invest in local capabilities. Much can be learned from the long established programs of OECD countries to diffuse new technologies among SMEs.[10] E-leadership institutions should be in a position to inform and influence the relevant policies and regulations and in devising such diffusion strategies.

Another e-leadership challenge is that of content and applications that would be developed specifically to address the special needs of different segments of the population. Successfully creating and disseminating these will generate greater demand and positive multiplier effects from ICT adoption.

4.6. Strategic Communication, Monitoring and Evaluation

Often neglected is the strategic communication of progress made, impact measured and lessons learned to all concerned stakeholders. Yet, without such awareness and communication programs, e-development cannot be sustained. As a demanding transformational task, e-development requires mobilization of political leaders and policy

[10] Nagy Hanna, et al. (1995). *The Diffusion of Information Technology: Experience of Industrial Countries and Lessons for Developing Countries*. World Bank. Washington D.C.

makers to lead policy reforms and institutional change, and mobilization of potential communities of ICT users to innovate and press for change from below. For example, the experience of the UK suggests that, even among advanced countries, understanding and mobilizing demand are a critical function to realizing the benefits from the major investments in e-government services.

The monitoring and evaluation (M&E) of e-development strategies and programs is another challenge facing governments and aid agencies. A review of current national strategies for e-development of many countries indicates that this is the least developed function of e-leadership institutions.[11] Even in most developed countries, the assessment of how well investments in ICT strategies and programs have been utilized has been very limited.

However, mechanisms for assessing the private and social returns of e-development activities (i.e. their value to firms and to society) are extremely important. Such mechanisms can serve as tools for improving internal program management, for answering questions from stakeholders, for meeting official reporting requirements, for better understanding program strategies and goals, and for promoting interest in – and support of – a program or activity.[12] Furthermore, information from the monitoring and evaluation process must be used to redesign, change direction, and implement new strategies where necessary. M&E is often confused with cost-benefit analysis, which has traditionally been associated with efficiency-focused ICT investments. M&E of e-development programs is concerned with achieving public value creation and development results. Canada provides a good example of best practice with its series of studies concerning the use of e-government services and the use of such findings to reshape its e-government strategy and investment programs.[13]

[11] See "Trends in National E-Strategies: A Review of 40 countries" in *Global Trends and Policies*. 2006. World Bank.
[12] Ruegg, Rosalie and Feller, Irwin. A Toolkit for Evaluating Public R&D Investment. National Institute of Standards and Technology, Gaithersburg MD, 2003, pp. 13-17.
[13] See Institute of Citizen-centred Services: www.iccs.isac.org

5. Key Institutions for e-Development

Addressing the cross-cutting nature of e-development does not come naturally for most governments as they are sectorally structured, often by law. There are a number of new institutions that have been adopted by various countries to promote overall coordination of e-development and cover the above-mentioned functions. In the following section we describe some of the more common ones. These may or may not be relevant to individual countries and should be adapted to local conditions. Later we discuss how these institutions may fit into various administrative structures and cultures to create an efficient design and delivery mechanism for e-development programs. This review makes clear that countries continue to create and experiment with various institutions in support of the emerging knowledge economy. It also makes clear that how these institutions are defined and fitted with others depends in fundamental ways on the basic political structure and culture of the country—its degree of centralization and devolution of power.

5.1 High-level National Council for e-Development

This high-level consultative body, at times called national ICT council or committee, is an entity within which the government can discuss e-development strategy, policies and action plans with all major stakeholders, including representatives of civil society, the private sector and academia. The main objective of the council is to identify national priorities, build a broad-based national consensus as well as monitor and benchmark implementation of major programs and projects. The council may establish sub-committees on major e-development target areas, such as improving information infrastructure, e-Business, e-Government, etc. Such councils usually play advisory and supervision roles, but can also be given some operational responsibility in driving national ICT awareness agenda.

5.2 Cabinet Committee for e-Development

This is usually a Cabinet-level, inter-departmental body for collective decision-making on major policy issues and coordination of e-development projects in ministries and agencies. It is usually comprised of the ministers and cabinet level public administration officials and is chaired by the Prime Minister. Such Committees often meet on a monthly basis, or when decisions concerning several or all ministries need to be taken. Working in close collaboration with a high-level national council for e-development, such a committee performs an e-development policy formulation and coordination function. It can also be given certain operational responsibilities for complex cross-agency projects such as promoting universal access to Information Infrastructure.

5.3 Ministerial Committee for e-Government

This is usually a cabinet-level inter-departmental body that facilitates, coordinates and monitors the implementation of the national e-government strategy. The committee is usually comprised of the deputy ministers and/or other senior public administration

officials in charge of the public sector reform and e-government. It develops action plans based on recommendation of the high-level national council for e-development and the ministerial committee for e-development. The committee may also be given limited operational responsibilities to manage certain complex and cross-departmental projects, such as government networks or one-stop-shop e-Government portals.

5.4 Executive agency for e-Development (ICT Agency)

This is a government body (usually a ministry or independent agency) responsible for the formulation and implementation of the national e-development policy and corresponding action plans. The ICT executive agency is usually responsible for a wide range of e-development tasks, including e-society, e-business/e-commerce, and the strengthening of the local ICT industry. Moreover, the agency is often charged with developing mechanisms to encourage all stakeholders and key players to become involved in e-development issues and exchange information, experience and best practices through focus groups, workshops, seminars and online tools. The agency coordinates and monitors the implementation of e-development policy, typically under the overall policy direction and supervision of the committee for e-development, with guidance from the e-development council and in close co-operation with the committee for e-government. The agency sometimes also serves as a secretariat to one or more of the above three bodies.

5.5 Executive e-Government Office

This executive office or agnecy, situated either within the Prime Minister's office or within a key ministry, is responsible for facilitating, coordinating and monitoring the implementation of the national e-government strategy. It could serve as the secretariat to, and the executive arm of, the committee for e-government. Amongst its responsibilities would be the developing, implementing and monitoring of policies, standards and guidelines for the execution of the e-government strategy. It also supports departments and administration bodies in the development of their own e-transformation strategies, develops shared infrastructures and applications in collaboration with relevant departments and administration bodies, promotes common policies for the management of information (including privacy), develops common public administration services, and co-ordinates training in ICT skills for public administration officials. Overall, this body performs e-government policy facilitation, implementation and monitoring functions.

5.6 Public CIO Cadre and CIO Council

As in the private sector, experience in public organizations has shown that effective deployment of ICT requires organizational transformation, managerial and process innovation, and substantial changes in relating to clients and delivering services. These imperatives demand special leadership attention and managerial know-how. Long term and transformational change require institutional leadership to accompany the political or executive vision. Following on the private sector, the executive in charge of the e-government office is increasingly often called Chief Information Officer (CIO). The CIO

Office is still a relative novelty for most developing countries. Given the central role of e-government in the overall e-development agenda, it deserves a special attention.

Traditionally, in most countries, heads of the data centers or technology departments were responsible for IT or e-government projects. In early 90s, however, ICT and particularly the Internet brought about disruptive and revolutionary changes in public sector operations and service delivery—these changes made access to ICT beyond the control of the technology specialists and in the hands of users. Governments realized the need for policy and strategic leadership that goes beyond technology itself and instead focuses on fundamental issues of change management, service innovation and business process transformation. For example, in 1996, CIO office became mandatory in agencies of the US government. Demands for whole-of-government services highlighted the need for cross-agency coordination and government -wide strategic guidance. In the USA, the Federal CIO Council was created, residing in the powerful Office of Management and Budget.

Many developed countries pursued similar path, creating national CIO offices, supported by CIOs in ministries and agencies. This approach combines centralized direction and policing role with decentralized implementation and ownership. It promotes accountability by introducing a certain degree of separation of oversight and evaluation functions from execution. The responsibilities of the CIO generally vary and cover roles such as policy and oversight, infrastructure and enterprise architecture, business change, consultancy services, operations management, interagency coordination, ICT industry liaison, or any combination thereof. The scope of CIO responsibilities in e-government could include, but may not be limited to, all government ICT and ICT-related activities, including network and telecommunications services, data administration, and libraries, archives and records management. Also included in this scope are ICT-related procurement services and project and contract management. The CIO may also act as an authority in defining the career paths and professional development of ICT specialists in the public sector.

Overall, the CIO is expected to ensure the fostering of a coordinated approach to e-government solutions across the whole government so as to provide more responsive and improved government services and enhanced management of the government's information assets. The above objectives aim at achieving government-wide focus while at the same time recognizing that actual service delivery occurs in the various government ministries and agencies.

Some jurisdictions use a Chief Technology Officer (CTO) for technology management, procurement and operation. Under such circumstances, successful e-government strategy requires strong coordination between CTO and CIO functions. They perform highly complementary and somewhat overlapping roles, but have distinctively different focus. Ultimately, CIO is a business strategist. He or she has to have deep understanding of public sector functioning and how to strategically re-engineer it with the use of ICT to deliver value to stakeholders within and outside the public sector. CTOs as technology managers focus on particular technology solutions to implement this vision and, in most

cases, directly or indirectly report to the CIO. In practice, many CIOs act as CTOs, and never get to fulfill the strategic role of CIO.

Several countries have also created national (federal) and state CIO councils, including the USA, Canada and Mexico. The role of the Federal CIO Council of the USA was established in 1996 and has since become increasingly critical to the governance and implementation of e-government. It has evolved over time. It has established several active committees to address CIO priority concerns and challenges such as investment planning, information sharing and security, and IT human resources development. It has been engaged in CIO capacity development through inputs into defining core competencies, accrediting CIO education and training programs, and the sharing of information and best practices among CIOs. It has become a key element of ICT governance across the public sector. The Council is expected to play an increasing role in consensus building, vertical and horizontal communication, team-based problem solving, and knowledge sharing.

5.7 Other institutions

Government institutions other than those mentioned above may also play a crucial role in implementing e-development and e-government strategies. They can take responsibility for the implementation of specific elements of e-development programs, appoint CIOs in various ministries to lead e-government initiatives, implement e-government approaches in the delivery of traditional services and functions, restructure their internal business processes and budgets to modernize their operations and create new ICT-enabled services, coordinate with the national e-development bodies to ensure that services to the public are integrated, and contribute to formulating and implementing the e-development agenda.

Specialized bodies involved in regulating telecommunications, broadcasting and other services are still relatively new among developing countries. The interface between such regulatory agencies and other core institutions responsible for other elements of e-development are critical to coordination between information infrastructure and e-government services development.[14] Poorly functioning regulatory agencies would frustrate programs aimed at improving connectivity and affordable access, and consequently impede the delivery of e-services, the adoption of e-business, and the promotion of outsourcing and ICT-enabled services. [15]

Other leadership institutions may be mobilized to harness ICT for social and economic development. Parliaments can play a critical role in promoting the national e-development agenda by providing a legal framework for it, by approving the budgets required for its programs, by raising awareness at all levels, and by influencing public

[14] Regulatory agencies have become more critical in setting prices and standards as infrastructure provision is increasingly left to the private sector and traditional telecommunications or ICT ministries lost their relevance or had to transform their role.

[15] This is especially the case for rate setting for data services.

policies and enforcing implementation. Non-government and academic institutions are also very important partners in the e-development process, as are private ICT enterprises and associations (both domestic and international) and consulting and research companies. All of these stakeholders may to be engaged at all stages of e-development strategy design and impelmentation through national forums, focus groups, workshops, seminars, online discussions and other venues.

6. Five Basic Models

Model 1: Distributing responsibility among existing Ministries

In this main section, we describe five basic models or approaches to create a national institutional and governance framework to lead and implement the e-development agenda. These models are not all encompassing in that they do not represent all the possible options for the creation of institutions for e-development. Rather, they provide five basic approaches or archetypes of the variety of different ways countries have created and evolved their institutional structures to lead and coordinate e-development. These models are classified primarily along the centralized-decentralized continuum—starting with the most decentralized model of both policy formulation and program implementation.

This section also illustrates these models through country case studies. Country cases suggest that institutional arrangements are more complex and diversified and do not fit neatly into these simplifying models. Moreover, country institutional arrangements are changing over time, and thus often shift from one model to another. They are classified here under one model or another based on their most distinguished structural features for the most recent period and/or longest duration. The country case studies indicate the motivations behind such shifts, for example, a shift of administrative responsibility from Ministry of ICT to Ministry of Interior or Public Administration, to reflect a transition from a technology or infrastructure focus to a managerial or institutional transformation focus of e-government programs. Such shifts come with corresponding shifts in power and influence in the constituent ministries and these shifts in turn have a significant impact on the type and extent of the ICT-enabled transformation underway. These institutional models are thus used for comparative analysis and for detecting patterns and trends of an otherwise complex reality and rich institutional innovation and learning.

The five basic institutional models are:

Model 1: Shared Responsibility Among Ministries
Model 2: Policy Coordination Function Under Head of State
Model 3: Lead Ministry: a) Ministry of Finance
b) Ministry of Economy or Planning
c) Ministries of ICT and Public Services
d) Ministry of ICT
Model 4: Executive ICT Agency within the Civil Service
Model 5: ICT Agency as a Private-Public Partnership

Model 1: Shared responsibility among existing Ministries

In this model, the e-development policy development and implementation functions are distributed amongst existing ministries (Figure 2). Thus, each ministry is made responsible for a part of the e-development strategy that falls within its field of

expertise. For example, the e-commerce policy portfolio is given to the Ministry of Trade (or Industry, as the case may be), and the e-government portion is handed over to the Ministry of the Interior, Infrastructure to the Ministry of Telecom, etc. This model requires that specific coordination mechanisms be set up among the ministries undertaking e-development in order to synchronize activities and consider global 'whole of government' effects.

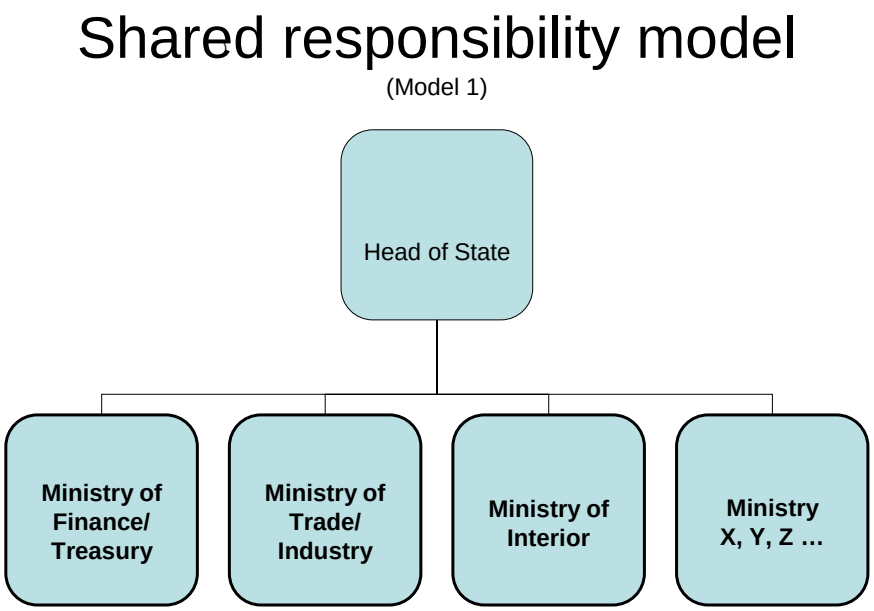


Figure 2

Potential advantages: Since it uses an existing institutional framework, this model can be the least disruptive and may appear the least costly in terms of upfront institutional investment. As it builds on the existing responsibilities of ministries, it is the least politically sensitive. It is often the "by default" solution. This is often adopted by governments with long history of ICT use, and as such established ICT organizations (MIS departments) with interest in autonomy and self preservation.

Potential disadvantages: The model functions well only in the countries with strong traditions of collaborative culture and decentralized government, where ministries and agencies are capable of coordinating their activities without significant and centralized high level "push". Very few, if any, developing countries can meet this requirement. Lack of incentives or levers for coordination and prioritization inevitably leads to duplication of efforts, poor information sharing, interoperability problems, and waste of resources. Cross cutting infrastructure services and inter-agency projects may be difficult to implement under this model. It lacks mechanisms to overcome the prevailing stovepipe mentality of public bureaucracies and to become client focused. In fact, it can further entrench these practices through expensive and difficult to change ICT investments. It may also hinder the creation of synergies between the various elements making up an e-development strategy, such as e-commerce and e-government. It ignores

the problems of lagging sectors and regions—exacerbating social imbalances and the digital, knowledge and development divide. Finally, lack of prominent e-Champion may limit the overall resource mobilization for ICT-related projects in all ministries.

Examples: Finland, Sweden, Germany, France.

Finland has made a major stride towards building a knowledge economy, primarily driven by its ICT sector (box 1). It turned an economic crisis in 1991—induced by globalization and the collapse trade with the Soviet Union—into an opportunity for accelerated change and economic transformation. Finland enjoyed the necessary flexibility to capture the opportunities made possible by globalization and the information technology revolution. This flexibility was facilitated by high level of education, social cohesion, and safety net.

Finland developed many complementary and reinforcing institutional mechanisms to create a vision and facilitate consensus about future directions and to promote collaboration and partnerships among stakeholders in public sector, business, academia, parliament, and civil society. The highly decentralized implementation process and shared responsibility across many actors is supported by a variety of consultative mechanisms, shared awareness, incentives, innovation funds, political championship, and future-oriented institutions. It illustrates some of the positive potential of this model, provided key pre-conditions are met, such as high trust society and culture of collaboration and public service.

Finland has formulated information society strategies spanning 20 years (1995-2015). It is currently implementing its 2003-2007 information society program, headed by the Prime Minister. Implementation is shared by a ministerial group, including Finance, Communications, Interior, Trade, and Education.

The Finish experience offer several lessons for developing countries. First, globalization and the information technology revolutions are double edged swords—they can lead to economic crises be if effectively harnessed, can help countries to leapfrog development stages and accelerate economic transformation, They require a society that is capable of continuous renewal, can make best use of their strengths, and can tap into global knowledge. Second, institutions to develop shared visions and national consensus are imperative imperatives of transformation to the information society. Third, these institutions should be supported or led by the highest political of political leadership, even while implementation may be a widely distributed responsibility. Fourth, countries cannot be content to learning from their past; they must also attend and prepare for the future, as per Finland's Committee for the Future. Finally, it is important to pursue a national e-strategy. Even when comprehensive top-down programs to may not be possible, as in many poor countries, countries would benefit from developing broad consensus on strategic directions and key enabling reforms to be complemented by pilot bottom-up initiatives and mechanisms for gradual scaling up.

Box 1. Finland: Transforming Through National Consensus

The Finish experience since 1991 is an example of how ICT can become a driving force in economic transformation and how institutions can play a critical role in forging national consensus, flexible response and concerted action to guide this transformation. Until the 1970s Finland relied on resource intensive industries. Since the beginning of the 21st century it has become the most ICT-specialized economy in the world and has ranked as number one in the World Economic Forum's competitiveness index.[16]

How did Finland become an ICT-enabled, innovation-driven economy? This transformation is the outcome of strategic focus and intent, applied in a coherent way and over time to various elements of e-development or knowledge economy. Electronics. ICT and related high tech industries were targeted though a coherent industrial and innovation policies that encouraged competition and technological learning. The Finish Nokia has grown from a diversified corporation into a specialized, innovation-driven world leader in ICT and mobile communications and now accounts for 35% of the mobile phone market. Nokia became an engine for the ICT industry and by 2003 accounted for 25% of Finland's R&D expenditure. This was complemented by creating public and private R&D institutions, venture capital funds, partnerships and associations that supported innovation, diffusion and clustering of ICT industries. The Science and Technology Council is chaired by the Prime Minister and is responsible for the strategic directions of the national innovation system. The Finish National Fund for Research and Development was the public instrument to experiment and commercialize innovations on a broad front, without budgetary and political delays; since 1991 it has operated as a public foundation under the Parliament. Many other institutions and institutional innovations have also contributed to promoting the policies, enabling environment and knowledge sharing necessary for a thriving ICT industry and fast technological learning.

The information infrastructure has also played a critical role. Finland is a relatively sparsely populated and geographically isolated country. Its early focus on competition in the telecommunication services and the wide access to the Internet helped lay the basis for a dynamic sector, facilitate collaboration on the national level and establish presence on a global scale. This has accelerated the adoption of managerial innovations and tools for all types of user industries and for service sectors such as finance. Systematic efforts were made to reduce the digital divide.

Another key component of the Finish success is the education system and the development of necessary human resources for a technologically-driven economy. Apart from securing broad literacy, educational institutions have been sufficiently flexible and responsive to technological change to produce the specialized skills for an ICT-driven economy.

What about the use of ICT in the public sector and society at large? Finland has formulated information society strategies spanning 20 years (1995-2015). It is currently

[16] Dahlman, Routti and Yla-Anttila. 2006. *Finland as a Knowledge Economy*. Washington D.C.:World Bank

implementing its 2003-2007 information society program, headed by the Prime Minister. Implementation is shared by a ministerial group, including Finance, Communications, Interior, Trade, and Education. E-government is introduced as a tool of competitiveness and public sector reform. It is embedded into Finland's information society since early 1990s and it is backed by broad citizen acceptance and participation. The stress is on quality and relevance of public information, transparency, e-engagement and e-democracy. Wide Internet use and e-literacy have been enabling factors for the adoption of e-services. The Prime Minister's award is used to promote awareness, innovation, and best practices in e-government. An IT Strategy Committee is organized under the Ministry of Finance and led by a national CIO to promote technical interoperability, common platforms, information security and digital TV.

Finland innovated several other political and administrative institutions to build national consensus, guide and lead the ICT-driven information society. The Committee for the Future is one such institution. It is one of the Finish Parliament's standing committees. It conducts active and initiative-generating dialogue with the government to build long term orientation and consensus on the future. Another agency is the Information Society Advisory Board, whose goal is to monitor and analyze the development of information society in the country. This is an independent advisory body with broad representation from relevant government agencies, parliament, private sector associations, and civil society. It is chaired by the minister of communications. Another body is the Association of Finish Local Authorities, charged with promoting the information society and bridging the digital divide at the local level.

These and many other institutions helped build trust, shared vision, and public-private partnerships. It helped Finland undergo a wrenching restructuring process to redeploy people from declining sectors in the old economy to the new ICT sectors and to position the country to take advantage of the forces of globalization.

Some of the key enabling conditions for success of Finland are trust in government and in technology, trust in government use of private information, good governance, openness to the outside world, shared vision and enthusiasm about information society. A decentralized system of public administration, combined with national consensus and cohesiveness among the senior public service leaders helped the development and continued innovation of ICT use at all levels of government and society.

The challenge is to continue leadership in ICT production and yet further master ICT use. It is the use of ICT-not necessarily its production- that is the decisive factor for long-term economic growth. In the public sector, the challenge is to deepen cross-agency coordination and collaboration and back office process innovation. These challenges will require continued institutional innovation and renewal.

The **Swedish** model of government is extremely decentralized, with individual agencies enjoying great autonomy. While general e-government frameworks for the agencies are put in place by central government, agencies set their own targets and means

of reaching those targets. Action plans, therefore, vary significantly among agencies.[17] The Agency for Public Management is responsible for implementing the national e-government program, which was kicked-off in mid-2000 and is know as "24/7". The Ministry of Industry, Employment and Communications supports businesses in implementing e-commerce and manages the information technology political strategy group, tasked with advising the government on how to create an all-inclusive information society. Other ministries, notably the Ministry of Justice, also have some involvement. But there are no formal coordinating mechanisms across government agencies.

In **France**, no single authority has control of the information society strategy. An Inter-ministerial Committee for the Information Society (CISI) sets this agenda; it is coordinated through a loose network of contacts across departments, and primarily driven by the separate departments. For e-government, the responsibilities are divided between the Minister of Public Affairs, Government Reform and Regional Planning, the State Secretary for State Reform (the latter is involved mainly in electronic administration), and the Ministry of Finance (responsible for electronic signatures and for online payments, which currently include VAT and income tax payments). While France does have an overall information society strategy, it does not appear to have a specific e-government strategy. Current e-government efforts are dealt with at the ministry level (e.g. the e-Ministere project run by the Ministry of Economics, Finance and Industry). The result is a fragmented approach.[18]

Germany is another example of shared and decentralized leadership (Box 2). It is based on cooperative and collaborative relationships for horizontal and vertical integration. It illustrates some of the limits of this model. Central coordination is light and primarily the responsibility of a central group of "catalysts" from the federal Ministry of Interior who coach and support leaders of individual projects. How the catalysts were utilized as a common facility was dependent on the degree of receptiveness of various departments to make serious process changes. The catalysts' control function was limited to reporting on the degree of implementation.

Box 2. Germany: The Challenges of Shared and Decentralized Leadership

Germany**'s** e-leadership institutions are shared across different government departments. The Ministry of the Interior is responsible for the delivery of e-government, the Ministry of Economics is responsible for delivery of e-economy initiatives, and the Ministry of Education and Research for issues such as e-learning and science and technology.

The implementation of e-government strategy was primarily left to the individual departments Bundonline plan 2005. Central coordination is light and primarily the responsibility of a central group of "catalysts" from the federal ministry of interior (with

[17] Accenture. E-government Leadership: High Performance, Maximum Value. Accenture Government Executive Series, 2004, p. 101.
[18] Booz Allen Hamilton. International e-Economy Benchmarking: The World's Most Effective Policies For The e-Economy. London, 2002, p. 139.

the assistance of an international consulting firm) who coach and support project leaders of the individual implementation projects. The Bundonline plan also provided for basic shared components such as data security, payment transaction platform, content management system, and competence centers to disseminate specific know how about the basic components. Implementation of e-government at the states and municipalities is also constrained by the German federal system which puts any attempt to standardize government services to a test. Horizontal sharing of personal data and integration of databases are also constrained by data protection requirements under German law. How the catalysts were utilized as a common facility was dependent on the degree of receptiveness of various departments to make serious process changes. The catalysts' control function was limited to reporting on the degree of implementation.

Moving beyond Bundonline, a next generation of e-government has been underway, called Deutchland-Online. It is a move to a cooperative structure in which various partners collaborate: federal government, states and local authorities collaborate on different projects and each party bears some responsibility. The project owner has to develop a financing model which may turn out differently for individual projects; the financing of collaboration is always dependent on the interests which partners perceive for themselves from a given project. The aim is to encourage collaboration and reduce duplication through shared financing of projects.

Model 2: Policy Coordination Function Under Head of State

In this model, the e-development policy agenda is coordinated out of a single function under the Prime Minister's or Cabinet Office, while the actual implementation of policies is undertaken individually by each ministry (Figure 3). The policy coordination function is often constituted by the head of state and created under their (or the Cabinet's) office. The coordinating function's tasks are to formulate e-development policy and to direct its implementation across all sectors of the economy. While these entities are rarely granted executive powers, they act as an independent oversight and coordinating body for a range of ministries and other institutions responsible for implementing specific components of the national plan.

This model advances centralization of policy and strategic coordination, but leaves implementation relatively decentralized as in model 1. The coordinating function may be divided into two separate entities: one for all major stakeholders within and outside the government, another for the government itself. The coordinating function may be further divided into those focused on the broad e-development agenda, and those for implementing a more focused e-government agenda.

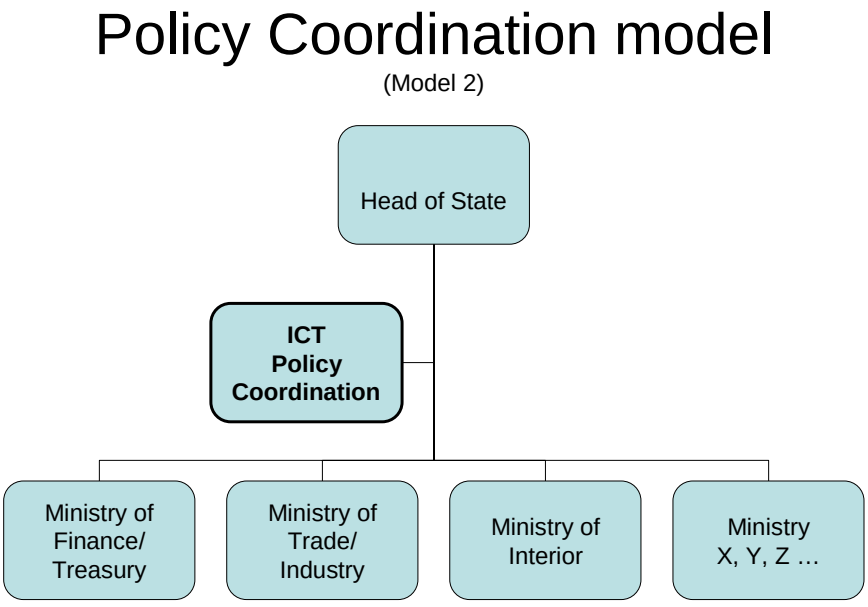


Figure 3

Potential advantages: The model enforces policy coordination across key ministries and public agencies compared to the shared responsibility model. It involves minimal centralization by focusing on policy only. High-level political profile helps to secure the budget, build momentum and overcome departmental silos and rivalries.

Potential disadvantages: Coordinating bodies often struggle to have direct influence over ministries and stakeholders and promote cross-departmental programs. Limited to policy coordination, such bodies cannot drive alone the development and implementation of cross-departmental infrastructure, particularly at early stages of e-development and e-government. Such entities are increasingly given operational responsibilities over the most crucial cross-departmental projects, such as building government wide enterprise architecture.

Examples: The United States, United Kingdom, Italy, Japan and China.

In the **United States of America**, e-leadership at the federal level is placed in the Office of Management and Budget (OMB), within the Executive Office of the President (Box 3). The focus is on making government responsive to its customers. The General Services Administration (GSA) plays a facilitating role that focuses on technology standards, procurement, CIO competency standard setting, and other technical issues. The OMB is leading stewardship of IT and its effectiveness through a set of governance tools. One key tool is the development of the Federal Enterprise Architecture (FEA) with the support of the GSA and the Federal Chief Information Officer (CIO) Council. The FEA is a business-focused framework that provides the OMB and the federal agencies with a way to govern and guide investments in ICT within agencies and to identify opportunities to collaborate and integrate investments and initiatives at the federal level.

To drive transformation, the e-government program is placed within the President's management agenda, tied to performance management and a balanced scorecard. Agencies are graded on specific criteria: the formulation of a modernization blueprint; the development of business cases for IT investments; IT human resources; IT program management; IT security; and partnership with other government agencies for shared infrastructure. The President's Management Council (PMC) further allocates special budget for selected strategic projects that focus on cross-agency integration such as the government-wide portal.

A key to policy, governance and overall implementation of e-government in the USA is the Information Technology Management Reform Act (a.k.a. the Clinger-Cohen Act). In brief, this Act sets the process for acquiring information technology in the Federal Government and for the responsibilities of the Federal CIOs. Its primary requirements on Government agencies are to:

- Design and implement a process for investment planning and control
- Establish goals for improving agency operations and delivery of services through the effective us of ICT
- Designate a Chief Information Officer
- Implement an integrated enterprise (IT) architecture
- Promote improvements in work processes

This Act has provided coherent governance for ICT across the US government. Its greatest contribution has been to set the framework for IT to support both agency and

government-wide missions. It also created and positioned the CIO in a senior leadership capacity within agencies and the CIO Council across the federal government. It reformed the IT acquisition and oversight environment and made the IT procurement process more responsive. It also helped move the focus in the government IT community from procurement to management. It has also improved alignment of IT with agency mission. It provided a framework for promoting government-wide infrastructure improvements and standardizing and modernizing common business processes (lines of business like human resources management) across agencies.

Box 3. United States: Driving Innovation and Integration Through the Executive and Federal Budget

In the United States, the Director of Information Technologies and E-Government is located at the Office of Management and Budget (OMB), which is part of the President's Executive Office. The U.S. is– alongside Canada – the country with the most widely used (by businesses and by individuals) e-government services.[19] Successive U.S. administrations have been supportive of the Federal e-government initiatives, appointing strong leadership with rigorous program management skills, placing the responsibilities for e-government in the Office of Management and Budget, encouraging them to use the power to redistribute department IT budgets under the Clinger-Cohen Act, and putting in place a conspicuous and transparent tracking mechanism. The OMB, working with the Federal Chief Information Officers (CIO) Council and the General Services Administration, established the Federal Enterprise Architecture Program which builds a comprehensive business-driven blueprint for the entire US feral government. The direct reporting link to the OMB allowed the e-government team to specify a new business-case methodology for IT projects that was integrated into the annual budget process.[20]

The federal government spends US$ 60 billion annually (2004) on IT.[21] To show results, these resources must be harnessed through executive leadership, interagency collaboration and constant monitoring. The catalyst has been the President's management agenda. The Agenda includes: strategic management of human capital, competitive sourcing, improved financial performance, expanded e—government and budget and performance integration. Its guiding principles for e-government are: citizen-centered, results-oriented, and market-based. The aim is to simplify and unify services around citizen needs, support projects that operate across budget boundaries, and maximize operability and minimize redundancies.

The effort focuses on IT strategies and resources across government with the e-government office reporting to the head of the OMB to provide the necessary support and authority. To drive transformation and cross-country integration, the e-government team turned to the President's Management Council (PMC)—an organization made up of deputy secretaries who function as COOs in departments. This group selected strategic projects that focus on cross-government integration and straddle four major customer

[19] Booz Allen Hamilton, 2002, p. 150.
[20] Todd Ramsey (2004). *On Demand Government: continuing the e-government journey*. IBM Press
[21] CISCO 2004. *Connected Government.* Premium Publishing, London.

sets—citizens, businesses, employees and other governments. It was recognized that transformational change is dependent on executive leadership and on buy-in from all levels of leadership. A President's Management Agenda scorecard was developed to chart each agency progress. This provides transparency and holds the government accountable for e-government progress and results not only to the President but also to the taxpayers. To support cross-government integration, a common federal enterprise architecture was initiated through the CIO council. The central unit also analyzed the primary lines of business of the federal government (e.g., financial management, human resources management) to extract key common solutions across multiple agencies and provide gradual and measured integration.

The transformation and cross-agency integration process is a long journey, with many challenges remaining. Without congressional support (appropriately reflected within each agency's budget), cross-government integration is a secondary priority within agencies. Changes in leadership undermine continued top-down support for cross-government projects. To mobilize funding, agencies are looking at models where the private sector provides a capability upfront and receives payments as transactions occur. But these models are difficult to implement successfully. Without process transformation secured upfront, these transaction models may automate old processes or implement private sector-developed systems that may be incompatible with other government systems.[22]

Interestingly, the primary leadership and coordination of e-development or "knowledge economy" pillars are located at the state level. The states have been at the forefront of innovation and integration to transform public services and the local economy. For example, the CIO of the State Maryland is concerned with not only with e-government initiatives, but also with promoting the local ICT industry, connectivity and digital divide issues. The CIO reports directly to the governor of the State. She is also concerned with developing e-policies, promoting digital literacy, and other synergistic elements of e-development.

The **United Kingdom** relies on a high level policy and coordination mechanism and decentralized implementation structure (Box 4). In 1999, the UK created the Office of the e-Envoy (OeE), working under the Cabinet Office and reporting directly to the Prime Minister. The Office was charged with setting the overall policy, ensuring coordination across government and monitoring the progress. It also had some executive powers to manage a number of cross-departmental e-Government projects. Despite significant achievements, the Office's lack of direct influence over ICT programs of various departments and ministers did not allow it to ensure seamless integration of all relevant ICT programs, especially in the area of electronic service delivery.

The UK continues to experiment with new ways to mainstream e-government and correct for past shortcomings. The aim is to drive demand and usage up, and to realize

[22] Ramsey (2004).

the potential savings and redeploy resources to the front line. Since 2002, there has been a progressive shift towards both enforcing a central direction to secure shared vision and integrated service, and mainstreaming e-government to secure customer-focus and ICT-enabled transformation. An e-Government Unit took over the responsibilities of the e-Envoy and became accountable to the Minister for the Cabinet Office. Compared to the e-Envoy, it has a number of additional responsibilities and more direct control over governments IT programs. The CIO Council was created in January 2005 to support this mission. in December 2005 the Government CIO and the head of the e-Government Unit, was appointed the Head of the Prime Minister's Delivery Unit—further raising the profile of the e-Government agenda.

Box 4. United Kingdom: Experimenting with e-Leadership Institutions to Become Customer-Focused

In the United Kingdom, the government in 1999 created the Office of the e-Envoy (OeE), working under the Cabinet Office and reporting directly to the PM and to two e-ministers: the Secretary of State for Trade and Industry (who is responsible for e-commerce across Government) and the Minister in the Cabinet Office (who is responsible for modernizing government). The three main goals set for the OeE were: making all services of the British government available online by 2005, improving the e-commerce environment by 2002; Ensuring Internet access to anyone who wants it by 2005. The Office was charged with setting the overall policy, ensuring coordination across government and monitoring the progress. It also had some executive powers to manage a number of cross-departmental e-Government projects, such as a government intranet and Government Gateway portal. On top of that, the Office of the e-Envoy had influence over the Treasury's financing decisions. The e-ministers and e-Envoy provided the Prime Minister with a monthly report of the progress made.[23]

Overall, the Office of e-Envoy received high marks for its performance. At the same time, its lack of direct influence over ICT programs of various departments and ministers did not allow it to ensure seamless integration of all relevant ICT programs, especially in the area of electronic service delivery. Model 2 of policy coordination alone did not suffice in enforcing a "whole of government" approach to service delivery.

Since 2002, there has been a gradual shift towards both enforcing a central direction to secure shared vision and integrated service, and mainstreaming e-government to secure customer-focus and ICT-enabled transformation. An e-Government Unit took over the responsibilities of the e-Envoy and became accountable to the Minister for the Cabinet Office, reporting to the Cabinet Secretary. Compared to the e-Envoy, it has a number of additional responsibilities and more direct control over public IT programs. The key responsibility of the new position is to improve government delivery of online public services by building them around customers and not departments. It is not just

[23] OECD U.K. Report: http://www.oecd.org/dataoecd/9/62/1952944.pdf?channelId=33757&homeChannelId=33703&fileTitle=IT+Policy+Profile%3A+United+Kingdom

about providing government services online, but ICT-enabled provision of all services over multiple channels. While each agency has the responsibility to develop business-led ICT strategies in their areas, the role of the e-government unit is to ensure they are joined up with other services and create a roadmap across government as a whole.

The responsibilities of the e-Government Unit include:

- Strategy: developing policy and planning for e-Government
- Architecture: providing design, standards, governance and guidance for ICT in central government; commissioning government-wide infrastructure and services; and addressing issues of systems integration
- IT Monitoring and Finance: in partnership with OGC, monitoring major IT projects in government and advising on major investment decisions.
- IT Human Resources: manage the IT professionals in government and lead their professional development.
- Research: undertaking policy and strategy studies, identifying and communicating key technology trends, opportunities, threats and risks
- Security: overseeing government IT security policy, standards, monitoring and assurance, and contingency planning for the critical national infrastructure
- Supplier Management: in partnership with OGC, managing the top-level relationship with strategic suppliers to government and conducting supplier analysis.[24]

A CIO Council was created in January 2005 to support this mission. The head of the e-Government Unit chairs the CIO council. The council enables partnership between IT professionals across government. The CIO council so far has had tough time dealing with its main legacy problem - UK government still has a plethora (several thousands, actually) of independent departmental websites, some of which get only few hundred visitors a year. Very limited information is available on the costs of creating and maintaining those websites.

Interestingly, in December 2005 the Government CIO and the head of the eGovernment Unit, was appointed the Head of the Prime Minister's Delivery Unit. The Unit's overriding mission is to ensure the delivery of the Prime Minister's top public service priority outcomes. The CIO continues to report directly to the Cabinet Secretary, and to have managerial responsibility for the eGovernment Unit. This raises the profile of the e-Government agenda significantly.

(http://www.cabinetoffice.gov.uk/newsroom/news_releases/2005/051215_watmore.asp)

The reform agenda of transforming government is a huge challenge and thus require building appropriate human resources and institutional capacities. Therefore, the head of the e-government unit is engaged in developing:

[24] http://www.cabinet-office.gov.uk/news/2004/250504_egov.asp

- A common career framework for IT professionals
- An integrated approach to training
- Effective deployment of experienced IT professionals to where they are most needed in government.
- Cross-agency deployment to build broad work experience
- Knowledge sharing through building a community of practice
- Dialogue with policy makers, business leaders, IT suppliers and professionals.

The UK continues to experiment with new ways to mainstream e-government and correct for past shortcomings. The aim is to drive demand and usage up, and to realize the potential savings and redeploy resources to the front line. The modality is to secure line business management responsibility for each group of customers and thus ownership of management for improving and integrating service for these customers. Customer-segmented clusters or "franchises" are created over time for each major group of customers (parents, students, etc.). The franchise approach is being introduced incrementally to build ownership and confidence in this model and to work out the principles and the process. Each franchise is run by a team and led by a senior business manager. User engagement and research drives the design and performance of the franchise and its delivery of integrated services over multiple channels. Franchise directors are critical to departmental ownership of the e-government program. They are the champions of each customer group and the change agents in their department.

In **Italy**, the Minister for Innovation and Technologies was appointed in 2001. Although called a Minister, the function in effect reports directly to the Prime Minister and coordinates work across ministries through an inter-ministerial committee, very much like the British Office of the e-Envoy. Given growing concerns about e-government, however, a recent (June 2006) decision has been made to combine two ministries into one: Ministry of Innovation and Technologies and Ministry of Public Administration.

Japan presents a case of a developed country that has slipped behind in the race toward a knowledge economy (Box 5).[25] Japan's traditional strengths have been incremental and continuous improvement, in-house development and innovation, stable lifetime employment, in-house corporate training, proprietary standards, and accumulation of tacit and shop-floor-based knowledge. The new paradigm of the knowledge-driven global economy calls for flexible labor markets, flexible and networked production, networked-based innovation, tapping external information and global knowledge, venture capital and entrepreneurship, and open forms of governance and organization. It is built on common and open standards and modularization. It calls for changes in business practices and decision making systems, in public and private sectors. It also calls for strong leadership and top-down strategy to integrate enterprise-

[25] Tsutomu Shibata (editor). 2006. *Japan: Moving Towards a More Advanced Knowledge Economy*. World Bank Institute. Washington D C: World Bank

wide systems, transform business processes and work practices, and overcome resistance to institutional and policy change. Japan's traditional strengths must be adapted to match the new demands of the new paradigm.

Japan's experience suggests that top level policy formulation, advanced information infrastructure and technological capabilities are not a guarantee to diffusion and effective use of ICT. Other e-development components must be advanced, coordinated, and sequenced as well. For example e-government is far lagging behind, back office processes remain backward, and the adoption of e-services is quite low. Mechanisms to secure coordination of service delivery and interoperability across agencies are still lacking. The gap between CIOs and policy makers in the public sector remains wide. In Japan's private sector, only 13% of small and medium enterprises have a CIO, compared to almost 100% in the USA.

Japan's experience further suggests that even advanced countries cannot rely on past strengths and established institutions; they must develop appropriate leadership institutions and practices to adjust to a paradigm change. Japan is currently addressing the policy, institutional and managerial reforms to catch up with the information technology revolution, and in particular, in using ICT to transform government and industries. Speed, focus, and collaboration must be reinforced by strong leadership. The challenge to move with speed to achieve fast growth with equity cannot be underestimated.

Box 5. Japan: Losing the Race Toward the Knowledge Economy?

During the ICT revolution since the 90s, Japan was in an economic down turn. Despite the slowdown, Japan continued to invest in ICT at levels comparable to the USA, but did not reap the same productivity gains while the USA did. This is in significant part because it did not adjust its corporate and managerial systems to the new paradigm called for by this revolution. The ICT revolution calls for changes in business practices and decision making systems as well as relations among enterprises and between suppliers and customers. With the diffusion of electronic networks and the development of in-real-time global supply chains, the development of external information and explicit knowledge important to competitive industry and innovative economy.

IT investment is not just about buying hardware and software systems. Success in reaping the benefit of ICT demands co-investment in human and organizational capital and co-invention among suppliers and users and across supply chains. Introducing supply chain management (SCM) and customer relationship management (CRM) systems must be paralleled by changes in organizational structures, business processes, work practices, incentive systems, and supply and customer relationship. They often imply reduction in back-office staff and rapid shifts in labor demand. The same imperatives apply to e-government as they do to e-business.

Japanese policy makers and business executives have been relatively slow in meeting these imperatives. In particular, IT management is fragmented by department. Without

top-down leadership, including e-leadership, few firms have been able to drive the investments and changes necessary to implement firm-wide networks, CRM, CRM, and enterprise-wide architecture. It has been also difficult to articulate and codify the business processes and thus to reengineer and digitize them. Furthermore, most firms remain in-house bound in terms of information, innovation and business intelligence. Organizational rigidities have limited the effective use of new ICT systems and the flow of information within and across enterprises. To achieve speed in ICT-enabled transformation, strategic management and leadership would be necessary.

In Japan's public sector, the ICT policy advisory function is undertaken by the Information Technology Policy Office (ITPO). The ITPO has a cross-departmental coordinating role and employs about 20-30 people; it does not manage any projects of its own. The Prime Minister is considered the Director General (DG) for the central, strategic IT program, with the ministers of ICT, Internal Affairs, and Trade and Industry as vice DGs. Past programs have emphasized the development of advanced broadband infrastructure. A 2006 IT Reform Strategy focuses on a ubiquitous Japan (U-Japan). Its priority measures include information infrastructure, IT human resources, and IT structural reform capabilities, and the development of an effective CIO cadre. In addition, the strategy aspires to utilize ICT to accelerate the movement of information, services, people and goods throughout Asia and to make Asia the World's information hub.

Despite these formal e-leadership institutions, Japan lags in the use of e-government for similar reasons as in the corporate sector. Information flows very slowly across departments, if at all. Management style is even more conservative in the public sector. Public CIOs are primarily trained as technical staff, with limited appreciation of the institutional changes and process innovation required to realize the benefits from ICT investments.

China presents special challenges in forging an overarching e-leadership framework as the country is undergoing multiple transformations (Box 6). It straddles between model 1, of shared responsibility among many agencies, and model 2 of policy coordination. It has made substantial achievements, particularly in implementing large technological networks and complex "Golden" projects. But it lags behind in e-government, particularly in government services to businesses and citizens (G2C and G2B). Regulatory authority is vague and overlapping.

A key challenge is to address the complexity and resulting uncertainty of the division of legal and regulatory responsibilities and their lack of coordination in the ICT sector. The absence of a legal framework stipulating the principles and scope of informatization has made regulations unclear. Cooperation among regulatory departments is weak. Institutional mechanisms for coordinating ICT use in government are also emerging, but still mainly limited to some policy areas and few large investments in major public service projects called "Golden Projects". An e-government unit within the Ministry of Finance controls a small part of the budget for e-government proposals. The State Council Informatization Office, SCITO, a specialized body, provides guidelines for

overall e-government development and technical assessments of aspects such as the ranking of government websites. Given the size of China, local e-government and e-community play a growing and important role in providing access to public services and building the information society. The Ministry of Civil Affair is the lead player for this level of e-government.

To pursue ICT-enabled transformation most effectively, China needs to develop an e-leadership institutional model capable of promoting a coherent policy environment, government-wide enterprise architecture, interoperability standards, public-private partnerships (PPPs), and effective outsourcing and contract management. Leaders should also develop governance frameworks and programs to promote the exchange of experience, information sharing, and prioritization across e-development and e-services. Given the size and diversity of China, this institutional framework would need to be replicated at lower levels of government and/or adapted to different regions. Institutional mechanisms are also needed to promote cross-regional sharing of information resources and collaboration on e-government applications at all levels of government.

Box 6. China: A Complex Institutional Framework for ICT Policy and E-government Coordination[26]

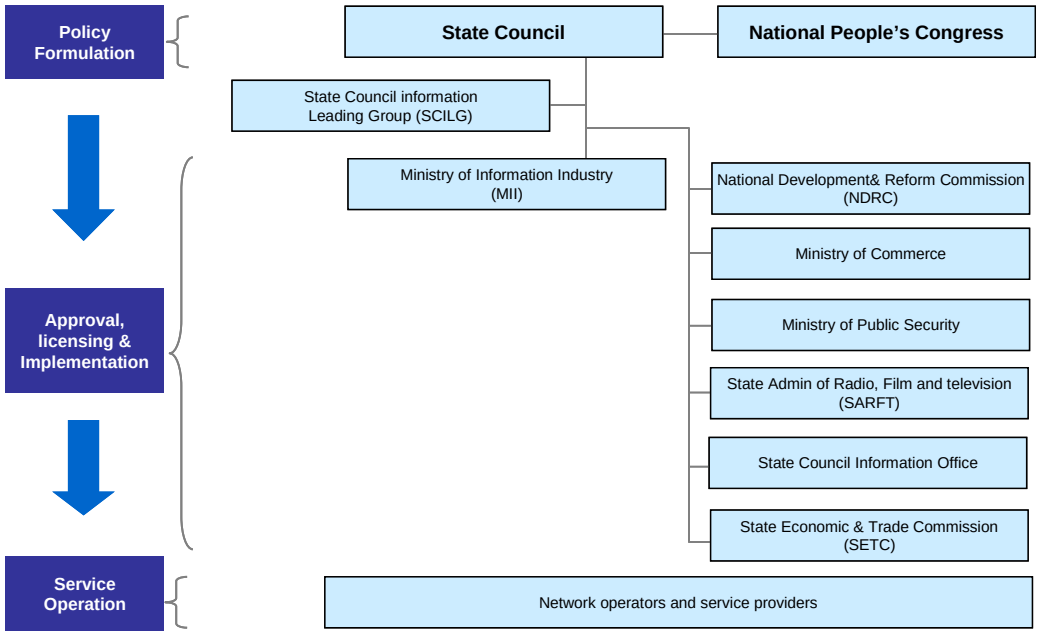
China' e-leadership institutional framework straddles between the shared responsibility (model 1) and policy coordination (model 2). For a country as large and diverse as China, governance of the ICT agenda and leadership in implementing it are major and continuous challenges. Top-down authoritarian visions have to compete with bottom-up liberal visions. Key players and a wide range of institutions have to bargain intensely over how to restructure the rules of the game. Whether called information industry, Internet, digitalization, or informatization, the new technologies have been viewed by the political elites as resources to enhance China's advancement and yet maintain their own influence and political stability. As the knowledge economy and Internet action grew rapidly, ministries and agencies tried to bargain and carve out bigger pieces for themselves. "Golden" projects proliferated. Much of action has been driven by institutional entrepreneurship, social connections and extensive networks. In this context, it has been difficult to develop an overarching institutional framework for informatization.

Despite fast technological convergence of telecommunications, broadcasting and Internet technologies, regulatory convergence is absent and division of regulatory responsibility is vague (Figures 4 and 5). These aspects of the ICT sector are regulated mainly by the Ministry of Information Industry (MII) and the State Administration of Radio, Film, and Television (SARFT). Numerous other agencies, however, are involved in ICT regulation. The MII has been the main regulator of telecommunications and e-commerce. SARFT

[26] This case study draws on Qiang (2007)

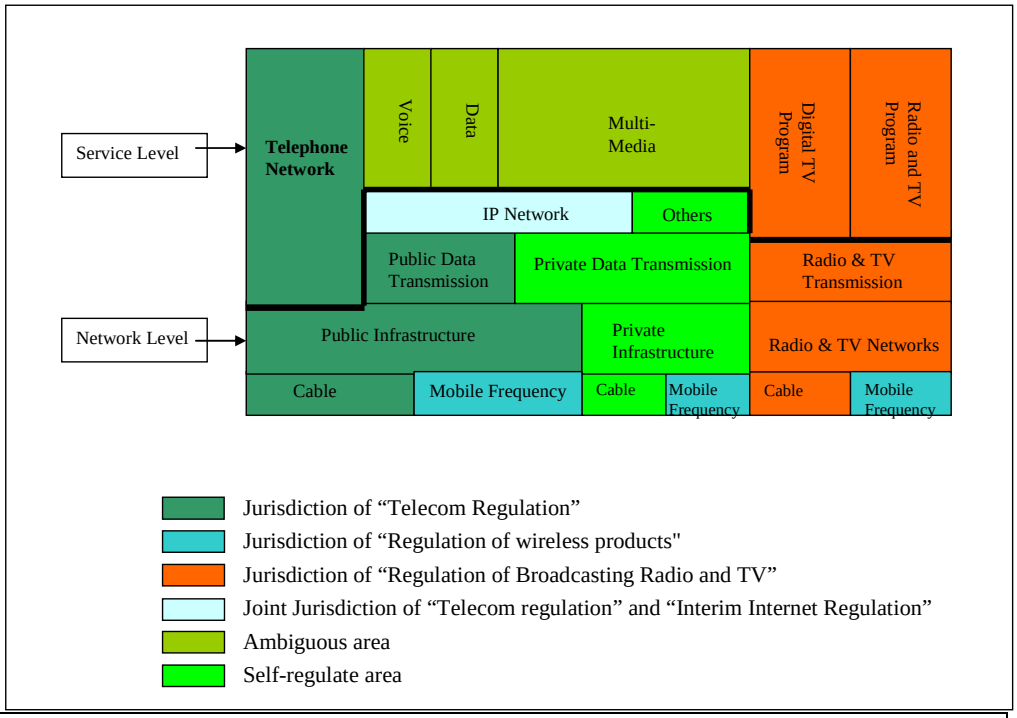
regulates broadcasting networks and television administration. Several bodies under the State Council also contribute to ICT and e-commerce regulation. For example, the State Council Informatization Leading Group (SCILG) formulates national ICT policies, coordinates ministries and bureaus, and settles disputes among them on ICT policies. In addition, the National Development and Reform Commission and State Economic and Trade Commission oversee funding and operations of state enterprises, influencing the diffusion of e-commerce.

Figure 4: Institutional Structure of China's Telecommunications and Broadcasting Sector



Source : Qiang (2007)

Figure 5. Regulatory Jurisdictions for China's ICT Services and Networks



A key challenge is to address the complexity and resulting uncertainty of the division of legal and regulatory responsibilities and their lack of coordination in the ICT sector. The absence of a legal framework stipulating the principles and scope of informatization has made regulations unclear. Cooperation among regulatory departments is weak, and China's myriad agencies have different and sometimes overlapping responsibilities. As a result many agencies often regulate the same area—yet accountability is lacking and the resulting regulations are inconsistent. Improved policy coordination would accelerate progress on many fronts: network security, data protection and privacy, open access to government information, interoperability, and more broadly, developing a dynamic information infrastructure and enabling environment for content and applications development.

Institutional mechanisms for coordinating ICT use in government are also emerging, but still mainly limited to some policy areas and few large investments in major public service projects called "Golden Projects". The golden projects range from internal automation to online transactions and cover applications in trade and customs, payment systems, government portal, Internet and government intranet, tax administration, and many sector-specific applications in agriculture, health, insurance and tourism, among others. These projects involve one or more leading ministry and/or a number of participants. Other e-government projects, representing the majority, are launched by various government departments; departments have adopted on their own internal informatization of key functions like financial management and website development. An e-government unit within the Ministry of Finance controls a small part of the budget

for e-government proposals. The State Council Informatization Office, SCITO, a specialized body, provides guidelines for overall e-government development and technical assessments of aspects such as the ranking of government websites.

Given the size of China, local e-government and e-community play a growing and important role in providing access to public services and building the information society. The Ministry of Civil Affair is the lead player for this level of e-government. In 2000, it launched the Citizen Facilitation Project to foster ICT applications targeted at communities. The project was designed to provide civil resources online, improve the Social Affairs Administration Department, and build a community service information platform that includes ICT-based community management and service applications as well as "intelligent call centers". Most e-community applications, however, are aimed at strengthening the government's capacity to provide services to communities rather than community-centered services. In response to demand in large cities, such as Beijing and Shanghai, which tend to have higher ICT access, some municipal governments have established integrated e-community service platforms, to connect many community service centers.

Coordinating the development of e-government in China is a massive undertaking. China is transforming from an agricultural to industrial economy, from rural to urban society. It is transforming from a centrally planned to a market economy. Government role is shifting from micromanagement to macro-coordination. Globalization and joining the WTO are further accelerating this transformation, with major implications for ICT role in making the government more efficient, effective and transparent.

To pursue ICT-enabled transformation most effectively, China needs to develop an e-leadership institutional model capable to promote interoperability, enterprise-wide architecture, public-private partnerships (PPPs), effective outsourcing and contract management, exchange of experience, information sharing, and prioritization across e-development and e-services. A leading institution should develop an enterprise-wide architecture and interoperability framework to coordinate across government departments and at different levels. It should develop a framework for PPPs at the central, provincial and local levels and thus mobilize the vast resources and expertise of the private sector while protecting the interests of government and citizens. It should set standards for demand analysis, process reengineering and monitoring and evaluation of e-government services and thus reduce the excesses of technology and vendor-driven investments. Institutional mechanisms are also needed to promote cross-regional sharing of information resources and collaboration on e-government applications at all levels of government. A central institution may also lead the process of moving towards an open government and motivate government agencies to share information with the public. Finally, e-leadership is needed for prioritizing e-government infrastructures and applications for maximum development impact. So far, investment has focused on telecommunications, networks, databases and back office e-government (G2G) applications, while G2C and G2B services have lagged far behind.

Model 3: Lead Ministry

In this model, all elements of e-development are directed by a single government ministry or thematically divided among a couple of powerful ministries: usually the Ministry of Finance (or the equivalent such as the OMB, Ministry of Economy or Planning), the Ministry of State or Public Service, or the Ministry of ICT (Figure 6).

Examples of countries with the Ministry of Finance in the lead are Canada and Israel.[27] Those with the Ministry of Economy or Planning in the lead include Russia, China, and Brazil. Examples of the Ministry of ICT in the lead on national ICT strategy, with the Ministry of Public Services in the lead on e-government include South Africa, Mexico, and Egypt. Finally, examples with the Ministry of ICT in the lead include Australia, India, Romania, Slovenia, Vietnam and Thailand.

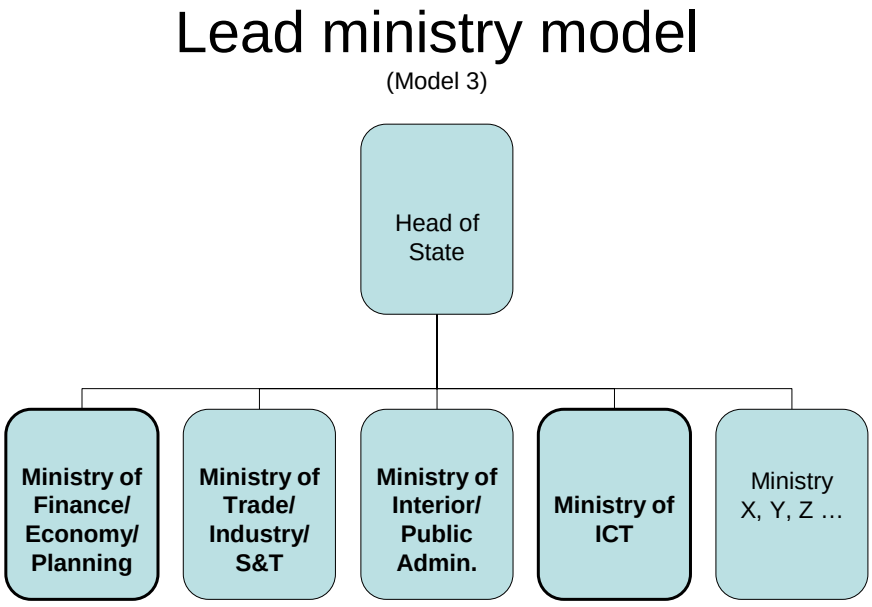


Figure 6

Potential advantages: Working out of the Ministry of Finance (or Treasury) gives the function of formulating and implementing an information society strategy a direct access to the funding it needs. It also enables easier control over funds that will be required by other ministries in their pursuit of e-development goals set down for them. The ministries of economy or planning, with similar cross-cutting mandates, may play similar leading roles for e-development. This model may fit large countries with a relatively developed role for local governments so as to involve a core Ministry (Finance,

[27] Recently (June 2005), Canada adopted a new model, where the lead agency is Supply and Services Canada, a government-owned services agency, along model 4.

Economy or Planning) in a strategic way in setting policies and priorities through the budget process, and allow effective decentralization of implementation through state or local governments.

Working out of a technical ministry such as the Ministry for Information and Communication Technology (or the Ministry of Trade and Industry, or Science and Technology) ensures that competent staff is available to deal with ICT issues. This mandate may also be a natural evolution of the traditional role of the ministry of telecommunications—typically when the adopted approach to e-development is technology-focused. Ministries such as trade and industry may have the advantage of involving the private sector and other non-government stakeholders more effectively in the e-development process and thus allow for innovative public-private partnerships.

Potential disadvantages: Leadership by a non-technical ministry may result in distortion of the overall strategy. the finance ministry may focus on ICT applications for revenue generation and public financial management—but neglect the potential of ICT for public service transformation and social inclusion. Such leadership would also lack the necessary substantive knowledge of e-development for policy-making and ICT governance, and may be preoccupied by macroeconomic management issues.

When the Ministry for ICT in the lead, it may be too focused on telecommunications infrastructures and technology. The Ministry of Industry may be too focused on the ICT industry. E-government programs led by the technical ministries also suffer from technology-driven approaches that ignore public sector reforms and institutional transformation. Leading through any sectoral ministry also raises the common risks of turf wars among ministries.

To make the lead ministry model work, governments often create high-level bodies for policy coordination (and thus combine features of models 2 and 3). When leadership is assumed by the technical ministry, strong financial mechanisms with well defined "sticks and carrots" would be needed to ensure compliance and cooperation.

Examples with Ministry of Finance or Treasury in the lead: Canada, Israel

Canada adopted common features from both model 2 and 3. The Treasury Board of Canada plays a policy coordination function in addition to strategic resource allocation and program review. The e-Development agenda is divided among: 1) the Chief Information Officer Branch in Treasury Board for the overall allocation of ICT budgets, enforcement of common technology architecture and program review of e-services; 2) Ministry of Supply and Services for the delivery of e-government services; and 3) Industry Canada for e-business and infrastructure development and liaison with the private sector. The Cabinet Committee is chaired by the President of Treasury Board, to whom the CIO reports.

Despite its top international ranking on e-government, Canada periodically reviews its e-leadership institutional arrangements and the role of its CIO, among others. Canada's e-

government dual challenge remains as one of government-wide integration and country-wide inclusion. The focus since 2006 has been to move beyond the front-end delivery and encompass transformation of the back-office through the Business Transformation Enablement Program. Also the government has created an independent ICT agency (model 4), called Supply and Services Agency, to lead the next stage of e-government and drive change towards deep transformation.

The Canada case suggests a progressive shift from model 2 to 3 to 4, in view of consultations with citizens and the need to deepen ICT coordination and ICT-enabled transformation. Canada started with model 2, but policy coordination alone could not overcome vested interests in fragmented investments. The Treasury as the lead ministry (model 3) gave more impetus to the Government-on-Line program and e-service delivery. But leadership remained inadequate and reactive rather than proactive in using ICT for back-office transformation.

The recent shift to an independent Supply and Services Agency (model 4) and a strengthened national CIO role aim to address the next generation of challenges involved in deepening the transformation. Canada's e-government dual challenge remains as one of integration and inclusion. The government continues to renew ICT institutional and governance mechanisms in response to the annual reviews of results, surveys on the take up of e-services, and continual consultations with citizens and businesses.

Box 7. Canada: Learning to excel in e-government through engaging clients and renewing leadership institutions

Canada is one of the early starters in e-government; its national e-government program has topped Accenture's "E-Government Leadership: Engaging the Customer" report for the past several years. Canada was the only country out of the 22 surveyed that was defined as having fully transformed its services due to the move to e-government.[28]

Governance is carried out through a horizontal governance structure or "the leadership of many". The e-Development agenda is divided among:

1) the Chief Information Officer Branch (CIOB) in Treasury Board for the overall allocation of ICT budgets, enforcement of common technology architecture, and program review of e-services;

2) Ministry of Supply and Services for the delivery of e-government services; and

3) Industry Canada for e-business and infrastructure development and liaison with the private sector. The Treasury Board is chaired by the President of Treasury Board (minister), to whom the CIO reports.

CIOB was created in 2000 and is responsible for determining and implementing a strategy that will accomplish the government's information society goals. These goals include managing the government's IT assets, promoting service improvement and innovation across all delivery channels under the Government On-Line (GOL) initiative,

[28] Accenture. E-Government Leadership: Engaging the Customer. Accenture Government Executive Series, 2003, p. 9.

and leading the government's IT professionals. Since, the responsibility for the e-government was moved to the Ministry of Supply and Services.

The GOL has been a government-wide initiative with annual milestones. In 1999, the framework was defined and a three-tiered approach was adopted: online publishing of all key services by 2000, delivery of federal services by 2004, and seamless service delivery across channels and the three levels of government, currently underway. In 2000, the strategy was set for three client groupings and implementation started in 2001. Several institutions were established: the Institute for Citizen Centered Service, the Internet Research Panel (to provide feedback from users of online services), and the GOL advisory panel. By 2002, emphasis shifted to policies to ensure integrated service delivery and the first public GOL progress report was released and tabled in parliament. In 2003, horizontal and vertical integration of services moved further. The emphasis in 2004 was on taking stock of GOL results, continuing consultations to ensure G2C meets citizen's expectations and leveraging the e-channel to support greater service transformation. During 2005, the focus was on sharing lessons, outcomes management, and the take-up of e-services.

The experience gained through successive milestones and projects was used to accelerate the development of policy frameworks in areas such as privacy and security, and these in turn contributed to developing the foundation for more responsive e-services. Institutional frameworks and governance mechanisms evolved accordingly, to promote horizontal and vertical integration, building trust and ensuring the strategic alignment of polices, projects, infrastructure and implementation plans. Extensive consultations with citizens through surveys and focus groups acted as a catalyst to improve government services and validate that needs are met. Leadership remained critical to providing guidance in an environment of rapid change in service delivery and moving from silos to integrated approaches.

Despite its top international ranking on e-government, Canada periodically reviews its e-leadership institutional arrangements and the role of its CIO, among others. Canada's e-government dual challenge remains as one of integration and inclusion. The focus since 2006 is to move beyond the front-end delivery and encompass transformation of the back-office through the Business Transformation Enablement Program. As of June 2006, the government has created an independent ICT agency (model 4), called the Supply and Services Agency to lead the next stage of e-government and drives change towards deeper transformation.

To advise the government on e-commerce issues, the e-business Roundtable was established in 1999. This was a collection of industry leaders with a self-defined mandate of achieving growth in the Canadian knowledge economy. Formally, the Roundtable advised Industry Canada, which in turn lobbied the federal government to enact select changes. It was considered unique because it was one of the first examples of voluntary co-operation within the private sector dedicated not to the goals of a particular industry but to stimulating the economy as a whole. The Roundtable was segmented into 5 different pillars, each with a mandate to improve Canada's attractiveness or performance

in that particular area: e-Business Acceleration, Capital Markets, Brand Awareness (of Canada as a location for e-commerce), e-Business Talent Pool, and Governments On-Line Acceleration. Each Roundtable pillar interacted with a corresponding Industry Canada team, headed by a nominated champion.

The Canadian e-Business Initiative (www.cebi.ca) (CeBI) was established as a successor to the Roundtable and in recognition of the latter's success as a forum for mutual education of both the public and private sectors. The CeBI was created as a voluntary, private sector-led partnership with the federal government. CeBI was officially launched in September 2002, with a two-year mandate to advocate e-business adoption and use amongst SMEs, advise on tax and investment rules, brand Canada as a tech-savvy country and benchmark Canada's performance in the digital economy. Much of CeBI's work was done through product-driven teams: e- Business Engagement, Business e-Transformation, Online Privacy & Security, e-Talent Issues for SMEs Team, Benchmarking & Metrics, Investment Climate Team.

The time limit idea is an interesting feature of CeBI. It forces the new body to focus on results and helps to avoid developing bureaucracy. It also enables this partnership to attract very high-level people from the private sector who otherwise would be uncomfortable with endless commitment of time. CeBI had very high level representation, such as, for example, the President of Cisco Systems Canada.

In **Israel**, the leading body formulating and implementing the national ICT strategy is the General Accountant Office (GAO) under the Ministry of Finance. A special inter-ministerial steering committee, headed by the General Manager of the Prime Minister's office, oversees the ICT-related activities of the GAO.[29] The GAO's lead on e-development activities began in 1997, with the creation of the governmental Internet committee dedicated to creation of websites and the connection of all government ministries to the Internet. The committee's goal was to set working regulations for building governmental Internet sites and to assimilate information technology in governmental offices by setting appropriate working regulations, conducting pilot projects and training government officials in ICT skills. The committee worked in coordination with the government offices through a steering committee that met on a regular basis.

Other ministries play a role in the country's broader ICT agenda. The Ministry of Communications is the government entity responsible for ICT infrastructures and the regulation of ICT services, the Ministry of Science and Technology is responsible for funding basic scientific research (mainly in academia), and the Ministry of Industry, Trade and Labor is responsible for applied research and technology development and for the supporting of the domestic ICT industry.

[29] Cohen, Yizhak. A Three-years Master Plan "E-Government" Initiative 2003-2005. Ministry of Finance - General Accountant Office, Jerusalem, 2002.

Examples with the Ministry of Planning/Economy in the lead: Russia and Brazil,

A number of countries have assigned the planning or economy ministry as the leading agency for formulation of e-development. Like the Ministry of finance, the Ministries of economy or planning have cross-cutting mandates and with strong influence on resource allocation and public investment programs. Brazil and Russia may be classified under this model, with the lead for strategy formulation coming from the ministry of planning or economy. In all cases however, implementation is often shared or delegated to the Ministry of ICT.

Brazil aspires to create an inclusive digital economy through broadband connectivity and a "connected state" through e-government. Political leadership increasingly view connectivity and e-government as effective means to promote social inclusion, reducing the costs of doing business, and enhance the competitiveness of the whole economy. The e-government framework at the federal level aims at prioritizing e-citizen services and their delivery channels, promoting interoperability and information sharing across government agencies both horizontally and vertically, and overcoming the digital divide. The lead agency for developing and implementing this framework is the Secretariat for logistics and Information Technology.

Brazil's e-government efforts have led to mixed results. Some single purpose applications like e-voting attained wide fame, mainly due to political commitment to such visible e-government applications. Similarly, substantial progress has been achieved through modernization of public financial management, with the power of the Fiscal Responsibility Law. But overall progress on using e-government to integrate processes across agencies, deliver seamless and responsive citizen-centered services and secure social inclusion remains limited. Local innovations and promising pilots are seldom shared and scaled up. The lead agency, the Ministry of Planning, assisted by the Ministry of ICT, is technically competent. But it lacks the political support to overcome the daunting challenges of interoperability, change management, business process reengineering, and service delivery integration.

Some of the most promising pilots and innovations in Brazil have been initiated by progressive municipalities and state governments, but leadership for scaling up at the federal level is lacking. Digital cities programs are politically popular and several state governors have been elected in 2006 with the promise of making all municipalities in their states digital (with broadband connectivity). The private sector is active in financing broadband connectivity, but the last mile problem remains, particularly for the poor regions of the country. Substantial universal access funds (FUST) remain unutilized for such purposes--tied up by legal and regulatory constraints and more broadly by lack of national consensus and leadership at the national level. Technical leadership cannot substitute for political leadership.

Russia has a mixed experience with the model of splitting the lead role between two agencies, one for policy and the other for implementation. Russia uses a hybrid

model of two leading ministries, the Ministry of Economic Development and Trade (MEDT) for setting the conceptual program and funding, and the Ministry of ICT for implementation. Rivalry among these two ministries continues. The experience of Russia illustrates the problem of dividing the mandate along the line of conceptual planning and operational implementation. That division proved unclear, unstable and ineffective. In a typical Russian fashion, it remains a puzzle.

Despite the substantial resources committed to e-Russia, much of the funding remains underutilized and mechanisms for effective coordination and implementation remain underdeveloped. There are no formal leadership structures in place but only project-by-project or program specific committees. There are no unifying visions or strategic projects to build common e-government infrastructure. The result: the federal program for e-government has a poor implementation record, despite ambitious plans and good intentions. Other aspects of e-development are being pursued separately. For example, the Ministry of ICT is competing with other concerned ministries to promote technology parks, the ICT industry and software services.

Examples of the Ministry of ICT in the lead on national ICT strategy, with the Ministry of Public Services (or State) in the lead on e-government: South Africa, Egypt and Mexico.

South Africa settled on a decentralized approach to promoting e-development initiatives. The Department of Communications (DoC) is responsible for promoting the overall National ICT Strategy. The DoC "owns" the ICT strategy, but is not empowered to coordinate implementation. Its activities are focused on policy and infrastructure issues, while related programs are advanced by other institutions, such as the Department of Science and Technology.

South Africa was one of the first countries to institute government-wide Chief Information Officer cadre to provide shared leadership and facilitate coordination. The State Information Technology Agency was established as a public sector company to consolidate and coordinate the State's information technology resources in order to achieve cost savings through scale, increase delivery capabilities and enhance interoperability. Three high-level consultative bodies have been created to advise the president on: global ICT markets; local ICT initiatives and human capital; and government IT functions.

Box 8. South Africa: Towards more structured coordination mechanisms

Overall, South Africa settled on a decentralized approach to promoting e-Development/e-Government initiatives. In the last 5-7 years it heavily focused on expanding basic infrastructure and building internal IT capacity. As of mid 2006, coordination is largely focused on the technical level – procurement, interoperability, security, etc. This situation may change as the government is exploring its options to introduce more structured

coordination mechanisms, most notably to advance the e-Government Gateway project for single window.[30]

Three high-level consultative bodies have been created to advise the president on the ICT-related issues: International Task Force on Information Society and Development (global ICT markets), the Presidential National Commission on Information Society and Development (local ICT initiatives and human capital) and the IT Council (government IT functions). In addition to the major private and public sector players, first task force includes representatives of several foreign governments, such as Brazil and India, to promote international cooperation.

The Department of Communications (DoC) is responsible for promoting the overall National ICT Strategy, Info.com 2025. The DoC "owns" the ICT strategy, but is not empowered to do coordinate implementation. Its activities are focused on policy and infrastructure issues, while related programs are advanced by other institutions, such as the Department of Science and Technology (See a special initiative on Meraka Institute, African Advanced Institute for Information and Communication Technology.) Policy coordination is conducted through task forces and, on the working level, through government thematic clusters, such as Economic Cluster headed by the department of Trade and Industry. The implementation of the e-Government strategy is led by the Department of Public Service and Administration (DPSA) in consultations with DoC. The DPSA has limited executive e-government powers, instead acting more as a network entry point manager.

South Africa was one of the first countries to institute government-wide Chief Information Officer solution. The1998 Report of the Presidential Review Commission on the Reform and Transformation of the Public Service concluded that e-government investment in South Africa "has been made in a highly fragmented manner and economies of scale are not being realized. … a huge cost has been borne by the South African public without any appreciable benefit in the form of greater service delivery or a more efficient and effective public service." The Commission recommended to establish the institute of Chief Information Officer to "provide clear, strong leadership, … to define a vision and oversee implementation, to encourage and facilitate cooperation; and to serve as a catalyst for change."

Depending on the authority level, government departments in South Africa have either a Chief Information Officer or Information Technology Officer. Often, these terms are used interchangeably. The Government Information Technology Officer's (GITO) Council, with the secretariat at the DPSA, serves as coordination and monitoring unit, involved in the investigation, formulation and development of IT security policy framework, e-government policy and strategy and IT procurement guidelines. The office

[30] The UN e-Government Readiness Ranking indicates that South Africa is gradually losing ground to others. The 04 e-Government rankings, which measures the state of e-readiness and the extent of e-participation, puts South Africa number 55 out of 191 countries (the score of 0.490, on a scale of 0 to 1). South Africa lost its first place ranking among 46 African countries surveyed to Mauritius (0.544).

of the Government Chief Information Officer (OGCIO) in the DPSA works closely with the GITO Council to facilitate project coordination aimed at delivering a single access window to government services.

The State Information Technology Agency (SITA) was established as a *public sector company* to consolidate and coordinate the State's information technology resources in order to achieve cost savings through scale, increase delivery capabilities and enhance interoperability. According to SITA estimates, about 80% of public agencies procure at least some IT goods and services through SITA. Effectively, SITA is the Agency in charge of implementing ICT projects in government; it is responsible for developing and enforcing government-wide interoperability and security standards. It is directly accountable to Parliament and the Department for Public Service and Administration. Its most prominent stakeholders also include DPSA, GITOC and National Treasury.

The motivation for the introduction of SITA is that large numbers of departments were unable to recruit suitably qualified, experienced or knowledgeable staff and were forced to either contract the work out to the private sector or recruit consultants. In many cases these consultants became full-time "employees" at considerable cost to the department. The consequent overdependence of Government on contractors and costs for services rendered are some of the key issues for resolution by SITA. In reality, many departments still retain their own IT units to procure IT services through SITA and to ensure interoperability and security.

Egypt's experience suggests that leadership and institutional structures may change with the evolution or changes in emphasis of the national ICT strategy. The Ministry of Communication and Information Technology (MCIT) first took the lead on the whole agenda of e-Development, with particular emphasis on building the information infrastructure, broadening access to the Internet, ensuring connectivity in schools, promoting the IT industry and establishing the necessary e-laws and regulations.

As substantial progress on connectivity was achieved, the e-government program commanded more attention and the focus of e-government shifted to service delivery and process transformation. Correspondingly, leadership was transferred form the MCIT to the Ministry of Administrative Reform. Interestingly, the former minister of MCIT became the Prime Minister, and his deputy (and the e-government unit reporting to him under the MCIT) was transferred to the Ministry of Administrative Reform. The MCIT remained active in promoting the ICT industry and in attracting ICT multinationals to invest and outsource in Egypt. The Prime Minister's vision of leveraging ICT for Egypt's modernization and competitiveness remained a key driving force.

Mexico represents case of shared responsibility between the Ministry of ICT, concerned with e-Mexico, and the Ministry of Public Administration, concerned with e-Government (Box 9). E-Mexico is concerned with creating digital access and the e-

policy framework. The President's Office for Government Innovation sets the direction for e-government as a whole and coordinates e-government within the framework of the Good Government Agenda. It provides political support and leadership for e-government, including establishing the e-government network and ensuring broad participation across agencies. The Ministry of Public Administration' E-Government and IT Policy Unit translates the broad e-government agenda into specific initiatives and leads the process through policy, strategy, guidelines, practices and standards. The Unit also works very closely with the President's office to perform goal setting, monitoring, and evaluation at the Federal level.

During the past administration (2000-2006), much of e-government leadership in Mexico came from the top—from the Presidential Good Government Agenda, to the negotiation of targets with the highest officials of the President's office, to the organization of several national and international events for the dissemination of e-government practices. This political leadership was essential in raising the visibility of e-government strategy, diffusing the e-government agenda and pushing for new initiatives. Yet, long term change still requires institutional leadership to share and realize the political vision. Currently the head of the e-government unit is the general ICT coordinator for the federal government, to provide the central e-government policy leader, with agents of innovation and change at the public agency level. This national level CIO is expected to translate high-level political consensus into ICT and e-government policy.

The current president of Mexico published a decree in late 2006 to consolidate that all IT activities and functions in only one responsible area in order to promote to the highest level the planning processes and to align the ITC projects with the Institutional strategies. This action intends to take the CIOs to a strategic level instead of a simply technical role.

Box 9. Mexico: Bridging the Digital Divide and Enabling the Good Government Agenda.

Mexico has initiated two complementary initiatives: e-Mexico, or the advancement of Mexican Information Society, and specifically to overcome the digital divide, and e-Government, as part of the Good Government Agenda.[31] The Ministry of Communications and Transportation had broad responsibility for the information society agenda through the e-Mexico initiative. E-Mexico coordinates overall information society policy both horizontally at the federal level and vertically at the federal, state and municipal levels. It obtains guidance from the e-Mexico National System Council, which includes representatives from the President's office and the seven ministries that are most involved in the provision of information through the e-Mexico portal. It is concerned with creating digital community centers, the regulatory frameworks for electronic media and e-commerce, e-government, e-health, and e-education.

The President's Office for Government Innovation sets the direction for e-government as a whole and coordinates e-government within the framework of the Good

[31] OECD e-Government Studies: *Mexico* . OECD 2005.

Government Agenda. It provides a framework for e-government accountability and negotiates measurable targets and goals with the heads of agencies. It provides political support and leadership for e-government, including establishing the e-government network and ensuring broad participation across agencies. The Ministry of Public Administration' E-Government and IT Policy Unit translates the broad e-government agenda into specific initiatives and leads this strategic business in the entire Federal Administration. The Unit coordinates horizontally across the Federal Administration through policy, strategy, guidelines, practices and standards. It coordinates the E-Government Network which serves as a forum to consult, discuss and determine e-government goals and strategies and to share best practices and find common solutions. The Unit also works very closely with the President's office to perform goal setting, monitoring, and evaluation at the Federal level.

Mexico is building an e-government and ICT governance framework to ensure the institutionalization of e-government. As a first step towards the institutionalization of e-government in Mexico, the e-government portfolio was transferred from the President's Office to a newly created Ministry of Public Administration (2003). Mexico is in the process of stipulating a legal framework "who does what" regarding e-government. The proposed IT and e-government governance structure includes a ministerial council, a federal CIO office or ICT coordinator general, a national CIO council, consultative groups and specialized technical committees (2004). Individual IT units have a great deal of responsibility with regard to e-government implementation but they do not receive adequate guidance from the e-government Unit. A major challenge for the institutionalization of e-government in Mexico, as in many other countries , will be the role and capabilities of CIOs in government.

"The Inter Ministerial Commission for e-Government Development" was created at the end of 2005, as a Governance and Regulatory Framework in order to support the e-government national strategy. This Commission includes five main bodies.

1. Strategic Council. Constituted by all Federal Government Ministers. The ICT Coordinator General for the Federal Government is the Executive Secretary of this Council.

2. ICT Coordinator General for the Federal Government. The e-government and IT Policy Unit at the Ministry of Public Administration already plays this role and under this scheme it would continue to do so. The ICT General Coordinator also has the role of chairing both the Strategic Council and the Executive Council so as to ensure smooth communications between the two groups. This national level CIO translate high-level political consensus into ICT and e-government policy.

3. Executive Council. Constituted by ICT and e-government officials in government agencies. The ICT Coordinator General for the Federal Government is responsible for this council.

4. Consultation Group. Constituted by representatives of different social sectors, like businesses, universities, and citizens. The Consultation Group report directly to the Executive Council.

5. Specialized Technical Committees. Constituted by ICT and e-government officials of government agencies and experts on the subject. The Specialized Technical Committees report directly to the Executive Council.

This Commission considers that the head of the e-government and IT Policy Unit at the Ministry of Public Administration holds the equivalent post of a national CIO that co-ordinates e-government policy at the federal level. The head of the e-government Unit is expected to become the ICT general Coordinator for the Federal Government and have a clear legal mandate to co-ordinate e-government between different Ministries and agencies at the federal level.

Examples with the Ministry of ICT in the lead: Australia, India, Romania, Slovenia, Vietnam and Thailand.

Australia started its e-development in 1997 with the creation of a National Office for the Information Economy (NOIE) that combined 3 functions: policy and research, standard setting, and program management and implementation support. Since 2004, these functions have been split: policy issues under the Department of Communications, Information Technology and the Arts (DCITA), and standards and implementation support under the Australian Government Information Management Office (AMIGO). AMIGO reports to the Minister of CITA. It is tasked with developing standards, common services infrastructure and software sourcing arrangements to facilitate a whole of government approach.

These functions under the Australian ICT ministry are guided by a number of committees. An Information Management Strategy Committee (IMSC) provides collective leadership on matters that affect the whole of government and information management issues pertinent to service innovation. A Chief Information Officer Committee addresses priorities identified by IMSC and develops options for adoption at the agency or whole of government level. These governance mechanisms, among others, enable shared planning and decentralized implementation. Individual agencies remain responsible for the management and administration of services and their delivery—as they are best placed to involve stakeholders and innovate new services.

India is a case of duality, with major technological capabilities driven by the ICT industry, but little harnessing of these capabilities for the modernization of government services or the rest of economy. These technological capabilities have been developed over time—due in part to government early investments in high quality technical and business education (the Institutes of Technology and of Management, IITs and IIMs), and in building R&D institutions. Success in exporting IT-enabled services and in becoming a global R&D platform has not been matched by the local use and diffusion of the new

technologies in support of public agencies or small enterprises. This has created two Indias—a globally connected knowledge-driven India and a disconnected, poverty-stricken India.

India is recognizing the challenges and opportunities presented by globalization, persistent inequality and digital divide, the strength of ICT sector, the emergence of new cost-effective communication technologies, and the presence of a rich laboratory of ICT use among progressive states and agencies. Until now, most of the local pilots remain isolated success stories without structure for scale-up and replication.

India is developing an institutional mechanism for scaling up e-government applications from pilots to an ambitious US$ 6 billion program across all states (Box 10 and Figure 7). The governance mechanism locates the e-government program management under the leadership of the MCIT, where the core technical competencies would be complemented by private sector participation, yet secures the advisory inputs of other stakeholders and the buy-in of political leadership and the Cabinet. This innovation in ICT governance and scaling up is yet to be tested in the context of the federal structure and extremely diverse development conditions of India.

Box 10. India: Scaling up E-government to over a Billion Citizen

India offers many interesting lessons in e-development. Its rise as an exporter of software services and more recently as a destination of outsourcing services is well known. These technological capabilities have been developed over time—due in part to government early investments in high quality technical and business education (the IITs and IIMs), and in building R&D institutions. Governments at the federal and state levels also financed software and IT parks to bypass their underdeveloped infrastructure, and to provide incentives for small Indian enterprises as well as foreign direct investment by the ICT multinationals. More recently, the telecommunications sector grew rapidly, spurred by reforms to open markets, introduction of competition, and abundance of fiber access.

Success in exporting IT-enabled services and in becoming a global R&D platform, however, has not been matched by the local use and diffusion of the new technologies in support of public agencies or small enterprises. This has created two Indias—a globally connected knowledge-driven India and a disconnected, poverty-stricken India. The explosive growth of the ICT services (for export) has been concentrated in urban areas.

India is recognizing the challenges and opportunities presented by globalization, persistent inequality and digital divide, the strength of ICT sector, the emergence of new cost-effective communication technologies, and the presence of a rich laboratory of ICT use among progressive states and agencies. The challenge for India is to leverage its strengths, harvest local learning and replicate local successes. It has begun to improve its institutional and regulatory environment. Government and the private sector are

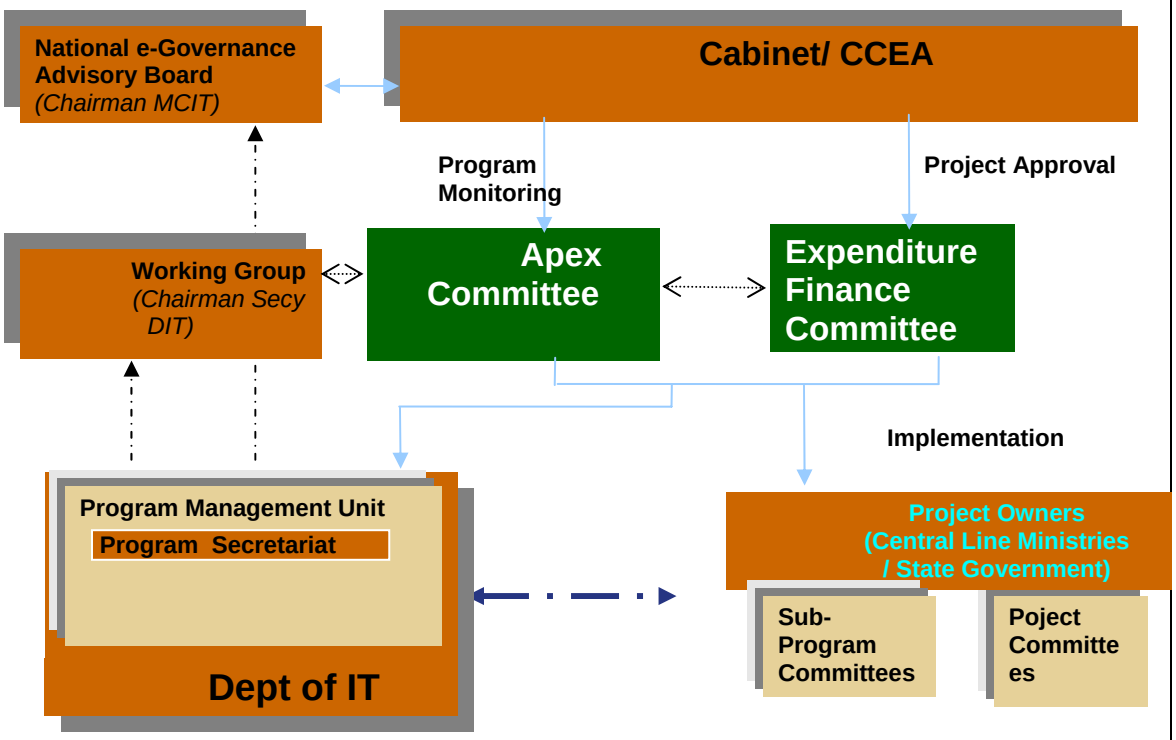
increasingly aware of the need to enhance the quality and relevance of higher education to ensure is becomes demand-driven, quality conscious and dynamic. However, the low rate of literacy remains a fundamental barrier to broad-based transformation to a knowledge economy. ICT has hardly been used to expand access and improve quality of education. The incentives to promote ICT applications for the domestic economy and to develop local language content are still weak and overshadowed by the export drive. Perhaps most lagging is the use of ICT to increase government efficiency and transform public services. Until now, most of the local pilots remain isolated success stories without structure for scale-up and replication.

A new governance structure is needed to make this shift and engage the relevant stakeholders. The Government has created a high-level Knowledge Commission to orchestrate the process. Inspired by the successful e-services initiatives of the State Government of Andhra Pradesh among others, and the urgent need to improve governance and the welfare of rural population, the government also decided (2006) to support a National e-Governance Action Plan (NeGAP). The aim is to scale up successes, develop common frameworks and infrastructures for e-government, promote partnership between levels of government, and engage the private sector in the deployment of major e-government projects. NeGAP is a core element of India's 10th Development Plan and its cost is estimated at US$ 6 billion. It has been conceived in 2003, but had taken some time to gain consensus across government agencies at the central, state and district levels, and among other stakeholders.

The emerging governance structure for this ambitious national e-government program is as follows (Figure 7). The strategy setting is led by the Cabinet Secretary. A National e-Governance Advisory Board is chaired by the Minister of Communication and Information Technology (MCIT), while the working group is chaired by the Secretary of the Department of Information Technology (DIT), and Program Secretariat is housed within the DIT. This is clearly a centralized initiative, with the sponsorship of political leadership at the federal level and the managerial leadership of the MCIT. Program management is expected to draw on central technical resources such as the National Informatics Center (NIC) and, for policy development and monitoring, the National Institute for Smart Government (NISG).

The success of this program is likely to depend on the soundness of this governance structure and its fit into the political and institutional structure of the country. Implementation is expected to be carried out through the central line ministries and state governments. They are expected to be the owners of e-government projects for various applications and services. The federal-state relationship is likely to be a critical success factor. It is not clear yet how the MCIT and other central ministries will relate to the political leadership and other local institutions at the sate level. This relationship should be shaped by a shared vision of reform, mutually acceptable guiding principles, and the availability of incentives and appropriate funding mechanisms to induce state cooperation. It should be strengthened by capacity building and e-leadership development programs that should promote partnerships and forge relationships across agencies and levels of government.

Figure 7. Overall Governance Structure for India's National e-Government Program (NeGAP)



Romania can be classified as combination of model 2 (IT Group for policy and funding, under the PM) and model 3 (ICT ministry as lead agency for operational implementation). The Ministry of Communication and Information Technology is responsible for implementing the country's e-agenda. It receives its policy agenda and funding authorizations from the Information Technology Promotion Group (GPTI). GPTI was created in 2001 and is made up of the Prime minister, the Minister of Public Finances, the Minister of Public Administration, the Minister for the Coordination of the General Secretariat of the Government, the Minister of Education and Research, the Minister of Communications and Information Technology, the Minister Commissioned with the Research sector, and the State Secretary with the Ministry of Communications and Information Technology[32].

Slovenia institutional framework for the information society represents an attempt to combine the information infrastructure function with the broader functions of information society. The Ministry of the Information Society was responsible for both the ICT infrastructure and the e-development services via two of its departments. The Department of Information Infrastructure is responsible for policy formulation and

[32] Ministry of Communication and Information Technology. Romania.*A National Strategy for the New Economy and the Implementation of the Information Society*. 2002,Bucharest pp. 34-35. http://www.mcti.ro/img/uploads/strategie/strategie_ENGLEZA_nationala.doc

implementation in the area of ICT infrastructures, including the deregulation of the telecommunications sector. The Department for Information Society Applications is in charge of the formulation and implementation of the e-development agenda, which includes e-government, e-commerce, and the strengthening of the National Innovation System.

After some notable progress, these functions were split and reassigned to two established ministries. The Ministry of the Information Society was dissolved in 2004. The work of the former directorate for applications in the information society was assumed by the Directorate for the Information Society at the Ministry of Higher Education, Science and Technology. The work of the former directorate for information infrastructure is now performed by the Directorate for Electronic Communications at the Ministry of the Economy (http://www.mg-rs.si/). The Ministry of Public Administration, established in December 2004, holds responsibility for the development and implementation of e-government in Slovenia. It is not clear how these agencies coordinate their work.

Thailand represents a case of ICT Ministry-driven national strategy—imposing serious limitations on progress on e-government and the broader issues of the e-development agenda (Box 11). Thailand put great emphasis on promoting the ICT industry and outsourcing, inspired by the strides made by neighboring Asian countries. The ICT ministry did not use the superior position it enjoyed in the government hierarchy to improve the enabling environment, force compliance with interoperability, and establish a national ICT governance mechanism. It remained opportunistic, ICT-focused, turf-bounded, and supply-driven. Throughout the last decade, Thailand has been struggling with the process of taking ICT from a set of pilots and innovations to scaled up programs and the mainstream development agenda.

Box 11. Thailand: Should it Focus on ICT Governance to Go to Scale?

Thailand has been aspiring to create a knowledge economy since late 1990s, and thus anchored its aspirations in the ICT 2000 plan (1996) and Thailand ICT Master Plan (2001), among others. Throughout the decade, Thailand has been struggling with the process of taking ICT from a set of innovations to a mainstream agenda.[33] After much debate in 2001-2002, the Prime Minister, supported by the Parliament, decided to overhaul existing governance and strengthen leadership by establishing a Ministry of ICT. In September 2002, the new Ministry absorbed parts of many ministries with large number of civil servants; but it remained short on competent and experienced staff and suffered from high managerial and staff turnover. It was unable to compete with the private sector for ICT talent.

As is the case with many new agencies in this fast moving field, the Ministry had to meet many unrealistic expectations and had to use much of its scarce resources to build credibility through highly-visible, politically-attractive projects or pilots. Thus the Ministry gained good press and raised expectations but diverted from its strategic intent long term commitments, and institutional capacity building. Rather than focusing on

[33] Magdi Amin (2003). Going to Scale. World Bank (memio)

governance and learning to scale up and staff accordingly, the Ministry diverted its scarce resources and limited capacity to support an ambitious number of unrelated projects and isolated pilots. Some of these projects were critical in raising awareness of ICT in the government and public. However, the pilot projects suffered from insufficient planning and management support to secure effective implementation and learning. Despite numerous planning exercises, the e-development agenda lacked prioritization. Since its inception, the ministry did not use the superior position it enjoyed in the government hierarchy to improve the enabling environment, ensure coherence and interoperability, and establish national ICT governance mechanisms. It remained opportunistic, ICT-focused, supply-driven.

Thailand faces many ICT governance challenges to scale up its successes; e-leadership institutions must re-tool accordingly. ICT should be viewed as enabler: it empowers stakeholders to achieve their business or development goals. Value comes not from technology, but from changes in behavior, process and organization, enabled by technology.[34] Hence, the Ministry's role should be to ensure that the strategic goals and transformations desired by the government, business and society are achieved. It needs to ensure legitimacy through adding public value, establishing ICT governance for e-government, promoting an enabling environment for competitive ICT industry and infrastructure, and improving IT project management skills and practices. This is an ambitious mandate and cannot be carried out by the MICT in isolation. The Ministry should be part of a broader system of e-leadership institutions that is needed to diffuse and integrate ICT into government, business and civil society to achieve their own goals.

Vietnam's e-institutional framework is similar to Thailand's model. The Ministry of Post and Telematics (MPT) is in the leadership role. It has taken the initiative in e-government, and prepared an e-government master plan in 2005. In the late 1990s, e-government activities were coordinated by the Office of Government (OoG), along model 2. This institutional locus then fit with the view of e-government as part of the state administration modernization program. The ADB then funded an e-government program (with a large component on government computerization and modernization) with OoG as its counterpart implementing agency. But performance was mixed, as the OoG lacked execution capacity and could not address the e-government precondition of connectivity—confirming the limitations of model 2.

Vietnam's shift to model 3, with MPT in the lead of e-government activities, is based on the view that the Internet is a key platform to provide services from all state agencies to citizens. In 2006, the World Bank started financing an e-government project under the MPT. It is too early to make an empirically-based judgment about this institutional arrangement. But the MPT should transcend its technology-focused culture, link its e-government efforts to broader administrative reforms, and address the challenge of coordination across strongly turf-bounded and secretive government agencies. Donor

[34] OECD (2000). *A New Economy? The Changing Role of Information and Information Technology in Growth.* Paris.

funding may have inadvertently reinforced the technology focus and turf driven agenda of current e-government efforts.

Regarding the overall e-development agenda of Vietnam, coordination is still carried out at the policy level along model 2. A national ICT steering committee is chaired by the Minister of MPT. It meets regularly. But it does not have the authority to approve plans or to implement programs in lagging components of e-development. For example, low connectivity and digital literacy remain major barriers to making e-government a reality for the average citizen. This raises questions about sequencing the e-development agenda: should the MPT direct more of its energy to address connectivity and telecom reform before launching major e-government programs? Should other ministries shoulder more of the leadership burden for e-government and ICT literacy?

Model 4: Executive ICT Agency within the Civil Service

Under this model, a dedicated executive ICT agency is created within the civil service, most often under the Cabinet or Prime Minister's Office (Figure 8). This is a government body responsible for the formulation and implementation of the national e-development policy and its corresponding action plans in a wide range of e-development thematic areas, including e-society, e-business/e-commerce, and the strengthening of the local ICT industry. Moreover, the Agency is often charged with developing mechanisms to encourage all stakeholders and key players to become involved in e-development issues and to exchange information, experience and best practices through focus groups, workshops, seminars and online tools. The Agency coordinates and monitors the implementation of e-development policy, often under the overall supervision of an e-Development Council and possibly a Committee for e-Government. The Agency may also serve as a secretariat to these bodies. The chief of the Agency may serve as the national CIO.

In order to be successful, such an agency needs to be led by experienced ICT managers, who may be loaned from other government departments, or hired from private sector. Professional staff should cover a wide range of e-development issues. To attract scarce ICT policy and consulting skills and enable such a cadre to lead e-transformation, ICT agencies often require special incentives and career schemes—often beyond those prevailing in the civil service.

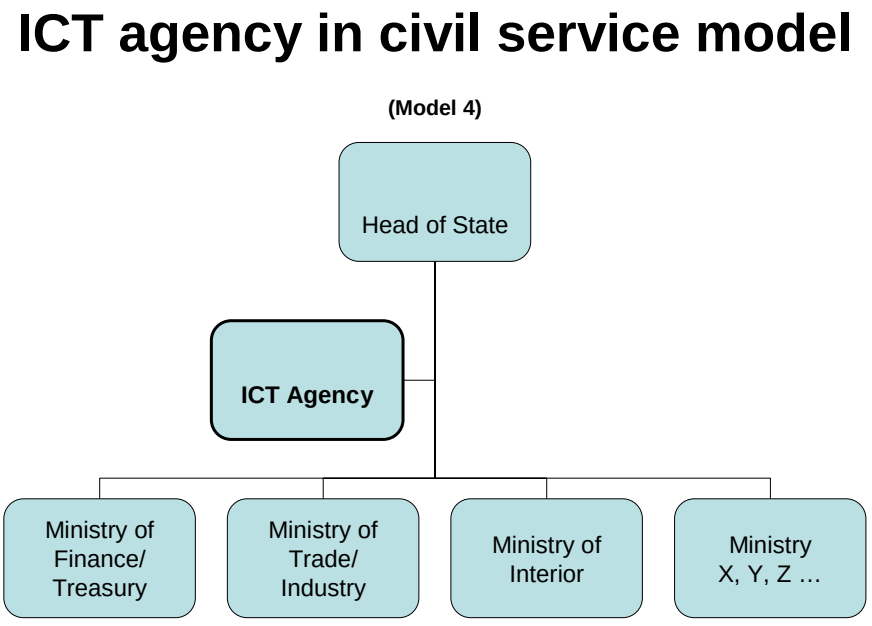


Figure 8

Potential advantages: The ICT agency can provide a focal point for resource mobilization from government, donor agencies and private sector. It provides strong

coordination and helps align funding with overall government priorities. It can also maintain a holistic view of e-development and appropriate balance across all information society programs. This model fits small countries with relatively advanced civil service.

Potential disadvantages: The creation of new government agency involves incremental costs, at least in the short-term, to cover the set-up costs of a new agency. Concentration of policy, operational and monitoring functions in one body may at times create conflict of interests. Finally, a totally new entity may struggle to obtain necessary political weight and resources. Thus, it is advisable for the ICT Agency to have strong ties to an existing powerful ministry, such as the Ministry of Finance or Public Administration. It should draw on representatives of other key stakeholders as well, particularly those bodies concerned with public sector reforms such as the Administrative Reform Commission. The most binding constraint on this model is the limitations of the civil service to attract and motivate high caliber staff for the new agency.

Examples: South Korea, Ireland, Singapore, Bulgaria, Rwanda, and Andhra Pradesh (India).

Korea presents rich lessons from its long journey in " informatization" since the 1980s under the leadership of the Prime Minister, presidential committees, and the relatively autonomous and highly competent National Computerization Agency (box). This model fits well with Korea's centralized and hierarchical political and institutional culture. Korea invested in e-government through a centrally-driven allocation mechanism, after the country first invested heavily in broadband connectivity and ICT user education. It created robust legal and institutional frameworks. A key e-leadership institution is the National Computerization Agency, a relatively autonomous agency with special salary structure and incentives to attract a technically competent cadre of staff. It also created a number of high level policy coordinating committees.

The rapid advance of Korea's e-government program is also due to:

- *Political will*: the President of South Korea personally controls the realization of e-government and manages the transition from industrial society to information society.

- *Substantial financial resources*: for the period 1998-2000 the government of Korea allotted more than 1 billion dollars yearly for information technologies. For the period 2001-2003 the South Korean IT budget exceeded 2 billion dollars yearly. These sums do not include recourses for information technologies connected with the defense of the country.

- *National priority*: assigned to the development of the information and communication sectors with the help of special programs and funds.

- *Long term perspective*: taken by the government, as Korea adopted successive strategies for informatization and e-government since 1987. Currently (2007) Korea is establishing its next generation strategy covering 2007-2030.

- *Centralized organizational structure*: with clear responsibilities for realization of e-government, having the necessary authority and financial resources.

- *E-literacy and mass media*: with early and heavy investments in national consensus, public awareness campaigns, and Internet training. The Korean population is also an avid user of new technologies. A national "Forum on E-Government" includes media, business leaders, academia and the government.

- *Mandatory adoption of common business processes*.

Box 12 . South Korea: a National ICT Agency Driven by Political Leadership

Korea's informatization can be largely described in 5 phases:

- 1st Phase: National Basic Information System (late 1980s)
- 2nd Phase: Korea Information Infrastructure (KII) Initiative (mid 1990s)
- 3rd Phase: Cyber Korea 21 / e-Government Initiatives (late 1990s ~ early 2000s)
- 4th Phase: e-Korea Vision 2006 / Broadband IT Korea Vision 2007 (mid 2000s)
- 5th Phase: u-Korea or ubiquitous service.

The first national IT plan aimed at building basic information systems in key areas such as public administration, finance, and education. Following such initiative, in the early 1990s, building the Korea Information Infrastructure (KII) was regarded as the essential factor for raising national competitiveness. From 1999 to 2002, the focus shifted to the Internet. This was also a time when Korea faced a serious economic crisis. And ICT was used as a strategic tool to emerge from this crisis. Building an advanced information infrastructure, raising national competitiveness, and creating new businesses and jobs were the main activities in the Cyber Korea. This phase also included priority e-government initiatives such as e-service center and e-procurement.

The fourth phase focused mainly on the utilization of infrastructure and technologies already developed. Broadband internet service was launched and e-government services were offered. This phase, characterized by the push for a knowledge-based society, was accompanied by a paradigm shift in 2005 to move forward to the next step: establishing u-Korea, or an intelligence-based society, in which ubiquitous convergence of human, objects, and ICT provide intelligent services and more convenience to all.

South Korea shares several features of models 3 and 4. The Ministry of Information and Communication is in charge of formulating the country's ICT agenda,

with separate branches of the ministry – such as the Informatization Planning Office, the Information and Communication Policy Bureau and the Telecommunications Policy Bureau – responsible for the e-government and telecommunications fields, respectively. The Ministry of Trade Industry and Energy is responsible for the industrial aspects of ICT, and for implementing programs that contribute to its growth. Since 2004, the Ministry of Government Administration and Home Affairs (MOGAHA) has taken the lead on e-government.

An Informatization Promotion Committee (IPC) was established in 1996 and has been chaired by the Prime Minister, with participation from 24 ministries and agencies. The minister of finance serves as its vice chair. The IPC and its executive committee are advised by an Informatization Promotion Advisory, run by private sector experts form industry, academia, and research institutions. The managerial work for the IPC is done by the Ministry of ICT, and since 2004, e-government managerial work is done by MOGAHA. A national CIO Council, chaired by the Minister of MOGAHA, was also created to facilitate discussion among agency CIOs about policies, projects and performance.

In January 2001, a Special Committee for e-government under the Presidential Commission on Government was charged with interagency coordination and oversight over major e-government initiatives. It reports directly to the President and thus enjoys great influence over enforcing horizontal integration. However, apart from political leadership, the core competency and driving force for implementing e-development remains with the National Computerization Agency (NCA). Originally, the NCA reported to the President, then to the Mnistry of ICT and since 2004, also to the MOGAHA.

The NCA is the public sector's IT consulting agency and responsible for the implementation of the country's e-government and the e-literacy and ubiquitous connectivity or U-Korea programs. Created in January 2003, the Korea Agency for Digital Opportunity and Promotion is a public entity created specifically to ensure that ICT services reach all sectors in the population. It targets the disabled, elderly, those with a low income, and sectors of the economy that are less technology-intensive, such as fishing and farming, and works to provide them with free access to information and communication services.

Korea's trailblazing e-government strategy has been centrally driven. It saw ICT as a source of providing a competitive edge in the global economy and e-government as source of increasing national productivity. As of 2004, it has achieved the highest level of broadband connectivity in the World. Since, it has been managing the shift from building the information infrastructure and promoting the ICT sector to changing the way government does business with ICT-enabled transformation. It has invested heavily in e-government to put the platform for many government to citizen services, present a unified portal to users, encourage departments to digitize content, establish the necessary policies and infrastructures for data sharing and data security, and define the legal status of electronic documents and online transactions.

Despite this rapid advance, particularly in building the information infrastructure and common e-government applications and networks, Korea now faces a number of challenges. A top down approach proved valuable in making process changes that runs counter to vested interests. But pursued alone, a top-down strategy may not deal effectively with innovation and deep transformation of business processes. Although e-services have been made available, the adoption of those services by citizens and businesses has been lower than anticipated. Low take-up rate implies that citizens do not feel they are at the center of e-government efforts. To move to the next stage of e-government, the focus may need to shift from technology and automation to managerial innovation, public participation, information resource management, and social marketing of e-services.

The Government has been developing its next generation long-term e-government strategy (2007-2030). This strategy gives special attention to the development of an innovation infrastructure for e-government. The shift of e-government portfolio from the Ministry of ICT to Ministry of Government Administration, and thus the reporting of the NCA to the latter, reflects this shift towards managerial innovation and process transformation. The central agency is also giving increasing attention and incentives to encourage local governments to co-invest in common e-government projects.

Ireland, Singapore and Bulgaria have also adopted variations of model 4 -- a central executing ICT Agency that is driven by an informed political leadership and given special autonomy and salary structure to attract the best technical talent even while operating as a public sector agency.

Ireland's Information Society Policy Unit (ISPU) is under the Prime Minister and has overall responsibility for developing, coordinating and driving implementation of the Information Society agenda. It focuses on policy development for telecommunications, universal participation, e-government, e-business, promoting lifelong learning, R&D and the legal and regulatory environment. It also has functional responsibility for e-Government, e-Cabinet, e-Europe, and evaluating submissions to the Information Society Fund.

The Irish Minister of State is responsible for coordinating the Information Society agenda across all Government departments, assisted by the ISPU as secretariat, the Cabinet Committee on the Information Society, which drives forward the implementation of the Information Society agenda, the e-Strategy Group of Secretaries General, and the Assistant Secretaries e-Government Implementation Group (Box 13). Ireland's institutional framework for information society also includes the National Competitiveness Council, the Industrial Development Agency, and the National Policy and Advisory Board for Enterprise, Trade, Science, Technology and Innovation. Together, they address the interdependent components of e-development.

Box 13. Ireland: Institutional Leadership for an Information Society

In Ireland, the Information Society Policy Unit (ISPU) or commission is under the Department of the Taoiseach (Prime Minister) and has overall responsibility for developing, coordinating and driving implementation of the Information Society agenda in the country. It focuses on policy development in the seven key areas set out in the Government's Action Plan, which are the delivery of Ireland's telecommunications infrastructure, promoting universal engagement and participation, developing the potential of e-government, promoting e-business, promoting and facilitating Lifelong Learning in the knowledge economy, stimulating R&D and promoting a supportive legal and regulatory environment.

Whilst the Unit has predominantly a policy development and advisory, monitoring and co-ordination role, it also has specific functional responsibility for the following areas:

- Further developing the potential of e-Government;
- The e-Cabinet initiative;
- Monitoring and reporting on the implementation of e-Europe in Ireland
- Evaluation, in conjunction with the Department of Finance, of submissions to the Information Society Fund.

The Irish Minister of State is responsible for coordinating the Information Society agenda across all Government departments. She is assisted in her role through a number of structures, whose secretariat is provided by the ISPU. These include:

- The Cabinet Committee on the Information Society, which drives forward the implementation of the Information Society agenda. The committee is chaired by the Taoiseach and convened by Minister of State and includes key government Ministers.
- The e-Strategy Group of Secretaries General, made up of heads of Government departments, which addresses national e-Strategy issues and complements the work of the Cabinet Committee on the Information Society.
- The Assistant Secretaries e-Government Implementation Group. Its objective is to ensure that Information Society policy is implemented in a coordinated manner across all Government departments and agencies.

Ireland's institutional framework for information society also include the National Competitiveness Council NCC), the Industrial Development Agency (IDA), and the National Policy and Advisory Board for Enterprise, Trade, Science, Technology and Innovation (FORFAS). The NCC publishes an Annual Competitiveness Report and makes recommendations for improving Ireland's international competitiveness. It consists of representatives from the government, business and trade unions. The Private sector plays a prominent role, for example, the chairman is from IBM Ireland. It collaborates with the Information Society Commission on e-development issues.

IDA is Ireland's arm for promoting FDI. It has played a key role in the liberalization of the telecommunications sector and the creation of the independent regulatory agency for

telecommunications. ICT enterprises are also supported through Enterprise Ireland, as sister agency of IDA. FORFAS is the secretariat for the NCC and is vested with the authority to promote industrial and technology development—much of it targeted for the high tech and particularly for the ICT sector.

Together, this set of institutions addresses the interdependent components of e-development. They have developed various mechanisms for collaboration among themselves and between the public and private sector. They have been key players in the substantial transformation of Ireland to a knowledge and innovation-driven economy, and in the rise of ICT sector to become the engine of growth and competitiveness of the country.

Singapore is a pioneer in developing national ICT plans, which have become increasingly comprehensive over time. Singapore's e-leadership institutions have evolved correspondingly (Box 14). Some of the technical expertise that was developed within the public sector under the National Computer Board (NBC) and later, the Infocomm Development Agency (IDA), was subsequently transferred to semi-public enterprises like the National Computer Services. IDA was created1999 as a result of the merger between the NCB and the Telecommunications Authority of Singapore (TAS)—thus creating a single agency for integrated planning, policy formulation, regulation and industry development of the ICT sectors.

IDA plays several roles: as a policy setting and regulating agency to ensure a competitive environment; a promoter of Singapore's ICT sector, a national CIO office to supply expertise for e-government programs, and an enabler for citizens for working in the "New Economy". IDA works closely with other key institutions: an e-government office in the Ministry of Finance that champions the e-government; and the e-Government Policy Committee that provides oversight for the program. The Committee is chaired by the Head of Civil Service, composed of Permanent Secretaries from selected ministries, and assisted by a steering committee composed of CIOs. However, the Permanent Secretaries of ministries are responsible for the ICT infrastructure and services within their own organization.

Box 14. Singapore: Pioneering a Centrally-Driven Public Agency

Singapore has been a pioneer in developing national ICT plans since 1980. Its successive plans have become more comprehensive over time, covering all elements of e-development. ICT visions and plans remained centrally-inspired and driven and closely integrated with the overall growth and competitive strategy of the country. Over time, Singapore's e-leadership institutions have evolved. They have been broadened and deepened. Some of the technical expertise that was developed within the public sector under the National Computer Board and later, the Infocomm Development Agency (IDA), was subsequently transferred to semi-public enterprises like the National Computer Services (NCS) to deliver e-development and e-government advisory services beyond Singapore. More recently, Singapore has been positioning itself to go global, to

source talent and partner with others around the Asia region, and to leverage its infrastructure and capital to become a hub for the global economy.

IDA was created in December 1999 as a result of the merger between the National Computer Board (NCB) and the Telecommunications Authority of Singapore (TAS). It operates under the Ministry of Information, Communications and the Arts (MITA, formerly the Ministry of Communications and Information Technology - MCIT).[35] The government saw technology as an enabler, providing the country with a sector responsible for economic growth as well as with a means for providing greater socio-economic benefits to the population as a whole. The rationale behind the creation of IDA was therefore to have a single agency for integrated planning, policy formulation, regulation and industry development of the information technology and telecommunications sectors.

IDA has several roles. As a regulating agency, it formulates clear and transparent policies to ensure a fair and balanced competitive environment. As a developer of Singapore's ICT industry, it works closely with the private sector to create a vibrant business environment. As a promoter of Singapore's ICT sector, it works to encourage foreign companies to locate in Singapore and partner with the country's companies, as well as handling the preparation of citizens for living and working in the "New Economy" Finally, as the government's CIO office, it drives the implementation of the Singapore e-government action plan and provides the technical expertise for the management of various e-government programs.

IDA does not operate alone; it is closely linked to other key institutions. An e-government office was established in the Ministry of Finance to champion the e-government. It works closely with the CIO in IDA. The e-Government Policy Committee provides strategic directions and oversight for the program. It is chaired by the Head of Civil Service and composed of Permanent Secretaries from selected ministries. The Committee is assisted by a steering committee composed of CIOs. The Permanent Secretaries of ministries and CEOs of statutory boards are responsible for the ICT infrastructure and services within their own organization.

Accenture ranks Singapore second (after Canada) for the fourth year in a row in its e-government report.[36] Singapore has adopted a centralized and adaptive information infrastructure. This approach fit well with its size, highly disciplined civil service and hierarchical managerial culture. After more than a decade of computerization and training in the civil service and heavy investment in broadband communications, Singapore was more than ready for exploiting the Internet and making services available online.

[35] IDA website: http://www.ida.gov.sg/idaweb/aboutida/infopage.jsp?infopagecategory=&infopageid=I216&versionid=10

[36] Accenture. E-government Leadership: High Performance, Maximum Value. Accenture Government Executive Series, 2004, p. 94. Canada and Singapore present major contrasts in managerial and political cultures, despite being the two highest ranked countries on e-government achievements.

Since 2002, the Agency turned its attention to creating relevant content and to promote public usage of e-services, and ensure universal access to e-services. Government agencies were required to conduct surveys of their customers and marketing campaigns were launched to promote the use of e-services through the single window, eCitizen. The Singapore Public Service also put in place an integrated, one stop portal to enable e-Business. To secure ownership of e-government by civil servants, InfoCom has been empowering public sector officers with training and resources for ICT-enabled innovation and knowledge sharing The InfoCom Education Program was launched to equip officers with the necessary ICT competencies, and a Knowledge Management Experimentation Program provided seed funding to encourage public sector agencies to jump-start pioneering KM projects to nurture knowledge sharing.

In **Bulgaria**, a shift from Model 2 to Model 4 occurred on September 2005. Prior to that date, the Council of Ministers included two functions for the promotion of its e-development agenda. The Directorate of Information Technologies and Communications proposed programs for adopting information technologies in state and municipal administrations. On the Issues related to the Development of an Information Society, the Coordination Council drafted and proposed programs for the development of the information society and provided advice and consultancy on implementing modern information technologies at national and regional levels. However, specific government ministries and agencies continued to carry out much of the implementation of e-development programs.

Recognizing the limitations of this organizational arrangement, the Bulgarian government decided (September 2005) to establish a new body to manage the telecommunications and Information Technologies. The State Agency for IT and Communications is directly responsible to the Council of Ministers. Until this decision, the communications component was part of the Ministry of Transport and Communications.

Model 4 is not just limited to middle income or advanced countries. **Rwanda** presents an interesting example of how some developing countries have articulated their institutional framework to capture the interdependencies among e-development pillars and to anchor e-strategy within the overall national development strategy and goals (Box 15 and Figure 9). The diagram shows the complex linkages involved in ICT governance and various organizational units and partnerships that are created and nurtured in support of ICT program implementation and the central role of a national ICT agency within this governance structure.

Box 15. Rwanda: A Promising Model for Africa

Rwanda is early into its ambitious Vision 2020. At the policy level, ICTs have been anchored securely into broader economic, social and development policies and strategy and indeed occupy a central position in them. The *ICT Policy for Rwanda,*

approved by the Cabinet in early 2000, is an integral part of the larger *Vision for Rwanda.* This policy is translated into the main strategic instrument of the *National Information and Communications Infrastructure* (NICI) plan. Policy and planning are mirrored with an equally comprehensive process of institution creation and development. The *National Information Technology Commission* (NITC), and a set of Working Groups, along with the *Rwanda Information Technology Authority* (RITA) comprise the main coordination entities, and the latter also implements many of the current 5-year NICI tasks. A single regulatory body, the *Rwandan Utility Regulatory Authority* (RURA), set up in 2003, has established a *Universal Access Fund.*

NITC is a high-powered ICT Policy Think-Tank with the mission to lead the process of creating the Rwandan information society and economy in line with the aspirations of the Vision for Rwanda. It is responsible for advising the Government on all matters relating to how best Rwanda can formulate, develop and implement its ICT policies, strategies and plans to accelerate the process of transforming Rwanda into an information-rich, knowledge-based society and economy. The NITC is chaired by the President, the National ICT Champion. Its membership is made up of the President of the National Assembly, the Prime Minister and a number of other senior Cabinet Ministers from key Ministries and distinguished representatives from the Private Sector, Academia, Civil Society, and Labour Organizations.

RITA is a statutory and autonomous National Agency that acts as the National ICT Implementation and Coordination Body under the direct supervision of NITC. RITA also serves as the Secretariat of the NITC and has an administrative link and working relation with to the Office of the President, the Prime Minister's Office and the Ministry of Public Works, Transport and Communications (as its sponsoring Ministry).

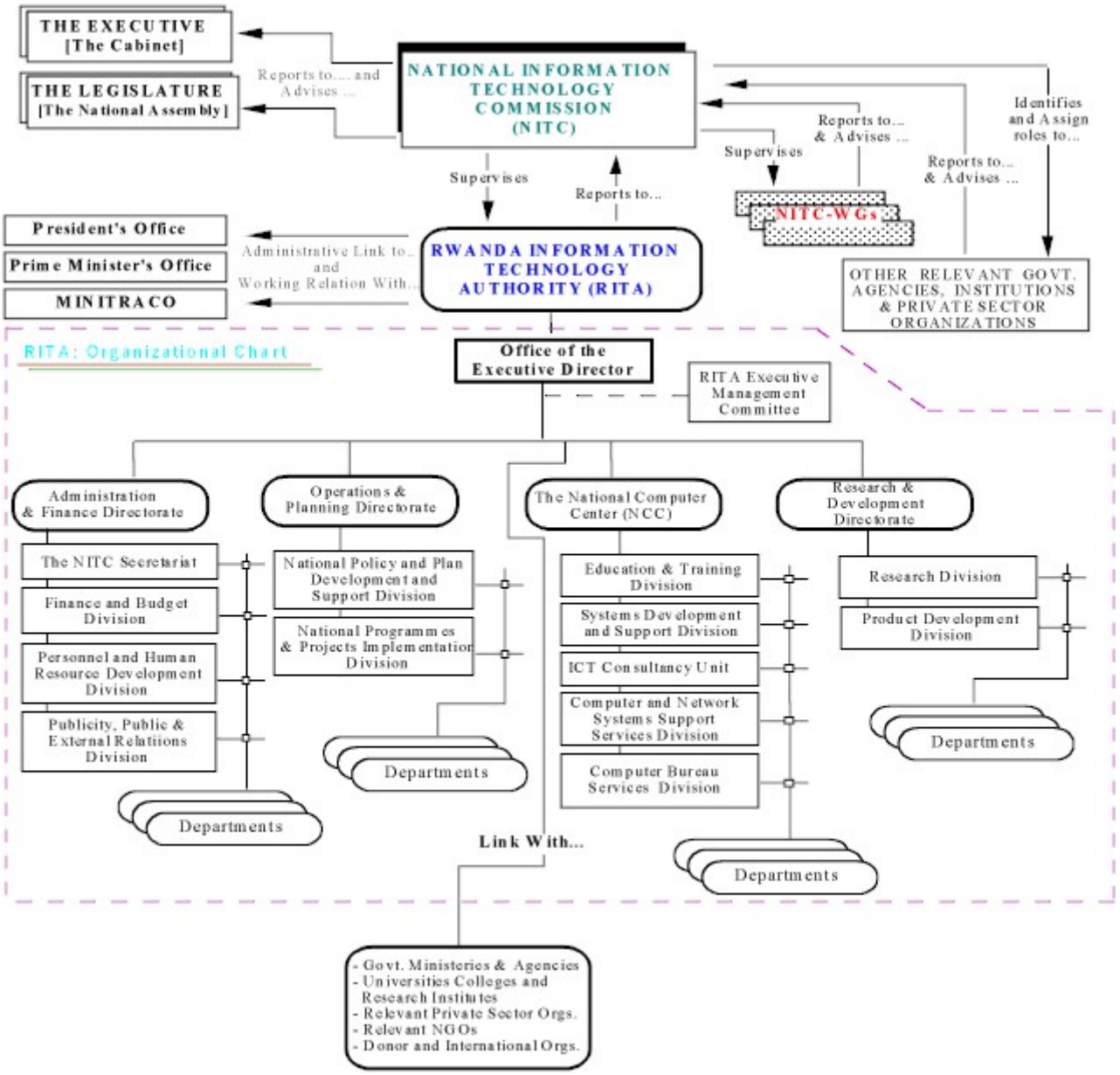
RITA, reporting to the NITC through its Executive Management Committee, has the following functions:

- Coordinate on behalf of the NITC, the formulation, implementation, monitoring and evaluation of National ICT Policies, Strategies and NICI Plans and ICT human resources development programs.
- Promote and coordinate on behalf of the NITC the development and implementation of National ICT Standards, Procedures and Guidelines, Certification and Procurement Procedures and Guidelines to facilitate the deployment, utilization and the development of ICTs products and services in economy and society.
- Undertake national ICT policy formulation advisory functions, to facilitate the development and the periodic review of the National ICT Policies, Strategies and corresponding Plans, in consultation with other appropriate Bodies and Agencies of Government and the Private Sector.
- Provide, ICT consultancy and other related services through the National Computer Centre (NCC) to Government institutions, agencies and other public and private sector organizations. Also provide through the NCC, technical advisory and support services to the NITC, the NITC- Working Groups and to various Government Ministries and other public and private sector organizations

and establishments.

- Coordinate and implement--in cooperation with other Government agencies, the Universities, Research Institutes and other Private Sector Organizations--policy and technological reviews, national ICT studies and periodic surveys to facilitate the ICT Policy formulation, implementation, monitory and evaluation.
- Promote and coordinate on behalf of the NITC, the implementation of National Awareness Campaigns and Education Programs on the activities, initiatives, policies, and programs of Government towards the realization of the Vision.

Figure 9. The Rwandan ICT Framework



The Indian state of **Andhra Pradesh** presents an interesting case of state government that has effectively pursued an ambitious e-government program and relied on the strong local ICT industry in implementing such programs (Box 16). The ICT agency of AP is a technical arm of the state government and reports to the Department of IT at the state level. The Agency is atypical in relaying on outsourcing and public-private partnerships to finance and implement its programs. It enjoys special compensation structure and significant autonomy relative to the rest of civil service. This case also illustrates the powerful role played by the chief executive of the state and his success in using this agency structure to attract some highly qualified and committed staff to execute his vision.

Box 16. Andhra Pradesh: A State-level Driven Agency Model

In Andhra Pradesh, until several years ago one of the less-developed states of India, the government has pursued an aggressive strategy to promote the diffusion of ICT, especially in modernizing governance systems through e-government. The successful implementation of this strategy has propelled Andhra Pradesh to become a central location of software investment and development within the global economy. This progress was largely due to the strong commitment of the chief executive of the state, Babu Naidu, the recruitment of a small highly motivated team in his office, and the extensive use made of public-private partnerships. Public-private partnerships have been the driving force behind the state's success in building its ICT infrastructure (including fiber optic networks and ISPs) and in promoting ICT businesses (especially in the software sector) and technology parks. In public services, PPP enabled the provision of high-quality infrastructures and services by utilizing the profit motive to deliver clearly defined performance standards. Meantime, the Government of Andhra Pradesh has focused on developing content and the digitization of data collections, so that transaction based services become attractive for the private sector players to provide at a fee.

The results of the initiatives undertaken by the state have been impressive. In e-government, these include, among others:

- The CARD (Computer-Aided Administration of Registration Department) program, which provides an end-to-end solution for electronic legal documents,
- The e-Seva program, a one-stop-shop for citizen services providing a wide spectrum of online services (including utility payments, issue of certificates, and issue of licenses/permits), and
- The FAST (Fully Automated System for Transport) program, whereby Department of Transportation services such as the issuing of driver's licenses and the registration of vehicles have been automated.

Model 5: ICT Agency as a Private-Public Partnership[37]

In this model, an ICT agency exists as an entity that is independent of civil service regulations (Figure 10). It operates as a public-private partnership, more along the lines of a business, and yet is ultimately responsible to the country's political leadership. It typically has a board of directors, appointed by government, the chairman of which reports directly to the head of state or his equivalent. Its responsibilities cover the whole range of the e-development strategy: formulation, implementation, monitoring and evaluating. The national CIO may be an executive of such an ICT agency, although this would not necessarily eliminate the need for CIOs within government ministries (in charge of implementing the parts of the e-development strategy relevant for their ministries or what is often called vertical applications) or for a CIO council to coordinate their activities. Ministerial CIOs are the link to policy and process ownership which remains within the ministries. Effective CIOs should be demanding clients of the ICT Agency and effective users of its capacity and resources.

To be successful, this public-private partnership will need to be staffed by experienced development strategists, ICT professionals in various disciplines, and program and project coordination specialists who can liaise between public and private sectors. They could be hired from either the public or the private sector, as available. A hybrid staff may reflect the diversity of skills and experiences needed to cut across the public, private and civil society sectors and to understand and partner with diverse groups of beneficiaries.

Striking the right balance in PPP--or the most effective blend of business culture and public value and accountability--is not easy. It must be tailored to country conditions. The ICT Agency should have a governing board that is independent and representative of the key stakeholders of the information society. Other governance mechanisms may be necessary to focus on policy setting or resolve inter-ministerial conflicts: national ICT policy council to secure inputs from all sectors of society in policy setting; inter-ministerial committee to resolve conflicts and facilitate prioritization of e-government applications across ministries; and CIO council to facilitate collaboration and ownership for the 'whole of government' approach at the ministry level.

This model is perhaps the most challenging in terms of balancing public and private influence in governing ICT diffusion and promoting social inclusion. It is also demanding in terms of involving all stakeholders in ICT programs from the formulation to the final evaluation stages. Few countries have adopted such model in a full fledged form, but several country cases under model 4 have recently incorporated features of

[37] This is different from the use of PPPs for specific applications or transactions to mobilize private investment and expertise on a case by case basis. The focus of this institutional model is on the governance of e-development and the management and possible funding of a leading ICT agency. It is about the use of private partnership to influence policy formulation, priority setting, resource mobilization and other cross-cutting aspects of e-development, not single transactions.

model 5—to strengthen private sector and NGO partnership in influencing central e-leadership institutions.

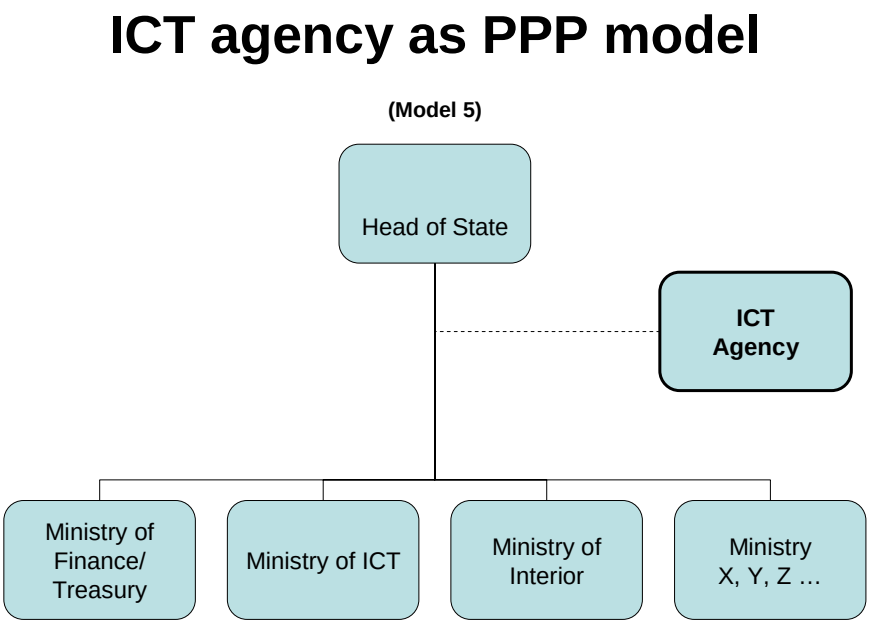


Figure 10

Potential advantages: The major advantages of this model are that the ICT agency would be freed from government bureaucratic requirements and would have the flexibility to swiftly react to changing demands. Additionally, it can more easily hire the required cutting-edge professional staff at competitive wages. It would have the freedom to provide shared technical services (such as network infrastructure and other ICT services) to the government as a whole or to contract out to the private sector. By pursuing public-private partnerships and high levels of outsourcing, the Agency can remain focused, lean and agile. Lastly, an active participation by the private sector would help the agency to operate in a business-like fashion and make best use of scarce resources. This model fits well with (compensates for) the prevailing conditions of a weak civil service environment in developing countries.

Potential disadvantages: The lead time between the creation of an agency and its ability to deliver results may be lengthy; it could be overtaken by political developments. Additionally, the private-public partnership may not receive the political and financial support it needs if it is not directly linked to a powerful ministry or the PM's office. The bureaucratic culture of the public sector may also re-assert control over the agency, and political interference may reduce the effectiveness of agency staff. In this case, it is critical to create a corporate culture that preserves the flexibility intended. It is also important to establish a professional and highly respected Board for the agency and to

strengthen the links between the agency and the ministry of Finance, Administrative Reform Committee, and perhaps other governance mechanisms.

Sri Lanka presents an institutional innovation that is closest to model 5 of public-private governance--a national Information and Communication Technology Agency (ICTA) under the head of the state (Box 17). Although ICTA is a wholly owned government entity, it is mandated to operate in a business-like fashion. ICTA is managed by a Board of Directors that is made up of representatives of public, private, academic and civil society sectors. The Board provides guidance to the CEO and approves strategic directions. The Board is responsible to the Parliament and the President's Office. Other guidance mechanisms, including an inter-ministerial committee on ICT, are in the formative stage.

This public-private model helped promote partnerships and inject new work ethic and project management practices. It allowed for an action-oriented, results-based, "can do" culture. Freeing ICTA from civil service constraints has been critical to the Agency's agility and high performance. Staff was recruited from the private sector, government, civil society, academia and even from the Sri Lankan diaspora. However, the high-performance high-reward business culture of the Agency may have created at times tensions and psychological distance *vis a vis* government agencies—with the latter's hierarchical, unmotivated, overstaffed and turf-bounded bureaucracy.

Box 17. Sri Lanka: An Institutional Innovation in a Turbulent Political Environment [38]

In Sri Lanka, the national Information and Communications Technology Agency (ICTA) was set up in June 2003 under the Ministry of Science and Technology and Economic Development. In June 2005 ICTA was placed under the leadership of the Prime Minister and from January 2006, under the President. It is managed by a Board of Directors that provides advice and guidance to the CEO and reviews and approves all the strategic decisions of ICTA. The Board, through its chairman, is responsible to the Parliament and periodically reports to the President's Office.

Although ICTA is a wholly owned government entity, it is mandated to operate in a business-like fashion. It is staffed by experts from both the public and the private sectors. It is charged with implementing the e-Sri Lanka initiative, including the following:

- Building the necessary connectivity infrastructure throughout the country.
- Creating the enabling environment, working with other responsible ministries to accelerate the enabling laws for e-government and e-commerce
- Developing human resources at multiple levels
- Modernizing the public sector and partnering with other concerned agencies to deliver citizen services through e-government

[38] Hanna (2007)

- Bridging the digital divide with funds to promote the development of innovations and uses aimed at poverty reduction and social development.

Regarding the structure of ICTA: the Agency is run by a Board of Directors made up of representatives from the public, private, academic and civil society sectors. The number of staff is kept very small but a good range of skills is represented. A major challenge for this young agency is to manage expectations, to avoid excessive centralization, to work through partnerships and outsourcing, and to secure sustained political support without intensive political interference or diminished autonomy and professionalism.

The ICT Act that established the Agency provides for cross-cutting powers enabling the responsible head of government (or concerned minister) to issue directions across ministries and Government agencies as well as to make regulations for the purpose of implementing the ICT policies and action plans of the Government. In addition to ICTA, the government of Sri Lanka has also established a National Ministerial Committee on Information and Communication Technology to formulate e-government priorities, and a task force or policy council that would include NGOs and industry experts to advise on policies and strategic directions.

This public-private model aims at promoting partnerships and injecting new work ethic and environment and new project management practices. So far, it has allowed for an action-oriented, results-based, "can do" culture. Although not fully independent of the civil service, and remaining responsible to Parliament, ICTA is freed from civil service constraints and this has been critical to the Agency's agility and high performance. The skill set and experience of staff reflected the wide array of e-Sri Lanka's stakeholders; staff came from the private sector, government, civil society, academia and even from the Sri Lankan diaspora. This provided complementary talents to deal effectively with different partners and reflect and balance the perspectives of various stakeholders. But it also generated challenges for Agency management to blend perspectives and create synergies rather than conflicts. Competitive salaries have attracted the best of Sri Lankan talents.

However, having most staff on relatively short term or annually-renewable contracts made it difficult to retain staff or have a long term view of the program—although it may have put more emphasis on performance and left no room for complacency. The high-performance, high-reward, private sector culture of the Agency may have created at times tensions and psychological distance *vis a vis* government agencies—with the latter's hierarchical, slow-moving, overstaffed and turf-bounded bureaucracy. Playing the role of catalysts and change agents did not come naturally to ICTA staff.

Positioning ICTA under the President presents both opportunities and challenges. On the one hand, it has given ICTA the visibility and cross-cutting power it needed to overcome some of the resistance to change in the civil service. On the other, being in the center of government and in a highly politicized environment, ICTA faces the possibility

of being politicized, with external interference in staffing and operating decisions. Frequent changes in government further exacerbate uncertainties in setting priorities and program directions. The ICTA Board and other governance mechanisms are being strengthened to provide a buffer from political interference and establish a steady strategic guidance in an otherwise turbulent environment.

Private sector participation in ICT governance and rigorous public-private partnership frameworks in investing and implementing e-government programs have been more developed among industrial countries. These partnerships and business influence on governance are also increasing in developing countries. This is particularly the case where public sector performance suffers from civil service constraints and the technological know-how of the local private sector is advanced.

Some Indian states have begun using public-private partnerships to better formulate and implement national and regional e-development programs. For example, the National Institute for Smart Government (NISG), a national policy think tank, is a joint venture of the Federal Government, State Government of Andhra Pradesh, and NASSCOM, the national association of software services companies. The NIIT, a leading software service and education provider in India, created a partnership with state governments to provide funds to NIIT to promote and implement the use of the Internet and ICT in public schools. The e-Seva program of telecenters that deliver e-government services is a successful model of public-private partnership. These are promising bottom-up models of public-private partnerships in ICT governance. But they have yet to scale up to the scope of India and its development challenges.

7. Analysis: What Works and for Whom?

To summarize, this paper has presented five basic models for the creation of e-leadership institutions to push forward a country's e-development agenda (Table 1):

- Under the shared responsibility model (Model 1), each government ministry or agency is responsible for specific e-development activities within its area of responsibility.
- Under the policy coordination function (Model 2), a high-level policy body exists to provide policy coordination across the various ministries and agencies, but leaving program implementation to each.
- Under the lead ministry model (Model 3), a single ministry – usually the ministry of Finance, Economy, or ICT – is given control over all government activities in the cross-cutting e-development sphere.
- Under the civil service ICT agency model (Model 4), a relatively autonomous government agency is created to undertake the role of national e-development policy formulator and coordinator and to provide government-wide shared infrastructure and services.
- Lastly, under the private-public partnership model (Model 5), the national ICT agency operates as a semi-private enterprise, while still reporting to the government (and receiving funding from it). The table below summarizes the five models.

The main differences among these models lie in the different degrees of decentralization and of private sector engagement:

- Model 1 is the most decentralized and the least complex, thereby making it the easiest to implement. No coordinating body exists, and funding for e-development activities comes out of the respective budgets of the ministries.
- Model 2 is slightly more centralized in that it includes an e-development policy coordination entity at national level, which must be funded separately and which makes the undertaking of e-development activities more coherent.
- Model 3 may not rely on a high-level coordination body. Instead, it places all e-development responsibility under a single government ministry, thereby making it even more centralized. It comes in main two variants, under a cross cutting ministry like Finance or under a sectoral ministry like ICT, with corresponding degrees of integration into the development agenda and technological competencies.
- Model 4 is a more centralized and comprehensive governance of e-development and requires the creation of a new agency to carry out corporate services and strategic e-development projects across ministries.
- Model 5, involves the most direct engagement of the private sector in the national e-development strategy.

Table 1: Summary of models

	Country examples	Advantages	Disadvantages	Skills needed	
Model 1 (Shared responsibility)	Finland, Germany, Sweden, France	- Least demanding as it uses existing institutional framework; - Fit with a consensus oriented political culture. - Workload can be divided between specialized ministries; - Little political sensitivity (does not challenge the existing responsibilities of ministries).	- May lead to duplication of efforts and to waste of resources; - May hinder creation of synergies between the various e-development elements; - Cross cutting infrastructure services and inter-agency projects may be difficult to implement.	- Coordination mechanisms within the various ministries undertaking e-development to synchronize activities between them; - E-development specialists from various fields distributed amongst relevant ministries.	
Model 2 (Coordinating function under head of state)	USA, U.K., Italy, Japan, China	- Maintains political profile at a sufficiently high level for policy formulation --Minimal investment in institutional coordination for implementation of policies and investments.	-weak capacity for coordinating implementation of policies and investment plans.	- Program management and coordination specialists to staff coordination function; - E-development specialists from various fields distributed amongst relevant ministries.	
Model 3 (Lead ministry)	Canada, Israel (Ministry of Finance or Treasury). Russia, Brazil (Ministry of Planning or Economy) South Africa, Mexico, Egypt (Ministries of ICT and Public Service) Australia, India, Romania, Slovenia, Thailand (Ministry of ICT)	- Working out of the Ministry of Finance or Treasuryassures direct access to funding; - Working out of the Ministry of Finance enables control over funds that are required by other ministries; - Working out of specific ministry (Trade/ Industry/ICT) ensures that professional staff is available and/or eases access to non-government stakeholders (firms, NGOs, academia). - Ministry of Public Services can be closer to e-government action and public sector reform.	- A single ministry may have problems competing for resources and authority with other ministries; - Finance or Economy ministries may lack the necessary focus, policy and technical skills required for coordinating e-dev.. - ICT ministry may be too oriented towards technology and telecommunications infrastructures; - Industry/Trade ministries may be too focused on the ICT industry. - Ministry of public service may be too weak.	- Program management and coordination specialists to staff lead ministry.	
Model 4 (Government ICT agency)	South Korea, Ireland, Singapore, Estonia, Bulgaria, Rwanda. Indian state of Andhra Pradesh	- ICT agency can provide for a convenient structure to manage government, donor and private sector funds from a single point and align them with overall government priorities.	- Lead time between creation of agency and delivering of results may be overtaken by subsequent political developments; - Work in all ICT areas may be too much for one agency to handle if not well staffed; - Creation of new government agency can be costly in the short-term.	- Experienced ICT managers to lead ICT agency (could be moved or loaned from other government departments, or hired from private sector); - Professional ICT staff in wide range of e-development issues to staff the agency (could be moved or loaned from other government departments, or hired from private sector).	

Model 5 (Public-private partnership ICT agency)	Sri Lanka	- ICT agency is free from government bureaucratic requirements; - Possesses flexibility for swiftly reacting to changing demands; - Can more easily hire required professional staff at competitive wages; - Has freedom to provide, or contract out, the provision of technical services; - Private sector participation provides incentives to ensure operation in a focused and efficient manner.	- Lead time between creation of agency and delivering of results may be lengthy and overtaken by subsequent political developments; - A private-public partnership may not receive the political and financial support it needs if it is not directly related to specific ministry or PM's office; - Work in all ICT areas may be too much for one agency to handle if it is not sufficiently well staffed.	- Experienced ICT managers from public or private sector; - ICT professionals from public or private sector; - Program coordinators to liaise between public and private sectors.	

In the remainder of this section, we analyze the five broad models and assess which model would work for which countries.

The shared responsibility model (**Model 1**) has seen some interesting success stories, but almost exclusively in countries with long tradition in national consensus and broad consultation. These countries also have long histories of investments in science and technology in general and in ICT in particular. Countries like Finland, Germany, France and Sweden have invested heavily in ICT infrastructures, in the domestic ICT industries, in ICT education, and in proactive ICT policies. Implementation was delegated to different ministries and agencies. Usually, these countries' e-government initiatives are also relatively mature, having being introduced towards the end of the 1990s, and building on decades of computerization and systems development in governments.

Where these initiatives were run out of decentralized governments, such as Germany and Sweden, less power and influence were exercised at the national level. This led to more programs being led at the regional or local levels, but did not lead to best practice sharing between states and regions. Where such initiatives were run out of centralized governments, as was the case in France, they were often too difficult to coordinate and implement effectively across the country as a whole.

The coordinating agency model (**Model 2**) has relatively mixed results. In the U.K., investments in promoting the ICT sector have paid off, yet the results of the e-government service projects have been mixed. According to two reports undertaken by the National Accounting Office (NAO) at the end of 2002[39], just over half of the 524 services that government departments routinely provide have been online. Furthermore, the vast majority of these only provide information rather than letting people carry out

[39] National Accounting Office: "Government on the Web II": http://www.nao.org.uk/publications/nao_reports/01-02/0102764.pdf and National Accounting Office: "Better Public Services Through E-Government": http://www.nao.org.uk/publications/nao_reports/01-02/0102704-I.pdf

transactions. Only seven services (3 percent of the total) provide grants or benefits online, and none collect revenue. A key aspect of e-government for the citizen, that of making government services cheaper or free, was not achieved.[40] In many government departments and agencies, Internet traffic has not grown substantially, largely explained by a lack of quality electronic content and of interactive features.

This may point to a major weakness in the strategy: providing the services online does not guarantee that citizens will use them. In the rush to migrate services online, not enough consideration has been given to demand mobilization, user education, and the development of genuinely innovative services around the user. The resulting issue was that for those services which were already online, use remained disappointingly low, particularly amongst citizens.[41] Institutional leadership is a key to drive the necessary transformation.

Recently, the new strategy on "transformational government" enabled by technology was announced by Tony Blair, the Prime Minister. He called it "a strategy on how we can use technology to transform government services". The strategy document puts the total number of sites at "more than 2,500"." Instead of a clear and precise structure, government websites look like a ball of string with never ending trails and threads seemingly leading to nowhere. There has to be an approach to the websites that envisages a total package, where information is clearly provided and easy to follow.

The U.K. shift to an e-Government Unit points to the need for a broad and far-reaching role for the coordinating unit under the head of state. It is not enough to create a coordination unit tasked solely with policy formulation duties and with operational responsibilities in a narrow part of the e-development agenda. The UK experience suggests that such a unit must be empowered to play a significant mobilization and operational role in the national e-development strategy in addition to the administrative and advisory roles that it may have been originally tasked with. Continuity of leadership is also critical to effective and sustained policy coordination.

In other e-development areas, the U.K. has made better progress. Its ICT sector has continued to grow at world-leading rates. It has become the world's second largest and sophisticated private equity and venture capital sector (behind the U.S.), providing a significant financing resource to innovative businesses. Broadband coverage now reaches over two-thirds of the population, and the overall environment for e-commerce is considered one of the best in the world.[42]

The lead ministry model (**Model 3**) seems to have worked relatively well for those countries that chose to work out of a powerful Ministry such as Finance in Israel or a powerful central agency such as Treasury Board as in Canada. Large countries with

[40] ZDNet UK: "Public Should Benefit From E-Government Savings." 5 April 2002. http://news.zdnet.co.uk/internet/0,39020369,2107816,00.htm

[41] Booz Allen Hamilton. International e-Economy Benchmarking: The World's Most Effective Policies For The e-Economy. London, 2002, p. 27.

[42] Booz Allen Hamilton. 2002, pp. 21-22.

decentralized governments such as Canada differ from more centrally run administrations in two respects: the federal governments may deliver fewer services themselves (leaving more to be locally administered), and consequently they may have fewer staff, and a simpler organizational structure. These factors may give them an advantage in redesigning their services and pushing e-government at the national and regional level.

Small countries with a centralized government, such as Israel, possess similar advantages, having a relatively small civil service and simple organizational structures that provide relatively uniform services across the whole country. These countries too can implement policies relatively easily and effect change quite rapidly. Under the ministry of Finance, the budget can be a powerful tool for priority setting, compliance with ICT governance and standards, coordination in investing in shared platforms and infrastructures, and cooperation among spending agencies.

Most countries where the Ministry of Finance is currently the e-leader, had started the adoption of e-government initiatives relatively early, with sustained commitment. Canada is today among the leading nations in terms of e-government strategies; its government laid out a clear, specific, comprehensive and actionable strategy at an early stage, the strategy has been well rolled out to government departments and implemented by a dedicated team, and there has been a focus on breaking down government silos and taking a user-centric view. In addition, the public has been formally engaged for feedback and measuring progress. Other countries, such as the U.S., have had similar success born out of early beginnings and sustained commitment. These countries also tend to spend more on ICT in government per capita than do most other countries.[43]

With few exceptions, the ICT ministry as lead agency did not work out as well, due to rivalry among sectoral ministries, and the ICT ministry's lack of competencies beyond technological know how. Under such institutional leadership, ICT remained outside the core development agenda. Ownership of the information society agenda by other sectors remained problematic.

The public ICT agency model (**Model 4**) has been used successfully by governments seeking to improve their nation's standing in the global economy. Countries such as Singapore, Ireland, Korea, and, to a lesser extent, Estonia and the Indian state of AP, have formulated and successfully implemented ICT-enabled strategies to increase their global and regional positioning. They have seen dramatic increases in foreign investment as a result of adopting this strategy and the creation of a coordinated government ICT agency to orchestrate it.

Moreover, most of the countries that have opted for this model have been successful in translating their substantial economic development into substantial social development in the form of gains for the population, including vulnerable and disadvantaged groups. In other words, the focus on global economic positioning was supplemented by the use of ICT to achieve specific development objectives, such as improving the competitiveness of SMEs and promoting digital inclusion.

[43] Booz Allen Hamilton, 2002, p. 143.

The existence of an ICT agency within the government seems to make the focus on development goals easier and more effective. The very creation of such an agency typically involves the adoption of comprehensive approaches to integrating ICT into broader development strategies, thereby gaining from the synergies between different elements of a holistic approach to development. In the case of Estonia, for example, the national ICT initiative, Tiger Leap, had a dramatic effect within a single sector – improving access and content in schools – but created spillover effects in other sectors such as health, banking and public administration.

The public-private partnership ICT agency model (**Model 5**) is the most recently adopted of the five models, and is therefore harder to evaluate. Not enough countries have adopted it at this point, and those that have do not have enough experience with it to make a well-rounded assessment possible (see box on e-Sri Lanka). But a trend can be discerned in this direction: given the innate conservatism of public agencies and the transformative nature of ICT, it is not surprising when government leaders turn to bodies outside the regular ministerial structure. The viability of this model is also critically dependent on the authorizing environment, and whether the political leadership in the country is committed to allow the agency the necessary autonomy to act in a business-like manner and to avoid political interference in staffing and day to day management. Impact on e-government is also dependent on institutional linkages to the leadership within line ministries which undertake process transformation and own sectoral (vertical) applications.

Some initial lessons can already be learned from the recent few years of using this model. First lesson points to the value of engaging the private sector to the maximum extend possible. This is particularly in the case of e-government projects when the civil service is very weak and corrupt. Second, adopting private sector or business-like culture may take many features short of creating an ICT agency as a company or special public enterprise. For example, the first CIOs (or their equivalent) in the USA, UK and Italy were recruited from the private sector. Third, the public-private "blend" is a strategic design decision. A corporate image that is too close to the private sector may alienate public sector organizations and weaken the authority of the agency to push for ICT-enabled modernization of public services. Yet, placing the agency at the center of government or too close to political leadership may politicize the new body and undermine accountability to its diverse stakeholders. Placing the agency on the public-private continuum may be guided by the country's political and administrative culture.

8. Critical success factors

An analysis of the experience of countries that use each model provides valuable insights into the critical success factors of e-development programs[44]. The identified factors are:

- Vision and leadership
- Long term perspective and sustained commitment
- A holistic and integrated approach
- Strategic management, selective coordination
- Clear CIO authority
- Knowledge sharing and scaling up
- Reliable and adequate funding for prioritized multi-year programs
- Monitoring, evaluation, accountability and learning

Vision and leadership: A compelling, demand-driven and client-centered vision of ICT-enabled economy or public sector transformation is essential to secure political support and resources necessary for the transformations involved. More broadly, national ICT or e-development strategy should be articulated in terms of development challenges and country aspirations, not in terms of supply-push or technology requirements.

Leadership to drive the transformation of government and the economy in general should be deep, multi-layered and multi-sectoral. Personal commitment of top political leadership and individual champions is essential. Transformational leadership involves taking risks, managing resistance to change, and challenging habits, routines, loyalties, vested interests, and ways of thinking and doing. Programs to develop e-leaders and CIO cadres is a critical success factor in engendering sectoral (business) ownership of ICT investment programs and building local capacity to lead staff, process and cultural changes. Moreover, e-leadership must be institutionalized, networked, deepened and broadened to engage lower levels of government as well as private sector and civil society.

Long term perspective and sustained commitment: Early declaration of policy and formal adoption of strategies are no guarantee to success. Several countries have entered the e-world at a relatively later stage and have nevertheless managed to produce remarkable results. Some early starters had their programs falter and political will waned as they faced resistance to change. E-transformation takes time to mature and bear sustainable results. This is particularly true in e-government, where the use of online services by businesses and citizens will increase as services are tested in "real life" conditions", and as user comfort and knowledge grow.

[44] The empirical evidence is still scant and these observations are based on the author's own experience in advising many client countries and the experience being shared (but yet to be codified) among an emerging community of practice of e-leaders.

Long term perspective to commit resources and reach real transformation is necessary. Robust platforms for "a whole of government" approach are potentially resource intensive at the start, but can have a tangible impact on saving valuable resources and substantially improving service delivery in the long run.

This long term perspective should be complemented with specific short term targets to ensure continued political support and accountability for results. Positive and early results from the effective implementation of programs and projects are as important as well-formulated visions and strategies. Often, the transformational vision is not fully understood or owned until demonstrated in a pragmatic way by a real process transformational project—only then people "get it". Furthermore, successful projects or programs are usually those targeting specific problems, issues or populations, thereby promoting a clear focus and identifying explicit goals. Specific and measurable impact indicators should be defined at the outset in order to assess progress and success of programs and projects.

A holistic and integrated approach: Given the potential synergies among the key components of e-development, a holistic approach to ICT strategy is necessary to maximize developmental impact. E-leadership institutions must collectively shape and coordinate these key components. For example, human resources are at the heart of e-transformation. Yet ministries of education are often left out of the network of e-leadership institutions. Similarly, the ministries of trade and industry are often left out, yet they are critical to the promotion of ICT industry and creating the enabling environment for the diffusion of e-commerce and the use of ICT among small and medium enterprises.

An integrated approach to e-government is essential to sustained performance improvement in the public sector. E-government programs are most effective when other conditions are also met: affordable connectivity, vibrant software application and ICT support services, broad ICT literacy, a culture of public service innovation, and enabling policy environment. A holistic approach will also require co-management of process and institutional change, new roles and skill development, and open client-centered culture.

Strategic management, selective coordination: Holistic and integrated approaches to e-development or e-government do not imply exploiting all types of potential synergies or extensive coordination at any cost. It is therefore critical to choose what to coordinate and the levels of coordination, cooperation and collaboration. No central ICT institution can coordinate and integrate all aspects of e-development or reach down to all levels of government. Governments use multiple forms of coordination, including: direct and centralized such as a central e-government unit; direct and peer-to-peer such as CIO councils; indirect and centralized such as common frameworks and architectures; and indirect and peer-to-peer such as voluntary agreements and partnership. The challenge is to selectively focus on those most critical aspects and appropriate tools for coordination and integration.

Organizational structures are influential but not the sole determinant of effective leadership for holistic e-development and integrated e-government. Other tools of governance and coordination are often necessary and complementary to enable coordination and collaboration, such as setting common standards, standardizing on common business processes, and developing incentives and securing resources for collaboration. A powerful complement is to create an e-government "movement" that would provide the authorizing environment for champions and leaders to take risks, innovate and collaborate.

Clear CIO authority: The position of CIO should be assigned at a senior executive level to align all government ICT resources with the national e-development agenda. Devoid of a close working relationship with the head of state, and of budgetary authority levers over cross-sectoral ICT investment decisions, the national CIO will face too many bureaucratic and jurisdictional constraints that may prolong, if not preclude, procurement, project management, and allocation of centralized versus decentralized functions, all of which contribute to effective ICT integration and management. If the national CIO does not report directly to the head of state, then his or her relationship with other cabinet-level authorities creates a chain of command that diffuses his power. Furthermore, when CIOs are required to report to multiple authorities, it suggests that the central ICT office or advisory board retains more power in specific areas that the CIO should be entitled to, such as policy and strategic planning. On the other hand, nations must be wary of assigning too many responsibilities and overburdening the CIO, which is a common problem in the private sector. Therefore, the legislation mandating the CIO office should define duties in broad and strategic terms in order to allow the position enough latitude to change in response to the changing technological environment and needs of the country.

Knowledge sharing and scaling up: Developing frameworks for innovation, sharing, learning, collaboration and integration is a critical function of national e-leadership institutions. Integrating ICT into public institutions and development programs demands experimentation and institutional learning. Economies of scale are also an important factor in e-development. On a per citizen basis, the more populous countries - especially those with higher adoption rates or larger on-line populations - are likely to achieve better value for money, if they learn to share experience among its regions and local governments. Mechanisms for the sharing of experience, data, networks, applications, for standardizing common business processes and for scaling up successes are particularly important for poor and populous countries.

Reliable and adequate funding for prioritized multi-year programs: While e-development in general and e-government is particular involve long term economic and institutional transformations, budgetary cycles are short term horizons (one year) in most countries. Budgetary rigidities discourage collaboration across agencies, limit shared funding for multi-agency e-government applications and inhibit public-private partnerships. Underfunding is often the result of poor understanding of how ICT can enable development and of the complementary (human and institutional) investments required to make ICT an effective enabler. Successful e-development programs have

enjoyed a budgeting process that allowed for flexible, prioritized multi-year funding. Some progressive budgetary practices have also encouraged private investment in e-government and public-private partnerships in all aspects of e-development.

Monitoring, evaluation, accountability and learning: The monitoring and evaluating of programs and projects before they begin (*ex ante* evaluation), while they are ongoing (interim evaluation), and after they are brought to a close (*ex post* evaluation) is crucial. Such efforts can prevent the initiation of bad projects, enable the changing or termination of poorly executed ones, and judge the impact of finalized endeavors. They can be helpful to sequencing, coordination and integration. They can help articulate potential benefits to various stakeholders, as well as the costs and impacts. They can also provide feedback for policymakers on how relevant and effective the existing strategies are, and thereby contribute to their improvement.

Successful e-development programs also emphasize accountability and learning. They hold agencies responsible to clear roles and specific targets. They assign clear accountabilities for shared projects and for public-private partnerships. They identify readiness, barriers and progress and thus enhance commitment, adaptation and learning. Monitoring and evaluation systems are key tools for leaders to secure accountability and learning; the challenge for leaders is to move from espousing to practicing such tools.

9. Core institutional competencies

Country experiences indicate that regardless of the specific institutional option or organizational model adopted, the e-development policy formulating and implementing entities need to possess or acquire core competencies to advance the e-agenda. These competencies include: demand and supply leadership, technological and process change management, strategic communications, human resources development, financial resource mobilization and management, partnerships with key stakeholders, and program and project management.

Demand and supply leadership: e-leadership institutions should possess core leadership capabilities to shape demand and supply of ICT-enabled development. On the demand side, they should shape and inform expectations of policy makers and development strategists of the role and potential of ICT in development. They should be able to create visions of what the agency, public sector, enterprise or economy could be like if it were using ICT in the best way possible. They should be able to develop an informed e-vision that the cabinet, public managers and business leaders will find credible and compelling. For example, they should clearly articulate the positive impact e-government will bring to citizens, businesses and/or employees. They should use ICT governance frameworks to integrate ICT strategies with overall development strategies, and to determine whose ICT demands are met, who gets to make them, and who is accountable for what. Institutions should be able to create the incentives and enabling environment for ICT use and diffusion in business, government and civil society. They should create trust in e-services through appropriate privacy and security policies.

E-leadership institutions are also concerned about setting the policies, organizing the resources, building the skills and managing the risks to deliver development results. Hence, on the supply side, e-institutions should be able to develop, organize, harness and manage the national ICT infrastructure and the specialized human resources necessary for effective deployment of ICT across the economy. They should develop the incentives and frameworks for government-wide coordination and collaboration. Where appropriate, they should develop the industrial and innovation policies necessary to promote technological competencies and competitive advantages in promising segments of the ICT industry for domestic ICT absorption and adaptation, and for export.[45]

Strategic communications: This is a core competency that is closely related to leadership capabilities. It is a tool for raising awareness about the potential of ICT to achieve development goals. The government, the private sector, and the general population need to be educated about the advantages that technology can hold for their everyday lives. Initiatives that clearly identify development goals within the needs and context of the target population are more likely to deliver tangible results. This will also

[45] Nagy Hanna, et al. (1996). *The East Asia Miracle and Information Technology: Strategic Management of Technological Learning.* World Bank Discussion Paper # 326. Washington DC. Also, Nagy Hanna et al. (1995). *The Diffusion of Information Technology: Experience of Industrial Countries and Lessons for Developing Countries.* World Bank Discussion Paper # 281. Washington, DC.

serve to spark strong interest in and mobilize resources for these initiatives amongst potential stakeholders and partners including local and foreign investors, think tanks, mass media and civil society organizations. It is also critical to gain and sustain political support.

CIOs, a core part of institutionalizing e-leadership, should ensure that the vision and strategy coming from the top is understood, accepted and shared by all. They should also be able to clarify, measure and communicate performance and success. They should raise awareness of the potential of ICT for development and engage public policy makers, business leaders, and civil society in articulating their demand for information, communication, ICT applications, information infrastructure, and ICT skills and services. Further, they should engage citizens and businesses in the policy setting process and provide them with channels to provide feedback on e-government services, among others, and thus maximize the usefulness of such services.

Technological and process change management: e-leadership institutions should acquire adequate skills and understanding of the tools of ICT governance such as the role of standards, architectures, and outsourcing. They should be familiar with the potential of low cost technologies such as open source software to enable users to fashion sustainable and affordable solutions and bridge the digital divide. They should remain abreast of emerging technologies and trends and their implications for national e-strategies. They should be aware of key enablers such as adopting open standards and flexible solutions, sharing e-services delivery among agencies, and standardizing processes across organizations.

Like the private sector, government agencies should however refrain from trying to be experts in all technological areas: they should rely on sourcing such specialized knowledge through technical advisory bodies, outsourcing, and consultations with the private sector. Given that most of the challenges come from the process, skill and institutional changes that are required to realize the benefits of ICT investments, core competencies of e-leadership must include full awareness of the techniques of process reengineering and change management and how to engage specialized consultants to secure such changes.

Program and project management: This core capability is crucial to the day to day implementation of e-development programs. First, this includes the ability to prioritize objectives and turn them into programs and projects, which in turn are broken down into projects and tasks, with responsibilities clearly allocated and timelines, deliverables and milestones unmistakably defined. Mastering project management techniques is a critical core competency. Related competencies include portfolio and risk management, the coordination of different stakeholders (possibly from different organizations and even sectors) and the utilization of reliable evaluation and monitoring tools throughout programs and projects lifetimes. However, program management should guard against focusing on complex methodologies and techniques at the expense of outcomes and results.

Human resources development: recruiting, retaining and motivating qualified staff is a key factor in building all the other core competencies required for undertaking e-development. This is one reason for some countries to shift from model 4 to 5—and for many countries operating under model 4, to establish special compensation and career structure for their national ICT agencies. Beyond providing competitive compensation, e-leadership institutions should focus on capacity building and on job training for their staff. Given the pace of change of these technologies and the new application opportunities made possible by such change, e-leadership institutions must create the culture, incentives and learning systems to enable staff to grow, learn, and innovate. They should support learning and capacity building through partnerships with think tanks and private sector actors including leading multinationals. They should be able to support communities of practice of CIOs, policy makers and business leaders, perhaps extending such communities to tap the knowledge of neighboring countries. Knowledge management and communications systems should be set up to enable the sharing of experiences amongst staff and partner organizations.

Resource mobilization and management: While e-development is usually a national priority, government budgets may not be able to financially support the wide range of activities that it entails. The first challenge is justifying and securing funding from the national budget. But other funding sources and financing schemes must be also explored. E-leadership institutions should be aware of the ever expanding innovations in financing small as well as large and risky ICT programs through foreign direct investment and public-private partnerships. Once funding has been secured, competent staff should be in place to manage it wisely and allocate it efficiently between the various priorities. Since ICT procurement for the public sector can be complex and substantial, financial management must be undertaken in an open and transparent manner so as to leave no doubt about the integrity of the e-development institutions. Core competencies in finance may also extend to providing seed capital and financing innovation mechanisms to support grassroots initiatives by NGOs and innovations by public CIOs.

Partnership with key stakeholders: Building partnerships and learning to deliver programs through partnerships are essential competencies for the relatively small and agile e-development agencies. Such agencies would rely on partnerships and outsourcing and yet possess a core set of skills in technical areas as well as in strategy, management and development policy fields. Broad-based private sector participation and at times business leadership of specific e-development programs is key to keeping the key public leadership institutions focused on the overall vision and strategic control of implementation.

The interests of key stakeholders must be broadly aligned with the goals of the national e-development policies. This call for securing commitment to these policies from all key parties, including participation from local communities, private enterprises, non-government organizations, multilateral organizations and local governments. Strong public and private institutional support and leadership can assist in maintaining commitment and alignment from all parties. This requires clear partnership frameworks including strategically agreed roles and responsibilities for all partners. However,

successful and sustainable partnerships are not forged overnight. They take a long time to form, and require mutual trust and the ability of each side to understand – and accommodate – the others' expectations and requirements.

Public-private partnerships: E-development and in particular e-government and information infrastructure present substantial opportunities for transforming service delivery and mobilizing private finance and technological capabilities through public-private partnership (PPPs)s. However, these opportunities are conditioned by the political environment and the relative competencies of the public and ICT services sectors of each country. A key competency of e-leadership institutions is the capacity to identify, procure and manage such PPPs on behalf of the government as a whole, as well as establishing the policy and legal frameworks and processes to support sound PPPs by individual government agencies --consistent with the politically-acceptable role of the state and the relative competencies of the public and private sectors of the country.

Governments embarking on e-development programs with a PPP thrust need to adapt their skills and processes to ensure that such PPPs deliver what is expected of them.[46] E-leadership institutions should ensure that PPPs that proceed are those which represent priority projects and are best done through the PPP route of procurement. In early stages of e-development or e-government, PPP expertise is likely to be scarce and central guidance on good practice will be needed. A central cross-government pool of expertise in PPP is likely to be needed to supplement any nascent capacity in the line agencies that contract for PPPs. The degree of centralizing this function may vary. It may be limited to information sharing and broad guidance on PPPs, or extend to approving PPPs, understanding and monitoring the fiscal costs of PPPs, and/or direct development and execution of complex PPPs on behalf of all government agencies.

[46] See for example, World Bank (2006). *India: Building Capacities for Public Private Partnerships.*

10. Strategic Options and Conclusions

Adopting a national e-development strategy will always demand a comprehensive policy approach beyond addressing the requirements of a single sector or infrastructure. The cross-cutting nature of ICT makes it impossible to use traditional institutional arrangements that designate the entire agenda to a single ministry or agency. It requires strong coordination of e-development activities among various government agencies, taking into account the needs and capabilities of the private sector and civil society. E-leadership is seldom a good fit with any single institution or ministry, as the challenges are wide ranging and cross-cutting.

For the formulation and implementation of such comprehensive strategies, governments are obliged to determine what sort of institutional framework they could best adopt to undertake these tasks. This review suggests five basic models of national institutional structures to define and support e-development policies. While by no means all-encompassing or definitive options, these basic and stylized models provide a basis for comparing institutional frameworks adopted by various countries, for the restructuring of existing institutions or perhaps the creation of new hybrids.

Strong Demand for e-leaders and e-leadership institutions: One key conclusion is the need to build local demand for e-leadership institutions.[47] The authorizing environment for e-leadership institutions cannot be taken for granted—it should be built and nurtured over time. Successful countries empower their institutions with the necessary authority, resources and incentives to lead the change process, inculcate a culture of service innovation, and partner with key stakeholders. To build tihs demand over time, stakeholders, potential beneficiaries, parliamentarians and citizens at large are provided with information on public sector performance, service standards, measures of progress, and e-development results.

Effective demand for e-leadership institutions can be created by building business and civil society pressure for better public services. It can be nurtured by raising awareness of societal leaders and exposing them to international best practices. Citizens should be made owners of e-government and e-development programs. They should be engaged—through political leaders and e-leadership institutions—in shaping the kind of government, information society and knowledge economy they should have and in realizing their shared vision. The media can play a critical role here, as it did in Korea and several other East Asian countries.

Demand for new institutions or reforms to existing ones is often time sensitive. When such demand emerges, it is usually the product of crisis or major change in the political environment that create more than a brief window for reform. There are serious

[47] In general, successful institutional reforms have occurred when a society has generated strong domestic demand for institutions. Insufficient domestic demand for institutions is the single most important obstacle to institutional development in developing countries. See, Francis Fukuyama (2004). *State Building*, Cornell University Press, Ithaca, New York.

limitations to the ability of external partners or aid agencies to create demand for institutions and therefore limitations on the ability to transfer knowledge about building new institutions—as demonstrated by the scarce success of state building when states fail.[48] Such windows of opportunities should therefore be anticipated and quickly captured.

The demand for the CIO function comes ultimately from outside the government i.e. from its customers. Thus, the CIO has to effectively build four major constituencies– government; private sector; universities and think tanks; and civil society organizations. Promoting such cooperation is a very challenging task in most developing countries. The CIO also has to be able to secure high-level political support and to overcome government bureaucracy and silos to build broad-based momentum, ensure compliance and promote cooperation. For example in Sri-Lanka, which recently secured a large World Bank e-development project, CIOs are expected to be selected largely based on their good communication and leadership skills with a flare for innovation. The right attitude is fundamental--as necessary technical skills can be developed during subsequent training or even procured from the private sector.

Fit within the country's institutional architecture: Institutional development is path dependent. Countries must deal with their institutional legacies while adapting and innovating new ones. The design of e-leadership institutions should be also guided by a deep understanding of the political economy of reform and modernization.

Institutional relationships for e-development extend beyond the central government to include different levels of government, the private sector and NGOs. The role of public institutions is expected to vary in response to the level of development of the local private sector, the current performance and constraints of the civil service, and the psychological and cultural gaps between these potential partners. For example, governments like Korea, Singapore and Taiwan China took key roles in promoting the ICT industry as these states had strong capacity to implement coherent industrial policies, including the capacity to partner with the private sector to systematically address the specific needs of this infant but dynamic industry.

This research also suggests that e-leadership institutions tend to evolve with the maturity of e-development and e-government programs. For example, several countries have adopted first the approach of shared responsibilities (model 1) or policy coordination (model 2) then realized that lead agencies must be appointed and empowered to institutionalize the coordination and implementation of complex e-development or e-government investment programs.

Many countries moved from models 1 and 2, with their selective and strategic coordination of e-development implementation, and towards variations of lead ministry (model 3). This shift towards stronger coordination of execution has become prominent with the advent of citizen-focused whole-of-government approaches and the consequent need for investment in common infrastructure, transformation of business processes,

[48] Fukuyama (2004).

single window interaction with citizens, and adherence to enterprise-wide architecture and delivery channels. Several leading countries assigned the leading role to a powerful cross-sectoral ministry like Finance, Economy, Planning, or the equivalent. In fact, governments that have been using ICT since the 1960s, mainly for task automation, had a legacy of model-I type investments, MIS organization, human resources and culture. Governments without such legacies have the option of leapfrogging model 1 and 2 to models 3, 4 or 5.

Some countries such as Korea, Mexico and Egypt assigned the lead role to the ICT ministry, when connectivity was viewed to the binding constraint on ICT and e-government adoption, then reassigned this role to the ministry of public service or home affairs as they shifted attention to e-government applications. Smaller countries such as Singapore and Ireland opted for a single central public agency model under the head of state (model 4). With increasing emphasis on private sector participation and investment, a few countries have created public enterprises or public-private agencies to lead the country's increasingly integrated e-development strategy (model 5).

Based on this research, one possible conclusion is that countries or states with low institutional capacity (weak civil service) may opt for more centralized models at the start to harness sufficient authority for coordination, build on scarce local capacity and achieve some economies of expertise (models 4 or 5). Countries may even go further and create new hybrids that would blend the strengths of public, private and civil society institutions. For example, Sri Lanka had to create a hybrid model of a public-private ICT Agency outside civil service constraints to attract the appropriate skills, avoid the dysfunctions of the prevailing civil service culture, and provide some room for the agency to become an agile learning organization. On the other end of the continuum, countries that enjoy widely shared institutional and technological capacity as well as political consensus on the importance of ICT for modernization and competitiveness may opt for shared responsibility, or for selective policy coordination combined with decentralized implementation (models 1 and 2) as in Finland and the USA.

Evolving e-leadership Institutions: We discern some broad trends in the evolution of e-leadership institutions. First, there is a shift towards 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-government 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.[49] At that

[49] The number of nations who turned to such task forces is notable: Singapore in 1992, USA in 1993; followed by Japan, Korea, China, among others. See Wilson (2004).

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 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 president, prime minister or the equivalent. 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 non-government actors.

Fifth, as e-government programs take hold and mature, countries move beyond concern about the central agency and common information infrastructure to start organize and rationalize 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 change 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, sstate and municipality levels, institutionalize innovation and process reengineering, promote collaboration across boundaries, engage more stakeholders and disseminate best practices.

Finally and more broadly, the components of e-readiness and e-development are changing over time, and e-institutions should evolve accordingly. As the basic level of readiness and information infrastructure are built, 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 these new balances and requirements.

Optimal Centralization and discretion: Striking the appropriate balance between centralization and decentralization is a key consideration in all institutional models and governance frameworks. Countries are in search of an optimal level of

centralization that is consistent with the opportunities to create seamless information sharing across government, the imperatives of effective adoption of the technology, the need to secure complementarities among investments, and the prevailing socio-political culture of the country.

The centralization/decentralization dimension involves striking a balance among political and administrative control, direct and indirect coordination mechanisms, and levels of control that range from mandatory to facilitation and consultation. Governments may opt for a mix of centralized and decentralized elements. For example, the centralization of some aspects of e-government like technical standards may allow the decentralization of other decisions such as prioritization of applications and investments in e-services. Similarly, enhancing the information sharing and processing capacity among e-leadership institutions through CIO councils, for example, may also allow for less and selective control by the central agency.

In large federal countries such as Russia, India and Brazil, the e-government structures and CIO functions may be more decentralized, with operational responsibilities of the national CIO limited to crucial cross-agency areas such as common infrastructure. Smaller countries tend to assign significantly bigger degree of operational power to the central ICT agency, the e-government unit, and the national CIO office. Not only should states invest resources in a statewide e-development plan and common platforms, but agencies should also be responsible for having and revising their own ICT plans and integrating these functional plans into the agency's business planning process.

The protean nature of ICTs requires continuous attention to their changing effects and expanding potential, and thus bottom up innovation and user participation. Top-down reforms and strategies must be complemented by bottom-up pilots to create learning, develop stakeholders for change, and build momentum for further reforms. National ICT strategies require business-driven applications and local ownership on the one hand, and shared vision, strategically-driven programs, coordinated investments, and common infrastructures, on the other. E-government involves substantial changes in business processes and practices. While the levels of power and responsibility of the leading institutions are likely to vary, a recognized form of authority devoted to information technology must exist to provide statewide guidance and to show the citizens that their elected leaders are striving to achieve rapid advancement in order to remain competitive and on the cutting edge of change.

Different elements of e-government require different degrees of centralization in their institutional or governance models (Box 18 and Figure 11). E-government programs require the building of shared infrastructure and strategic applications that cut across agencies such as payment systems and smart cards. They also promote the standardization of common business processes (or lines of business like financial management and human resources management functions) across government agencies. Furthermore, they aim to develop government-wide enterprise architecture and "single window" government. Thus, the need for centralized coordination and governance for those aspects is most critical. Yet, a more decentralized model is more conducive to

content development programs that are responsive to the mission and priorities of each agency or sector. It is also more consistent with vertically-owned and context-dependent applications, process reengineering, institutional transformation and service innovation.

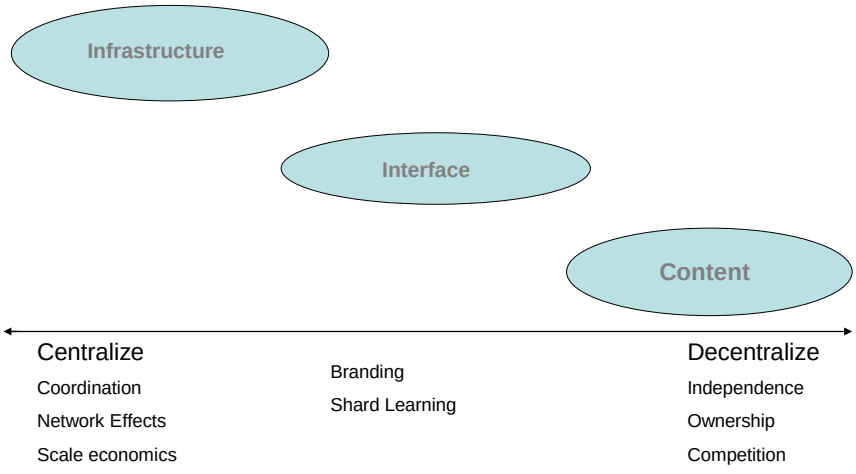
Box 18. Key Institutional Design Issue: Degree of Central Leadership and Coordination

Preliminary research based on the principles of institutional economics suggests that there are merits to centralize strategy formulation and implementation when it comes to infrastructure investment and common databases such on population, land and national statistics (figure). Interfaces such as portals would benefit from shared learning and branding and hence would require some degree of coordination and centralization. Coordination on interfaces can also facilitate client focus and 'whole of government' view.

Content and applications can vary in terms of coordination needs. E-leadership institutions are advised to keep vertical applications under the control of sectoral ministries and local government agencies. Applications and content development would benefit from competition, line management and user ownership, and a high degree of decentralization in investment and operation. But even here, central e-leadership institutions play critical roles: they can create the enabling environment and support mechanisms such as consultancy expertise, cost sharing schemes and innovation funds, cross-agency learning and sharing of best practices, and complementary infrastructures.

Figure 11:

Centralize vs. decentralize: where and how much locus of strategy formulation and implementation?



Other elements of e-development also vary in terms of their optimal level of centralization and coordination.. For example, programs for wide diffusion of ICT use among SMEs and civil society can be better led by decentralized institutional arrangements. Promotion of the software industry may yet take different institutional arrangements, including private-sector led partnership with public institutions. In telecommunications, a highly centralized and autonomous agency may be the most appropriate model for tasks characterized by high specificity (high ability to monitor service output) and low transaction volume.

Integration with development policy and sectoral decision making: Institutional and governance frameworks are fundamentally about who makes decisions and who has an input about ICT policies and investments, the ICT specialists or the sector (education, health, public administration, finance, business) specialists. This is an issue that continues to challenge private sector organizations and much can be learned from their experience.

The business literature about IT governance in diversified large enterprises suggests a range of governance styles, ranging from a *business monarchy*, where IT decisions are made by business executives (CxOs), *feudal style*, where decisions are delegated to autonomous business or local units, *federal or duopoly styles*, where governance rights are shared jointly by business and IT executives at the corporate or business unit level, to IT monarchy, where corporate IT professionals hold the decision rights for IT infrastructure, IT architecture and business applications.[50]

While no one size fits all, top IT governance performers in the private sector attempt to balance pressures fro both synergy (of IT) and autonomy (of business or local units). They usually bring together senior business and technology executives for joint decision making for overall IT policies, major investments and prioritization. The mechanisms used to implement governance vary, but they range from IT councils, composed of business and IT executives, executive committees, to IT leadership committees that bring together senior IT executives from across the enterprise. Governance styles should fit business orientation, for example, those enterprises seeking synergies across their businesses may require tight corporate coupling between corporate and IT executives.[51]

What would be the analogies and relevant lessons for the public sector and e-development strategy in general? The above stylized governance models do not map neatly to the models proposed in this research, but they may still provide new insights. It could be argued that the distributed responsibility model (Model1) is equivalent to governance by business monarchy, particularly if sectoral ministries do not engage their own IT or CIO executives in their IT decisions. If the lead ministry is Finance, Economy or Public Administration (variants of model 3), the *business monarchy* governance may prevail for similar reasons. If decisions about IT investments are delegated down the line

[50] See, for example, Broadbent and Kitzis,2005. *The New CIO Leader*. Harvard Business School. Boston, Mass. pp. 113-116
[51] Op. cit. pp 122-127

to lower administrative units, this could lead to *anarchy*—not a good governance model to follow under any circumstances. On the other hand, both the ICT Agency model (models 4) can lead to the *IT monarchy* model, particularly if they these agencies are not governed by policy councils or national steering mechanisms that bring public policy executives and sector managers to co-govern and influence IT decisions.

Many advanced countries attempt some variations of the federal or duopoly styles, that is, 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 business decisions thus 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 inter-ministerial 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.

Effective interactions among e-leaders and among e-development institutions: Social capital and enduring networks that link policy makers, civic leaders, academics, businessmen and the media are critical to the diffusion of ICT in society and the overall success of e-development—far beyond the soundness of any single e-development agency. Social control of e-development goes beyond government agencies. Studies of ICT policy reforms and institutions suggest that successful countries have created a tight web of e-leaders and e-leadership institutions that cut across public, business, academia and civil society sectors.[52] Such a web can act to stimulate the demand for sound e-development policy environment, the supply of necessary investments and skills, the coordination of interdependent actions, and the sharing of knowledge for design, implementation and learning.

Trust, informal norms and shared expectations are important in shaping this web of learning and governing organizations. Leadership is key in creating the conditions for trust and developing tight networks that cut across agencies and sectors. During periods of major structural change, the contribution of good leadership is magnified. "Effective leaders provide the psychological and professional bridges between previous period of certainty and later periods of wider agreement."[53] Through their compelling visions, leaders provide meaning and direction in a chaotic world. They bridge boundaries, model risk taking and show others the future.

Understanding institutional options, promoting innovations, and institutionalizing Project Implementation Units (PIUs): The basic institutional frameworks identified in this review suggest the range of possibilities open to governments. E-development and e-government do not have natural homes. As described in the above country examples, hybrid models are also possible, each consisting of one or more elements of the basic ones. The challenges of the dual roles of ICT as a sector and as an enabler across all sectors should spur further institutional innovation.

[52] See, for example, Wilson (2004).
[53] Wilson (2004), p. 93

Understanding these institutional options and the strengths and weaknesses they represent is a starting point for country leaders to mobilize and fashion the necessary institutional resources, mechanisms and competencies for leading e-development.

Institutional change and managerial innovation are at the heart of the development process, yet aid agencies often prescribe institutional designs and project implementation units as if "one size fits all" or as if institutions do not matter. The design and location of PIUs for e-development programs should not just reflect the status quo, or the dominance of a single agency such as the Ministry of ICT, for example. PIUs should not reinforce the silo mentality within governments, or further create isolated information systems that would be very costly to connect in the future. Externally-assisted leadership models and implementation mechanisms should reflect our understanding of the institutional map and networks of the country and the national consensus on the role of the state. Aid agencies should also go beyond investing in large ICT systems to nurture the necessary conditions for success and mobilize the demand for e-leadership institutions when lacking.

Aid agencies and their client countries should create PIUs that can develop the in-house core competencies needed, and innovate the necessary mechanisms for attracting and retaining the essential competencies for partnering and outsourcing the rest. PIUs should be designed with an eye on institutionalizing ICT governance and ICT-enabled development. Ultimately, e-development is a process, a journey, an exploration that changes the functions of government as well as the practices of businesses, and their relationships to partners and stakeholders. It is not a one-off project, product or blueprint.

11. Directions for future research

Research is urgently needed to further our understanding of the governance and institutional mechanisms needed to guide e-development; this research is a modest investment in this under-researched area.

First, in-depth country and regional case studies can be a fruitful area of future research. Such in-depth analysis would extend our treatment of e-leadership institutions beyond the central ICT agency and the national coordination mechanisms dedicated to ICT issues and would include sectoral ICT organizations, among others. Case studies of leading countries could provide inspiring stories and concrete models of institutional leadership. Country cases of institutional chaos or missing or poor institutional architecture may also provide a warning to others of the cost and consequences involved.[54] Case studies would also provide deeper understanding of the political, social and economic context to which e-leadership institutional models must be adapted. This research provides some hypotheses in this regard that should be tested and systematically evaluated through in-depth country studies.

Second, he business sector has also gained rich lessons over the last two decades concerning the potential benefits of ICT investments--including that costly ICT investments do not guarantee competitiveness, and that the key challenges to realize the promises of ICT involve human and organizational resources as well as managerial and process innovations. Strategic and effective use of ICT requires a profound transformation in the internal organization of the firm and its interconnection with the markets and suppliers. Hence, the role of CIOs, ICT governance and information architecture for a whole enterprise have been evolving and increasing in importance. These lessons need to be captured and adapted to the challenges facing policy makers are they design e-leadership institutions and e-governance tools for the public sector and the economy as a whole.

There is a lot to be learned from how large and diversified enterprises have developed their ICT governance and organization. Research may cover how business enterprises authorize the ICT organization to set policies or engage in operations, integrate the CIO function within their executive leadership, invest in major ICT infrastructures and applications, and coordinate across business units for a shared knowledge system. The business sector has been using ICT as a competitive factor or enabler of overall business strategy and it would be instructive to learn how successful CIOs and ICT organizations have enabled top management to do so. Also management structures and frameworks adopted by the private sector to deal with outsourcing of ICT functions could provide useful pointers for governments.

[54] Many developing countries such as Senegal have developed a clear vision at the political level of the significance of ICT, but still lacked the institutional architecture and implementation capacity to realize their visions.

Third, this research focuses on the central e-leadership institutions at the national level, but much of the rich institutional experience at the sub-national levels (states and municipalities) remains to be studied and tapped. Further research is needed to link institutional and governance arrangements at the federal level with those at the sub-national, for example, to coordinate interoperability across administrative boundaries (see case of India, Box 10). Increasingly, success will depend on institutional arrangements at the state and city levels, where most of government services are delivered, pilots and innovations are carried out, and partnerships with central governments are to be forged.[55]

Fourth, several of the country studies surveyed touch on the interface between the central ICT agency (or lead ministry) and the ICT departments within ministries—mainly through the CIO link. Future research could go in depth in exploring the options available to governments to link the apex ICT agency to its sectoral counterparts, or to link those institutions concerned with horizontal infrastructures and government wide ICT services with those concerned with sectoral or vertical applications. This link is essential to effective e-government programs. Of particular interest would be the links between the central ICT agency and the ICT organizations within the ministries that are typically major users of ICT and owners of large databases and common business processes such as ministries of Finance, Education and Public Administration.

Fifth, specialized bodies involved in regulating the telecommunications and multimedia infrastructure have emerged in most countries and lessons learned about creating and adapting these bodies should be drawn on for other e-leadership institutions. These regulatory agencies are still relatively new among developing countries, as the need for such institutions were not obvious when governments owned, operated and set the performance criteria for the provision of telecommunications, broadcasting, and other communications services. Lessons may be learned about how these institutions have been able to sustain their independence and finances and how they continue to adapt in the face of technological convergence and fast changing telecommunications and media industries. Lessons can be also gained from how such agencies have engaged various stakeholders and how their inter-institutional relations proved critical to discipline powerful actors in their task environment. Of special relevance is the interface between such regulatory agencies and other core institutions responsible for other elements of e-development; these inter-institutional relationships should support coordination between information infrastructure and e-government services development, for example.

Sixth, this review focuses on formal institutions, but does not cover CIOs, CIO councils or e-leaders, and the programs needed to create and develop these new cadres of leaders. A complementary research topic could address these programs in more depth. Many countries are establishing a CIO cadre and national CIO councils to help implement e-government programs within and across agencies. The roles of CIOs leaders and CIO councils are rapidly evolving and demand increasing attention. The

[55] The same arguments can be made for other knowledge economy institutions. Much of the experimentation, support services and partnerships must be forged at the regional, city and cluster levels where cooperation and competition and institutional partnerships occur.

relationship between CIO councils and the central ICT agencies should be better understood and managed. Also, many developing countries are interested in defining the core competencies needed for the new CIO leaders and improving the supply mechanisms and training programs needed to address this capacity gap.

Seventh, funding mechanisms for the various institutional models is another fruitful area of research and knowledge sharing. Given resource constraints in developing countries, various business models may be explored to generate revenues for the central ICT organization, for example, earn revenues from the management of e-procurement, maintenance of authentication systems, or e-payment gateways. Such operational management functions may however distract the ICT organization away from its core functions of policy, governance and investment program leadership. What has been the experience with various funding mechanisms? In-depth country case studies may also quantify the inputs needed for the different agency models, based on different country conditions and development scenarios. Such studies of the operational and funding requirements may include for example indicators of staffing and the annual budget for operating such agencies or for key e-development tasks. They may also survey some of the innovative practices to fund these agencies in ways that can enhance their independence, responsiveness, adaptability and/or sustainability. In this context, lessons may be learned from the common practices of funding the telecommunications regulatory commissions.

Eighth, privatization has been a cross-cutting area of development and reform, and lessons can be learned from creating the institutions that carried out privatization programs—often financed by the World Bank and other aid agencies. Unlike the ICT dimension, privatization programs often involved sunset clauses and were expected to phase out once the legacies of state-owned enterprises were privatized. But like the drive to develop and diffuse ICT across the economy, privatization was viewed with a sense of urgency and as a new dimension of development that had no natural home within governments. Privatization agencies were at times created as placed under the President of Prime Minister of the country (similar to model 4 or 5), at times under a powerful lead agency like Finance or Economy (as in model 3) and at times shared among concerned ministries and/or guided by light policy coordination mechanisms (as in models 1 and 2). Since privatization programs had peaked in the 90s and much implementation experience and development outcomes had been gained since, it would be instructive to review the strength and weaknesses of these alternative institutional arrangements in the context of different country conditions and in relation to development outcomes.

Ninth, building effective public-private partnerships remains a challenge even among advanced countries, and much more research and evaluation of the key factors contributing to success and failure of such partnerships is needed. Few countries are experimenting with model 5, or some features of increased participation of the private sector and civil society in the funding and governance of e-leadership institutions. It would be fruitful to capture early learning and promising innovations for developing countries, particularly given the scarcity of public resources and the promise of broadly-owned e-development programs.

Finally, this survey represents only a 'snap shot' of institutional arrangements for ICT-enabled development – a field that is fast changing as countries are continuously adapting and replacing their institutional models over time. A mechanism for monitoring, updating and evaluating country institutional arrangements and governance frameworks on a regular basis is therefore needed.[56]

[56] Currently all e-readiness methodologies and indices do not measure the fit and quality of e-leadership institutions.

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