KNOWLEDGE SHARING SERIES

ISSUE
I

ICT for DEVELOPMENT
INSTITUTION BUILDING

UNITED NATIONS
ESCAP /APC**i**CT
Economic and Social Commission for Asia and the Pacific

MINISTRY OF STRATEGY
AND FINANCE
REPUBLIC OF KOREA

Knowledge Sharing Series

Issue 1

ICT for Development Institution Building

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Knowledge Sharing Series

Issue 1: ICT for Development Institution Building

Supported by

MINISTRY OF STRATEGY
AND FINANCE
REPUBLIC OF KOREA

Korea Eximbank

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FOREWORD

The transformational power of information and communication technologies (ICTs) in connecting people, improving business efficiency and empowering communities — eliminates any doubt about the importance of making these technologies accessible to all and ensuring that everyone has the capacity to harness their potential.

The 'mobile miracle' has brought the benefits of ICTs within reach of nearly everyone. In less than five years, the number of mobile phone subscriptions in Asia and the Pacific more than doubled, rising from 1.08 billion to 2.53 billion.[1]

As we know however, ICT is not only about connectivity. More importantly, it is about leveraging the power of connected technologies for inclusive and sustainable development. Two decades ago, phones were used, almost exclusively, for talking to one another. Presently, a wide range of services and applications are available on mobile phones that are being used every day for banking, learning, and obtaining real-time information - helping to improve people's lives.

However, the benefits of ICTs are still not available to everyone. In fact, the digital divide in Asia and the Pacific is one of the widest in the world. For instance, the least developed Asia-Pacific countries and the Pacific island developing economies have, on average, fewer than 28 mobile phone subscriptions per 100 persons, compared to an average of 99 in high-income countries. A similar pattern can be found in Internet usage with 1 per 100 in least developed countries, compared to 78 per 100 in high-income countries.[2]

Without adequate access and capacity to utilize ICTs, least developed countries and marginalized populations risk falling further behind the rest of the world and will face great difficulties catching up, thus widening the digital divide.

Much remains to be done to ensure inclusive and sustainable Asia-Pacific growth. Unfortunately, the growth of ICT availability has not been matched by an equally rapid expansion in knowledge concerning the opportunities and challenges that ICTs present, and the ways to effectively leverage the potential of ICTs for development.
To bridge this knowledge gap, the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) welcomes the launch of the Knowledge Sharing Series being spearheaded by the Asian and Pacific Training Centre for Information and Communication Technology for Development (UN-APCICT/ESCAP), one of our ESCAP regional institutes.

As ICT for development (ICTD) programmes are often huge undertakings, that cut across multiple sectors, and require the participation of stakeholders from multiple specializations, knowledge sharing is fundamental to the effective development and implementation of ICTD strategies and plans, to the creation of innovative ICT solutions to complex development challenges, and to the avoidance of pitfalls and duplication of efforts. Knowledge sharing is, in fact, an important component of lifelong learning and capacity building, as it promotes a better and deeper understanding of different aspects of ICTD from various perspectives. Knowledge sharing is also a catalyst for establishing partnerships. This Knowledge Sharing Series has been developed for precisely these reasons.

As our member States continue to grapple with the effects of global economic uncertainty, ICT as an enabler for development, has become a key element in national strategies for building social and economic resilience, and promoting inclusive and sustainable development. It is therefore more important than ever to share ICTD knowledge to develop synergies, pool resources and strengthen capacities for shaping a safer and more sustainable future.

Noeleen Heyzer

Under-Secretary-General of the United Nations
and Executive Secretary of ESCAP

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1   http://wwwupdate.un.org/wcm/content/site/chronicle/cache/bypass/home/archive/thedigitaldividend/digit alasiapacificinthe21stcentury?ctnscroll_articleContainerList=1_0&ctnlistpagination_articleContainerList=true
2   http://www.unescap.org/survey2011/

PREFACE

In recent decades, the rapid development of information and communication technologies (ICTs) and their proliferation into all sectors of society have opened up new opportunities for socio-economic progress, poverty reduction and environmental sustainability. Yet, between and within countries, and among different areas, communities and socio-economic groups, there remains noticeable disparity in the access to ICTs and people's capacities to use them.

Bringing technologies to the people goes beyond the provision of infrastructure and hardware. The greatest need is for initiatives that encourage learning in different local contexts and exchanges of experiences and knowledge. As the World Summit on the Information Society outcome on Capacity Building states, "each person should have the opportunity to acquire the necessary skills and knowledge in order to understand, participate in, and benefit from the Information Society and Knowledge Economy." To this end, the Plan of Action calls for international and regional cooperation in the area of capacity building with an emphasis on creating a critical mass of skilled ICT professionals and experts.

In response to this call, the United Nations Asian and Pacific Training Centre for Information and Communication Technology for Development (UN-APCICT/ESCAP) was established on 16 June 2006 in Incheon, Republic of Korea as a regional institute of the United Nations Economic and Social Commission for Asia and the Pacific (UN/ESCAP). The role and mission of APCICT is to strengthen the efforts of the 62 ESCAP member and associate member countries to use ICTs in their socio-economic development through building the human and institutional capacity for ICT. In pursuance of this mandate, APCICT's work is focused on three inter-related pillars – Training, Research and Knowledge Sharing, and Advisory Services. Together they form an integrated approach to ICT human capacity building.

A core activity based on the integrated approach is the *Academy of ICT Essentials for Government Leaders* (Academy), a flagship programme of APCICT. The Academy is a comprehensive ICT for development (ICTD) training curriculum that aims to equip policymakers with the essential knowledge and skills to fully leverage opportunities presented by ICTs to achieve national development goals and bridge the digital divide. The Academy has reached thousands of individuals and hundreds of institutions throughout the Asia-Pacific and beyond since its official launch in 2008. The Academy has been rolled out in over 20 countries in the Asia-Pacific region, adopted in numerous government human resource training frameworks, and incorporated in the curricula of university and college programmes throughout the region. The Academy training curriculum with nine modules (and more forthcoming) has been translated into nine languages, and is available as an online course on the APCICT Virtual Academy in English, Bahasa Indonesia and Russian.

Complementing the Academy, APCICT has been conducting research on ICTD human resources development and promoting knowledge sharing among member countries on different aspects of ICTD through the development and dissemination of in-depth analyses, policy notes, case studies and best practices. APCICT also has an online knowledge sharing portal that includes: (1) a handful of communities of practice with a network of professionals committed to share knowledge and learn about different aspects of ICTD; and (2) the e-Collaborative Hub, a dedicated online platform used by about 900 members to enhance their learning and training experience through access to ICTD resources, training courses, news and events.

Based on a continuous demand for step-by-step "how-to" guidelines on different aspects of ICTD that translates technical details into a form that can be easily referenced, understood and applied by government officers, APCICT has created the Knowledge Sharing Series to further strengthen APCICT's knowledge sharing efforts and strategically contribute to ICTD capacity building. The Knowledge Sharing Series is kindly supported by the Ministry of Strategy and Finance of the Republic of Korea, Korea Eximbank and Korea Institute for Development Strategy.

The development of the Knowledge Sharing Series and this first issue in the series would not have been possible without the dedicated efforts of many individuals and organizations. I would like to specially acknowledge the authors of this first issue, Hee Joon Song and Cheol Ho Oh; and participants of the Second Asia-Pacific Regional Forum on ICT Human Capacity Development in October 2011 who attended and provided feedback on the session on "Knowledge Sharing and Global Partnership". I hope that this publication will offer useful insights and road maps that will help you better develop ICTD policies and research endeavours.

Hyeun-Suk Rhee
Director
UN-APCICT/ESCAP

ABOUT THE KNOWLEDGE SHARING SERIES

The Knowledge Sharing Series intends to help bridge the knowledge divide on how ICTs can be used for social and economic development, and ultimately help bridge the digital and development divide.

Aimed at policymakers and at government officials in operational departments and offices in developing countries, the series provide step-by-step guidelines, concrete strategies, proven best practices and select case studies on different aspects of ICT for development (ICTD). By making research findings, analyses and lessons learned easily accessible and comprehensible, the series can be useful for making informed decisions.

Each issue in the Series focuses on a specific ICTD theme, programme or project, and offers an end-to-end road map that can help policymakers in their planning, implementation, monitoring and evaluation processes.

The inaugural issue of the Knowledge Sharing Series is focused on ICT for Development Institution Building. Institution building for ICTD is fundamental to developing common vision and strategies, directing and securing resources, defining roles and responsibilities, and promoting coordinated efforts and partnerships that makes ICTD possible and effective. Institution building forms the foundation for developing ICT infrastructure, skills and innovative applications for the different development sectors. Without institution building, ICTD programmes and projects are likely to fail.

Different nations are at different stages of institution building for ICTD, and there is no "one size fits all" approach to institution building. This inaugural issues shares the knowledge and experience of ICTD institution building in the more advanced countries, for the benefit of developing countries that are designing and developing appropriate institutional arrangements for ICTD policy planning and implementation.

TABLE OF CONTENTS

List of Figures

List of Tables

EXECUTIVE SUMMARY

According to Douglass C. North, the 1993 Nobel Prize winner in Economic Sciences, institutional factors are more important than technological or demographic factors in the economic and social development of a country. While the demand for knowledge on institution building for information and communication technology for development (ICTD) is increasing, knowledge sharing among the countries in the Asia-Pacific region on this subject is not sufficient. For example, although policymakers in developing countries recognize the need for ICTD policy and programmes, they tend to fail in the development of institutional capacity that is appropriate for their political environment and policy context. What is really needed, therefore, is not merely formal or theoretical knowledge, but useful knowledge that combines comparative studies on relevant countries and in-depth analysis of success stories. This is what is meant by knowledge sharing in this series.

This publication introduces various institutional arrangements for ICTD in different countries, and then examines in detail the case of the Republic of Korea. It discusses the Korean government's policies and strategies for ICTD and how changes in the institutional arrangements for ICTD and also for e-government have helped to achieve development goals.

Institution building generally refers to the conscious efforts of policymakers in designing organizational structure and rules to direct societal changes by adapting existing institutional arrangements to new circumstances or by developing new institutions to create new opportunities.

No matter how it is defined, strategies of institution building for integrating and coordinating ICTD policy and programmes vary among countries. While, in some countries, ICTD policy functions are integrated into one ministry, they are scattered to (or shared by) several ministries in others. Why is that? Rationalism, incrementalism and interactionism in policy making theories may contribute to explaining the rationale behind the institutional design each country adopts.

Institutional models of individual countries have their own advantages and disadvantages. Thus, one model does not fit all situations. For example, at the ministry level, countries adopt one or some mix of four types of institutions depending on political or administrative culture. They include: (1) budget, finance, treasury and planning (Finland); (2) administrative process, public services and interior affairs (Japan); (3) techno-industrial network (Canada, China); and (4) integrated ICTD (India, Republic of Korea, Saudi Arabia).

With some theoretical knowledge of institution building in mind, a detailed analysis of the Republic of Korea case is made. The Korean government created the Ministry of Information and Communication (MIC) in 1994 as the lead agency for ICTD. The MIC was established as a result of a strategic decision to enhance national competitiveness through the promotion of ICTD-related policies. The MIC was responsible for developing regulatory policies; building information infrastructure; promoting IT related research and development, promoting IT industry and trade; and resolving problems faced in the process of building an inclusive and development-oriented information society.

For undertaking its missions, MIC had a variety of policy instruments including several affiliated support agencies, supportive legal and regulatory frameworks, comprehensive master plans, and flexible financial management system with a long-term outlook. MIC could design and execute ICTD master plans by mobilizing these human and financial resources. In addition, MIC was able to coordinate various ICTD programmes in cooperation with the Informatization Promotion Committee (IPC) chaired by the Prime Minister.

e-Government on the other hand, was mostly driven as the President's agenda by the Presidential e-Government Special Committee (PEGSC), of which the major purpose was to oversee the workflow of the whole-of-government system. The PEGSC was strongly empowered by the continuous and consistent commitment of the President.

This publication is composed of five chapters. Chapter 1 introduces the publication, explains the importance of institution building in ICTD policy making and programme development, and defines key concepts. Further, it suggests a framework for the policy process that comprises the environment, institutions, policy contents and policy instruments. Chapter 2 suggests models of ICTD institutions for policy planning, coordination and implementation at supra-ministerial and ministerial levels, and provides a comparative analysis of the different models of ICTD institutions used in various countries. Chapter 3 examines institutional arrangements for ICTD in the Republic of Korea. It deals in detail with the organizational structure and functions of the MIC and IPC, and discusses policy instruments that were used to strengthen and support their functions. Chapter 4 presents the institutional arrangements for e-government in the Republic of Korea. It focuses on the role of the PEGSC that was established to drive cross-agency and government-wide e-government projects under the strong leadership and commitment of the President. Various institutional resources that were used for building e-government such as budgets, legal frameworks and support agencies are examined. Chapter 5 concludes the publication and makes a set of recommendations for ICTD institution building in developing countries based on the MIC case, which is considered as one of the best practices in institution building for ICTD.

This publication represents the beginning of the journey to understanding, exploring and sharing knowledge on the different aspects of institution building for ICTD. UN-APCICT/ESCAP has created an ICTD community of practice, i.e., "an interactive network of committed professionals bound by a common interest in ICTD."It has an online workspace for its members that will serve as an effective platform for mutual learning and sharing of knowledge and experiences on institution building for ICTD.

Complementing this publication is Modules 2 and 3 of the *Academy of ICT Essentials for Government Leaders (Academy)* on ICTD policy, process and governance and on e-government, respectively. The *Academy* is a comprehensive ICTD training curriculum for policymakers and government leaders.

Acronyms

ADSL	Asymmetric Digital Subscriber Line
APCICT	Asian and Pacific Training Centre for Information and Communication Technology for Development (United Nations)
CDMA	Code Division Multiple Access
CIO	Chief Information Officer
CIOC	Chief Information Officer Council
ESCAP	Economic and Social Commission for Asia and the Pacific (United Nations)
ETRI	Electronics and Telecommunications Research Institute (Republic of Korea)
G4C	Government for Citizens
GIDC	Government Integrated Data Centre
ICT	Information and Communication Technology
ICTD	Information and Communication Technology for Development
IPC	Informatization Promotion Committee (Republic of Korea)
IPF	Informatization Promotion Fund (Republic of Korea)
IPFA	Informatization Promotion Framework Act (Republic of Korea)
IT	Information Technology
ITU	International Telecommunication Union (United Nations)
KCC	Korea Communication Commission
KISA	Korea Internet and Security Agency
KISDI	Korea Information Society Development Institute
KTA	Korea Telecommunications Authority
MCST	Ministry of Culture, Sports and Tourism (Republic of Korea)
MIC	Ministry of Information and Communication (Republic of Korea)
MOGAHA	Ministry of Government Administration and Home Affairs (Republic of Korea)
MOKE	Ministry of Knowledge Economy (Republic of Korea)
MOPAS	Ministry of Public Administration and Security (Republic of Korea)
MPB	Ministry of Planning and Budget (Republic of Korea)
MPT	Ministry of Post and Telecommunications (Republic of Korea)
NCA	National Computerization Agency (Republic of Korea)
NCIA	National Computing and Information Agency (Republic of Korea)
NIA	National Information Society Agency (Republic of Korea)
NIFA	National Informatization Framework Act (Republic of Korea)
OECD	Organisation for Economic Co-operation and Development
OEGIT	The Office of Electronic Government and Information Technology (United States of America)
OMB	Office of Management and Budget (United States of America)
PCGID	Presidential Committee on Government Innovation and Decentralization (Republic of Korea)
PCIS	President's Council on Informatization Strategies (Republic of Korea)
PEGSC	Presidential e-Government Special Committee (Republic of Korea)
QGI	Quasi-Governmental Institution (Republic of Korea)
R&D	Research and Development
TTA	Telecommunications Technology Association
UK	United Kingdom
UN	United Nations
USA	United States of America
WiBro	Wireless Broadband
WTO	World Trade Organization

1. INTRODUCTION

You will find in this chapter discussions on:

- **The importance of ICTD policy and institutions;**

- **Definitions of key concepts such as institution, institution building, informatization and e-government; and**

- **The role of institutions in the policy process.**

1.1.   ICTD Policy and Institutions

Technological innovations in recent decades, and digital convergence between information and communication technology (ICT), consumer electronics, and entertainment contents have shaped a most unique characteristic of today's society. As industries and services cut across different traditional sectors and geographical boundaries, it becomes necessary for modern governments to revisit institutional arrangements. Initiating new ICT for development (ICTD) policy agenda under old institutional arrangements often brings about severe conflicts and controversies among actors from different institutional backgrounds.

An institutional approach can explain how public organizations work in the policy process. Douglass C. North, the 1993 Nobel Prize winner in Economic Sciences, stresses that economic and social developments are influenced by institutional factors more than by technological or demographic ones. Similarly, several empirical studies suggest that institutional arrangements are a key factor in determining the performance of government policy by reducing transaction costs caused by human behaviour and opportunism in markets (Williamson, 1975).

Despite the importance of institutional capacity, there are few references for policymakers, high-level officials and experts in developing countries to properly tackle the issues of institution building for ICTD. It is, thus, meaningful to provide a comparative analysis of institutional models for ICTD in several countries and examine the case of the Republic of Korea's integrated ICTD policy model in detail in this publication.

1.2.   Key Concepts

Relevant concepts are defined here for readers' convenience. Institutions matter. They are, however, quite difficult to define. The term "institution" is usually defined as an organizational entity such as the congress or a government ministry in a narrow sense. It can, however, be defined more broadly as shared rules, norms and strategies operating within or across organizations (Ostrom, 2007: 36-37). Institution in this publication covers: (1) different types of public and quasi-public organizations such as government ministries, agencies and non-governmental public entities; and (2) rules that are used to structure patterns of interaction within and across these public and quasi-public organizations such as laws, and planning and budgeting principles. Institutions, often called "institutional capital", are either a result of historical evolution in society over a long period of time or a political determination with specific purposes.

"Institutionalization" or "institution building" is here defined as conscious efforts of policymakers to design organizations and rules to drive societal changes. This is achieved by adapting existing institutional arrangements to new environments or developing new institutions in order to solve problems or create new opportunities. To top policymakers, mobilizing resources and securing legal legitimacy are powerful instruments for putting their political will and policy vision into action.

The term "informatization" refers to enabling or facilitating efficient activities in various fields of society by producing, disseminating or utilizing information. It is a container concept in which the combination of processes, started by computerization or the deployment of ICTs, is lumped together (Snellen, 2005: 399). "e-Government" is the use of ICTs such as the Internet and other technologies as tools for achieving better government by pursuing better policy outcomes, higher quality services, and greater engagement with citizens (OECD, 2004: 11). Informatization is wider in scope than e-government in that it includes a variety of policy activities such as building information infrastructure, research and development (R&D), and promotion of industry and trade.

"Information and communication technology for development (ICTD)" can be defined as the full exploitation of ICTs for promoting political, economic, social and technological developments oriented toward building an inclusive and sustainable information society.

1.3. Policy Framework

Policy is a purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern (Anderson, 1984: 3). There are, in general, two approaches to understanding policy: analysis and process. Policy analysis is centred on activities to produce and transform policy-relevant information that can be utilized in political arenas to resolve policy issues. Process perspective concerns primarily the activities composed of a series of steps that shape the transformation of policy inputs into outputs.

Policy process is conceptualized as a continuous set of three-phase activities: formulation (including problem identification, agenda formation, planning and coordination), implementation and evaluation. It is also a course of action consisting of causal links: policy environment → institutions→ policy contents→ policy instruments→ outputs and outcomes.

First, flows from the environment composed of political, economic, social and technological constraints deeply influence the content and implementing method of ICTD policy. In addition, political ideas and vision, and policy goals top decision makers pursue are another critical factor.

Second, planning and coordination are very important activities throughout the policy process. For better results and more meaningful outcomes, it is vital that various interests are represented in the policy formulation phase.

Third, institutions are a device or vehicle of transforming pressures of external environments into concrete policy actions for problem-solving and opportunity creation. Political ideas, vision and goals of top policymakers responding to a variety of political, economic, social and technological constraints affect the institutional design for policy planning, coordination and implementation.

Fourth, policy contents for ICTD consist of four major activities: regulation; infrastructure building; promotion of R&D and industry; and informatization such as e-government, e-business, and so on.

Finally, there are various policy instruments or tools for attaining policy goals and contents according to the degree of coerciveness, directness, automaticity and visibility (Salamon, 2002: 24-37). In this publication, public bodies, legislation, planning, and financial resources are considered as tools of ICTD policy.

A summarized conceptual framework and scope of ICTD policy is shown in table 1.

Table 1. Conceptual framework and scope of ICTD policy

Factors	Main considerations
Policy Environment	Political, economic, social and technological constraints Political ideas and vision Policy goals
Institution Building	Institutionalization for policy planning and coordination Institutionalization for implementation
Policy Content	Regulatory policy: competition, pricing, spectrum management Building infrastructure: high-speed network, mobile Promotion: R&D, industry, trade Informatization: e-government, e-business, bridging the digital divide
Policy Instrument	Public bodies: research institute, quasi-governmental bodies Legislation: organic, authorization and appropriation laws Planning: master plan and action plan Finance: budget and special fund, incentive system

Chapter 2 basically deals with the conceptual and theoretical context for a better understanding of institution building for ICTD. In particular, it discusses institutions for ICTD policy development in Asia-Pacific countries from a comparative perspective. It suggests a theoretical framework and applies it to cases in several countries. Some advantages and disadvantages of each institution model are also presented.

Chapter 3 describes how the Republic of Korea has built institutional capacity for national informatization including e-government. It examines in detail institutional structures for planning, coordination and implementation of ICTD policy in the Republic of Korea. In so doing, it specifically makes analysis of the Ministry of Information and Communication (MIC) and the Informatization Promotion Committee (IPC) of the Republic of Korea, frequently referred to as a successful model for institutionalizing the integrated ICTD policy. MIC dealt with the overall policy agenda including policy areas such as competition and spectrum management, information infrastructure, industrial promotion, e-government and social informatization. The ICTD policy functions of MIC were integrated at the central government. The empowerment of MIC with supporting legal and institutional frameworks and accessible organizational, financial and human resources contributed to its success in leveraging ICTs for economic and social development. Policy implications for developing countries are offered to help them benchmark the lessons from the Republic of Korea.

Chapter 4 discusses the institutional arrangements for e-government in the Republic of Korea since 2001. In particular, it deals with implementing organizations for building e-government, which is a critical feature of national informatization. To this end, Chapter 4 gives attention to the Presidential e-Government Special Committee (PEGSC), which was organized in order to drive multi-ministry and government-wide e-government projects under the strong leadership and commitment of the President.

Chapter 5 summarizes this publication and suggests a set of implications for institution building for ICTD.

2. MODELING INSTITUTIONS FOR ICTD POLICY

You will find in this chapter discussions on:

- **Three models explaining the logic of institutions for ICTD policy—rationalism, incrementalism and interactionism;**

- **Three models of institution building for ICTD at the supra-ministerial level—chief executive staff, cabinet committee and supra-ministerial committee; and**

- **Four models of institution building for ICTD at the ministerial level—planning and budget, administrative process, techno-industrial and integrated ICTD ministry.**

2.1. Models of Institutions

There are three perspectives of institutional design governing public organizations: rationalism, incrementalism and interactionism. These three are not mutually exclusive, but share some mixes between them. The realities of policy mechanism in central government are much more diverse than explained by these three models.

In decision-making models of policy sciences, rationalism assumes the existence of a central rational policymaker with a bird's eye-view on policy issues. While the central ruler sets clear goals of ICTD policy and coordinates among relevant actors in this model, other actors are dependent upon resources mobilized by the formal authority. While the criterion for success is the attainment of formal goals already formulated, that for failure occurs due to unclear goal setting, resistance from implementing agencies or clients, and lack of information and control. As rationalism offers a justification for centralized authority, it favours planning and coordinating organizations with a higher authority and integrated implementing ministry.

Incrementalism regards the interests of local actors with a worm's eye-view as critical in policy formulation. Ministries or agencies can exert autonomy and discretion within their own jurisdictions and defined policy domains. Because they have their distinct policy turfs to defend interests of their clients, horizontal coordination between them tends to be incremental and thus, fragmented. The criterion for success is whether or not, and how much, they obtain discretion and resources. This approach may fail if local actors are excluded from policy formulation, there is too little discretion, or resources are insufficient. The policy process can be improved by increasing the autonomy and discretion of ministries as well as by providing more resources. Incrementalism explains the institutional arrangements in which ICTD policy functions are distributed to several ministries, with a centralized role of a higher level authority being absent or weak.

Interactionism considers policies to be made in networks consisting of various actors. As a ministry does not possess a superior position to other ministries, the policy process is not regarded as the automatic implementation of already formulated goals, but as the frequent horizontal interaction among ministries.

In reality, various institutional arrangements used in the success stories are rich mixtures of public and private instrumentalities (Ostrom, 1999: 182). As a criterion of success is the realization of collective action in order to establish a common goal, the lack of incentives to cooperate with each other can result in failure. This model favours inter-ministerial organizations such as a cabinet committee and ministerial board.

Table 2. Models of institutions in the policy process

Factors	Rationalism	Incrementalism	Interactionism
Actor	Central ruler	Ministry or agency	Various actors
Goals	Government-wide goals	Localized goals	Agreed upon goals
Perspective	Bird's eye-view	Worm's eye-view	Lateral eye-view
Source of relations	Authority, monarchy	Autonomy, feudalism	Network, federalism
Role in process	Planning, vertical coordination	Implementation, horizontal coordination	Collaboration, cooperation
Criterion of success	Attaining formal policy goals	Obtaining local discretion and resources	Realizing collective action
Causes of failure	Ambiguous goals, lack of control and information	Severe sectionalism, lack of coordination and resources	Lack of incentives for collective action
Institutional design	Centralized or integrated model	Decentralized or diffused model	Governance model (e.g., committee)

Considering various conditions of developing countries, where market and civil society are not sufficiently mature, and where organizational sectionalism among ministries prevails, supra-ministerial planning and coordinating organization and implementing ministry with integrated ICTD policy functions are more favoured for producing better results. This publication suggests institutional models in two dimensions: policy planning and coordination, and implementation. It provides a somewhat different explanation of institution building from the previous research undertaken by the Organisation for Economic Co-operation and Development (OECD, 2005, Ch. 5) and the World Bank (2009, Ch. 6).

The next section compares different institutional arrangements of ICTD policy planning, coordination and implementation in selected countries.

2.2.   Supra-Ministerial Models

2.2.1. Basic Models

In general, building supra-ministerial organizations that depend on the formal authority of the president or prime minister is a rational approach to policy decisions in government. A presidential system has greater flexibility than a parliamentary one in terms of size, policy function and recruitment of staff. For example, the Singapore Cabinet Office is not directly engaged in the policy process but provides only secretarial support to the Prime Minister and the Cabinet with a few staff members. In contradistinction to this, the US Executive Office of the President with thousands of staff members exercises more power in the policy process (Schiavo-Campo and Sundaram, 2009: 88-9). In Japan and the United Kingdom (UK), Cabinet Offices fall in the middle between Singapore and the US in terms of size and function. Their primary task is to ensure the well functioning of the Cabinet and its committees by preparing the Cabinet policy agenda and briefing the prime minister. Staff of the Cabinet Secretariat in Japan and the UK is, for the most part, recruited or seconded by civil servants from other ministries.

Three models of institutional arrangements for ICTD policy formulation at supra-ministerial level

are suggested here. The first model is the chief executive staff model where staff members that are developing policies are under the direct control of the president or prime minister. An example of this model is the Office of Management and Budget (OMB) under the US Executive Office of the President that plans and coordinates the e-government agenda and information resources management of the federal departments and agencies. The advantages of this model include direct access to top policymakers' visioning, easy distribution of resources and no policy turf issues. Disadvantages include a heavy work overload for the chief executive staff, problems with coordination and cooperation, and development of policies that may be unrealistic or irrelevant to local needs. In addition, line ministries are liable to be less motivated to participate in ICTD policy development.

The second model involves cabinet committees consisting of relevant ministers dealing with various policy areas. Canada has adopted this model of ICTD policy formulation since the 1990s. This approach brings the relevant ministers to the table to plan and coordinate cross-cutting policy activities. This has the advantage of permitting more decentralization to participating ministries than the chief executive staff model. The gathering of relevant ministers also makes it easier to coordinate mutually conflicting agendas. However, in this model there is no ministry that can set clear boundaries on cross-cutting policy areas, and conflicts may cause policy delay and drift away from the original vision and goals.

Table 3. Supra-ministerial institution models for ICTD

Model	Case	Advantages	Disadvantages
Chief executive staff	UK, USA	• Clear visions from top policymaker • Easy distribution of financial and human resources • Free from delivering services to existing clients and no policy turf	• Highly centralized • Heavy workload for chief executive staff • Weak motivation of line agencies may cause implementation failure
Cabinet committee	Canada	• Relevant ministries' participation in ICTD policy development • Smaller size than cabinet itself • Include ad hoc or informal experts from outside	• Possible policy drift due to interest conflicts between relevant ministries • Policy delay due to difficulty in decision-making
Supra-ministerial committee	Republic of Korea	• Mobilization of experiences and technical expertise • Various stakeholders and technical expertise can participate • Stability and continuity of policy agenda	• Delay in decision-making and accountability lacking due to the involvement of many participants • Lack of financial and human resources • Indifference of relevant ministries in implementation

The third model establishes committees under the direct control of the president, prime minister or vice prime minister. Committees have various forms in terms of title (e.g., committee, commission, council), format (e.g., formal vs. informal; regular vs. ad hoc) and function (e.g., resolution or decision, deliberation, advice, argumentation, advocacy). Committees can include representatives of political parties and stakeholders such as trade union, employers' associations, and non-governmental organizations, as well as experts from think tanks and academia. Advisory

committee members provide various kinds of factual and evaluative materials to decision makers with which they are affiliated. They can also help policymakers advocate for the ICTD policy agenda. On the other hand, this supra-ministerial committee model can cause delays in policy making and result in a lack of accountability due to the involvement of a variety of participants with different backgrounds, a lack of financial and human resources, and indifference of relevant ministries in implementation. The Republic of Korea has maintained this model since 1987.

2.2.2. Chief Executive Staff Model

In the chief executive staff model, a top policymaker puts together an executive team that assists him/her in formulating ICTD policy. Due to the heavy workload, top policymakers by themselves have little time to spend on coordination, and rely on their executive staff to make effective policy decisions. In this model, executive staff can visualize the top policymaker's political idea and policy vision clearly into action, and do not have to be involved deeply in implementing action plans and delivering services. They can also take up a neutral position in coordinating conflicting interests, because they do not have designated policy turf to defend.

An example of this model is the OMB under the US Executive Office of the President. As an agency of monitoring and coordinating institutions, the OMB can exert full influence in policy formulation over the federal departments under the leadership of the President. The Office of Electronic Government and Information Technology (OEGIT)[1] under the OMB based on the e-Government Act of 2002 plays the role of an information technology (IT) control tower. The OEGIT, headed by the Chief Information Officer (CIO) of the federal government, develops and provides directions in the use of ICTs to make it easier for citizens and businesses to interact with the federal government, and streamlines citizen participation. The OEGIT is in charge of the e-government agenda and federal enterprise architecture, and is supported by the Chief Information Officer Council (CIOC). The Office of Information and Regulatory Affairs[2] in the OMB carries out several important functions, including reviewing federal regulations, reducing paperwork burdens, and overseeing policies relating to privacy, information dissemination, statistical policy and coordination, records management, information quality, and information technology. Although the ICTD policy of the US federal government is distributed to relevant organizations, e-government and federal information resources management functions are integrated into the OMB's main function.

The UK relies upon a supra-ministerial organization in dealing with the planning and coordination of ICTD policy issues. The government CIO (Director General), directed by the Chief Operating Officer of the Efficiency and Reform Unit under the Cabinet Office, deals with the ICTD policy agenda including ICT strategy and policy, shared ICT infrastructure, government cloud programmes, and e-government.

2.2.3. Cabinet Committee Model

Cabinet and cabinet meetings, which can be regarded as a formal institution that represents all relevant interests concerning ICTD policy, tend to be a policy turf in which ministers protect the interests of their ministries and clients. As they cannot formulate ICTD policy themselves under the growing complexity of policy issues, they tend to choose among the several policy alternatives proposed by cabinet committees or sector ministries. As ICTD issues are related to a limited number of ministries, many countries do not rely upon the cabinet itself but cabinet committees and subcommittees. Cabinet committees can involve diverse membership by including ad hoc or informal members with political representation or technical expertise from

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1 http://www.whitehouse.gov/omb/e-gov.

2 http://www.whitehouse.gov/ omb/inforeg_default.

outside, in addition to ministers or their designated representatives.

The Treasury Board,[3] a Cabinet committee of Canada, is responsible for accountability and ethics, financial, personnel and administrative management, comptrollership, approving regulations and most Orders-in-Council. It has an administrative arm, the Secretariat, which was part of the Department of Finance until it was proclaimed a department in 1966. The Secretariat is organized into branches (CIO, Priorities and Planning) and sectors (Economic, Social and Cultural). The CIO Branch provides strategic direction and leadership for the government-wide information management and information technology in Canada. The CIO Branch is responsible for policy development, monitoring, management oversight, and leading community development and capacity building initiatives in information management, information technology, identity management and security, and access to information and privacy to ensure the sound management and stewardship of the Government of Canada's ICT assets and its communities of practice.

The Japanese Cabinet[4] established the first ICT Strategy Headquarters (chaired by the Prime Minister) to build a strategic system for ICT revolution and to promote Japan as a globally competitive society in 2000. The ICT Strategy Council, composed of 20 opinion leaders, was also formulated to bring the public and private sectors together to carry out strategic investigations in the ICT field. Its primary objective is to catch up with other countries in ICTD policy areas, with the recognition that ICTs are indispensable to economic development and services to the public at large.

2.2.4. Supra-Ministerial Committee Model

The advisory committee model plays a great part in preparing the ground for many decisions of the top policymakers in many countries. In countries such as Japan and the Republic of Korea, civil servants recruited by means of competitive and merit-based general examinations are usually rotated periodically from one job to another within a ministry or between ministries, inhibiting the accumulation of knowledge and experience in specialized policy areas. The participation of outside specialists and stakeholders in committees can complement that kind of technical vacuum in bureaucracy. In order for this type of advisory committee to work, liaison officers as a linking pin have to facilitate communication between committee members and policymakers.

2.3. Ministerial Models

Developing countries may rely on ministerial organizations to take a lead in ICTD policy making. In general, they adopt one or some mix of four models for ICTD policy formulation at the ministry level. They include: (1) budget and planning (finance and treasury); (2) administrative process (public services and interior affairs); (3) organizational networking (science, technology, industry and trade); and (4) integrated ICTD.

Firstly, one strategy for efficiently formulating and implementing ICTD policy is to utilize ministries in charge of finance, budget and planning. The budget ministry can have direct control over ICT budgets required by other ministries and, thus, integrate ICTD policy into a long-term economic development plan and expenditure framework. It, however, may lack a specific vision and focus of ICTD policy and pay little attention to technical expertise needed to coordinate ministries in resolving ICTD related issues. Australia and Finland are those countries that employ the budget and planning model.

Secondly, the administrative process model aims to simplify administrative processes for

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3   http://www.tbs-sct.gc.ca/tbs-sct.
4   http://www.kantei.go.jp.

improving both front office services and back office management. In so doing, it is expected to enhance administrative efficiency and customer satisfaction by streamlining administrative processes, reducing paperwork and decentralizing tasks through e-government agendas. It, however, has some limitations. The administrative process model can face difficulties in mobilizing financial and technical resources, and in coming up with a comprehensive approach to ICTD policy. Japan, for example, has adopted this model.

Thirdly, the core of the organizational network model is the loosely networked relations among organizations (players) in the public and private sector that share common interests in ICTD policy. The network consists of government agencies, universities, research centres and firms, leading the wide spectrum of ICTD policy issues such as R&D, and industrial and market development. In this model, policymakers consider ICTs as a strategic tool for enhancing industrial competitiveness and vitalizing domestic and global markets. Thus, ministries in charge of industrial or economic development deal with ICTD projects as part of national industrial policy. This model also has some limitations. Most importantly, it is less likely to prioritize other related policy issues such as financial performance management and administrative simplification through e-government. Canada and the USA may be close to the notion of this model.

Finally, in the integrated ICTD model a specific ministry is given full authority over and responsibility for most ICTD policy functions. Such a ministry can be established by either transforming an existing organization such as the Republic of Korea's Ministry of Post and Telecommunications (MPT) or by forming a new "niche" ministry with the role of planning and executing ICTD policy. In this model, ICT professionals usually take the leading role in the process of formulating and implementing ICTD policy. Nonetheless, this model can lead to inter-ministerial conflicts as digital convergence progresses due largely to perceptional or policy gaps among ministries regarding ICTD. It also tends to rely too much on emerging technologies, thus, approaching ICTD policy from a technological perspective with little consideration of other important aspects such as government reform. India, the Republic of Korea (1995-2007) and Saudi Arabia are examples of the integrated ICTD model.

Some countries may not have a government-wide ICTD lead agency at the ministry level, allowing individual ministries to initiate their own ICTD policy. There is, however, no need to reshuffle existing institutions just to meet one of the models mentioned here. The models are just a set of examples for ministry-level lead agencies, which developing countries need to assess and apply to their country context based on their suitability.

2.4. Policy Implications for Developing Countries

2.4.1. Supra-Ministerial Models

The establishment of supra-ministerial organizations is critical to the successful implementation of ICTD policy in circumstances where ICTD policy issues, cutting across the traditional boundaries, call for functional integration and vertical coordination between ministries.

The OMB in the US is a well-established supra-organization under the authority of the President. In the Republic of Korea, supra-committees composing of higher level officials and civilian experts have been established since 1987 under the strong support of presidents. Political will and policy vision of the president is essential for the development of successful ICTD policy through institution building. Committees under the authority of the top policymakers play a variety of roles including deliberation, examination, monitoring and evaluation, in addition to the provision of technical advice and advocacy.

Some countries with the cabinet system often institutionalize cabinet committees instead of the

cabinet itself to deal with the ICTD policy agenda. The Treasury Board of Canada is a good example of introducing cabinet committees as a strategic instrument, because it permits the identification of conflicting views and interests, and attempts to resolve them before the formal policy process. Decisions of the cabinet committee are ratified by the full cabinet. Whether it is the presidential office or supra-committee, cabinet office or cabinet committee, strong commitment of top policymakers is crucial to ICTD policy development.

2.4.2. Ministerial Models

Various factors should be considered in the institutionalization of ICTD policy formulation at the ministry level as follows:

First, government-wide policy formulation led by one ministry without any enabling competence is often difficult due to departmental sectionalism. It is critical for top policymakers themselves either to intervene in the policy formulation process, or to empower the lead ministry with sufficient resources, upon which other ministries can seek assistance and support from.

Second, in developing countries where social pressure on the management of the number, size and types of ministries is not so strong, new institutions wholly responsible for ICTD policy can contribute to enhancing the overall performance within a relatively short term. MIC in the Republic of Korea and the Department of Information Technology in India are typical cases that have actively harnessed the power of ICTs for economic and social development. Ministries with integrated ICTD policy functions usually take charge of developing R&D, human resources, industry of ICTs, information infrastructure, e-government and regulatory policy activities; and ensure that their supply meet demands.

Third, in countries where industry and market systems are mature, it is usually more advantageous for ministries in charge of industry, trade and R&D to assume ICTD policy. Techno-industrial networks consisting of industry, enterprises, research institutes and academia reveal the level and capability of industrialization of a country. Those networks can contribute to the rapid diffusion of ICTD innovations and their commercialization. The recent trend in deepening digital convergence and increasing embedded software provides an advantageous environment for promoting the whole industry and market through linking emerging ICT industry to traditional ones.

Fourth, the administrative process model is oriented toward combining e-government with process simplification, paperwork reduction, decentralization, and so forth, driven by ministries assuming public administration and internal affairs of the government. The model is more applicable for facilitating seamless integration at the whole-of-government level through ICTs. And it can increase efficiency and effectiveness, further administrative transparency and the participation of citizens through e-governance, which may be less favoured in some developing countries. It is, however, very difficult to integrate reform related e-government agenda into the whole ICTD policy agendas such as the promotion of ICT R&D and industry.

Fifth, even if the budget and finance ministry does not directly assume the tasks of the ICTD related policy agenda, it plays an important role in ICTD policy formulation in general. The main function of the ministry is to integrate ICTD policy planned by other ministries with the national economic policy, mid-term expenditure framework and annual budget. If the budget and finance bureaucrats lack the vision and focus of ICTD policy, and disregard technical expertise, economic and social developments through ICTs cannot be expected.

Sixth, the ICTD policy development process need not be confined strictly to government.

Governance mechanisms are frequently adopted in several countries in order to facilitate the flow of information between the public and private sectors, and promote the exchange of views of various stakeholders on important ICTD policy initiatives. Top policymakers, therefore, have to take into consideration the recruitment of experts from outside the government. The bureaucratic system itself tends to be insensitive or even resistant to changes arising from technological innovations. Outside experts can contribute to bridging the technological gap between the public and the private sectors. One frequently used arrangement for this is to create a temporary task force, ad hoc committees and working groups at any level of policy formulation.

Seventh, in developing countries where institutionalization is heavily dependent upon the directions laid out by top policymakers, the establishment of new institutions may need to create and exploit opportunities of economic and social developments driven by integrated ICTD policy functions.

The next chapters deal, in detail, with the case of the Republic of Korea adopting the integrated model for ICTD policy functions supported by a supra-ministerial committee. Key functions, organizational structure and its affiliated public bodies, master plans, legal system, and budget system for supporting the integrated ICTD policy functions are discussed.

3. INSTITUTIONS FOR ICTD POLICY IN THE REPUBLIC OF KOREA

You will find in this chapter discussions on:

- **The structure and functions of the IPC as the supra-coordinating organization, and the MIC as the implementing ministry responsible for the integrated ICTD policy in the Republic of Korea;**

- **The structure and functions of a variety of non-governmental public bodies supporting MIC in terms of policy development, R&D, and promotion and regulation of ICTD in the Republic of Korea; and**

- **Cyber Korea 21 as a master plan, legal and regulatory frameworks, and management of financial resources for ICTD policy in the Republic of Korea.**

3.1.　Basic Framework

Since 1987, the Korean government has relied upon two types of institutional arrangements for ICTD policy planning, coordination and implementation. First is supra-ministerial committees for promoting policy coordination between ministries, and for acquiring information and advice of opinion leaders and technical experts outside the bureaucracy. Among them are the Informatization Promotion Committee (IPC, 1996-2008), the Presidential e-Government Special Committee (PEGSC, 2001-2007) and the President's Council on Informatization Strategies (PCIS, 2009-present).

The second is the MIC, which is in charge of integrated ICTD policy functions. It dealt with widespread ICTD policy areas, ranging from the matters of the conventional telecommunications sector to emerging policy issues such as national informatization and e-government, promotion of Internet use, development of R&D and industry, and addressing the challenges of the information society.

The MIC and IPC led such integrated ICTD policy functions for more than a decade through a variety of policy tools such as quasi-governmental public bodies, legislation, master and action plans, and financial resources.

3.2.　Supra-Ministerial and Ministerial Organizations

3.2.1. Basic Structure

Background

The history of supra-ministerial committees that deal with ICTD projects in the Republic of Korea is divided into three stages. In the first stage (1987-1995), the National Basic Information Network Project was managed by the Information Network Supervisory Commission and chaired by the Chief of Staff to the President.

The second stage involved the establishment of the IPC that had a mission to carry out the Informatization Promotion Basic Plan. At the same time as this stage, e-government, mainly focusing on multi-agency and government-wide agenda, was driven by the PEGSC composed of higher officials in government and civilian experts (see chapter 5).

In the third stage the PCIS replaced IPC. The PCIS co-chaired by the Prime Minister and a civilian expert enacted the National Informatization Framework Act (NIFA).[5] The Ministry of Public Administration and Security (MOPAS) took over the general functions of ICTD policy from the MIC in 2008.

5　See http://www.cis.go.kr.

Table 4. Governance of ICTD master plans in the Republic of Korea

Phase	Plan/Project	Governing Body	Chairman	Lead Ministry
1	National Database ('87-'96)	Information Network Supervisory Commission	Chief of Staff to the President ('87-'89), Minister of MPT ('90-'96)	MPT (MIC)
2	Informatization Promotion ('96-'08)	Informatization Promotion Committee	Prime Minister	MIC
	e-Government ('01-'07)	Presidential e-Government Special Committee	Senior Secretary to the President + civilian expert	MIC, MOGAHA, MPB
3	National Informatization ('09-present)	President's Council on Informatization Strategies	Prime Minister + civilian expert	MOPAS

A common factor to the above projects is the strong motivation and continuous commitment of the presidents or prime ministers in respective administrations to ICTD and the aggressive role played by the MIC in pursuing ICTD. The Korean experience shows that this is the critical success factor.

Informatization Promotion Committee

The IPC under the Informatization Promotion Framework Act (IPFA) was established to strengthen planning, coordinating and implementing capacities of the MIC. It was chaired by the Prime Minister and played a leading role in coordinating the Informatization Promotion Basic Plan. The IPC and its subcommittees, consisting of relevant ministries within the central government, functioned to coordinate policy agendas with tough turfs in which each ministry represented and defended its own interests. In this situation, the MIC utilized the authority of the Prime Minister in tackling disagreements. In addition, the MIC effectively drove the IPFA agenda with the financial support of the Informatization Promotion Fund (IPF) and the technical and human resources of the National Information Society Agency (NIA).

Figure 1. Organization structure of the IPC
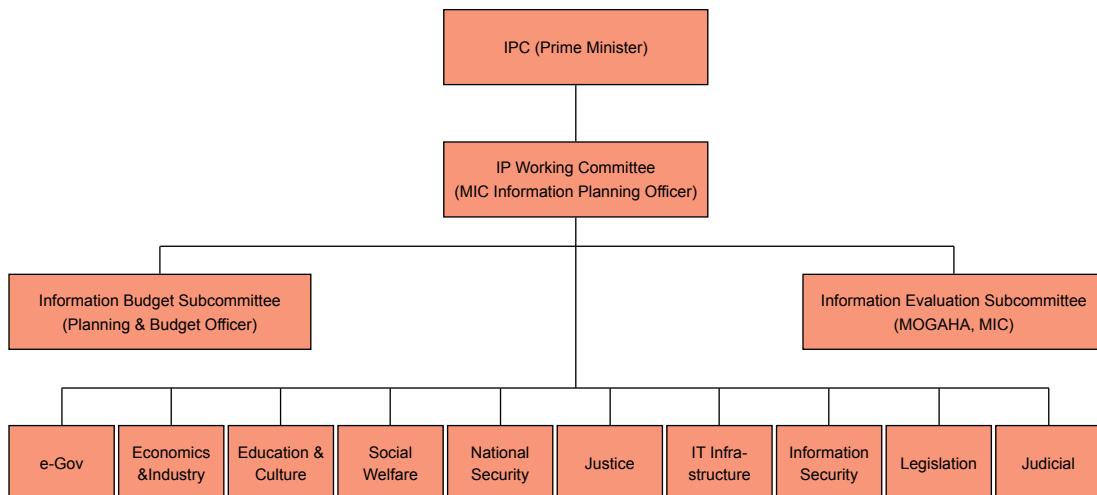
The main functions of the IPC were:

- Deliberation of mid- to long-term aspects of the Informatization Promotion Basic Plan
- Deliberation of annual plans of central ministries and agencies and their budgets
- Alteration of important items in the master plans and annual plans
- Coordination of informatization promotion plans
- Promotion of the establishment of broadband integrated networks and their utilizations
- Deliberation of the information technology architecture
- Monitoring of outputs and performance of informatization plans

There were 10 subcommittees including e-government, economy and industry, and social welfare. The e-Government Subcommittee was linked closely to the PEGSC in carrying out the presidential e-government roadmap agenda.

3.2.2. Ministry of Information and Communication

Background

The MIC was established in December 1994 as an integrated ICTD ministry model by expanding the policy functions of the former MPT. Transformation of MPT into MIC had a significant historical context in the Republic of Korea.

In many advanced countries in the 1980s, the main functions of the MPT, particularly telecommunications and postal services had been corporatized into public enterprises or devolved into executive agencies under policies of neo-liberalism, as governments became more oriented toward smaller sizes and higher efficiency. In addition, globalization and the free trade system prevailed all over the world in the 1990s and stimulated policymakers to focus on national competitiveness. The Korean government joined the World Trade Organization (WTO) in 1994 and the OECD in 1996. In addition, the government declared it would discontinue implementing five-year plans during the 7th Five-Year Economic and Social Development Plan (1992-1996) in 1994, which had been utilized for more than 30 years as a strongly centralized economic and social plan driven by the Economic Planning Board (chaired by the Vice Prime Minister). Instead, the Economic Planning Board and the Ministry of Finance were consolidated into the Finance and Economy Board in 1994. Therefore, the establishment of the MIC was the strategic choice of the Kim Young-sam Administration to encourage economic and social development through ICT.

The Ministry aimed to strengthen national competitiveness by promoting R&D and ICT industries to enhance the information society, including e-government, and assisting overseas telecommunications operations as well as encouraging the use of radio frequencies, and so forth.

Key Policy Functions

The MIC's key policy functions were stipulated in the Government Organization Act and other ICT related acts. The MIC at the time of its institutionalization was in charge of telecommunications policies, informatization planning, radio management, broadcasting, postal services and postal banking services. The MIC formulated integrated and systematic policies to facilitate the advent of the information society and to develop the ICT industry.

Main policy functions carried out by the MIC were:

1. Regulatory policy. Important regulatory activities of the MIC were the privatization of the monopolistic telecommunications sector and the introduction of a competitive market. The

Telecommunications Agency under MPT was transformed into the Korea Telecommunications Authority (KTA), a public enterprise, by separating business function from policy function in the telecommunications sector in 1981. For the purpose of facilitating market competition in the telecommunications sector, the MIC utilized a variety of policy tools such as the privatization of KTA, the introduction of asymmetric regulation, and the establishment of a price cap in order to ensure efficacious competition on a level playing field. After beginning the selling of its shares in the 1990s on a continuous basis, the Korean government sold its remaining shareholding in KTA in 2004, completing the successful privatization of the Authority. The competitive market system has worked in the telecommunications sector in the Republic of Korea. Regulatory activities for sustainable competition in the telecommunications market contributed to enhancing the quality of service, lowering service charges, promoting technological innovations, enhancing global competitiveness, and building high-speed networks.

2. Infrastructure building policy. Building social infrastructure such as highways, railroads, airports and so forth is recognized as a unique area of government intervention. In the development of the information society, the information infrastructures such as highways and railroads in industrial society are crucial to raising efficiency and productivity of society through the speedy and massive transmission of information and knowledge. The objective of the High-Speed Network Project (1995-2005), the first major project that the MIC initiated, was to link every household and business throughout the country at an mbps speed level, by adopting the asymmetric digital subscriber line (ADSL), a newly developed technology at that time. Upon successful completion of the project, the speed of data transmission increased from 2,400bps~4,800bps to 10mbps. The high-speed Internet services were provided free of charge to all primary, middle and high schools, more than 11,000 of them, for the first time in the world; and non-stop e-services in administration and business were made possible at any time in any place. Strong and consistent commitments of three consecutive presidents from different political parties, MIC's leading role in government-wide institutional arrangements, technological innovations and introduction of competitive markets are the key factors driving success.

3. Promoting policy of R&D, industry and trade. In the Republic of Korea, R&D has been regarded as a key strategic tool since the initiation of economic development plans in the 1960s, because technological innovations could boost the domestic market, reduce the import of equipment from foreign countries, and promote exports to other countries. Success in the development of TDX, a digital electronic switching system brought about a series of innovations such as the code division multiple access (CDMA), wireless broadband (WiBro), and digital multimedia broadcasting. These technological advancements were driven, for the most part, by the Electronics and Telecommunications Research Institute (ETRI) affiliated to the MIC. The ICT industry, which was promoted by the MIC, led the Korean economy after the economic crisis in 1997.

4. Informatization and e-government policy. MIC established several master plans and action plans for promoting informatization of society such as the Informatization Promotion Basic Plan and Cyber Korea 21. The purpose of the plans was not only to promote the use of high-speed networks, develop e-government services, and boost e-business, but also to address the challenges of the information society such as bridging the digital divide, information security and protection of privacy.

The MIC exercised diverse tools of promotion and regulation in ICTD policy areas, balancing the demand side and supply side factors. The Ministry created the demand for ICT goods and services through informatizing public and private sectors on the one hand, and strengthened the supply side foundations through R&D and human resources training policies on the other hand. The MIC was successful in developing policy instruments to balance both sides of demand and supply.

Organizational Structure

In order to carry out the above key policy functions, the MIC operated two offices and six bureaus, and several affiliated agencies and centres for its central organization. Figure 2 shows the organizational structure of the MIC in December 2007.

Figure 2. Organization structure of the MIC in the Republic of Korea
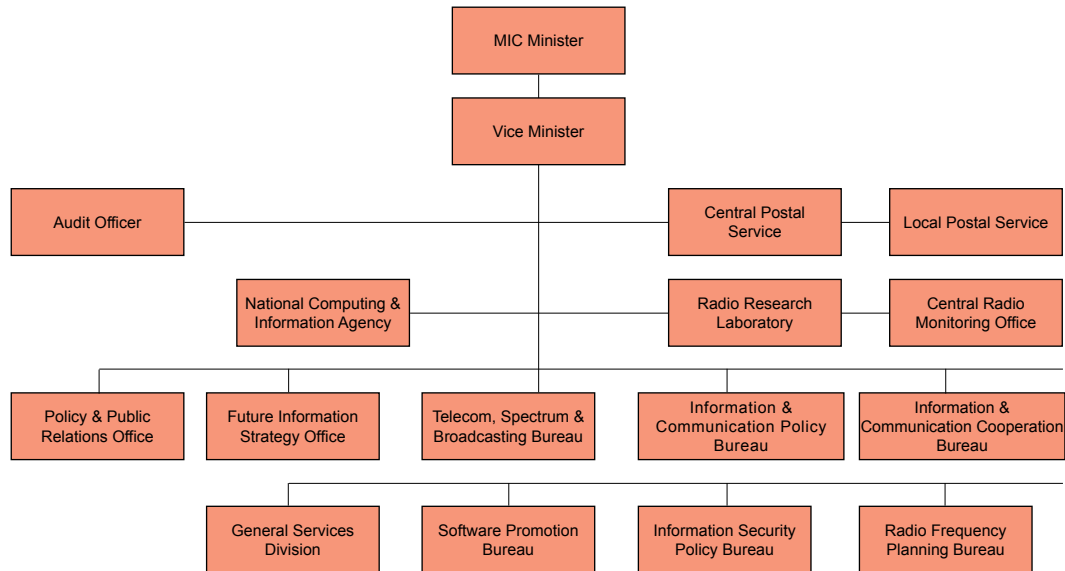
Apart from the Policy and Public Relations Office and the General Services Division that undertook common business with other ministries, other units solely carried out the policy functions of the MIC. Main functions of the units are summarized as follows:

Policy and Public Relations Office
• Managing and supporting administrative reform including innovation of business process and organizational culture of the Ministry
• Budget management
• Managing organizational matters and human resources training programmes
• Examining relevant laws and acts
• Computerization of the Ministry
• Emergency planning

Future Information Strategy Office
• Formulating and coordinating policies on the promotion of national and social informatization
• Planning and coordinating policies on information security, Internet malfunctions and bridging the digital divide
• Establishing and managing the Informatization Promotion Basic Plan
• Planning and managing a national broadband network

Telecom, Spectrum and Broadcasting Bureau
• Formulating long-term telecommunications policies
• Developing policies for emerging telecommunications and broadcasting technologies and their convergence
• Policies on fair competition, consumer protection and fees for services
• Formulating policies on radio, broadcasting and satellite projects

Information and Communication Policy Bureau
- Formulating and coordinating telecommunications policies
- Fund management
- Fostering the information telecommunications industry
- Managing technological development and standardization
- Formulating plans for promoting information technologies and human resources training
- Promoting information and communication industries

Information and Communication Cooperation Bureau
- Managing international cooperation on national informatization and information and communication policies
- Collecting and analysing information and knowledge on recent trends of ICTs in other countries
- Promoting international cooperation on issues of the global digital divide, free trade agreements, the WTO and OECD

Radio Frequency Planning Bureau
- Formulating policies on transmission of spectrum and broadcasting
- Establishing policies on promotion and support of mobile communications
- Formulating plans on development of spectrum and broadcasting technologies
- Licensing broadcasting system

Information Security Planning Bureau
- Formulating policies on private sector information security and Internet malfunctions
- Formulating and managing policies on protection of national information networks and critical information infrastructure
- Establishing and operating plans on digital signature, encryption and public key infrastructure

Software Promotion Bureau
- Establishing long- and mid-term plans for promoting software
- Promoting the software industry, diffusing software engineering technologies and training human resources
- Promoting and supporting industries of database, information processing and system integration

General Service Division
- Securing the internal affairs of the MIC
- Personnel management including recruitment, services, education and training, pension, public health, and medals and awards
- Managing records and archives, and offices and supplies

In addition to these, four affiliated organizations were operated by the MIC. The postal service was an executive agency and was to be corporatized into a public enterprise. The National Computing and Information Agency (NCIA) will be described in next chapter.

Postal Service
- Formulating basic policies on postal services and tariffs
- Issuing postage stamps
- Planning on delivery and transport of mail
- Formulating basic policies on postal banking services
- Managing the Postal Banking Fund
- Managing the MIC's finance and accounting

Radio Research Laboratory
- Development of and research on radio resources and their utilization methods
- Forecasting and warning of waves
- Research on environment and security of waves
- International registration of spectrum and cooperation with international organizations
- Research, establishment and revision of technical specifications of ICT equipments
- Supporting ICT standardization activities

Central Radio Monitoring Office
- General supervision of radio and examination and removal of radio jamming
- Measurement of spectrum
- Supervision of satellite radio and assurance of orderly utilization

3.2.3. Issues at Hand

Under the recognition of the successful completion of the key institutional missions of the MIC, the Lee Myong-bak Administration, starting in February 2008, decided to disperse its integrated policy functions into relevant ministries in accordance with trends of digital convergence and government reduction. The MIC was divided into one commission and three ministries: Korea Communication Commission (KCC),[6] Ministry of Public Administration and Security (MOPAS),[7] Ministry of Knowledge Economy (MOKE)[8] and Ministry of Culture, Sports and Tourism (MCST).[9] This meant that a rational approach to ICTD policy functions became incremental and thus, possibly fragmented.

Figure 3. Organization structure for ICTD in the Republic of Korea (2009)

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6 http://www.kcc.go.kr/user.do.

7 http://www.mopas.go.kr.

8 http://www.mke.go.kr.

9 http://www.mcst.go.kr.
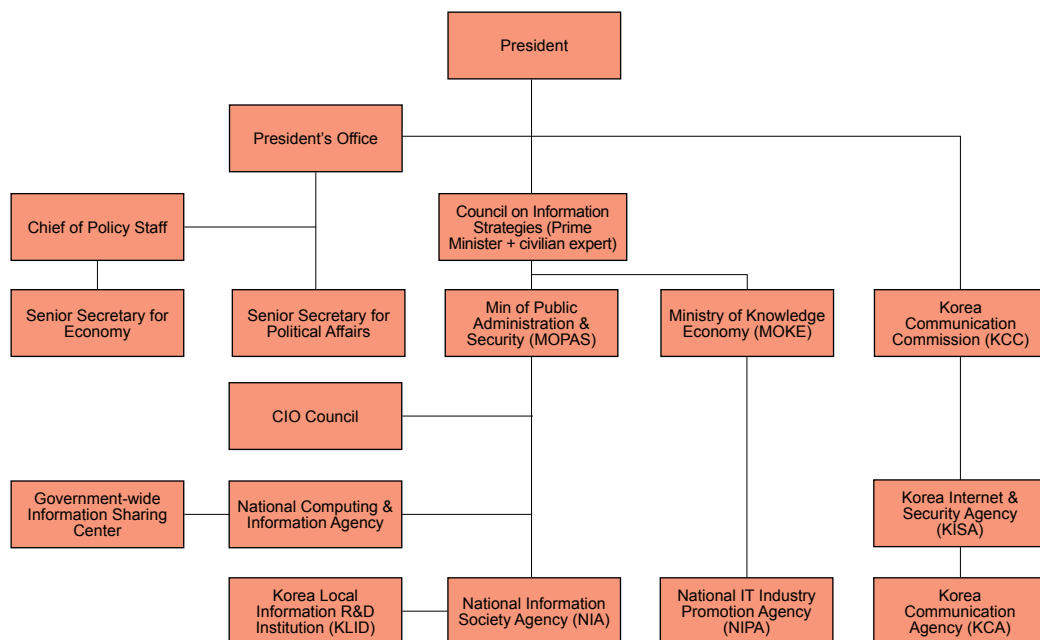
There were two reasons for this reorganization. One was to consolidate the main functions of the MIC and the Korea Broadcasting Commission into KCC in active preparation for digital convergence. The other was to mitigate the conflicts between the MIC and other ministries in several cross-cutting sub-functions of ICTD policy. The KCC incorporated the key functions and human resources of the former MIC. Public bodies under the umbrella of the MIC were disassembled into KCC, MOPAS, MOKE and MCST. The institution for ICTD policy in the Republic of Korea changed from the integrated model to a diffused one.

Table 5. Relocation of MIC's ICTD policy functions into new ministries

Main ICTD Policy Functions of MIC	Related Ministries to MIC	Reorganized ICTD Policy Functions of MIC (2008)
Broadcasting and digital convergence	Korea Broadcasting Commission (KBC)	Korea Communication Commission (KCC)
e-Government	Ministry of Government Administration and Home Affairs (MOGAHA)	Ministry of Public Administration and Security (MOPAS)
ICT industry, venture and trade	Ministry of Commerce, Industry and Energy (MOCIE)	Ministry of Knowledge Economy (MOKE)
Planning and finance	Ministry of Planning and Budget (MPB)	Ministry of Strategy and Finance (MOSF)
Digital contents	Ministry of Culture and Tourism (MOCT)	Ministry of Culture, Sports and Tourism (MEST)

This can be understood as one of the strategic choices by the Lee Myong-bak Administration, which pursued economic development through strengthening manufacturing sectors by converging ICT into traditional industry. In 2011, severe arguments over rebuilding of the ICT control tower or ICT support tower were raised among political parties, mass media and professional communities, with rapid progress in ICT applications such as smart phone, social network services and cloud computing. The final decision on the establishment of a new ministry in charge of integrated ICTD policy functions such as the MIC will be determined by the result of the presidential election in 2012.

3.3.   Public Bodies

3.3.1. Basic Structure

There are three types of public bodies in the Republic of Korea: state-owned enterprises, quasi-governmental institutions (QGIs) and research institutions. While state-owned enterprises are operating in accordance with market principles relying upon self-generated revenues, QGIs are commissioned to implement government businesses by the financial support of the government (Korea Institute of Public Finance, 2011: 10). QGIs carry out their missions and projects that line ministries regulate and commission according to the Act on the Management of Public Institutions managed by the Ministry of Strategy and Finance and other Acts stipulating the establishment and functions of each QGI.

Except for the KTA, which still played a very important role in the telecommunications market as a privatized public enterprise, most public bodies affiliated to the MIC were QGIs aiming at the strategic promotion of universal services or public goods. The NIA, Korea Internet and Security Agency (KISA), Telecommunications Technology Association (TTA), and Korea Communication Agency are included in this category. Another type is the research institute working as either a think tank analysing policy information and developing policy alternatives similar to the Korea Information Society Development Institute (KISDI), or R&D organizations similar to the ETRI.

3.3.2. Korea Information Society Development Institute

KISDI[10] was established in 1985 as a government affiliated research institute under the MIC, carrying out in-depth policy research on knowledge management, the information-telecommunications-broadcasting industry, broadcasting-telecommunications convergence, fair competition, and postal management. It works as a core think tank affiliated to the National Council for Economics, Humanities and Social Science under the Prime Minister's Office. Since its foundation, KISDI has contributed to the MIC in policy areas by providing: a vision of the information society and information economy; theoretical justifications for public corporatization and privatization of the telecommunications and postal service sectors; and policy options for opening up the communications market and free trade.

KISDI core research areas are now focused on:

- Convergence and future outlook – developing a mid- tolong-term roadmap for broadcasting-telecommunications convergence; ICT market forecasting; promoting ICT convergence; designing development strategies for new ICT industry and an Internet economy, etc.

- Telecommunications and spectrum research – developing competition-promoting policies in telecom services; analysing and forecasting telecom service market; designing mid-to long-term regulatory reform on telecom classification and market entry; developing user protection and (ex post) regulations for unfair market activities; developing legal and regulatory framework reform for broadcasting-telecommunications convergence; analysing competition in the telecom service market; studying domestic policies for spectrum assignment and allocation, etc.

- Broadcasting media research – studying policies for advancing broadcasting and media industries and promoting competition in markets; analysing and forecasting markets for the broadcasting and media sectors; analysing competition in the broadcasting market; studying new media and digital broadcasting and policies for video content; studying legal and regulatory reforms for broadcasting-telecommunications convergence, etc.

- International cooperation research – analysing and developing counter strategies for the broadcasting-telecommunications agenda established by international organizations (OECD, International Telecommunication Union [ITU], Asia-Pacific Economic Cooperation [APEC], etc.); managing high-level meetings; analysing agenda on trade issues in broadcasting-telecommunications including WTO negotiations and other WTO activities, and free trade agreements; supporting trade negotiations; providing policy consultation on broadcasting-telecommunications for developing countries and cooperation projects with developing countries, etc.

- Postal management research – developing postal business

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10   http://www.kisdi.re.kr.

3.3.3. Electronics and Telecommunications Research Institute

ETRI[11] was launched as a comprehensive research centre for ICT in 1985 by the consolidation of ICT related institutes under the Ministry of Science and Technology and affiliated to the MIC in 1992. As the largest government funded research institute in the Republic of Korea, ETRI has contributed to promoting the ICT industry and the national economy by developing innovative and advanced ICT solutions.

The Republic of Korea had a breakthrough in 1986 with the successful development of the TDX system that contributed to realizing the one-telephone, one-household policy by providing a nationwide telephone automation system. Thereafter, ETRI developed 4M, 16M, 64M and 256M DRAM, dominating the world semiconductor market. ETRI succeeded in commercializing the CDMA system for the first time in the world, and developed WiBro, super-speed portable Internet and terrestrial digital multimedia broadcasting in 2004 that acquired the international standard of the ITU. These technological innovations have made a huge contribution to the domestic industry and economy of the Republic of Korea.

ETRI's missions are:

* Creation, development and dissemination of knowledge and technology required for the development in the field of ICT, electronics, broadcasting and related convergence technology

* Information security and standardization of ICTs and electronics, broadcasting and related convergence technology

* Training professionals in the field of science and technology

* Technical consulting and provision of technical information for the industry and enterprises of ICTs, electronics, broadcasting, and related convergence technology

* Cooperation with domestic and foreign institutions in the field of ICT, electronics, broadcasting and related convergence technology

Among more than 1,700 staff members, about 750 are doctoral degree holders. ETRI focuses on research of ICT convergence technology, software, convergence components and materials, broadcasting and telecommunications convergence, Internet, contents, creative and challenging ICTs, technology strategy, commercialization, and so forth.

3.3.4. Telecommunications Technology Association

The Telecommunications Technology Association (TTA),[12] established by Civil Law in 1988, was reincorporated in 1992 under Article 30 of the Framework Act on Telecommunications, which operated under the jurisdiction of MIC. TTA was assigned as the formal management organization for ICT Standardization Projects by MIC and was recognized as the ITU Recommendations Referencing Organization in 2001.

Two basic functions of TTA are the establishment of technical standards, and testing and certification of ICT products. TTA's mission is to contribute to the advancement of ICT and the promotion of ICT services and industry, as well as the development of the national economy by effectively establishing and providing technical standards reflecting the latest domestic and international technological advances, needed for the planning, design and operation of global telecommunications and related information services. It is a governance structure with close

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11   http://www.etri.re.kr.

12   http://www.tta.or.kr.

collaboration among a variety of participants consisting of network operators, service providers, equipment manufacturers, academia, R&D institutes, and so forth that are concerned about ICTs.

In order to respond promptly to the rapidly evolving and converging ICTs, the ICT Standardization Committee of TTA operates seven Technical Committees including telecommunications, IT applications, radio communications, information security, INFRA SW, mobile communications and broadcasting in order to develop standards for all ICT areas.

TTA's main missions are:

- Establishment, revision and dissemination of ICT standards in telecommunications (IPv6, VoIP, PBX facilities, xDSL, optical Internet, etc.), radio communications (IMT-2000, fourth generation mobile communications, digital broadcasting, Bluetooth, satellite communications, etc.), and other ICTs (e-commerce, cryptographic algorithms, software components, Internet home appliances, etc.)

- Planning of ICT standards and research on confronting strategy

- Management and control of ICT standardization projects

- Testing and certification of ICT related products (networks, software, digital broadcasting, communication services): providing testing and certification services for networks and digital broadcasting equipment, and for domestic software products; developing and supporting testing for ensuring the interoperability of ICT products; managing testing consortia for ensuring the interoperability of ICT products; supporting small- and medium-sized enterprises by providing open lab environments and the leasing of services incorporating expensive testing equipment; and evaluating the quality of the networks of domestic telecommunications service providers.

- Training of ICT international standards experts and providing support to standardization forum activities

- Set-up and operation of a database for integrated standards information

- International standardization cooperation and standardization of ICT

3.4. Master Plans

3.4.1. History of ICT Master Plans

There are five master plans in the area of ICTD initiated in the Republic of Korea over the last quarter of a century. They include:

1. The National Database Projects (1987-1996) for computerizing national key databases such as resident registration, automobile registration, real estate, patent, and tax and tariff.

2. The High-Speed Networks Project (1995-2005) for building high-speed networks across the country.

3. The Informatization Promotion Basic Plan (1996-2007) that started as the comprehensive five-year plan under the Informatization Promotion Basic Law.

4. The e-government plans that focused on improving the back office or internal operations of the government, and on streamlining front office functions that included multi-agency and government-wide services to citizens and enterprises through the Internet and other ICTs.

5.   The National Informatization Basic Plan (2008-2012).

In addition, the Lee Myong-bak Administration has initiated several basic plans such as the Broadcasting and Communication Promotion Basic Plan, National Green IT Plan and New Growth Engine Comprehensive Plan established by KCC and MOKE.

The Informatization Promotion Basic Plan included the following items in accordance with clause 25 of the IPFA. It included basic direction and principles, main contents and areas of ICTD policy, and method of financing, which are key factors in the formulation of the master plan. In more detail, the contents of the Informatization Promotion Basic Plan were as follows:

- Basic directions of measures for informatization promotion
- Promotion of informatization of administrative business
- Promotion of informatization of industrial sector
- Promotion of informatization of fiscal and financial sector
- Promotion of informatization of education, research, science and technology, and environmental sectors
- Promotion of informatization of local area, culture and personal life
- Strengthening information security
- Promotion of information sharing and ICT standardization
- Protection of personal information, intellectual property rights, and rights of ICT users
- Building foundations of the ICT industry including R&D and training technical experts in ICT
- Upgrading the bases of ICT
- International cooperation
- Financial resources for the promotion of ICT

Cyber Korea 21, a revised basic plan, is introduced in detail below.

3.4.2. Cyber Korea 21

Background

Soon after the establishment of the MIC and the IPFA, the Korean government felt the need for an integrated ICTD policy to expedite national informatization. This was based on the recognition of a significant gap in the level of development of the information society between the Republic of Korea and other advanced countries such as the UK and the USA.

Cyber Korea 21 (1999-2001) was the master plan for building an information society in which information and knowledge were considered the primary sources of economic and social value. Cyber Korea 21 was a revised version of the five-year Informatization Promotion Basic Plan (1996-2001). The plan not only aimed to overcome the 1997 economic crisis, but also established the foundation for building an information society. It was a mid-term (three-year) plan with visible and performance-oriented objectives in economic and social development.

Core Objectives

The goals of the plan were to create 1 million jobs and USD 11.8 billion production inducement effects by investing USD 2.8 billion in the projects. According to this plan, the speed of the Internet became 100 times faster than in the past through linking the high-speed ADSL networks throughout the country, and 10 million people, about 20 per cent of the nation's population, were given an Internet ID. In addition, in order to attain efficiency and productivity through smooth information flows between large enterprises and small- and medium-sized ones in eight fields of industry (such as automobile, electronics, etc.), the plan suggested the rapid provision of Computer Aided Acquisition and Logistic Support (CALS) aiming at "commerce at the speed of light". By fulfilling the projects suggested in the plan, the government raised its global ICT competitiveness ranking from the 22nd country to the 10th country.

Projects

Cyber Korea 21 had three core projects with the vision to link the knowledge concept to national informatization, and concrete action strategies for building a creative knowledge-based nation. The three projects and their objectives were as follows:

1. Building information infrastructure for a creative knowledge-based nation
   • Establishment and upgrading of high-speed networks
   • Globalization of operating systems
   • Attaining the position of the best utilization of computers in the world
   • Legal and institutional rearrangements
   • Implementation of a secure and reliable environment for the Internet
   • Establishment of a sound digital culture

2. Enhancing nationwide productivity through information and knowledge management
   • Implementation of a small and efficient e-government
   • Enhancing the productivity of traditional industries through knowledge management
   • Promotion of a social campaign for fostering new intellectuals

3. Creating new jobs using information infrastructure
   • Promotion of Internet-based new industries
   • Vitalization of the information and communication industry

Implementing Institutions

Under the master plan, the government formulated action plans that ministries and agencies had to implement. At the same time, support was given to boost financial, human and technical resources, and improve institutional arrangements. Task forces under the MIC monitored barriers to the implementation of the plan. The government announced financing strategies to invest about USD 2.8 billion in Cyber Korea 21 projects, in which USD 1.1 billion were from the public sector and the remaining USD 1.7 billion from the private sector including the KTA.

Performance

The implementation of Cyber Korea 21 for three years resulted in the explosive expansion of the population using the Internet, the rapid dissemination of multimedia information, and accomplishment of nationwide high-speed networks projects ahead of schedule. It provided the foundations for the Republic of Korea to become a global leader in ICT.

Achievements include the following:

- Building high-speed network including optic fibres and ADSL across the country
- Raising the Internet penetration rate
- Strengthening education and training on ICTs and raising digital literacy
- Effective preparation for the Y2K problem
- Enhancing the efficiency and productivity of government administration using ICTs
- Fostering the software venture capital industry with emerging ICTs

3.5.   Legal and Regulatory Frameworks

3.5.1. Approaches to the Legal System

The success of ICTD policy development is dependent on the timely establishment of proper legal and regulatory frameworks. The legal frameworks in many countries are based on the assumption that each ministry works in silos without any overlap in functions between ministries. These frameworks often lack government-wide or multi-ministry cooperative and collaborative mechanisms, resulting in ICTD policies that are incremental, fragmented and even anarchic.

In addition, existing rules and regulations are usually defined for a national, analogue and mono-media environment, lacking an international, digital and multimedia perspective. Laws are generally passed to provide basic guidelines for action, foster orderly, efficient and effective operations of ministries and agencies, enhance administrative accountability, and reduce the scope for arbitrary behaviour of public officials. Without timely and proper legislation, the realization of policy goals is likely to be hampered. Institutions in charge of ICTD policy functions should facilitate the formulation of relevant legislation as well as timely amendment of existing laws and regulatory framework.

There are generally three types of administrative law governing public organizations: (1) organic or enabling acts create an agency, explain its powers and establish its jurisdictions; (2) authorization statutes create policy and programmes or instruct ministries to undertake certain responsibilities; and (3) appropriation statutes provide budget and funds, and mandate or prohibit certain actions (Schiavo-Campo and Sundaram, 2001: 72).

There are two approaches to ICTD related legislation. One is to enact a basic or framework law to include the key elements of the above-mentioned three types of law into a single over arching and comprehensive law. An example of this is the IPFA in the Republic of Korea enacted in 1996. It stipulates comprehensively the core elements of administrative statutes including the establishment of relevant agencies and their responsibilities, and important measures for attaining ICTD policy goals such as resource acquisition and financing, network operations and security, staffing and skills issues, service design, and monitoring and reporting.

Another approach is to enact respective laws and programmes according to real-time needs. There are generally two types of ICTD laws: (1) promotion (informatization, e-government, R&D, promotion of industry and trade); and (2) regulation (competition, spectrum management, privacy, information security, harmful and unlawful contents).

The IPFA as a framework law and the Act on the Protection of Personal Information as a regulatory law are introduced in this chapter. The e-Government Act as a promotion law will be discussed in the next chapter.

3.5.2. Informatization Promotion Framework Act

The Korean government has relied upon the framework law system since its initiation of an ICTD policy. The IPFA was enacted in 1995 to effectively implement the informatization of the state and society, and also to strategically promote the ICT industry. Major components of the framework law included nationwide master and action planning for promoting informatization of the state and society, development of sustainable ICT-related industries and advancement of the national ICT infrastructure. The purpose of the IPFA was to raise peoples' quality of life and contribute to the development of the national economy, by promoting informatization, fostering the foundations for the ICT industry, and advancing and upgrading the information and communication infrastructure.

Table 6. Informatization Promotion Framework Act (1996)

Chapter	Clause
General Provisions	Purpose, definitions, responsibilities of central and local governments, basic principles
Planning and Institutional Arrangement for Informatization	Establishment of Informatization Promotion Basic Plan and Action Plan, policy coordination, Informatization Promotion Committee and its functions, responsibilities for CIOs, establishment of NIA
Promotion of National and Social Informatization	Public informatization, diffusion of digital culture, establishment of sound Internet ethics, expedition of information disclosure of public bodies, information security, protection of user rights, realization of universal service and ICT welfare, protection of intellectual property rights
Fostering of Foundations for ICT Industry	R&D of ICT, standardization of ICT, strengthening of ICT human resources, development of ICT industrial cluster, support of emerging technology, international cooperation
Upgrading of ICT Infrastructure	Promotion of broadband ICT networks and utilization, management of high-speed public network, interoperation of networks
Information and Communication Promotion Fund (ICPF)	Sources and usage of ICPF, operation and management of ICPF, establishment of the Institute for Information Technology Advancement

In 2008, NIFA, the revised version of IPFA, was enacted. The focus of NIFA is to rebuild the governance structure, with other stipulations remaining almost unchanged. The supra-ministerial coordinating committee for ICTD changes from IPC (chairman: Prime Minister) to PCIS (co-chairman: Prime Minister and civilian expert), and the lead ministry changes from the former MIC to MOPAS. Details of the NIFA are given in table 7.

While the former IPFA stipulates fostering foundations for ICT industry and establishes the Information and Communication Promotion Fund as the financial source for industry promotion, the NIFA stresses e-government and prevention of information society problems, with stipulations of fostering foundations for the ICT industry and the Information and Communication Promotion Fund being included in the Act on the Promotion of ICT Industry enacted in 2009.

Table 7. National Informatization Framework Act (2008)

Classification	Item	Contents
Informatization of State and Society	e-Government and public informatization	e-Government, Civil Applications, Task Process, Civil Registration, Public Records, Public Information Disclosure, Distance Court, Location Based Information, Geographical Information, Judicial Process
	Establishment of favourable environments for utilization	e-Signature, e-Transaction, Copyright, Internet Address Resources, Trade, Personal Information Protection, Traffic, e-Check, e-Financial Transaction, e-Library, e-Procurement
	Prevention of information society dysfunctions	Privacy Protection, e-Credit Information, Communication Information Protection, Telecommunications, Critical Infrastructure, Consumer Protection, Criminal Acts
Advancement of the IT Infrastructure	Building and upgrading of ICT networks	Privacy Protection, Telecommunications Carriers, Frequency and Spectrum, ICT Enterprises, Broadcasting and Communication Development, Construction, Road Development

Source: http://www.law.go.kr/lsScdo?menuId=0&p1=&subMenu=1&nwYn=1&query=%EA%B5%D%EA%0%80%EC%A0%95%EB%B3%B4%ED%99%94%EA%B8%B0%EB%B3%B8%EB%B2%95&x=0&y=0#liBgcolor0.

3.5.3. Act on the Protection of Personal Information

Guidelines Governing the Protection of Privacy and Trans-border Flows of Personal Data recommended by the OECD Council in 1980 include eight basic principles of national application: collection limitation, data quality, purpose specification, use limitation, security safeguards, openness, individual participation and accountability. Further, the OECD Council recommends member countries establish legal, administrative or other procedures or institutions for the protection of privacy and individual liberties in respect of personal data.

The Act on the Protection of Personal Information was passed on 30 September 2011. It was enacted by merging two laws concerning the protection of personal information. The Act on the Protection of Personal Information includes new clauses that can contribute to enhancing the protection of personal information to a considerable degree. It faithfully materializes the OECD's eight principles in detail. Among them are processing and secure managing of personal data, and securing owner's rights to privacy. Moreover, public governance of privacy policy making and coordination and resolution of disputes are well established in institutions such as the Presidential Privacy Protection Committee and Privacy Dispute Resolution Commission. In addition, privacy impact assessment and class suit are introduced as another means to enhance the protection of personal information.

Table 8. Personal Information Protection Act (2011)

Chapter	Main contents
General provisions	• Objectives and definitions • Principles of the protection of personal data • Rights of owner of personal data • Responsibilities of the State, etc.
Formulation of privacy policy	• Presidential Privacy Protection Commission • Master and action plans • Standard guidelines of privacy protection • Promotion and support of self-regulation
Processing personal information	• Collection, use, provision and their limitations • Destruction of personal data • Methods of gaining the consent of personal data owner • Limitation of processing of sensitive personal data • Limitation of personally identifiable information • Limitation of installment of visual equipments like CCTV • Limitation of processing of personal data due to outsourcing
Secure management of personal information	• Obligations of secure measurements • Disclosure of privacy policy • Appointment of chief privacy officer • Registration and disclosure of databases on personal data • Privacy impact assessment • Notification of outflow of personal data
Securing owner's right to privacy	• Confirmation of personal data related to owner • Deletion, rectification or amendment of personal data • Request for standstill of personal data processing • Responsibilities for compensation for damage
Privacy Dispute Resolution Commission	• Establishment and composition • Applications for dispute resolution and period of processing • Group dispute resolution
Class suit	• Objects of class suit • Jurisdictions

Source: http://www.law.go.kr/lsSc.do?menuId=0&p1=&subMenu=1&nwYn=1&query=%EA%B0%9C% EC%9D%B8%EC%A0%95%E B%B3%B4+%EB%B3%B4%ED%98%B8%EB%B2%95&x=26&y=6#liBgcolor0 (in Korean).

3.6.   Budget Management

3.6.1. Importance of ICTD Finance

Among the various financial investments in ICTD initiatives including private sector capital, allocation of the government budget corresponds to the goals and priorities of government policies. Funds are vital to the pursuance of overall policy goals of economic growth, financial stability and social equity, which are attained through efficient and effective allocation and implementation. Under tight fiscal constraints in many countries, budgeting becomes more and more a tough political process for setting priorities and coordinating activities in order to reduce spending as well as allocate resources among competing policy purposes. It is, therefore, essential to establish mechanisms for formulating a sound policy framework, balancing long-term policy objectives and short-term budget constraints.

Integrated planning and coordinating activities for budget allocation in ICTD policy areas can avoid waste of budget due to overlapping projects between ministries. Several countries operate the performance-based budget review system of ICTD programmes by the budget and finance ministry.

3.6.2. Strategies for ICTD Budget Allocation

Budgeting for ICTD policy is a political process requiring the agreement of several actors with different perspectives and competing purposes. Traditional line-item budgeting with its control orientation has changed slowly to programme budgeting with its economic planning orientation.

There is an increasing recognition of the need to budget ICTD policy programmes, not as one-year expenditure for controlling ongoing operations of government according to the traditional government spending rules, but as multi-year high-value investments for innovating the work flows of the whole-of-government. The target of the line-item budgeting is to control the budgetary process annually, while the programme budgetary perspective is to encourage long-term enterprise-wide innovation of the government. The IPF, operated in the Republic of Korea since 1993, has attracted the attention of policymakers in many developing countries.

Table 9. Traditional budgeting versus high-value ICT investments in ICTD policy and programmes

	Traditional government spending	**High-value ICT investments**
Fiscal year	Single-year (or biennial) expenditure	Multi-year investments
Performance	Programme-by-programme performance	Enterprise or cross-boundary performance
Cost/benefit	Financial cost/benefits	Financial and non-financial costs/ benefits
Workflow	Level of effort within existing work flows	Changes in the flow of work
Operation	Ongoing operations	Start-up operations
Target	Control	Innovation

Source: OECD (2004: 54).

3.6.3. Informatization Promotion Fund

Budget of ICTD Policy

There is no rule for the proper size of ICTD expenditures. The portion has been decreasing slightly in several countries during the last decade. In the USA, the portion of ICTD expenditure has decreased slightly from 2.4 per cent (USD 45 billion out of USD 1,863 billion total government expenditures) in 2001 to 2.1 per cent (USD 79.4 billion out of 3,834 billion total government expenditures) in 2011.[13] Similarly, in Japan, the Republic of Korea and the UK, expenditure for ICTD policy amounts to approximately 1-2 per cent of total government expenditures and has been decreasing slightly for years. Developing countries, needing large investments in ICT infrastructure, do not have to follow this trend in amount and portion of ICTD expenditure.

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13   The White House, Office of Management and Budget, "The Budget", http://www.whitehouse.gov/omb/budget/overview.

Under various budgetary constraints, a special-purpose fund becomes a strategic approach to ensuring financial resources. In countries where the government budget is allocated according to the control-oriented line-item budgeting principles, a fund system can complement its weaknesses by providing operational flexibility. Among them are e-Government Fund of the USA, Capital Modernization Fund of the UK and the IPF of the Republic of Korea.

History

The IPF was a unique strategy to mobilize financial resources for ICTD policy. In order to undertake ICT network projects from 1987 to 1992, the Korean government adopted the "invest first, settle later" budgeting method that was exceptional in terms of fiscal accountability.

In the early 1990s, informatization projects including e-government were not prioritized in most ministries, because senior executives were not willing to bear the risk of project failure. IPF worked as a risk bearing mechanism. If a ministry allocated 50 per cent of the budget for a specific ICTD project, the MIC supported the remaining 50 per cent as a matching fund from the IPF, with technical and human resources support by the NIA. This made it easier for staff in computing units to persuade their minister and senior executives to implement informatization projects. The MIC's matching fund system provided a strong incentive and mediated risks concerned (US Federal CIOC, 2002).

The IPF was first formulated in 1993 for the promotion of R&D for ICTs, and national informatization toward an advanced information society. The IPF is now, for the most part, invested in R&D, standardization activities and human resources training of ICT.

Table 10. Historical evolution of the IPF in the Republic of Korea

Period	Funding structure	Lead ministry	Investment
1987-1992	Invest first, settle later	MPT	National database
1993-2004	Informatization Promotion Fund	MIC	Informatization projects
2005-present	Information and Communication Promotion Fund	MIC (MOKE)	ICT R&D

Main Source and Expenditure

Main sources of IPF revenue include contributions or loans of the government, contributions of telecommunications carriers, frequency license fees of mobile operators, earnings from fund operation, and loans. The Korean government is facing the problem of a rapid decrease in the amount of IPF due to changing ICT environments.

Table 11. Revenue and expenditure of IPF in the Republic of Korea

Revenue	Expenditure
1. Contributions or loans of government 2. Contributions of telecommunications carriers 3. Frequency license fees 4. Earnings from fund operations 5. Loans	1. R&D of ICT 2. Standards development and diffusion 3. Education and training of ICT human resources 4. Building infrastructure for ICT 5. Compensation for the withdrawal and relocation of frequency

Source: Informatization Promotion Framework Act, §34, §35.

3.7.   Policy Implications for Developing Countries

Political ideas and policy vision of top decision makers as well as economic and social needs are critical to the institutions responsible for integrated ICTD policy functions. With globalization and free market movements as well as the end of centralized economic planning system in the Republic of Korea, the MIC was established as a strategic tool for raising national competitiveness and advancing economic and social developments. It was a product of strong and consistent commitment of top policymakers to the establishment of the ministry managing ICTD policy functions in an integrated way.

For its smooth functioning, the MIC institutionalized the IPC as a supra-coordinating committee and commissioned several public bodies to manage its key policy functions. The MIC owed much to the coordinating capacity of the IPC chaired by the Prime Minster in tackling issues with conflicting views and interests among ministries.

The MIC carried out the following key policy functions: regulation, building information infrastructure, promotion of R&D, industry and trade, and informatization and e-government. In order to carry out the above policy functions, the MIC had two offices and six bureaus, and several affiliated agencies and centres for its central organization. Also, the MIC led various ICTD policy functions through formulating public bodies, legislation, master and action plans, and financial resources.

Establishment of mid- to long-term master plans based upon the framework law was crucial to the continuous and consistent implementation of the ICTD policy agenda. The Korean government successfully developed and implemented several master plans and projects including the National Database Projects, the High-Speed Networks Projects, Cyber Korea 21 and various e-government plans. Most of these were continuously and consistently driven and completed within the deadlines despite the change of government administrations.

Based on the experiences of developing and implementing the master plans, the following factors are viewed as critical success factors in master planning:

• Establishment of clear vision and objectives

• Analysis of the past and present situations

• Development of strategies and action plans

• Development of a roadmap and milestones

- Mobilization of financial, human and technical resources

- Institutional rearrangements with lead and relevant ministries, and public bodies

- Continuous monitoring and systematic performance management

Framework law, including organic, authorization and appropriation clauses together, is recommended in dealing with cross-cutting issues of ICTD policy, especially in regards to striking a balance between the promotion and regulation functions of the legal system.

The IPFA of the Republic of Korea included most of the important elements to carry out the integrated ICTD policy functions for the promotion of informatization. It stipulated the basic principles of informatization; development of the Informatization Promotion Basic and Action Plans; promotion of the ICT industry and ICT capacity building; upgrading of information networks; and the establishment of the IPC, NIA and the Information and Communication Promotion Fund.

Budgeting for ICTD policy projects needs be regarded, not as one-year line-item expenditure for controlling ongoing operations of government, but as multi-year high-value investments for creating additional economic and social value. The IPF of the Republic of Korea has been contributing to enhancing informatization and e-government as well as promoting R&D, industry, and human resources capacity, by permitting multi-year budgetary flexibility with a degree of discretion.

4. INSTITUTIONS FOR E-GOVERNMENT POLICY IN THE REPUBLIC OF KOREA

You will find in this chapter discussions on:

- Major implementing organizations (i.e., supra-ministerial committees and lead agencies) for building e-government in the Republic of Korea;

- Key laws for laying foundations for pushing e-government;

- Ways for securing stable and sufficient budget (i.e., special funds); and

- Major support agencies for providing policy and technical assistance.

4.1.　Basic Framework

Ingredients for the successful implementation of e-government include innovative ideas and a set of decisions, as well as strategies and plans to mobilize organizations and resources. As implementation is not an automatic process following policy formulation, committed government leaders are needed to push new initiatives. Institutional arrangements also need to be in place for securing resources and effective execution.

Institutions for e-government implementation are guided by a set of factors in the policy process. The core institutional factors and their compositions vary depending on individual nation's conditions (e.g., political, administrative tradition, culture). No single organization is solely in charge of e-government implementation, but in general, several organizations with different functions at different levels are involved.

This aim of this chapter is to examine the important institutional elements for e-government in the Republic of Korea, including organizations, budget, laws and support agencies. There is, however, one caveat. The institutional elements are not fixed, that is, they keep changing, depending on the conditions of individual countries. What is suggested here is an example of institution building for e-government in the Republic of Korea. Thus, developing countries may find other forms of institution building that are more suited to their needs and situations.

4.2. Organizations for e-Government

4.2.1.　Basic Structure

One of the critical factors for successful implementation of policies is organization (Jones, 1984). A variety of organizations are involved in the process of developing and managing e-government policies and projects. Organizations for building e-government in the Republic of Korea can be understood in a three-tiered fashion.

First, e-government related organizations at the highest level (generally in the form of a supra-ministerial committee) are expected to develop a vision and strategies, draw up a set of key projects, and find ways to secure stable and sufficient financial resources. In so doing, they suggest how ICTs can improve government and set targets for e-government deployment.

Second, specific lead organizations (e.g., MOPAS in the Republic of Korea, MICT in Sri Lanka and OMB in the US) turn the vision into a concrete e-government plan. They may be required to send this plan to a highest-level agency, which in turn re-examines and endorses it. Then thirdly, each government agency (e.g., ministries or departments) develops its own e-government projects (or action plans) that details what it should do to realize the e-government plan.

In the Republic of Korea, one of the formidable challenges in implementing e-government has been the coordination of various stakeholders (especially major ministries) and the development of a common government-wide understanding of the e-government vision and goals. With this understanding, the different stakeholders are expected to cooperate and work together, resulting in little conflict over programmes or waste of resources due to overlapping programmes. To this end, the Korean government has relied on supra-ministerial committees for efficiently managing the e-government policy process.

Advisory committees have played a vital role in preparing the ground for many decisions of top policymakers in government. The participation of outside specialists and stakeholders in committees can make up for the technical or policy vacuum in bureaucracy. In order for advisory committees to work effectively, it is, however, desirable for liaison officers to facilitate communication between committee members and policymakers. In the Republic of Korea, the Chief of Staff to the President or the Senior Secretary for Policy and Planning at the President's Office often undertakes such liaison missions.

The sections below will examine the different organizations that have been involved in building e-government in the Republic of Korea, including special committees and lead agencies (support agencies will be discussed at this end of this chapter). e-Government in the Republic of Korea has undergone notable development phases that are influenced by different government administrations, technological advancement levels, and mid- tolong-term planning. To understand the evolution of e-government policy and the institution building process for e-government, discussions below will look at the ways in which the three recent government administrations (i.e., Kim Dae-jung, Rho Moo-hyon and Lee Myong-bak Administrations), have moved forward the e-government agenda.

### 4.2.2. Presidential e-Government Special Committee

President Kim Dae-jung recognized the power of ICTs for boosting the Korean economy that was hard-hit by the economic crisis of the late 1990s. In January 2001, he announced a national vision for building a knowledge-based information society and issued a presidential order to the Presidential Secretary of the Policy Planning Bureau of the President's Office to organize the PEGSC, based on a supra-ministerial model. Although the Committee for Informatization Promotion was created to take charge of nationwide informatization in 1995, no such mechanism had been considered solely for pushing e-government until the Kim Administration.

The PEGSC, the first of its kind, was formed in January 2001 as a subcommittee under the Presidential Commission on Government Innovation. It was based on an administrative process model indicated in chapter two. The PEGSC aimed to coordinate inter-agency collaboration in information sharing across agencies and completing the infrastructure for e-government within a reasonable time frame. As a result, the importance and priority of e-government projects was elevated as the presidential agenda and implemented throughout all the government ministries and institutes. During this period, the government-wide work process became computerized through the IT infrastructure, and core information possessed by the government was provided to the citizens and shared among government agencies as a way of improving administrative services and maximizing efficiency of the internal administrative process (Song, 2007: 6-8).

The Special Committee selected 11 major e-government initiatives (or projects) that would meet the needs of citizens and private businesses by 2002. The successful completion of the projects were reported to President Kim Dae-jung in October 2002.

In implementing the 11 major e-government initiatives, the Special Committee first formulated a comprehensive framework for building an effective e-government. To ensure that the Special Committee would successfully carry out these tasks, some measures were taken. Firstly, meetings for monitoring the progress of each e-government initiative were held weekly, and conflicting issues facing government agencies were discussed, negotiated and coordinated. Secondly, a standard method of connecting various e-government projects was developed early and implemented across agencies. Thirdly, judicial and legislative frameworks supporting the e-government initiatives were set in place before Internet-based government services began.

Figure 4. e-Government organization during the Kim Administration (2001-2002)
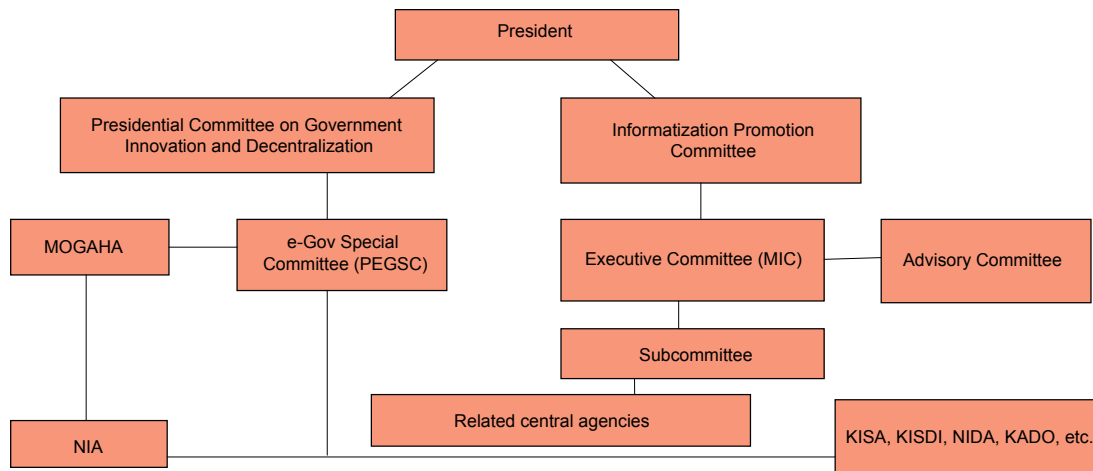
Source: Song (2006: 29).

The main organizational structure of the Special Committee was based on its working groups that consisted of civilians and directors of government agencies. To support the working groups, twoco-heads were appointed (one high-level government officer and one civilian expert). Various task force teams were also formed within the Special Committee to develop ideas and, more importantly, to coordinate many issues that surfaced among government agencies in the process of implementing e-government. For example, a team for system integration was formed to set a compatible standard for linking systems developed for the 11 e-government initiatives. In addition, a legislative team recommended necessary legislation, and a system testing team was formed to check the quality of online government services of each e-government project.

Subsequently, the Rho Administration also implemented e-government initiatives through the PEGSC under the Presidential Committee on Government Innovation and Decentralization as a way of furthering administrative innovation and decentralizing government authority. This was in nature a continuation and expansion of previous e-government initiatives.

The Secretary of Administration and Planning at the President's Office regularly reported directly to the President about the progress of the Special Committee. More importantly, with the direct reporting line to the President, the Special Committee could work efficiently irrespective of individual departments' resistance or deficient cooperation. In addition, the Special Committee successfully maintained a cooperative relationship with three important departments—the Planning and Budgeting Office (for government innovation support), the MIC (for technology and financial support) and the Ministry of Government Administration and Home Affairs (MOGAHA) (for cooperation of government organizations and local governments). This cooperation enabled the implementation of multi department projects with little serious hindrances (PEGSC, 2003: 25).

The main functions of PEGSC under the Presidential Committee on Government Innovation and Decentralization included the establishment of the vision for e-government, selection of 31 major e-government projects that mostly involved the cooperation of several agencies and evaluation of those projects' performance. MOGAHA was the lead agency for carrying out the 31 e-government projects that required cooperation and interoperability among government agencies. MOGAHA also monitored the progress of e-government projects of respective ministries. Each government agency established its own action plans for respective e-government projects and carried them out. In case of conflicts among government agencies, MOGAHA was expected to coordinate the related issues (in some cases the Special Committee intervened

in resolving and coordinating inter-departmental conflicts over specific e-government projects) and was in charge of executing programmes. The NIA provided technical support for carrying out the e-government projects.

Although e-government projects were integrated with government innovation and were part of the presidential agenda, which was similar to that of the Kim Administration, the authority of the Special Committee as well as administrative and financial support to individual departments were relatively weakened (PCGID, 2005: 37-48). Unlike the previous administration, in which the Special Committee on e-Government was fully in charge of both project planning and completion, the Special Committee in the Rho Administration played only a partial role such as suggesting and setting up projects. Once the roadmap for e-government was developed by the Special Committee, its influence on the execution of e-government became limited. Despite increasing integration of inter-departmental policies and programmes, the overall managing body was downgraded to the level of the central government (actual implementation functions were also transferred from MIC to MOGAHA), which made it very difficult for a government department to manage other equal-level departments when implementing multi departmental projects (Song, 2007: 16-19).

During the Lee Administration, in order to provide a new vision for national informatization and more effectively coordinate national ICT policies, the PCIS was established in November 2009, replacing the long-existing IPC under the Prime Minister's Office. The Council is currently the highest authoritative body that deals with issues related to national informatization and e-government (NIA, 2010: 17).

Established under the President, the Council serves as the control tower for overseeing and coordinating national ICT projects. The main responsibilities of the PCIS include: deliberating on the national informatization master plan and other action plans; adjusting relevant policies; fostering information culture; deciding priority projects for closing the digital divide; deliberating on mid- and long-term plans for knowledge information resource management; and designating knowledge information resources. It has 31 members including 15 government officials (mostly ministers) and 14 civilian ICT experts. Among the government officials, four are from legislative bodies, nine from central administration, and two from local administration.

The Working Committee under the Commission reviews policy agendas prior to submitting to PCIS and deals with issues commissioned by PCIS. The Working Committee is co-chaired by the Vice Minister II of MOPAS and one civilian expert. Several Professional Committees under the Working Committee develop and organize detailed agenda items. Professional Committees put together implementation plans, develop specific projects and monitor how the projects are progressing (NIA, 2010: 18). There are currently five Professional Committees under operation in the areas of: (1) e-government; (2) ICT ecosystem; (3) legal and institutional innovation; (4) digital convergence infrastructure; and (5) digital integration and culture.

Figure 5. e-Government organization in Rho and Lee Administrations
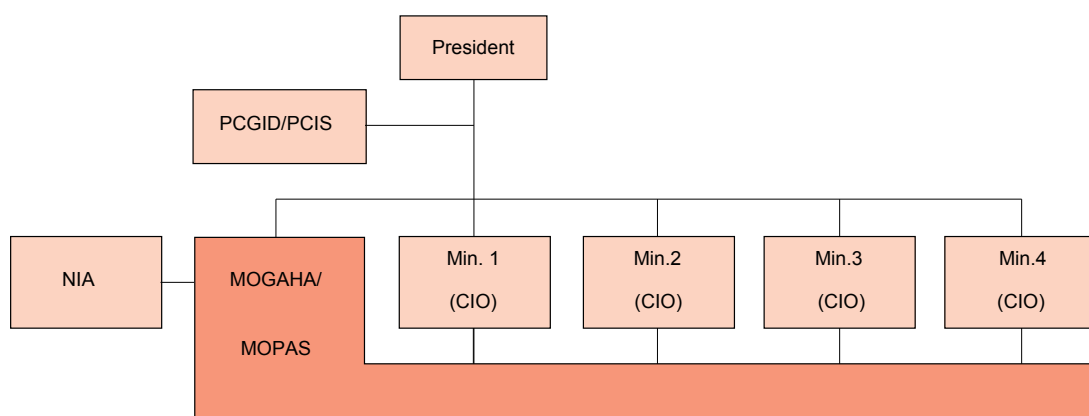
Source: Oh (2009a: 39-40).

Table 12. Main functions of e-government institutions

Types	Rho Administration	Lee Administration
Committee	Presidential Committee on Government Innovation and Decentralization (PCGID) • Establish vision for e-government and selected 31 roadmap projects • Evaluate e-government projects	Presidential Committee on Informatization Strategy (PCIS) • Establish vision for e-government • Coordinate plans/programmes at ministry level • Link programmes and budgets • Evaluate e-government initiatives
Lead Ministry	Ministry of Government Administration and Home Affairs (MOGAHA) • Lead agency for government-wide e-government projects • Monitor progress of e-government projects in respective ministries	Ministry of Public Administration and Security (MOPAS) Lead agency for government-wide e-government projects Monitor progress of e-government projects in respective ministries
Respective Ministries	• Formulate and implement action plans for e-government projects • In charge of ministry-level e-government projects	• Formulate and implement action plans for e-government projects • In charge of ministry-level e-government projects
Public Bodies	National Information Society Agency (NIA) • Provide technical support for carrying out e-government projects	Various agencies • NIA: Provide technical support for carrying out e-government projects • KISA: Provide privacy protection and network security

Source: Oh (2007: 6-7; 2009a: 39-40).

Since 1994 when the Ministry of Post and Telecommunications was renamed the Ministry of Information and Communication, the MIC has gradually gained expertise on e-government through supporting related projects with technology, financial resources and administrative management. In realizing national informatization, the MIC played a major role as a lead ministry

in implementing the High-Speed Broadband Network Plan and the Informatization Promotion Basic Plan, part of which was related to e-government. But as mentioned above, key agenda setting and the development of major programmes for e-government was mostly carried out by the committees under the President.

In 2003, President Rho, however, designated MOGAHA as the major executor of e-government instead of the MIC in order to implement e-government as a critical tool for government innovation. As a result, e-government was managed by two government entities: the planning part related to government innovation was implemented by MOGAHA and the technological part by MIC (Song, 2007). The Ministry of Strategy and Finance also participated as a collaboration body. In addition, CIOs of each ministry were officially placed in charge of managing e-government projects that were carried out at the ministry level.

As expected, there was occasional fierce competition and conflicts between the MIC and other ministries such as the MOGAHA and the Ministry of Commerce, Industry and Energy on issues related to the policy jurisdiction of e-government, the government-wide computing centre and software promotion to name a few. This seemingly never-ending conflict and confrontation among the major players in e-government (or national informatization in general) was the main reason for establishing special committees for managing administrative and policy issues more efficiently and effectively in planning and implementing e-government projects.

At the same time, there have been significant changes to the lead agencies of ICTD. With government reorganization in 2008, the function of MIC was reorganized into one commission and three ministries (KCC, MOPAS, MOKE and MCST). MOPAS (formerly known as MOGAHA), instead of the former MIC, has taken charge of managing overall national informatization policy including e-government according to the National Informatization Framework Act of 2008 (this law replaced the Informatization Promotion Framework Act).

Although MOPAS is capable of specifically dealing with such agendas as e-government projects and government innovation, it has fundamental limitations for leading other ICTD policy agendas (e.g., promoting ICT industry, upgrading infrastructure or R&D investment) due mainly to a lack of appropriate policy tools such as formal (legal) power to coordinate, insufficient budgetary allocation for ICTD policy, and sufficient support agencies, to name only a few reasons. As a result, the PCIS was created.

4.3. Public Bodies

4.3.1. Basic Structure

Support agencies have served as part of key think tanks in the implementation of e-government by directly or indirectly engaging in various activities such as planning, implementing and evaluating e-government projects. Consequently, agencies related to either designing or implementing policies or programmes for e-government play a critical role in the process of making them into a reality. For example, by operating in a collaborative way, they can prevent redundant investments, work on building integrated systems, and share information.

Support organizations cannot exist without those who need them, in most cases governments or political players. This publication uses the term "support agencies or organizations" in a broadest sense; that is, non-profit private and public organizations devoted to examining and analysing e-government policy or technology relevant issues, and producing research outputs (e.g., policy recommendations) in the form of publications, reports, lectures and workshops. These products and events are in most cases targeted at identifiable audiences (e.g., government officials)

with the hope of influencing policy making or public opinion for e-government (Oh, 2009b: 25).

Many support agencies have played a role in building e-government in the Republic of Korea in one way or another. Some of them are worth noting due to their contribution to critical aspects of e-government.

4.3.2. National Computing and Information Agency

A pan-government data centre was first proposed as one of the 31 initiatives in 2003, and the NCIA[14] was finally established in 2005 to address problems arising from the separate operation of government ICT systems such as overlapping investments, shortage of security infrastructure and sub-standard IT environment. The purpose of constructing a consolidated computing environment is to share information and human resources among ministries and agencies, to improve efficiency and to construct a national backup system to counter the risks of natural disasters and human accidents. Two centres function as a mutual backup centre for each other. Started as a pure collocation of hardware resources such as servers, the centres are in the process of integrating software and applications programs, and promoting information sharing and government services in the long run.

The two centres are located about 200 km away from each other, for a distributed installation of systems and mutual backup. The NCIA has created an optimal and reliable environment for integrated management of e-government infrastructure and systems around the clock. Ninety-three per cent (41 government agencies) of the nation's e-government systems have been successfully integrated and operated by NCIA. It is regarded as the first and only government integrated data centre (GIDC) globally. As such, it plays a central role in e-government in the Republic of Korea with its advanced infrastructure for reliable IT system operation, sound cyber security system and resilient disaster recovery system. The NCIA not only integrates and operates information resources of government agencies (IT system, infrastructure, network and security), it also provides technological support for their informatization projects. The NCIA has made contribution to saving national budget through integrated management of information resource of government agencies and enhancing the quality of e-government service with more secure and reliable operation systems.

Key features of NCIA can be summarized as follows:

1. Government-wide integration of information resources: 93 per cent (41 government agencies) of the nation's e-government systems have been integrated and are run by two NCIA centres.

2. Integrated network and service for government agencies: "K-net", a secure and reliable national information network, was established and provided to the business network and Internet network of government agencies.

3. Integrated operation of the IT system
   • NCIA developed "n-TOPS", which is an IT service management system based on the Information Technology Infrastructure Library framework through which an entire information resource and service is controlled.
   • n-TOPS automatically handles tasks such as management of service quality, failure, change, security and resource configuration in real time for 16,000 systems of 41 government agencies.

4. Strong Information Security and Disaster Recovery System

14   http://korea.ncia.go.kr.

- Physical security policies such as entrance monitoring and access control for NCIA building and system are in place.
- Real-time monitoring through the Enterprise Security Management System and seven-layer cyberdefense system enable NCIA to respond to possible attacks.
- A business continuity plan has been mapped out in preparation for disaster such as fire, earthquake and terrorism.

The NCIA has so far performed up to expectation. Some interesting statistics are highlighted:

- Decrease in monthly failure time per equipment
  - 67 min (2004, before integration) → 3.58 min (2006, at the initial stage of integration) → 0.11 min (2009)

- Export of the GIDC model of NCIA
  - Nepal and Mongolia: established small-size GIDCs (2007)
  - Viet Nam: signed MOU on establishment of the GIDC (2009), provide consulting and technology support to Viet Nam (as of 2010)
  - Brunei: MOU on establishment of the GIDC (2010)

- Visits to NCIA for benchmarking the GIDC (2009-Aug 2010): 294 visits from 49 countries

4.3.3. National Information Society Agency

The NIA[15] was originally founded as the National Computerization Agency (NCA) in 1987, based on the IPFA. The NCA successfully played a role in designing, implementing, auditing and evaluating the national informatization project, and gaining plenty of experience and expertise on e-government. It was authorized to provide exclusive technical consulting services for e-government in 2001 and designated as the chief managing body of the Republic of Korea's e-Government Project in 2004. NCA, however, was renamed as NIA in 2007, and based on the Framework Act of National Informatization in 2009, it was reborn as a new agency by merging with Korea Agency for Digital Opportunity and Promotion (KADO) whose main function was to close the digital divide and build a healthy information culture.

The NIA aims to provide support in developing policies related to the national informatization process, building a healthy information culture and reducing information gaps. To this end, it has four major goals:

1. Early realization of an advanced ICT-based country
2. Lead the integration of society through informatization
3. Lead a global knowledge society
4. Reinforce a customer-oriented sustainable management system

In particular, the NIA has developed a wide range of e-government policies including the plan for smart e-government in 2010. It has developed a number of significant national e-government projects that involve multiple ministries. It has also provided ICT expertise through consulting services for large-scaled national projects. Related to the implementation of e-government projects, the following highlights some of its major roles:

1. Execute knowledge-based e-government projects that emphasize communication, cooperation

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15   http://www.nia.or.kr.

and trust
- Execute the integration and linking of projects to improve communications and benefits for people, and active economic activities
- Build a sustainable base for e-government, protect information safely and reinforce information security

2. Support the planning of IT-related policy and specialized technology
- Support e-government policy making, including establishment of the direction for advanced strategic e-government projects
- Support outstanding e-government issues for each department and review e-government execution plans

3. Promote "Low Carbon Green Informatization" by utilizing information technology
- Support the establishment of policies for "green informatization" and execution plans for each department
- Develop and support standards for stimulating green ICT, and organize and operate green ICT associations

4.3.4. Korea Internet and Security Agency

Based on Article 52 of the Act of Promotion of Information and Communications Network Utilization and Information Protection, KISA[16] was established to upgrade the information and communications network, encourage the safe use thereof, and promote international cooperation and advancement into the overseas market in relation to broadcasting and communications. It has performed several functions, but the following is some of KISA's main functions:

1. Internet security incident prevention and response
- KISA operated the Korea Internet Security Center in December 2003 to monitor abnormal traffic activities in the Internet backbone on a 24/7 basis. In December 2010, an integrated situation room that enables the collection of diverse attacks and threat information from wider sources for comprehensive and systematic analysis was renovated.[17]

- KISA contributes to promoting a reliable and secure Internet environment by undertaking early detection, in-depth analysis and rapid response to Internet incidents. It also operates a proactive response system against cyber threats such as distributed denial of service attacks.[18]

- KISA operates the Spam Response Center to process spam related reports as stipulated in the Act on Promotion of Information and Communications Network Utilization and Information Protection, and providing guidelines on how to filter and handle spam. In order to minimize and prevent the damage caused by spam, KISA regularly raises user awareness on spam, develops and distributes anti-spam techniques and cooperates with related agencies abroad to resolve spam incidents that originate from the Republic of Korea.[19]

2. Personal information protection
- Illegally leaked and breached personal information may be abused in identity theft, phishing or spamming, causing material loss and psychological damage to the general public. KISA runs a self-test webpage where one can check personal information and improve it to avoid legal consequences.[20]

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16   http://www.kisa.or.kr.

17   http://www.boho.or.kr.

18   http://www.krcert.or.kr.

19   http://spam.kisa.or.kr.

20   http://www.privacycheck.or.kr.

- KISA operates the PIRST (Privacy Incident Response SysTem) 24/7 for searching and deleting leaked personal information on websites both domestic and abroad as well as checking peer-to-peer and Web hard drives.

- KISA focuses on prevention and post-accident support by using such measures as introducing and promoting the i-PIN (InternetPersonal Identification Number),[21] setting up personal information protection standards, and expanding websites that do not collect the Korean Resident Registration Number.

- KISA also offers a 24-hour help through the 118 hotline, a toll-free counseling telephone service.

3. Healthy cyberculture
- In an effort to build clean and healthy cyberspace, KISA runs education programmes on Internet ethics for individuals and carries out regular campaigns. To impart positive values in the use of the Internet to the young generation who will be the major Internet users in the near future, KISA offers a series of lectures in and outside of schools. At the same time, KISA leads various cyberculture campaigns such as the Korea Internet Dream Star that aims to build an ethical Internet world.

- From February 2012, the assignment of IPv4 addresses will not be available. KISA has already prepared for the future by distributing and promoting IPv6 that provides more Internet addresses.

4. International cooperation in broadcasting and communications
- KISA cooperates closely with international organizations such as ITU, ESCAP and the World Bank on Internet security and privacy issues, as well as running its own international programmes such as the Overseas Broadcasting and Communications Specialist Invitational Training Program.

- KISA also organizes the World Information and Communications Summit as well as the Korea Communications Conference, therefore playing a greater role as an IT powerhouse in the international community.

4.4. Major Projects

4.4.1. History

Looking back on the history of e-government implementation in the Republic of Korea, it is clear to see that the weight and value of e-government implementation has changed from enhancing efficiency of public administration through computerization of government works until the 1990s to increasing satisfaction and active participation of citizens in policy making after the year 2000. Today, e-government is considered as the government's key management system that serves as an infrastructure for developing and improving the foundation for a democratic society and national competitiveness.

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21   http://i-pin.kisa.or.kr.

Table 13. History of e-government in the Republic of Korea

Stage	Period	Projects
Inception	1978-1996	Building administrative networks (1987-1996) Implementing administrative computerization (1978-1987)
Foundation	1996-2000	Promoting informatization
Launch	2001-2002	11 major tasks for e-government services
Diffusion	2003-2007	31 major tasks for e-government services
Maturity	2008-	Expansion of integration of e-government

Source: Chang (2011: 4).

4.4.2. Kim Dae-jung Administration

Although many different policies and programmes have been developed and implemented to build e-government in the Republic of Korea, the so-called 11 initiatives (or killer projects) of the Kim Administration starting in 2001 and the 31 initiatives during the Rho Administration made a significant impact, thus, they are worth noting here. In addition, some of the major aspects of the current Lee Administration's projects are briefly presented.

The Special Committee for e-Government in the Kim Administration set the following principles and direction for e-government implementation: (1) focus on initiatives pertaining to national interest; (2) integrate inter-agency related initiatives into a single government-wide one; (3) maximize the sharing of information across agencies and eliminate overlapping administrative burdens; and (4) promote the use of ICT through business process reengineering. Under these principles and direction formulated by the Special Committee, extensive administrative processes that had impeded government services were readjusted and reformed to provide citizen-centred government services via the Internet through the expansion of information sharing across government agencies.

The overall e-government plan was composed of 11 major projects consisting of four front-office related, four back-office related and three infrastructure related projects. Most of the back-office projects also included systems for mass public service, which were composed of multi department projects such as the Government for Citizens (G4C) system.

The G4C system was established to interconnect the database networks built in the MOGAHA, the Supreme Court of the Republic of Korea, the Ministry of Construction and Transportation and other government agencies that independently stored government records for instance resident registration, real estate, vehicle registration and other areas. By interconnecting the databases, government processes were streamlined for more effective and efficient delivery of services to citizens.

The Home Tax Service through the Internet enables taxpayers to file tax returns, receive e-Bills and process e-Payments from their homes via the Internet. With the establishment of the Government e-Procurement Service, procurement processes involving bidding, contract agreements, and payment for services or supplies can take place online in realtime. And the National Finance Information System offers real-time financial information to high-level government officials by interconnecting independent financial systems built in each public agency. The database networks for health insurance, pension insurance, industrial accident compensation insurance and unemployment insurance policies, which are the four major social insurance systems in the Republic of Korea, have been interconnected into a seamless network. On 13 November 2002, President Kim Dae-jung held a meeting for the "Report on the Completion

of e-Government Infrastructure" with all ministers from participating ministries. Subsequently, President Kim announced that the 11 major e-government initiatives were successfully executed and declared the opening of full-scale e-government services to Korean citizens (PEGSC, 2003: 10-12).

Table 14. e-Government agenda of the Kim Administration (2001-2002)

Area	Type	Projects
Quality of Public Service	G2C	1. e-Service to Citizen (G4C) 2. Integrated social insurance service 3. Home Tax Service
Enhanced Business Environment	G2B	4. Integrated e-Procurement System
Transparent and Efficient Government	G2B	5. Integrated finance 6. National Education Information System 7. Personnel Policy Support System 8. Local Government Information System
Advanced Infrastructure	G2G	9. e-Documentation 10. e-Signature and e-Seal 11. Government Information Systems Consolidation

G2C: Government to Citizens; G2B: Government to Business; G2G: Government to Government.

4.4.3. Rho Moo-hyon Administration

The Rho Administration initiated 31 major projects, which were comprised of a mix of former e-government projects and newly added ones. The initiatives consisted of 4 sectors, 10 agendas, 31major projects and 45 unit projects. Its roadmap included firstly, integrating and expanding the infrastructure from multi department networks to a nationwide network; secondly, developing interactive websites (with Q&A, FAQ, etc.) and enhancing the participation of customers, civic groups and the general population in government policy activities to ensure transparency in civil services; and thirdly, advancing the integration of government's functions, information resources and other core activities throughout the government (PCGID, 2005: 50-52).

Over the last two decades, the focus of e-government implementation has changed from single department infrastructure to networking of back office and front office, then to networking of multi departments and finally, total integration of nationwide government branches. This change reflects the underlying value of user-focus (or -centred) service delivery of e-government (see Vergez, 2006; Oh, 2011).

Building on the progress of informatization promotion in individual ministries and the level of e-government development, the Lee Administration, inaugurated in 2008, has been pursuing quality management by maturing e-government through a shift of focus from "promotion"and "construction" to "utilization" and "connection". Further, the frameworks for e-government implementation were placed under the full responsibility of MOPAS with improved legal systems.

Table 15. e-Government agenda of the Rho Administration (2003-2007)

Area	Agenda	Priority Task
Procedural Reform	1. Establishment of online work process	1. Electronic document processing 2. Integrate central and local government financial information systems 3. Develop local e-government system 4. Develop e-auditing system 5. Develop e-assembly system 6. Develop integrated criminal justice system 7. Integrate human resources administration 8. Develop system for online foreign affairs and trade information 9. Develop system for real-time management of national tasks
	2. Expansion of administrative information sharing	10. Expand administrative information sharing
	3. Redesign of service oriented procedures	11. Develop business reference model
Civil Service Reform	4. Advancement of civil service	12. Enhance Internet civil service 13. Integrate national safety management services 14. Integrate and enhance construction, land and registry processes 15. Enhance comprehensive information service 16. Integrate national welfare information service 17. Integrate food and drug information service 18. Integrate employment information service 19. Develop Internet-based administrative court service
	5. Advancement of business service	20. Develop single window for business support service 21. Integrate national logistics information service 22. Develop e-trade service 23. Integrate foreigner support service 24. Support the export of e-government solutions
	6. Enhancement of citizen online participation	25. Expand online participation of citizens

Area	Agenda	Priority Task
Information Resource Management Reform	7. Integration and standardization of information resource	26. Integrate government-wide information environments 27. Enhance e-government network 28. Apply government-wide IT architecture
	8. Enhancement of information security system	29. Build information security system
	9. Capacity development of IT staff and organizations	30. Develop capacity of IT staff and organizations
Legal Reform	10. Legal reform of e-government	31. Reform of e-government and security related legal system

4.4.4. Lee Myong-bak Administration

The Lee Administration has not designated any specific e-government projects as part of the President's agenda as did previous administrations. Instead, it is utilizing the PCIS and MOPAS as major mechanisms for designing e-government related policies, developing projects and implementing them. Currently, PCIS is more interested in establishing policy directions and developing a few specific projects, while most of the projects that are financed by the e-Government Support Budget are developed and managed by MOPAS in consultation with other ministries. Likewise, individual ministries can also develop and implement their own e-government projects that are mostly funded from the ministry's general budget.

Table 16. e-Government agenda of the Lee Administration (2009-present)

Goal	Objective	Tasks	Lead agency	Area
Increase citizen convenience and national competitiveness by achieving an advanced information society	Construct next generation ICT infrastructure	• Facilitate mobile services • Improve and increase efficiency of national backbone information network	KCC, MOPAS, MOSF	Digital convergence infrastructure
		• Construct ICT-based intelligent SOC	MLTM, KCC, MOKE, MOSF	
	Improve e-government system	• Provide vision for next generation national informatization • Promote integration of e-government services • Establish mobile-based administration	MOPAS, KCC, MOSF	e-Government
	Step up international cooperation in ICT	• Increase international cooperation in ICT • Establish strategy and supportive scheme for exporting informatization know-how • Improve national image as the ICT leader through international events	MOKE, KCC, MOPAS, MOSF, MLTM, MOFAT	International cooperation

Source: NIA (2010: 19).

As for a policy framework for e-government, the National Informatization Master Plan, finalized in November 2008, provides five main goals for achieving an "advanced and leading country", one of which is "efficient knowledge government". The efficient knowledge government provides services that can communicate with the citizens and support substantial value-creation of citizens and businesses. It also expects to integrate and interconnect information systems of all departments and ministries in order to provide customer-oriented services while making government operations more efficient. In terms of quality, the Lee Administration's e-government plan aims to increase the e-government usage rate from 41 per cent in 2007 to 60 per cent in 2012 and climb three notches in the United Nations e-Government Development Index rankings from sixth to third. However, the e-government usage rate in 2009 was up to 60.2 per cent and the Republic of Korea ranked at the top of the e-Government Development Index in April 2010, already exceeding the goal initially specified in the e-government plan.

4.5.   Legal and Regulatory Frameworks

Laws and regulations required for successful e-government implementation need to be newly made or revised appropriately based on the development level of informatization. Implementing e-government requires a balance between promotion for systems development/distribution and control/management for information security and privacy protection. In general, laws and regulations tend to lag behind the speedy changes in informatization. Furthermore, public officers cannot fully carry out his or her responsibilities without proper legal bases. Thus, legal frameworks should be regularly re-examined and reformed before or during the implementation of e-government.

The Republic of Korea passed the Computer Network Act in 1987 as a legal base for developing five national Basic Information Systems. In 1995, the IPFA was enacted, providing legitimate grounds for utilizing the IPF for e-government projects of individual ministries. The e-Government Act was passed in 2002 to enhance the linkage between government innovation and e-government (in the US, the Electronic Government Act was also enacted in 2002). The e-Government Act aimed to improve citizens' convenience, innovate work processes and promote electronic management. In so doing, it expected to improve the efficiency and productivity of administration as well as the quality of civil services. The e-Government Act stressed the principles of e-government as follows: establishment of e-services and improvement of citizens' expediency; government business innovation and improvement of productivity and efficiency; security and reliability of information systems; protection of personal information and privacy; disclosure of public information and expansion of information sharing; prevention of overlapped investment; and improvement of interoperability.

In 2010, the e-Government Act was revised to advance the information society and improve government productivity. The revision puts emphasis on developing ubiquitous technology-based administrative services to enhance the convenience of service delivery for citizens. It also intends to expand the sharing of administrative information in order to improve administrative efficiency as well as reduce paperwork for filing petitions. In addition, integrated management of information resources and strengthened supervision of IT projects are included.

The Act of Information Management Governance in Public Administration passed in 2011 is another example of management governance for public management information system. The purpose of the Act is to improve the efficiency of activities in public administration and to improve public services and their availability. They are to be achieved by laying down provisions on information management governance in public administration and on promoting and ensuring the interoperability of information systems. This Act is, in a sense, similar to the e-Government

Act of the US in terms of dealing with the issues of government enterprise architecture and interoperability of information systems of ministries and agencies.

Table 17. Summary of the e-Government Act (2002)

Purpose	• Productivity, transparency, democracy of administration (§1)
Delivery and Utilization of e-Government Service	• Electronic processing of civil petitions (§7) • Processing of civil petitions without appearance (§9) • Electronic notice (§11) • Electronic provision of administrative information (§12) • Electronic payment of grants and benefits (§15) • Delivery and utilization of e-government service (§16) • Extension of citizen's participation (§17) • Introduction and use of ubiquitous-based e-government service (§18)
Digitization of Administrative Management	• Preparation of electronic documents (§25) • Establishment and effect of electronic documents (§26) • Transmission and receipt of electronic documents (§27) • Time of dispatch or arrival of electronic documents (§28) • Authentication of administrative digital signatures (§29) • Convergence of opinions through information and communication network (§31) • Reduction of paper documents (§33)
Sharing Administrative Information	• Efficient management and use of information administration (§36) • Administrative information sharing centre (§37) • Administrative information for sharing (§38) • Prior consent of information subject (§42) • View claims of information subject (§43)
Enhancement of Operating Foundation of e-Government Service	• Basic planning of IT architecture (§45) • Promote the introduction and operation of IT architecture (§47) • Business redesign by ICT (§48) • Appointment and application of standard e-service (§51) • Integrated management of information resources (§54) • Establishment and operation of the Local Information Integration Center (§55) • Establishment and implementation of security measures for information and communication networks (§56) • Information system supervision for government institutions (§57)
Establishment and Implementation of Policies for Materializing e-Government	• Promotion and support of e-government projects (§64) • Promotion and support of informatization projects promoted by local governments (§65) • Promotion of model projects (§66) • Prior consultations about e-government projects (§67) • Analysis and evaluation of performance (§68) • International cooperation for e-government (§70) • Establishment of the Korea Local Information Research and Development Institute (§72)

Source: http://www.law.go.kr and http://elaw.klri.re.kr.

The development of the information society and the increasing economic value of personal

information across all areas in society have made collection and use of personal information prevalent. However, absence of guidelines and standards of handling personal information raised serious problems, resulting in privacy and security blind spots in everyday life. In addition, personal information issues such as disclosure, misuse and abuse keep reoccurring, making people more alert about privacy infringement.

Such changes in people's mind set can be viewed as a chance as well as an obstacle for building e-government. Thus, privacy violation and information security was viewed as critical in implementing e-government. Most of the laws and regulations dealing with concerns related to privacy and security were promulgated after 2001 when major e-government projects (e.g., management of information and knowledge resources, information security, bridging the digital divide, protection of cyber infrastructure, etc.) were already fully under progress.

In the Republic of Korea, information security was adopted as one of 11 agendas during the Kim Administration, and the privacy impact assessment for evaluating the impact of a new project on private information was proposed. In order to resolve the problems related to information protection in a concrete and systematic way, the Personal Information Protection Act was finally enacted in 2011.

This law is comprehensive in the sense that it provides the principles and provisions of how to process personal information for both the public and private sectors, based on global standards. It also strengthens the prevention of personal information infringement by protecting the secrecy of private life and guaranteeing the rights and interests about personal information. Public institutions as well as non-profit organizations that deal with personal information for business should manage personal information in accordance with the law. Interestingly, provisions for restricting unique identification information and image information processing devices (e.g., CCTV) are newly made. The Privacy Commission and the Personal Information Dispute Mediation Committee are founded and a privacy class action system is introduced.

Table 18. Major acts related to e-government[22]

Statutes	Enactment
Framework Act on National Informatization	2009 (1995)
e-Signature Act	1999
Act on the Promotion of Information and Communications Network Utilization and Information Protection, etc.	2001
National Spatial Data Infrastructure Act	2009
Act on the Protection of Information and Communications Infrastructure	2001
Act on the Usage of e-Document in Civil Procedures	2010
Act on the Protection, Use, etc. of Location Information	2005
Act on the Use and Protection of DNA Identification Information	2010
Act on the Establishment of Infrastructure for Informatization of National Defense and Management of Informational Resources for National Defense	2010
Act on the Usage of e-Document in Informal Procedures	2010
Framework Act on Electronic Commerce	1999
Electronic Financial Transactions Act	2010
Electronic Trade Facilitation Act	2005

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22   For more detail, see http://www.law.go.kr and http://elaw.klri.re.kr.

4.6.   Budget Management

While many agendas on government innovation can be achieved solely by reforming the legal framework without financial assistance, e-government requires huge capital. Since the establishment of the MIC and the launching of large-scale government policies on nationwide informatization, mostly starting in 1996, the financial resources that the Korean government has provided to building e-government are massive. The majority of the resources have been channeled towards changing the form of government into an electronic one (Oh and Myung, 2002). Yet, the risks and uncertainty of e-government projects make it quite difficult to secure the necessary funds. Therefore, it is crucial to devise some ways to secure funds for e-government that are not from the regular budget.

The National Database Projects initiated in 1987 were first implemented by the so-called "invest first, settle later" budgeting method, explained in chapter 3, which is extremely exceptional in terms of fiscal accountability, but was possible then under the authoritarian government.

At the second stage in 1993, the IPF was established to promote informatization projects of central and local governments. The mobilization of financial resources for e-government through the IPF is considered a successful case. The IPF was financed from several sources including government funds, loans, funds provided by fixed and mobile telecommunications companies, dividend payouts from shares of Korea Telecom, and the selling of corporate stocks. The IPF, managed by MIC, was provided in a form of a matching fund to individual ministries for their ICTD projects. This measure worked as an incentive for mitigating risks associated with the projects. In an environment where success was uncertain and appropriate expertise was lacking, such policy-focused incentives must have played an important role in promoting the implementation of risky projects by individual ministries.

The fund's principal mechanism was to work as a flexible alternative to the existing budgeting system for implementing long-term ICTD and e-government projects in accordance with the President's agenda or national informatization master plan. Such a funding system, unlike the fixed budget process, could provide flexibility in the funds available to pursue long-term projects that are extremely difficult to execute and for launching initiatives that are based on never-before-used emerging technologies that have a high failure rate.

At the third stage of e-government, the budget for e-government was separated from the IPF as investments were placed on developing next generation information technologies. Since 2005, funding for e-government was obtained through the regular government budget and incorporated into the annual budget category. Along with this change, MOGAHA (renamed as MOPAS in 2008) instead of MIC was designated as a major implementation agency for e-government in 2003. MOGAHA, thereafter, became responsible for integrating and implementing the lump sum budget for e-government that is separately allocated to each ministry as part of the regular budget in order to enhance cross-agency integration and linkage (see Song, 2006: 52-53). With little authority to use IPF for implementing e-government, MOPAS is currently experiencing

great difficulties inefficiently handling e-government related policy agendas among ministries.

Table 19. Major strategies for securing e-government budget in the Republic of Korea

Year	Budget Allocation Methods	Managing Agency
1987-1992	Invest first, settle later	MIC (NCA)
1993-2003	Informatization Promotion Fund	MIC (NCA)
2004-Present	e-Government Budget	MOPAS (formerly MOGAHA) and NIA

4.7. Policy Implications for Developing Countries

The direct and indirect benefits of e-government have been proven and are well documented. As a result, some form of e-government is happening in almost all developing countries. However, e-government cannot be built overnight, rather, it goes through a series of developments phases, and many developing countries are still at the initial phases of e-government.

Many factors are involved in the e-government building process. In general, organizations, legal systems, budget and support agencies are frequently referred to as important factors for success. Such factors can be referred to as the institutional capacity for e-government.

Witnessing fundamental changes in the governments of many developed countries, developing countries are keen to transform their governments into ICT-based, more efficient and service-centred systems. When it comes to implementing e-government they, however, need to first understand how much they are ready to change and, more specifically, how to make such a change happen. By benchmarking and learning from advanced countries, developing countries can apply the good practices and lessons learned to the formulation of effective strategies for building institutional capacity for e-government.

Discussions below will focus on the organizational aspect of institutional capacity, that is, implementing organizations and support agencies. No policy can be executed without proper organizations in charge of implementing e-government. Those organizations can have different types or arrangements in terms of functions, authority or responsibility. Simply put, there can be: (1) organizations for planning and executing; and (2) those for providing policy or technical support to planners. As for the former, developing countries need to first consider who is going to take the lead and how to coordinate conflicts among players or the overlapping of programmes. If a specific department or ministry has legal or other form of legitimate authority to lead other departments or ministries in implementing e-government, other forms of organizations such as a special committee may not be necessary. Otherwise, other alternative arrangements to ensure the smooth implementation of e-government initiatives may need to be considered.

The Republic of Korea has relied heavily on so-called supra-ministerial committees (usually in the name of special committees under the President's leadership). Interestingly, some countries also have such committees, but they are often responsible for the overall national informatization process, of which e-government is a part. There, however, can be a serious lack of push for e-government unless the umbrella committees pay attention to building e-government vis-à-vis other areas of informatization such as the ICT industry, R&D and infrastructure, to name a few. This is why the Korean government launched special committees solely for implementing e-government besides the Committee for National Informatization Promotion.

Responsibilities for a supra-ministerial committee for e-government should include setting visions, strategies and projects that lay the basic foundations for building e-government in individual countries. Developing countries will need to consider where such a committee will be located. To increase the likelihood of buy-in from high-level policymakers, adequate financial resources and commitment to resolve complicated and conflicting policy issues, it would be beneficial to place the committee under the president's office, particularly if individual countries are more accustomed to centralized governance than a delegated and cooperative one. Alternatively, the committee may be placed under the prime minister's office as the office is normally expected to play a coordinator role in the governmental process. This is also true of the parliamentary system.

More importantly, measures for connecting the special committee and the president need to be implemented to allow the committee to work efficiently with other government organizations as well as with stakeholders outside government. For the special committees of the Republic of Korea, the Chief of Staff or Secretary of Planning and Budget at the President's Office played the role of liaison officer from time to time. The presence of such a figure gave the committee a symbolic or real power associated with the President's policy intention and leadership. Otherwise, special committees should be provided with strong legal authority that can bind or "force" other stakeholders to cooperate. Generally, committees that operate temporarily, say, during the time period specified by presidential orders, are rarely effective.

In addition to special committees, there also need to be lead agencies that can implement the visions, strategies or specific initiatives developed by the special committees. These lead agencies should be placed in charge of implementing and monitoring e-government programmes in cooperation with other departments or ministries. To this end, the MIC (until 2003) and the MOPAS in the Republic of Korea have taken the lead in pushing e-government projects into reality. For developing countries, a critical question would be which ministry should be the lead agency, and decision on that depends in large upon the condition of individual countries, including their political tradition and administrative culture (see chapter 2 for more details).

In the policy process of e-government, lead agencies and special committees need proper policy tools such as adequate budget and effective legal systems, but, more importantly, they need relevant and timely support from professional organizations in developing and implementing e-government projects. On this aspect, the Korean government has been aided by such support agencies as NCIA, NIA and KISA in terms of policy or technical expertise in the area of information resource management, policy development and programme audit, and information security to name a few.

Support organizations often become involved in facilitating the process of e-government implementation, though they do not have direct legal or official responsibility. In general, support organizations can be of great help to policymakers in building e-government by providing technical or policy support as well as assisting service delivery.

Policy makers in developing countries first need to think about the necessity of such support from other outside organizations. It is in a sense dangerous to simply assume that support agencies always play a good part (or perform well) with policymakers in governments. Sometimes, they do; other times they may not. It is, thus, more reasonable to accept claims of their importance with proof. In fact, support agencies such as think tanks in general may not be nearly as influential as we assume or believe especially in the context that policy is more likely to be shaped by political interests, not by ideas (Oh, 2009b: 24).

If government officials in developing countries can generally handle policy issues related to e-government inside their own organizations, they may assume that they do not need further support from outside organizations such as research institutes or professional agencies. In reality, however, policymakers need some form of external assistance for e-government policy planning and/or implementation. Furthermore, e-government projects require a certain level

of technical elements to realize, say, administrative efficiency by applying ICT, which justifies obtaining appropriate support from other organizations.

Support organizations can be formed in a centralized or a decentralized fashion, depending on the political tradition or other circumstances of individual developing countries. Centralization of support agencies refers to the organizational arrangement in which several roles/functions are performed by one or a few agencies that are closely net worked. On the other hand, decentralization refers to such an arrangement when different organizations are in charge of different support functions, thus, authority and responsibility are dispersed across several agencies.

There are no clear-cut criteria for choosing one of the two. In some countries, policymakers may try a combination of the two. But, countries that: (1) are accustomed to centralized governing; (2) prioritize efficiency over other values (e.g., equity, democracy, transparency, etc.); (3) are able to bring together human resources with high level of expertise in ICT; and/or (4) do not have sufficient financial resources for R&D investment, may opt for the centralized approach of creating support organizations. In this case, it is strongly recommendable that policymakers make sure different types of support from a few related agencies are well organized, coordinated and channeled under the one roof.

If a proper level of expertise (especially, technical expertise) is not sufficiently secured in the centralized agency, it is not easy to guarantee the quality of projects for building e-government. Thus, it is wise to build a network between the centralized agency and other related professional organizations to cover expertise or the crosschecking of issues that may be lacking in the central agency. The network, however, needs not to be tightly connected; rather the so-called loosely coupled connection may be more desirable and workable.

On the other hand, developing countries that: (1) have enjoyed the political tradition of decentralization; (2) already have access to a network of professional organizations that are dispersed across society; (3) have sufficient human resources in ICT and can easily find high quality experts with various specialties; and (4) can secure sufficient resources to nurture several research institutes without severely sacrificing other government projects over a long period of time, may prefer the decentralized way of forming support agencies.

Under the decentralized model, critical factors for successful operation of support agencies are: (1) efficient coordination among support agencies with different or sometimes overlapping functions; and (2) maintaining a high level of expertise over time.

As e-government projects are often large long-term projects, support agencies may compete against each other for a stake in the projects. However, support agencies that become too aggressive may actually be counterproductive. Therefore, it is advisable for government organizations to specify certain functions for each agency and crosscheck the quality of support. It is also desirable to conduct joint meetings among related support agencies on a regular basis when undertaking e-government projects. Through these meetings, support agencies can have the opportunity to build team spirit, work in a collaborative manner and collectively learn their role in the process of forming or implementing e-government projects.

Support agencies need to regularly recruit high quality experts to maintain a certain level of expertise or professional capacity. At the same time, they need to continually develop the capacity of their in-house professionals as technical or policy advisor. To this end, government may be expected to contribute financial resources to support agencies, especially government-sponsored institutes for their capacity building efforts. Otherwise, tight budgets may prevent government-sponsored support agencies from hiring or developing high quality experts in, for instance, emerging fields or with advanced new technological knowledge.

Finally, it is of no use to have a well laid-out e-government programme and sufficiently equipped organizations for implementation unless government services are appropriately delivered to the targeted population. This is why application is another critical factor for successful implementation of e-government projects. In most cases, the projects are implemented by government agencies that are involved in forming them. But recently, to save costs and reduce workloads of government officials (or agencies), outsourcing and partnerships with private companies are taking place.

Considering the complexity and technicality of e-government, policymakers in developing countries can consider such options for assisting in the efficient delivery of services. For example, the maintenance and regular upgrading of IT systems, and the management of data can be outsourced. The purpose is usually to save money and/or exploit the skills of another entity. Likewise, it is worth trying to build a partnership between government agencies and relevant actors in the private sector to improve or facilitate delivery of government services designed in the e-government projects.

Developing countries, however, need to be cautious before making a decision to either outsource a task or engage in public-private partnerships. The government organization needs to first examine which are the tasks that can be outsourced. More importantly, a thorough investigation is recommended to assess the capacity and trustworthiness of potential outside organizations. To begin with, tasks that are simple, mechanically manageable and cause minimal opposition from inside or outside actors can be worth trying.

For developing countries, the bottom line is that government agencies are still the major players in executing e-government projects and delivering public services. Outsourcing and public-private partnerships are tools to complement government activities or help government fulfil its responsibility. It will remain so at least until: (1) actors in the private sector are sufficiently developed and receive a certain level of credit from the public; and (2) government is capable of rendering transparent and efficient management in taking up such activities.

5. SUMMARY AND POLICY RECOMMENDATIONS

5.1. Summary

Institutional arrangements for ICTD policy are constrained by a variety of critical factors such as historical and geographical conditions, economic and social composition, technological advancements, and political and government machinery. In addition, political leadership and policy vision of top policymakers are crucial to the success in utilizing ICTs as tools for economic and social development. These factors together determine the structure and functions of institutions for ICTD policy, which in turn affect the selection, results and changes of the policy functions. Policy makers who are strongly committed are usually interested in building good institutional arrangements for integrating ICTD policy into broader policy goals and facilitating inter-ministerial cooperation.

Institutions are multi-purpose vehicles for either promoting or regulating various issues surrounding ICTD policy. Countries, whether advanced or developing, adopt several institution models in planning, coordinating and implementing various objectives at supra-ministerial and ministerial levels. While in some countries, ICTD policy functions are highly centralized into a supra-organization or a ministry, those functions are decentralized among several ministries in others. In general, an integrated institution model is a rational approach to ICTD policy making.

Recently, institutions undertaking ICTD policy functions tend to shift toward greater centralization of ICTD policy issues. It is somewhat a contrast to the decentralization, delegation and devolution trends of administrative functions in recent decades. Centralized governance needs coordination, cooperation and collaboration among relevant actors. Collaboration continues to be encouraged, with an even stronger emphasis on collaboration across sectors to create net worked society (United Nations Department of Economic and Social Affairs [UNDESA], 2008: 73).

It is more realistic to divide institutional arrangements for planning and coordinating ICTD policy agendas into supra-ministerial and ministerial levels. Many countries including Australia, Japan, the Republic of Korea and the USA have operated so-called integrated institutions for promoting the functions of government-wide ICTD policy since the 1990s. A common factor among those countries is strong leadership and continued commitment of top policymakers. CIOs and CIOCs can contribute to driving integrated ICTD policy into a master plan framework.

At the ministerial level, there are variations in institutional arrangements for ICTD policy agenda, especially, for e-government. There are four types of institutions for leading national informatization including e-government: planning and finance, administrative process, techno-industrial network, and integrated ICTD. Each model has its own advantages and disadvantages.

The success of ICTD policy initiatives depends highly on the role of government in ensuring a proper legal and regulatory framework for their formulation and implementation. In addition, various budgetary frameworks, legal rigidity and operational flexibility are needed in order to meet the specific demands of ICTD policy programmes. Political leadership to smooth the relationship between the government and the congress is indispensable.

In the Republic of Korea, the MIC, as a successful model of an integrated ICTD ministry, developed a variety of ICTD policy agendas to fill in the institutional vacuum arising from privatization or devolution of postal and telecommunications services since the 1980s. It was a product of a strategic choice of the Korean government to cope actively with globalization and free trade and enhance national competitiveness in the 1990s. With a variety of policy instruments to carry out its missions, the MIC immediately enacted the IPFA in 1995, and established High-Speed Broadband Network Projects (1995-2015) and the Informatization Promotion Master Plan (1996-2000). The MIC pushed ahead with several mega projects with the financial support from the IPF, and technical and human resources support from a variety of public bodies such as the NIA, KISDI, ETRI and KISA. If the MIC had limitations in leadership competencies in securing financial resources and technical expertise, the ICTD policy agenda would have remained outside not only the socio-economic development agenda but also broad public sector reform including e-government. Institutionalization of the MIC is, thus, regarded as a key factor for explaining the success of ICTD policy in the Republic of Korea.

Nevertheless, a considerable justification is required for designing new institutions for ICTD policy in order to resolve concrete problems or apply specific solutions to policy issues associated with various values and interests established over a long period of time. In addition, top policymakers should pay special attention to the values and interests that are systematically excluded or underrepresented by existing institutions.

5.2.   Policy Recommendations

Institution building should include, in essence, clear vision and missions, policy frame and critical policy instruments. In detail, institution building requires:

- Strong political leadership and continued commitment of top policymakers.

- Clear vision and missions on ICTD policy that are linked with the economic and social development agendas.

- Institutional arrangements: Establishment of a ministry with integrated ICTD policy functions and commitment of the president's or prime minister's office as a liaison officer.

- Support agencies: Establishment of specialized public bodies that are commissioned to work as ICTD think tanks, R&D, promoting or regulatory agencies, technical support or financial management.

- Master plan: As mid- to long-term plans can envision the future, continuous and consistent implementation of the master plan across different administrations is critical.

- Legal and regulatory frameworks: A framework law system is preferred because it can include organic, authorization and appropriation functions into a single law. In addition, a balance between promotion and regulatory functions is required.

- Budgeting: Establishment of a special fund for ICTD policy agenda is necessary to ensure budgetary flexibility in terms of time horizon, adaptation to emerging technologies, etc.

There is, however, no "one best way" or "one size fits all" solution to the question of how best to design institutional arrangements for ICTD policy. Institutional mechanisms must fit the policy context of individual countries. Not all successes in some countries are automatically guaranteed successes in others. Although creating a new institution may be easy and involve little cost in one country, it may be comparably difficult and involve huge costs in another. The MIC or PEGSC in the Republic of Korea is just one of several alternatives for institution building. Therefore, developing countries need to first be aware of their conditions and needs before benchmarking and applying successful cases of other countries to their own context. This is the most important lesson that policymakers and public officials in developing countries have to keep in mind.

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