Services catalog - Digital Territory Model

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NIPA, Korea

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Prólogo

El Ministerio de Telecomunicaciones y de la Sociedad de la Información (MINTEL) y la National IT Industry Promotion Agency (NIPA) en el marco de Cooperación International entre Ecuador y Korea del Sur, presentan el documento: “Services catalog - Digital Territory Model”. El presente documento es un aporte para el desarrollo de Territorios Digitales y fue elaborado por WoonKang Chung, Expert National It Industry Promotion, quien se encuentra colaborando en la Dirección de Fomento de la Industria y Servicios para la Sociedad de la Información.

El MINTEL tiene como objeto garantizar el acceso igualitario a los servicios relacionados con telecomunicaciones, para de esta forma asegurar el avance hacia la Sociedad de la Información y así el buen vivir de la población ecuatoriana asegurando niveles progresivos de acceso de la población a las TIC, mejorando las capacidades de la ciudadanía para el uso eficiente de las TIC, asegurando la existencia de aplicaciones y plataformas informáticas, fomentado el desarrollo de la industria de la información y del conocimiento, promoviendo marcos regulatorios, legales, culturales e institucionales adecuados y asegurando que los segmentos más desfavorecidos sean incluidos en el desarrollo de la Sociedad de la Información con proyectos y acciones específicas.

En el Marco del "Programa Nacional de Gobierno Digital" establecido en la Estrategia Ecuador Digital 2.0, se busca acercar la administración pública a la ciudadanía y sector productivo, a través de la formulación de programas y proyectos; además de empoderar al Estado, a los Gobiernos Autónomos Descentralizados y a la población ecuatoriana en el manejo, perfeccionamiento y buen uso de las Tecnologías de Información y Comunicación para su aprovechamiento en los procesos productivos, educativos, sociales, económicos alineados al Plan Nacional del Buen Vivir y por ende en procura de la mejora de la calidad de vida de la población ecuatoriana.

El proyecto plantea a través del Componente: Proyectos emblemáticos de e-servicios implementados, promover la transformación de diferentes ciudades en el país a fin de que logren convertirse en “Territorios Digitales”; para ello establece líneas de acción que el MINTEL ha consolidado a través del Libro Blanco de Territorios Digitales en Ecuador, publicado en el Portal del Observatorio TIC y en el cual se destacan: el modelo, fases de desarrollo, mecanismos de gestión, sustentabilidad y sostenibilidad.

El Modelo de Territorio Digital considera al ciudadano como actor central, tres componentes transversales: Infraestructura, Normativa y Sistemas de Información, y cuatro ejes fundamentales: Gobierno Electrónico, Alistamiento Digital, Temáticos Esenciales y Productivos.

Preface

“Ministerio de Telecomunicaciones y de la Sociedad de la Información, MINTEL” and “National IT Industry Promotion Agency, NIPA” in the framework of International Cooperation between Ecuador and South Korea, show the document: "Services catalog - Digital Territory Model". This paper is a contribution to the development of Digital Territories and was elaborated by WoonKang Chung, Expert National it Industry Promotion, who is working at “Dirección de Fomento de la Industria y Servicios para la Sociedad de la Información”

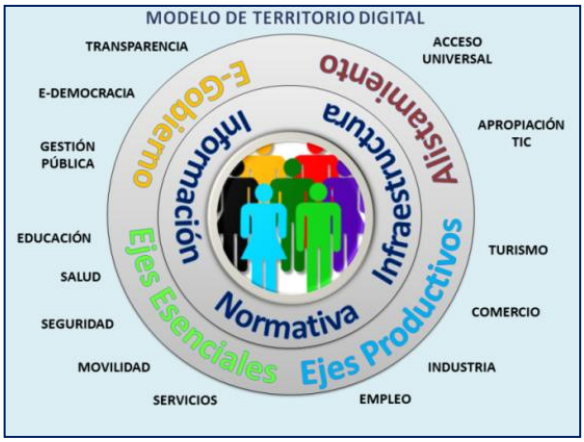
The MINTEL aims to ensure equal access to services related to the telecommunications area, to thereby ensure progress towards the Information Society and so good live Ecuador's population ensuring progressive levels of public access to ICT, improving the capabilities of citizenship for efficient use of ICT, ensuring the availability of applications and platforms, encouraged the development of information industry and knowledge promoting regulatory, legal, cultural and institutional frameworks appropriate and ensuring that the poorest segments are included in the development of the Information Society projects and specific actions.

In the framework of the "National Program for Digital Government" established in Ecuador Digital 2.0 Strategy seeks to bring the public service to citizens and productive sector, through the development of programs and projects; besides empowering the State, the autonomous governments and the Ecuadorian population in the management, development and proper use of Information and Communication Technologies for its use in the aligned productive, educational,

social, economic processes to the National Plan for Good Living and therefore in pursuit of improving the quality of life of the citizens.

The aforementioned project aims through Component: Major projects of e-services implemented, promote the transformation of different cities in the country in order for them to become "Digital Territories"; for it defines action lines that Mintel has consolidated through the “Libro Blanco de Territorios Digitales en Ecuador”, published in the Portal of ICT Observatory and which are: the model, stages of development, management mechanisms, sustainability and sustainability.

Digital Territory Model has citizen as central actor, three transverse components: Infrastructure, Standards and Information Systems, and four axis: Electronic Government, Enlistment Digital, Essential Thematic and Productive.



M1. Infrastructure component

1. The meaning of infrastructure building

The rapid development of ICT will change again to the new paradigm of social connection for the high-speed connection society. The high-speed connection society can connect various objects based on an intelligent network, and it is oriented to human-centered society utilizing the data derived.
To meet the imagination and creativity of the people is another paradigm for realizing people happy.
The advanced infrastructure can be a solution to solve the current social issues using ICT creatively, and it is an essential factor to create new demand and new business.
According to the changing of the national informatization to 'Combining and using of the ICT in the every social area', the accumulated information infrastructure will be the core of the future national development.

2. Infrastructure for e-government

E-Government refers to 'A government of changing the administrative work of the government and public agencies efficiently by ICT'. Government apply ICT such as information system and internet to process works of all government institutions, so can improve the efficiency, transparency, quality of service and facilitate the participation of citizens.

Implementation of ATM-based high-speed national network and service system can be the first step of the national information infrastructure.
Also, government integrated computerizing center could not be missed.
Government integrated computerizing center is an essential infrastructure of e-government, and it is a comprehensive solution to solve the budget redundant, lack of security facilities and poor computing environment.

Table 2-1: E-government infrastructure projects classified

Sector	Infrastructure
Citizen convenience	Consumer custom administrative information system based on joint use
	Advancement of civil service
	Build a National portal
	Connect welfare information system of multiple departments

Economy improvement	Business competitiveness Support System
	National Logistics, Trade Information Network Integration
Administrative efficiency	Spatial information (GIS) fusion, complex services
	National Diplomatic, Trade Information Management System
Strengthening social security	Socially disadvantaged comprehensive support system
	Prevention-oriented livestock safety management
	National Security Information Integration
	Meteorological data standardization and joint-use system
ICT-based reinforcement	Standard e-government common services and development framework
	National EA based joint use system
	Integrated Authentication System
	Service-oriented national resources open, shared system
	Green IT-based smart environment

Table 2-2 : Administration information network Progress (Korea)

1980	1995	2005	2009 2014
National infrastructure computer network	High-speed national network	E-government network	Communication service system
Administration Computer Network	Central government	Administrative institute	
Financial Computer Network	Local government		
Education, Research Network	Public institute	E-government integrated network	National backbone
Defense Computer Network	Schools		
Public safty computer Network		Local government	

3. Infrastructure essential

Network upgrading is an essential infrastructure of a digital society. Therefore it is a major challenge that is needed as the core of national competitiveness, such as job creation and the Internet led economic growth.
In the digital economic era launched by the internet revolution, ICT is coupled to the existing creative industries such as culture, art and creation, and so it creates new value-added industries.
Based on knowledge and information, ICT had leading the activation of the creative industries through improving the efficiency and productivity. Also ICT had leading the innovation of the creative industry such as 3D movies, augmented reality games and applications through combining to new technology and internet.
Meanwhile, we can expect that the mobile revolution lead the creative economy, and ICT could be the key resource in the valuable combining industries.
That is the role of the new information in the creative economy is to create new growth engines and values through facilitating of the personal creativity and fusion.
From the technical aspect, the global economic paradigm is led by ICT ecosystem linked closely with contents, platform, network and device.

Table 3-1 : Government Information Infrastructure consolidation phase

2005 - 2007	2009 - 2012	2013 - 2017
Location integration	Equipment integration	S/W, Service integration (PaaS, SaaS)
Government Integrated ITS	Infrastructure Resource Integration	WAS / DBMS standardization, integration
Surface integration	Network Security Integration	N-screen application
Green IT	Virtualization technology	Multi-tenancy application
		Common Business Integration

Center integration	Integrated implementation	Clouding computing

Table 3-2 : Big data essential infrastructure management details

Management	Database	User interface	Community
* User authentication	* User information	* Web-based analysis	Sharing:
* Resource allocation	* Infra. information	* Upload, download	* Big data output
* Infra. monitoring	* Collection	* Work follow	* Consulting
* Infra. management	* Analysis	* Visualization	* Technology
	* Working process	* File management	

Big data infrastructure interface					
Monitoring i/f	Control i/f	Hadoop i/f	HDFS i/f	Data i/f	User i/f

R&D infrastructure			
Hive	Pig	Mahout	Statistical analysis
Meta-data management		Java M/R	
MapReduce Framework			
Hadoop HDFS			

Data in-out			
ODI	Flume	Sqoop	OpenAPI

Human infra
* Virtual Practice * User selected S/W * Monitoring / Control module * Kernel-based virtualization (KVM)

4. Infrastructure productive

First, ICT technology will be changing in the direction that contribute to human abilities improving over the field of physical, emotional and cognitive through developing the wearable computer technology. And 3D Bio print, BCI (Brain-computer interface), Speech translation and Gesture control will be activate more.
Second, the productivity will be increased by human replacement type machines such as the hologram, unattended car, mobile robot, remote operations support (Virtual Assistant) and etc.
Third, the work efficiency will be maximized through combining the emotional intelligence and problem-solving skills of human and productivity and speed of machines. To achieve that, the technologies such as Unattended car, Mobile

robot, NLQA (Natural language question answer) and remote operations support will be utilized.
Fourth, it is possible to provide a better value to the emotion and situation of the people through the interaction that is related with the context-aware.
To improve the machine understanding about the human and environment, there will be utilizing Affective computing, Bio-chip, 3D scanner, location-based intelligence and voice recognition technology, etc.
Fifth, the smart people and machine will be appeared by giving recognition and intelligence through Big data, Analytics, Cognitive computing and etc.

Finally, in the view of the productivity, the infrastructure have to build to meet the changing of each era of the information society. Therefore, the following table explains the relation of the changing of information society and the infrastructure.

Table 4-1 : Changes in the information flow and Infrastructure

Periodization	Information 1.0	Information 2.0	Information 3.0
	Industrial revolution	Internet revolution	Mobile revolution
	Industrial economy	**Digital economy**	**Creative economy**
Creative economy	Cultural, artistic, creative	3D, Game, App, UCC, new media advertising, eBook, ...	Data-driven value creation, new technology leverage business
Effective	Automation	Computerized, efficient, productivity improvement	Creative utilization, value creation, new business excavations
Key Infrastructure	**Physical assets, labor, capital**	**Knowledge, information**	**Convergence, contents, creativity**

5. Infrastructure readiness

In the future information society,
First, an active response and resolve about the social issues as the disaster, welfare and education are needed. When an information infringement occurs,

countermeasures have to be taken quickly. In addition, it must be considered a method to reduce the Digital divide and Smart divide.
Second, the need for a national data spread throughout society and the need to create value-added will be increased.

Table 5-1 : Infrastructure readiness check details

Division	Details
Environment	Market Environment
	Political and regulatory environment
	Infrastructure Environment
	Business and innovation environment
Readiness	Private sector readiness
	Corporate sector readiness
	Government sector readiness
	Infrastructure and Digital Content
	Prices adequacy
	Utilizing skill
Utilization	Private sector utilization
	Corporate sector utilization
	Government sector utilization
Influence	Economic influence
	Social Influence

Table 5-2 : Technology sector readiness check details

Division	Details
Technology Infrastructure Readiness	Availability of latest technology
	Enterprise-wide technology acceptance
	FDI and Technology transfer
	Internet users
	International Internet bandwidth
	High-speed Internet subscribers

Appendix : ICT Infrastructure status of KOREA

Table a-1 : Process of national informatization promotion (Korea)

Division	Introducer	Growing		Maturity
	1987-1994	1995-2000	2001-2007	2008-current
Goal	Basic DB implementation	ICT infrastructure implementation & internet use spread		Advancement of ICT utilization
Method	Automate, streamline	Improve Networking productivity		Convergence Service Innovation
Main plan	National ICT network infrastructure	Information Promotion Master Plan	u-Korea master plan	National ICT master plan
e-Gov.		Departments, Local government information system	11 and 31 challenges of e-government	Smart e-government information resources integration
ICT infra.		High-speed information network		Broadband Integrated
				WiBro, RFID, DMB, IPTV

Table a-2 : National ICT infrastructure implementation process (Korea)

Year	User Trends	Infrastructure Implementation
1987	10 million phone lines	
1993	20 million phone lines	
1995	1 million mobile phone subscribers	1st phase high-speed information communications infrastructure implementation
1998	10 million mobile phone subscribers	
1999	10 million internet users 20 million mobile phone subscribers	2nd phase high-speed information communications infrastructure improvement
2001	20 million internet users	
2002	30 million mobile phone subscribers	3rd phase high-speed information communications infrastructure improvement
2004	30 million internet users	iPv6 promotion master plan
2006	40 million internet users	u-Sensor network (USN) implementation
2007	40 million internet banking users	BcN implementation
2009	10 million mobile banking users 1 million IPTV subscribers	Broadcast Network enhancement
2010	50 million mobile subscribers	
2013	30 million Smart phone subscribers 10 million Internet phone subscribers 6 million IPTV subscribers Wireless high-speed Internet penetration rate of 100%	Object Intelligent Communication Infrastructure implementation

M2. Regulation component

1. National ICT-related Regulation

ICT technologies in the modern international society are the important means of solving various social problems and creating value.
Therefore it is being play a key role of a sustainable future society.
Many countries in the world have a regulation, so called "National information society basic regulation". It is being the base of the strong momentum of the government.
And continuously they are improving the relevant laws and regulations according to the change of the state-of-the-art technology and society.
In general, information society regulations are classified into 5 types as follows according to their function and role:

- Making the Information Society foundation,
- Activate information society services,
- Information and Communication industries promotion,
- Information Society Intellectual Property establishment,
- Information Society dysfunction protection

Finally, all countries are promoting the ICT industries to achieve their own development and competitiveness, and they are realizing national information society and regional information society.

2. Information society basic regulation

Information society basic regulation is a kind of law to define an organization, promotion system, implementation and rule of national information society.
Therefore, the new or revised regulation is essential to the prior laws as the followings.

2.1 E-government and public information area

E-Government Act,
The regulation relating to the efficient operation of the administration,
The laws relating to civil petitions process,
Resident Registration Act,
Public Records management regulations,

Law on National Spatial Data

2.2 The environment of the information usage

Electronic Signature,
Electronic Commerce,
Intellectual Property Basic Law,
Law on Information Security

2.3 Prevention of Information dysfunction

Privacy regulation,
Regulations on protection and use of credit information,
Communications Secrets Act

2.4 Continuous development of ICT skills and industry

Telecommunications Basic Law,
Software Industry Promotion Act,
Industrial Technology Innovation Promotion Act,
Electronic Financial Transactions Act,
E-learning regulations,
Culture Industry Promotion Basic Law

3. Regional digitalization

3.1 The concept of regional digitalization

Regional digitalization means promoting regional development and solving local problems based on ICT technologies, by all of local government, local businesses and local residents.
The main purposes of the beginning of regional digitalization in the world were the elimination of the information gap and the computerization of administrative processing through improving people's information literacy.
Currently the purpose of regional digitalization is changing to the competitiveness improvement, the growth of residents income and the regional economic growth according to the development of ICT technologies as bi-directional, compact, wireless and ubiquitous.

Table 3-1. Range of local digitalization projects

Division	Range of projects
Local information infrastructure	Information systems, regional information infrastructure building
	Eliminating the digital divide
	Data protection and security for local information shared use
Local Services	Local service development and dissemination
	(History, culture, welfare, environment, etc.)
Information Resources Management	Integrated Management of Information Systems and Information Services
	Prevent duplication of investment of local digitalization
	Joint use of the local computerization

Table 3-2. Local government civil service promotion Overview

Division	Main topic
Object	Public relations of local government
	Information service providing for residents
	Communication and consultation with residents
	Administrative services
Operations	Configure a dedicated organization
	Consignment operators selection
Charged department	Promotion
	Gazette
	Information and Telecommunication
	Chief of Staff
Activation plan	Incentive offer to residents and officials
	Configure a dedicated organization
	Budget allocation

3.2 The basic principles of regional ICT regulation

- Facilitate the expansion of private investment and fair competition
- Establishment of regulations to respond actively to the environmental changes
- Freely access and utilization of information infrastructure
- No regional and economic discrimination
- Privacy protection and maintain the safety of the various information resources and intellectual property
- Promotion of international cooperation

3.3 Essential regulations of the basic plan of regional digitalization

The basic regulation for regional digitalization should include the followings:

- The basic direction of policy to promote digitalization
- The digitalization of administrative tasks
- Concerning the promotion of the industry
- Financial sector digitalization
- Education, Research, Technology and Environment digitalization
- Region, Culture and Life areas digitalization
- The sector of Information Security
- Telecommunications standardization
- Protect privacy and intellectual property
- Concerning the procurement and management of financial resources

Table 3-3. Basic checking items of regional ICT Regulation

Division	Detail items
ICT-based (Internet usage environment)	Computer holdings status
	Network Construction status
	WiFi-connected device
	E-book used equipment
	High-speed wireless Internet access devices
	Information obtained path
	SNS equipment
Information usage	Internet Usage status
	Wireless internet terminal usage status
	Wireless Internet utilization rate
	Wireless Internet services and contents
	Mobile Internet Usage status
	WiFi Usage status
	Wireless high-speed Internet Usage status
	Smartphone Usage status
	E-government services usage status
	Internet homepage main features
	E-commerce Usage status
	RFID service coverage
	Internet TV, Newspaper Usage status
ICT investment and business	Investment status for computerization
	Business innovation through IT

innovation	Green ICT status
	Telework status
	Mobile Office status
	ICT training
Privacy and Security	Security Management status
	Security Damage Tracking
	Information security product-specific usage status
	Security Policy status
	Data protection-related activities
Internet and communication	Means of communication
	Email Usage status
	Instant messanger Usage status
	SNS usage status
	Internet Shopping Usage status
	Internet Banking Usage status
	Internet Stock Trading status
Dysfunction of computerization	Internet incident response
	Data Security Management
	Illegal Spam response
	Corresponding privacy
	Abuse Information
Others	IT utilization index
	Digital Divide Index
	Vulnerable class's Internet usage
	Vulnerable class's PC holding status

4. Regional digitalization status of the world

4.1 USA

The United States had begun to make low cost and high efficiency government at Clinton administration, and has been pushing the digitalization for the growth and prosperity at Obama administration.
This is based on the perception that ICT technologies still can contribute to economic growth and to create jobs persists.

Table 4-1. United States regulations relevant to regional digitalization

Time	Typical regulation

Early 1990s	Regulation for National Performance Review
Mid-1990s	Clinger Cohen Act, 1996 (Government IT management and leadership required)
Late 1990s	Freedom of information Act E-Commerce regulation Electronic Signature regulation
Late 2000s	Online protection-related regulation Cyber Security
After 2008	Open-government regulation Cloud services related regulation

4.2 Canada

Canada is planning to invest approximately 80 million dollars in the digital economy promotion through the 'Economic Action Plan'. The purpose is to spread of digital technologies across the entire industry, and to overcome the gap between urban and rural areas.

Table 4-2. Canada regulations relevant to regional digitalization

Time	Typical regulation
1990 e-Government	E-government projects Regulation
	Administrative Service promotion Regulation
	Connect all Canadians with the network
2003 i-Government	Government organization Management Excellence
	IT Shared Services related regulation
	Corporate Services Regulation
	Service Canada
2008 Government-2.0	Public Service Modernization
	Governmental business modernization
	Strategic Assessment of e-government projects
	Next-generation Services

4.3 England

In 2010, British Conservative Party D. Cameron government had revaluated all of the digitalization projects of the previous government. And they reduced significant cost by the rearrangement of the projects low valued and duplicated.

After that, they announced 'Government ICT Strategy' to implement the possibility of the future of United Kingdom utilizing information and communication technologies in March 2011.

Table 4-3. Britain's regulations relevant to regional digitalization

Target	Implementation regulation
Economic Growth	Knowledge based Asset and Services
	Open source
	Strengthen ICT capacity
ITC infrastructure design	Open data standards
	Open technology standards
	Cloud computing framework
	Public Service Network
	Data Center Integration
	End-user terminal strategy
	Eco-friendly ICT
	Information Strategy
	Crisis management system
Public Service Innovation	Communication and interaction passage changes
	App. Programing Interface
	Online Government Advisory Council
	Social media passage changes
Governance system enhancement	Government-wide ICT sector cooperation regulation
	Governance enhancement regulation

4.4 Germany

The German federal government announced the strategy ‘Germany Digital 2015' in November 2010.
This strategy contains the following six basic regulations to reflect a comprehensive and future-oriented ICT.

- Competitiveness enhancement of the overall economy through the use of ICT technologies.
- Meet the challenges of the future society through a digital infrastructure and network expansion
- Private users protection
- Commercialization support of ICT areas
- Enhancement the training on the new media
- Ongoing utilization of ICT to improve the quality of life

4.5 Japan

Japan has made an effort to take advantage of ICT technologies in various fields as economic growth, job creation, welfare and green growth.

Table 4-5. Japan's regulations relevant to regional digitalization

Target	Implementation regulation
Citizen-centered electronic administration	Administrative reform using ICT
	Public services sharing using ICT
Local-based activation	Health care reform
	Elderly assistance
	ICT in education
New markets creation and International leader	Establish regional sovereignty
	Establish safety
	Realizing a low-carbon society
	(ICT and environment technology convergence)
	ICT Research and Development
	New business creation for the young generation

4.6 China

China has been pursuing a national ICT as a key competitive advantage. In 2002, they announced "National economic and social development plan", and begun to approach step by step under the strong leadership of the government.

Table 4-6. China's regulations relevant to regional digitalization

Target	Implementation regulation
Transition and advancement	Global economic response
	Industrial structure optimization
	Modern industrial system
Manufacturing industries reform	ICT industry R&D level upgrade
	Basic electronic products inside development
	Value Chain upgrade
	Cooperation between companies of the ICT industry
	Regional ICT industry M&A
	Build own brand
Strategic emerging industries promotion	Energy saving
	Environmental Protection
	New generation information technology

	Next-generation networks
	Internet of things (IoT)
	Cloud Computing
	State-of-the-art software
	Information Services
	Industrial investment fund
	Risk compensation policies including tax incentives
	Technical Standards System
Information level increase	Next-generation mobile communications
	Next Generation Internet
	Digital broadcasting
	Wireless Broadband city construction
	IoT applications Pilot Project
	Cloud computing services platform
	Broadcasting and Communication regulation

4.7 Australia

Australia's ICT strategy is focused to the efficient management of the natural environment and scarce resources.
And they have achieved a significant level of national digitalization in a short period of time through the creation of new economic value of ICT and the attention of social services.

Australia's six regulations for regional digitalization:

- Understanding the value of digital information and management
- Digital information governance roles and responsibilities
- Reliability of digital information
- Access to and use of digital information
- Management of the digital system
- Digital information protection, preservation and disposal

5. Conclusion

Now all of the countries of the world are implementing various policies to enhance national economic competitiveness.
In particular, they are enacting laws to achieve the regional digitalization according to the advancement of ICT and changing of usage environment.

After all, these efforts are for the national advancement, the improvement of the quality of life, and to improve the competitiveness in the world.
Wasting a time in vain a planning for the planning will give a great loss to the country and its people. Thus, the concrete implementation plans and regulations must be existed to support the realization of the digitalization taking into account the characteristics of the national and regional realities.
This will have formed part of the government leadership.

Appendix: Regulation progress for the realization of regional digitalization (Korea)

Table a-1 : Regulation progress for the realization of regional digitalization (Korea)

Year	Regulations
1980 - 1993	Regulation on the computer network dissemination expansion
	National Computer Network basic regulation
	Information society general regulation
	High-speed Communications related regulation
1994 - 1997	Framework Act on Computerization Promotion
	Computerization projects evaluation
	Advanced information network regulation
	Information Infrastructure Protection
2001 - 2003	Regional Digitalization Promotion
	Data protection regulation
	e-Korea Vision 2006 establishment
	Digital contents regulation
	Broadband IT Korea Vision 2007 establishment
	Establish local e-government roadmap
	Broadband Convergence Network (BcN) regulation
	Regulation on IPv6 distribution
2004 - 2006	Master Plan to establish a new growth engine
	Establish u-Korea Master Plan
	Next-generation e-Government Master Plan established
	3rd Regional Digitalization basic plan (u-Life) established
2007 - 2009	u-City implementation regulation
	President's records management regulation
	Green ICT regulation
	Cloud Computing regulation
	Wireless Internet general regulation
	Smart-work regulation
2010 - current	Smart infrastructure upgrade regulation
	IT Convergence Extension strategy
	Broadcast Communications regulation
	Social platforms regulation
	Smart e-Government Plan
	Mobile e-government action plan
	Cloud-based IT governance promotion

M3. Information System Component

1. The new paradigm of national information systems

The rapid development of ICT will change a new paradigm of social connection to our community once again. And the super connection society is connected to the various objects based on intelligent network, and is oriented human-centered society utilizing data derived.
This is new paradigm for the people happy realization based on the imagination and creativity of people.
Through this flow, national information system must be changed to 'ICT grafting utilization of whole of the social area' from 'ICT centered spread'.

2. National, Social Information System

2.1 Public sector

- **Central Administrative Information System**
  The government can improve the efficiency and transparency by using the information systems through the realization of e-government, can improve the quality of government services for citizens and businesses, and can make the growth of democracy through the participation of citizens.
  Central administrative information system should precede the computerization for business unit such as social security, real estate, cars, passports, patents, procurement, etc.
  In addition, it should be developed as a core management system of country through improved administrative efficiencies by sharing of the information between government agencies.

Table 2-1. Development stage of the central administrative information system

Stage	Main service
1st Stage (Start)	Provide limited information
2nd Stage (Progression)	Periodically management of content and information
3rd Stage (Electronic trading)	Visa, passport and personnel records online issuance Tax and Fees electronic payment
4th Stage	Provide online services without border between institutions

(Integrated process)	Public and private service convergence

- **Regional Information System**
  'Regional information system' means to promote development using the information and communication technology to solve regional problems between local government, local businesses and local residents.

Table 2-2. Development scope of regional information system

Division	Development scope
Information system infrastructure	Making the foundation of local information system
	Eliminating the information gap
	Data protection and information security for joint use
Regional information services	Development regional information system
	: history, culture, welfare, environment, etc.
Information resources management	Integrated management of information system and services
	Joint use of regional information

Table 2-3. Local administrative information system development roadmap

Division	1. Introduction	2. Application	3. Stability, Expand
Sustainable administration	* Process centered system design * Information joint use * Standardization and field support system	* Process centered system expansion * New function development	* New civil services development * Function expand * Joint use expand
Productive administration to create value added	* Standard process creating * Process management system establishment	* Local office business management system * Productive administration linking	* Local government performance, knowledge, customer management system

Advanced civil services	* One-click internet services * Attached documents Reduction	* Co-work internet window expand * Service content expand	* Provide diversification of service means
Unified reporting and statistics system	* Reporting and statistics systems of the local government as an information channel	* Reporting, statistics system expand	* Expanded system through process
Information resources management system	* Business and Technology standardization	* Expanded business and technology based on the standardization	* Expanded standardization
Applied business	* Hygiene, Women, Internal administration, Auditing, Legal, Parliament	* Welfare, Environment, local industry, Civil defense, Volunteer	* Health, Rural, Construction, Livestock, Forests, Fisheries, Culture, Water and Sewage, Road transport, Regional development, Disasters, Gazette

Table 2-4. Local administration spatial information system standard model

Business	System development content
Environment	* Emissions management, Hazardous chemical management, Water management, etc.
Health and Hygiene	* Hygiene, Sanitation management, Food hygiene, etc.
Economy	* Energy management, Industrial development, Labor administration
Internal administration	* Shared Asset Management (property search, surveys, acquisition, disposition management, etc.)
Cultural Tourism	* Tourist facilities management, Youth facilities management, Culture and arts distribution-related areas, etc

Fisheries	* Fisheries support, Fisheries management, Water specific management, etc.
Agriculture	* Eliminating the inefficiencies of handmade and double leverage system * Computerization of land management and related civil work
Road	* Improving location and condition monitoring system of roads and road facilities * Road planning, reimbursement, road occupation business management standard system
Traffic	* Licensing, transportation facilities management redundancy process improve * Illegal control, parking management support system
Health	* Health service needed person, company, institution position management * Citizen services based data gathering
Forests	* Natural Recreation Forest management, Arboretum management, etc. * Nature Forest assignment, composition, management system
Livestock	* Livestock statistics management, livestock hygiene management, etc. * Livestock statistics inquiry system
Cultural Heritage	* Cultural property management, development permit system * Cultural assets and monuments position inquiry system
Local Administration	* Survey and planning system for adjusting administrative area * Local administrative facility and resources management system
Regional Development	* Units zoning and management, groundwater management system * Development support system based on cadastral maps

2.2 Citizen's Life Sector

- **Education information system**

As being installing an education information institute by each municipality, the quality of education and studies will be raised through the production, survey and collection of the educational information.

- **Science and technology information system**
  The National Science & Technology Information Service is an information system for enhancing the efficiency of the research and development over the entire period.

- **Welfare, cultural information system**
  Medical Information System, Welfare information system, Social insurance information system, Employment information system and Cultural information system can improve the quality of life for local residents, and also those increase the reliability of the country.

- **Environment, disaster management information system**
  Environmental Information System, Disaster Management Information System, Food & Drug Information System and Police information system ensure the community safety of the residents.

Table 2-5. Resident participation safety information sharing platform

Safety Information Sharing Infrastructure						
Resident / Site		Police office			Police / Resident	
CCTV Smart phone Internet tip Black box		==> Digital archive center ==>			Portable terminals Field police Smart police car Civil services	
Related technology	GPS	Community mapping	Black box	WiFi	App	Smart Phone

2.3 Economic Sector

- **Industrial Information System**
  Agricultural and fishery information system
  Manufacturing Information System
  Construction Industry Information System
  Financial information system
  Logistics, retail information system

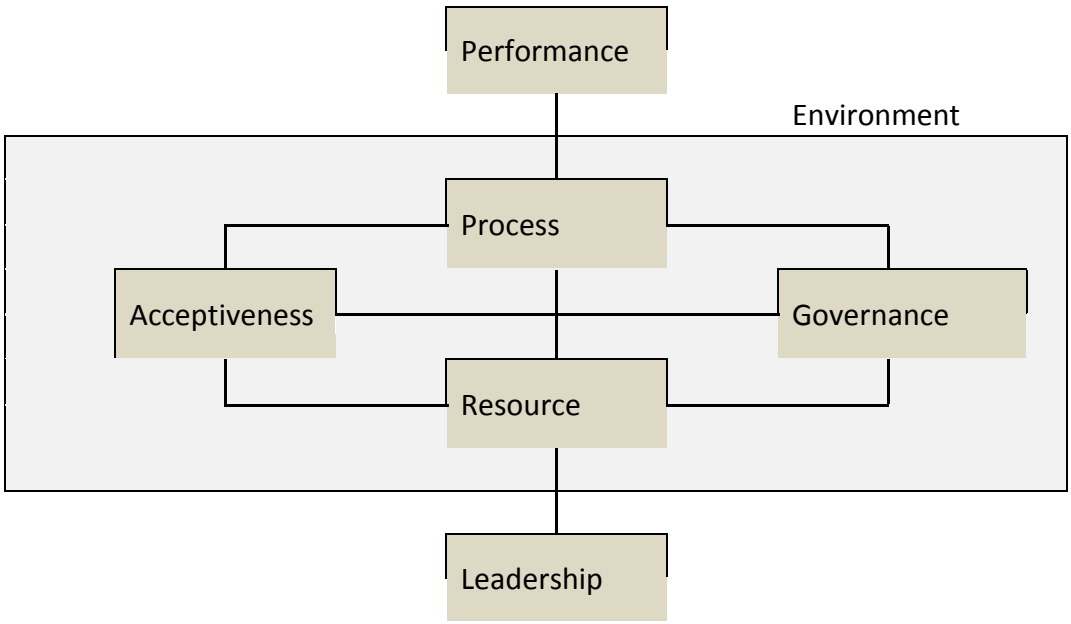
Tourism Information System

- **Social overhead capital information system**
  Intelligent Transportation Systems (ITS)
  Spatial Information Systems
  Smart Grid

3. Conclusion

Utilization of ICT and information systems are an essential element of modern society.
However, most local governments doesn't have enough professionals for planning and development of regional information systems.
So to do this, the support of the central government is absolutely necessary.
If the development of regional information systems is delayed because some problems such as manpower and budget, it will be more difficult to improve the quality of life of local residents.
The professional organizations of the central government must propose and support a regional specialized information system in consideration of the environment, budget and manpower in each region.
When utilize the developed information system, the environmental improvement must be continued through the 'Information Systems integrated assessment framework' as shown in the following figure.

Table 3. IT utilization index integrated assessment framework



Appendix : National Information Systems Promotion Policies and Results in Korea

Step	content
Administrative information system promotion	1978-1982 1st Administrative information system master plan 1983-1987 2nd Administrative information system master plan * Major public sector information systems Resident information computerized system Passport computerized system Regional information centers established Congress legislative information system Medical Information System Government representatives homepage opening Civil services over the Internet Real estate business computing systems
National Computer Network extended period	1995-1997 1st High speed information network foundation plan 1996-2000 1st Information system promotion master plan 1998-2000 2nd Information network advancing plan * Major public sector information systems Civil services integrated information system Comprehensive statistics service information system Local Government Administration information system Online family information system Knowledge Management information system
Country, Society informatization	1999-2002 Cyber Korea 21 promotion 2003-2005 3rd High speed information network advancing plan 2002-2006 e-Korea Vision 2006 promotion 2003-2007 Broadband IT Korea Vision 2007 promotion * Major public sector information systems Electronic tax filing system Electronic Publishing System Information Village Development Project Agriculture business integrated information system Korea e-government officially launched

	National Finance Information System
Knowledge information society Implementation	2006 u-Korea master plan 2008 National information system master plan 2009 National information system action plan
	* Major public sector information systems
	E-Government service through TV Mobile procurement service Government for Businesses (G4B) system Broadcasting, communications convergence public service Public Information Quality Management System

M4. Final Recommendation

1. Introduction

Any plan which is not realized is not useful.
All plans must be have the premise to realize.
Any plan without the will of realizing will bring a great waste.
In particular, the government's plan must be realized because it gives a direct impact to the life of citizens and the development of country.
Therefore, all the plans of the government should be established in consideration of feasible budget, personnel, resources, etc.
And it should be made the cooperation of government, business and academia in order to achieve the plan.
The government has to establish a policy and implementation plan, and the business has to secure technology and workforce, and academia has to work for the research and development.
In addition, the government should evaluate the maturity level by each stage of the realization, and performs the function increasing the maturity.

2. Current Ecuadorian ICT status in my personal view

The rapid development of ICT will transform our community into a new paradigm of super-connection society.
Super-connection society is oriented human-centered society by the connection to all of the social objects based on intelligent network.
Therefore, national information system should be changed to ICT utilization combined to all area of the society.
According to data released by international organizations such as UN, ITU, currently national information index of Ecuador has remained a low level.
But it never seems in a low level by looking the ICT infrastructure and utilization of the metropolis such as Quito.
This means that the gap in the infrastructure and utilization across the entire country is big.
So, if the gap is eliminated as soon as possible, the foundation of national information will be able to provide much faster.

3. ICT trends of the world

Future economic paradigm of the world is expected to be led by the creative activities.

The concept of creative economy was introduced for the first time to Business Week in 2000, the concept is that the creativity, innovation and speed which are based on the idea take place in the main axis of the economy.
In other words, the economic major source is not land or capital, but is the creative idea.
In the era of digital economy launched by the Internet revolution, ICT has created new value by combining to the existing industries such as culture, art, creation.
Meanwhile, in the creative era that will be led by the mobile revolution, ICT is expected to be used as a key resource of valuable association with other sectors.

Table 3-1. Classification of the creative industries and the economic contribution

Classification	Detailed industris	Employment contribution	Value-added contribution
Culture, Art	Visual arts, Performing arts, Culture, Ruins	12%	7%
Media	Printing and publishing, Film and video, Broadcasting, Games, Music, Digital media	34%	38%
Design	Advertising, Architecture, Interior design, Graphic design, Fashion design, Industrial design, Exhibition design	24%	18%
ICT, SW	IT consulting, IT development, IT services, Software	30%	37%

Table 3-2. The flow of the economy in terms of ICT

Periodization	Information 1.0	Information 2.0	Information 3.0
	Industrial Revolution	Internet Revolution	Mobile Revolution
	Industrial Economy	Digital Economy	Creative Economy
Industry structure	Primary, secondary and tertiary industry	Primary, secondary and tertiary industry + Creative industry	Primary, secondary and tertiary industry + Creativity, Contents, Convergence

Creative Industry	Cultural, artistic, creative	3D, game, app, UCC, new media advertising, eBOOK ...	Value creation based on Data. New business on new technology ...
Effect	Automation	Computerization, efficiency, improving productivity	Creative leverage, Problem solving, Value creation, New services excavation
Key resources	Physical assets, labor, capital	Knowledge, information	Convergence, content, creativity
Remark		Creative Britain (1998), John Hawkins (2001), UNCTAD (2010)	Experience Economy, Dream Society, High Concept & High Touch

4. Final recommendation for Ecuador ICT sector

Government, business and academia must perform their roles organically, and should find ways to achieve the maximum synergy effect by cooperation. MINTEL have to establish ICT-based country development strategies, and must realize the strategies by the cooperation with other government agencies, businesses and academia.

Table 4-1. ICT-based industry development strategy (Recommendation)

Division	Main content
Improving culture accessibility in the digital environment	* Digitalization of the national heritage collections, * Maximizing usage of the high-speed communications and mobile and broadcasting infrastructure
Increasing creative digital content production	* Methods research of promoting the effect of the digital content, * Strengthen institutional development plan for digital content production activities

Technology development for artists and managers	* Strengthen e-business training for the creative industry executives
Enhanced cooperation in the creation sector	* Linkage of digital content and e-learning programs, * Improving user centered Social Media
Promote the commercialization of creative innovation economy	* Financing model development for the creative industries, * Industrial strategy development

The key driving forces of modern society are Creativity, Contents and Convergence.
It's possible to do various attempts by combine the Creativity and ICT, and it can create new business, market and jobs.
For example, Apple and Facebook can be called representative icons that they created a new market by the fusion of ICT in new ideas and creativity.
Thus it should be promoted various creative ventures by using ICT.

In the digital-society, the value of 'Contents' is becoming more important.
Culture, art, film, and music industry have a lot of this knowledge and information, and they have created a large added value.
In particular, the content has the advantage of "One source Multi Use", so it is possible to get maximizing the value-added.
Recent Content has increased its influence fused with digital service, and spread to various industries, so it performs as a catalyst for economic growth.

Convergence is a key of changing the leading industry, and creating new products, business and market.
In the '90s, the convergence between machines had begun, and now it has expanded toward the service-application convergence and cross-industry convergence.
Convergence is being expanded the range among skills, human, things and space, and various cases of convergence are appearing as Cyborg, Biometric devices, Smart cart, Smart City, etc.
At this point, the realization of convergence technology of Ecuadorian own type is urgent.

Through the combine of Content, Convergence and Creativity, it is necessary to promote the following challenges continuously in order to realize the future economy based on the ICT.

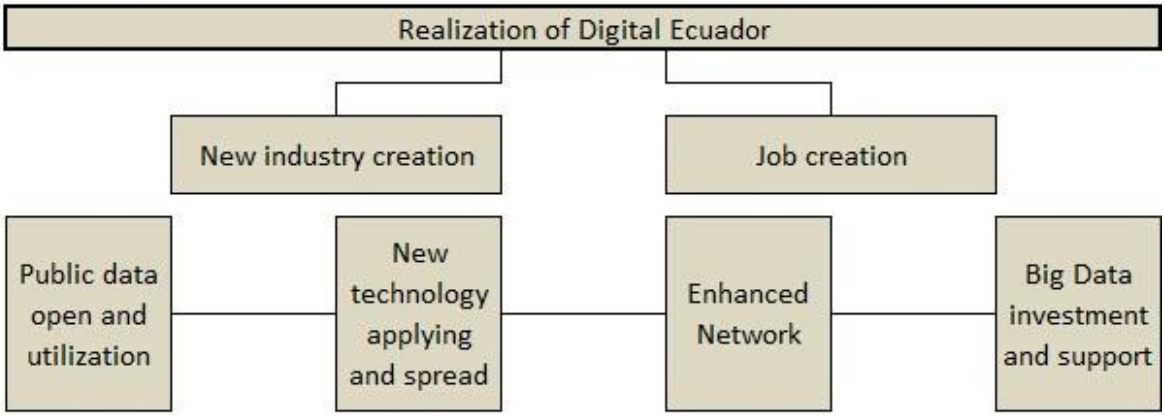
First, it's open and creative use of public data by private sector.
Zillow in the US has achieved over 1 billion dollar worth through the online real estate services utilizing public information as GIS information and demographic information.
The right to access to public data should be guaranteed to anyone, and new opportunities to create benefits utilizing public data will have to actively help.

Second, the new demand should be created through an application and diffusion of new technology
In particular, the new technologies including the Internet of Things and Cloud are creating new economic and social value across all sectors of industry as public administration, education, welfare and tourism.
Industrialized countries as USA and Japan are actively promoting the ICT R & D investments including the new industrial society-wide spread based on the convergence of ICT technology.

Third, the advancement of social networks for the future must be promoted.
Pre-emptive investments of the wire and wireless network should be done to provide for the future environment as M2M (Machine to Machine), IoT (Internet of Things), etc.
In the near future, super-connection society will be coming through connections of everything. In the super-connection society, the excellent source of network will lead the growth of new business, job creation and competitiveness.
Aggressive network policy is needed urgently.

Fourth, Big data is being highlighted recently, so strategic investments and support for big data are very important.
By leveraging the accumulated big data, the prospect and excavation for the future ICT emerging technologies will be required.

Table 4-2. The new role of ICT for Digital Ecuadorian economy (Recommendation)



Convergence :	Mobile	3D/4D	NFC	Cloud	Context Awareness	M2M
Creativity :	Creativity	Collective Intelligence	User Experience	Idea	Story Telling	Imagination
Contents :	Personal Information	Sensor Information	Space Information	Big Data	Admin. Information	Social Information
The new role of ICT: Creative utilization of knowledge contents, and promotion of creativity and convergence.						