Knowledge Societies Policy Handbook

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Foreword I

UNESCO, recognizing the transformative role played by information and knowledge across all spheres of human endeavor, has been promoting its vision of inclusive Knowledge Societies. Facilitated by information and communication technologies (ICTs), we see information and the sharing of knowledge, catalyzing changes across societal, economic and political landscapes. In this context, universal access to information and knowledge becomes crucial for social cohesion, sustainable economic development, intercultural dialogue and peace. Accordingly, UNESCO through its intergovernmental Information for All Programme (IFAP) and its Knowledge Societies Division, has continued to draw attention to the importance of the concept of knowledge societies and the need for related competencies and policies in today's globalized and connected world.

Since 2001, IFAP has been playing a leading role in the international policy landscape. IFAP provides a platform for international policy dialogue, cooperation and the development of guidelines for action in the area of access to information and knowledge. Through its capacity-building efforts and mobilization of resources, the IFAP network has been supporting Member States to develop and implement national policy and strategy frameworks in its six priority areas of information accessibility, information for development, information ethics, information literacy, information preservation and multilingualism in cyberspace.

It was therefore only natural that IFAP would seek to develop linkages between UNESCO's concept of knowledge societies and the most current, internationally agreed framework for humanity's progress, the 2030 sustainable development goals. The policy environment in which we operate is an evolving one, so dynamic processes for ongoing policy-crafting that can leverage global lessons and experiences in a timely manner are essential. The Knowledge Societies Policy Handbook and its associated online platform of tools, policy resources and a diverse community of practice represent our latest response to the emerging challenges and opportunities.

The 2030 Sustainable Development Goals are undergirded by a vision founded on a coherent, holistic approach to addressing challenges that relate to peace, people, partnership, prosperity and our planet. Realizing this vision requires both conceptual frameworks and processes that can be adapted and contextualized in light of local needs and specificities. Policies are essential. They make explicit the objectives embedded in each societal vision and also serve to manage the diverse actors, actions and resources available to each society. The Knowledge Societies framework presented in the Handbooks offers multiple diagnostic lenses for exploring each society, understanding its strengths, challenges and characteristics, thereby supporting the collective formulation of appropriate policy responses.

This effort would not have been possible without the collective and ongoing support of numerous institutional and individual partners whose contributions have been acknowledged elsewhere in this publication. We are particularly grateful to our partner the United Nations University's Special Operating Unit for Policy-Driven Electronic Governance (UNU-EGOV), for leading the fruitful research collaboration which has undergirded this effort. We are also thankful for the generous support provided by the Special Presidential Uruguayan Agency for Electronic Governance, Information and Knowledge Society (AGESIC), for co-organizing the international Expert Group Meeting in Montevideo and hosting ICEGOV2016 which served to validate this policy resource. We look forward to strengthening these partnerships and building new ones as we continue to build inclusive knowledge societies for peace and sustainable development.

Getachew Engida
Deputy Director-General
UNESCO

Foreword II

The National Information Society Policy Template which IFAP launched in 2009 was an important contribution to policy-making efforts at the international, regional and national level. In particular, this tool has been instrumental in supporting the development of national capacities to design and manage policy processes in a number of East African and South Asian countries. This training was delivered through a series of Executive Trainings in Government Information Leadership conducted in partnership with the United Nations University's Special Operating Unit for Policy-Driven Electronic Governance (UNU-EGOV). These capacity-building exercises conducted through week-long regional trainings have also served to build networks for cooperation and experience sharing between participating countries and with IFAP's and UNU-EGOV's networks.

The 2030 Sustainable Development Agenda, with its attention to the 5Ps - People, Planet, Prosperity, Peace and Partnership – offers new possibilities for more holistic and contextualized approaches to development. The new approaches as well as the demands of a framework with 17 goals and 169 targets has also highlighted an urgent need for tools to support policy-makers in more effectively aligning their actions and efforts to this new global focus of action.

To respond to this pressing need, IFAP and UNU-EGOV have again joined forces and leveraged their networks to develop the Knowledge Societies Policy Handbook. The Handbook builds on existing knowledge and practices to provide policy-makers with an actionable conceptual framework for understanding and assessing the relationships between the SDGs and Knowledge Societies. By identifying gaps as well as strengths, the Handbook will enable countries to more effectively deploy resources and implement appropriate policy measures.

In line with the perspective that policy-crafting is a continuous, evolving and dynamic process, the Handbook is supported by an expandable online case library as well as an online global community of researchers and practitioners. Through their online interactions - sharing of experiences and research, collaborative problem solving and co-creation, mapping of emerging trends amongst others – this community of practice will provide enhancements to the methodologies, tools and resources that support the Handbook.

We are truly grateful to our longstanding partner UNU-EGOV, for their ongoing support, and to the Uruguayan Agency for Electronic Governance, Information and Knowledge Society (AGESIC) for their role in the validation of the Handbook. We have been touched by the various institutions and individuals who have expressed support for this initiative and are appreciative of the commitments expressed by various Member States, notably Brazil and Colombia to provide direct and in-kind support to this initiative. IFAP invites like-minded governments, institutions and individuals to support this global initiative.

Chafica Haddad

Deputy Permanent Delegate of Grenada to UNESCO and Chair of the Intergovernmental Council of the Information for All Programme

Acknowledgements

The current report belongs to the set of four instruments developed by the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV) in collaboration with and co-funded by the UNESCO Information for All Programme (UNESCO/IFAP), to support UNESCO Member States' policy-making efforts to guide and coordinate the development of nationally- or locally-appropriated Knowledge Societies.

The instruments comprise:

1. Knowledge Societies Policy Handbook, as set of conceptual and methodological frameworks, guidelines and knowhow concerning the development of public policies for Knowledge Societies (UNESCO/IFAP and UNU-EGOV, 2016b);

2. Knowledge Societies Policy Library, a collection of relevant research literature, policies, indicators, case studies and other resources relevant to the development of public policies for Knowledge Societies (UNESCO/IFAP and UNU-EGOV, 2016c);

3. Knowledge Societies Policy Platform, an electronic platform that hosts the content of the Handbook and Library and facilitates the updates and additions to this content by community members through digital devices and channels (UNESCO/IFAP and UNU-EGOV, 2016d); and

4. Knowledge Societies Policy Community, a community of researchers, academics, policymakers, government officials and other stakeholders who, as part of their contribution to planning, developing, implementing and evaluating public policies for Knowledge Societies in the national or local context, are willing to use the Handbook, Library and Platform, and share the outcomes and experience for others to learn (UNESCO/IFAP and UNU-EGOV, 2016a).

The origin of the Knowledge Societies Policy Handbook and the accompanying Knowledge Societies Policy Library, Platform and Community dates back to the 2009 publication by UNESCO/IFAP of the National Information Society Policy Template (Template), and the organization of two editions of the Executive Training on Foundations of Government Information Leadership: 1) in Kampala, Uganda, in July 2013, co-organized by the UNESCO Regional Bureau for East Africa and the Center for Electronic Governance at the United Nations University International Institute for Software Technology (UNU-IIST-EGOV, the direct predecessor of UNU-EGOV), and 2) in Yangon, Myanmar in November 2013, co-organized by the UNESCO Regional Bureau for Asia and the Pacific and UNU-IIST-EGOV. Both trainings presented the Template and its application by the audience of policymakers and government officials to local circumstances, and a discussion between UNESCO and UNU-IIST-EGOV on the idea of updating and digitizing the template. The discussion continued through the session "Building Knowledge Societies in Countries in Transition – Lessons from the Mekong Region" co-organized by UNESCO and UNU-EGOV at the 8th International Conference on Theory and Practice of Electronic Governance in Guimarães, Portugal in October 2014 (ICEGOV2014).

Eventually, the discussion led to the elaboration of a project with the aim of developing the four instruments, and signing of an agreement between UNESCO and UNU-EGOV in September 2015 to enable its implementation. The initial version of the Handbook, Library and Platform, developed under this project, were presented, discussed and commented by the Expert Group Meeting (EGM) on "Knowledge Societies and the 2030 Sustainable Development Agenda" that took place in Montevideo, Uruguay on 29 February 2016, co-organized by UNESCO/IFAP, UNU-EGOV and the Uruguayan Agency for Electronic Governance and the Information Society (AGESIC). The EGM was attended by 36 experts from government, academia, NGOs and international organizations from 15 countries. The outcomes were presented during the UNESCO/IFAP invited session at the 9th International Conference on Theory and Practice of Electronic Governance in Montevideo, Uruguay on 1 March 2016 (ICEGOV2016), and during the Argentine Digital Transformation Forum in Buenos Aires, Argentina on 7 March 2016. Both sessions also called for expressions of interest for joining the Community. The current version of the Handbook was obtained by addressing the comments received during the three events.

We would like to thank UNESCO and particularly its IFAP programme for the opportunity to contribute to this important project, and for making available the necessary institutional support and project resources. We wish to particularly thank Mr. Getachew Engida, Deputy Director-General of UNESCO, Ms. Chafica Haddad, Chair of the IFAP Council and Deputy Permanent Delegate of Grenada, Mr. Indrajit Banerjee, Director of UNESCO's Knowledge Societies Division and Secretary of IFAP, Mr. Boyan Radoykov, Chief of Section, Universal Access and Preservation, and Mr. Guilherme Canela, UNESCO Adviser in Communication and Information for MERCOSUR for institutional support. We are also grateful to Mr. Jaco du Toit, Adviser for Communication and Information at the UNESCO Regional Office for Eastern Africa and Ms. Rosa Gonzalez, former Adviser for Communication and Information at the UNESCO Regional Office for Asia-Pacific, for openness and collaboration that led to the development of the current project. We also wish to express our sincere thanks Mr. John Bertot, Associate Provost and Professor at the University of Maryland, for insightful discussions and careful reviews of earlier versions of the Handbook and Library. We also wish to recognize Ms. Elsa Estevez, Senior Academic Programme Officer at UNU-EGOV, for her enthusiastic and tireless support to the project and to the joint development of collaboration between UNESCO/IFAP and UNU-EGOV over the years. Last but not least, we are most grateful to Morten Meyerhoff Nielsen, Researcher and PhD student at the Tallinn University of Technology, Ragnar Nurkse School of Innovation and Governance, and UNU-EGOV Academic Fellow; Kenneth Bagarukayo, Commissioner, Information Management, Ministry of ICT, Uganda and joint UNESCO-IFAP and UNU-EGOV Government Fellow; and Jun Cheng, Secretary General of the Professional Technical Committee, Beijing Information Resources Management Center, China and joint UNESCO-IFAP and UNU-EGOV Government Fellow; for useful comments and lessons learn from the adaptation of both documents.

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The contribution to the development of the four instruments is as follows. Concerning the Handbook, Chapters 1 (Introduction) and 8 (Conclusions) were authored by Elsa Estevez; Chapters 2 (Background), 3 (Foundations) and 6 (Adaptation and Transfer) were authored by Susana Finquelievich; Chapters 4 (Conceptual Framework) and 5 (Process) were authored by Jeremy Millard; and Chapter 7 (Platform and Community) was authored by João Álvaro Carvalho. Concerning the Library, Chapter 1 (Glossary), 2 (Policies), 4 (Tools), 5 (Indicators) and 6 (Case Studies) were developed by Rehema Baguma, and Chapter 3 (Publications) was developed by Nuno Vasco Lopes. Concerning the Platform, software development was performed by Guillermina Cledou, with inputs from João Álvaro Carvalho, and content updates were performed by Rehema Baguma, Guillermina Cledou and Nuno Vasco Lopes. The Community was initiated by Elsa Estevez, Paul Hector and Tomasz Janowski. Visual design of the covers, design of the reports and design of the platform were conducted by Formato Verde. Content and technical support were provided by Mário Peixoto and José Luís Faria respectively. Finally, the coordination, as well as methodological and editorial functions were performed by Tomasz Janowski.

Guimarães and Paris, May 2016

Tomasz Janowski, Head, UNU-EGOV

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List of Acronyms

EGOV	Electronic Governance
EU	European Union
EC	European Commission
ECA	Economic Commission for Africa
ECE	Economic Commission for Europe
ECLAC	Economic Commission for Latin America and the Caribbean
ECOSOC	Economic and Social Council
FDI	Foreign Direct Investment
HERD	Higher education expenditure on R&D
ICT	Information and Communication Technology
IFAP	Information for All Programme
IMF	International Monetary Fund
IT	Information Technology
InfoComm	Information and Communication
KS	Knowledge Societies
KSP	Knowledge Society Policy
KSP-BoR	KSP Board of Representatives
KSP-DAT	KSP Design and Analysis Team
KSP-MCU	KSP Management and Coordination Unit
KSP-SB	KSP Steering Board
MOOC	Massive Open Online Educational Courses
NGO	Non-Governmental Organization
NPHRST	National Profiles Human Resources in Science and Technology
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnerships
PPPP	Public-Private-People Partnerships
R&D	Research and Development
SD	Sustainable Development
SME	Small Medium Enterprises
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNU	United Nations University

UNU-EGOV	UNU Operating Unit on Policy-Driven Electronic Governance
UNDPEPA	United Nations Division for Public Economics and Public Administration
UNCTAD	United Nations Conference on Trade and Development
UND	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNEC	United Nations Economic Commission for Africa
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
US	United State Government
WIP	World Intellectual Property Organisation
WGIG	Working Group on Internet Governance
WICANN	World Internet Corporation for Assigned Numbers and Names
WTO	World Trade Organisation
WSIS	World Summit on the Information Society

Executive Summary

The Executive Summary is divided into six sections corresponding to different chapters of the Handbook as follows:

1. Background Chapter (Section 0.1),
2. Foundations Chapter (Section 0.2),
3. Conceptual Framework Chapter (Section 0.3),
4. Process Chapter (Section 0.4),
5. Adaptation and Transfer Chapter (Section 0.5), and
6. Platform and Community Chapter (Section 0.6).

0.1. Background Chapter

Chapter 2 describes fundamental terms for Information and Knowledge Societies – data, information, knowledge, technology and innovation, convergence of technologies and socialization of information. It also explains how the development of Information Society leads to the emergence of Knowledge Societies in different local, national and international contexts and how the two concepts complement each other and how Knowledge Societies can further development and sustainable development agendas.

ICT offer unprecedented opportunities to benefit from the right to freedom of expression, information and communication, as well as to produce knowledge and use it for individual and social evolution. Accordingly, as stated forcefully in WSIS outcome documents, this translates into an obligation for states and the international community to ensure enjoyment of these opportunities by everyone.

No country starts at “Ground Zero” in the construction and development of a Knowledge Societies, but rather the examples show that each country has its own entry point. Each local, national and regional reality is unique and needs a Knowledge Society adjusted to its circumstances. In addition, the world is rapidly changing; consequently, Knowledge Societies policies have to evolve too.

When facing the generation or updating of a Knowledge Society Policy (KSP) it is necessary to bear in mind that it needs planning for the long term: from ten to twenty years. A policy or strategy with key long-term objectives

functions as a framework for making decisions and provides a basis for planning. Generating a long-term strategic plan provides the insight needed to keep a government or a multi-stakeholder organization on track by setting goals and measuring achievements. By analyzing the information in the long-term plan, policy decision-makers and stakeholders can make necessary changes and set the stage for further planning.

ICT are a necessary but insufficient for the societal and political process of developing Knowledge Societies. This Handbook can be useful for all, since its dynamics are intended to allow different countries "to catch the Knowledge Societies train" at any of the "stations", to analyze their own context in the mirror provided by the diverse suggested steps, and to contribute to the retrofitting of the strategies. The methodology presented in this Handbook is a model intended to stimulate the actors involved to examine their country's needs and use their best capabilities and strengths to develop an appropriate policy for it, as well as to ensure its concrete implementation in diverse development contexts.

Knowledge Service, or Knowledge Management (KM) has been defined as: "The process of capturing, distributing, and effectively using knowledge". KM, is primarily about managing the knowledge of and in organizations. The most critical advantage in any group or environment (either public sector, private sector, NGOs, Academia, etc.) is what its people know. This knowledge, also called intellectual capital, is the organization's primary competitive strength. Knowledge Management provides the tools for ensuring that this intellectual asset is captured, organized, analysed, interpreted, and customized for maximum return to the organization. Policies for Knowledge Societies need to take into account the ways of using Knowledge Management to profit from the existing knowledge and skills, explicit or tacit, in the country, region, or cities in which these policies are going to be applied.

Knowledge Transfer (KT) is a term used to include a very broad range of activities to support mutually beneficial collaborations between universities, businesses and the public sector[1] , all of them preeminent stakeholders in Policies for Knowledge Societies. KT is the practical problem of transferring knowledge from one part of the organization to another. Like knowledge management, knowledge transfer seeks to organize, create, capture or distribute knowledge and ensure its availability for future users. It is considered to be more than just a communication problem. Knowledge transfer is more complex because knowledge resides in organizational members, tools, tasks, and their subnetworks and much knowledge in organizations is tacit or hard to articulate. ICT are valuable tools for knowledge transfer between different social agents, as well as for knowledge management.

Knowledge Policies are becoming a progressively significant element of Knowledge Societies, and Knowledge Economies. Such policies make available institutional grounds for creating, managing, and using organizational knowledge as well as social foundations for harmonizing global competitiveness with social order, social welfare, environmental sustainability and diverse cultural values. Knowledge Policies can be observed from a number of viewpoints: the required linkage to technological evolution, relative rates of technological and institutional change, as a control or regulatory process, obstacles posed by cyberspace, and as an organizational policy instrument.

Looking at the many efforts around the world, there is no general or unique formula for successful Knowledge Societies Policies and e-strategies. Government officers, experts' teams and policy makers in diverse development countries may identify examples of successes or best practices either within their own territories, regions, or in other countries with similar conditions, and adjust them as needed to fit their local unique circumstances.

The Internet can be used as a key tool to empower societies in a sustainable way. There is an enormous potential of stakeholders that act locally while thinking globally. It is at the local level where through collaboration, trust is built and implemented. It is at the local level where the visions and leadership of individuals can be seeds for global implementation.

1 See more at: http://www.cam.ac.uk/research/news/what-is-knowledge-transfer#sthash.WK7XSOHC.dpuf

Public policies show the intentions of governments. Without policies, there can be no governance. Explicit policies allow the public to measure the achievements of the government. A policy document lists out the intentions or objectives of the government for a particular department or government area.

A country has a KSP when such a policy is explicit in an official document, or implicit in a higher hierarchy document, such as a national development plan. The same is true for regions and cities: actions alone are crucial, but they are not sufficient; governments and other social agents have a Knowledge Societies policy when these actions are specified, planned and coordinated in official documents.

Competitiveness, innovation and job creation in Knowledge Societies are increasingly being driven by the use of ICT. This must be supported by a qualified workforce with the knowledge and skills to use these technologies knowledgeably. As technologies develop rapidly, the skills required to use them become more and more complex and need to be continuously updated. Improving the level of e-skills in the labour force requires action at national, regional, and local levels in education, training, research, industrial and labour policies, but also in areas such as immigration and taxation policies. It is then necessary to analyse and diagnose the existence of human capital related to Knowledge Society and to Knowledge Economy (e-skills). In other words, it is necessary to identify which skills are available in each territory and which skills need to be developed through education and training.

In particular fields, such as telecommunications, policies cannot be formulated at the national or regional level alone. International institutions such as the World Trade Organisation (WTO), the International Telecommunication Union (ITU), the World Intellectual Property Organisation (WIPO) and the Internet Corporation for Assigned Names and Numbers (ICANN) are influencing the rules for global participation. With the globalization of communications, such organizations will increasingly determine the frameworks for effective participation in public policies for Knowledge Societies. Therefore, it has become more and more important to invest intellectual resources in influencing these agendas and their outcomes. It is also relevant to train and prepare national representatives who will attend these international meetings. This is particularly important to represent the interests of developing countries and emerging economies.

This Handbook serves as a tool to assist in developing Knowledge Societies policies. KSP is a collaborative, open, and permanent process, not a finished product. It is a highway, not a harbor. In order to travel through, the highway must be visualized, planed, built, and made travelable to all citizens.

The Handbook is not only useful for the public sector, the business sector, and the academic sector. It is also useful for individual citizens and citizen organizations: it allows them to compare the possible policies with the policies and strategies adopted by their own governments, and hence, to make proposals or claims to their governments.

0.2. Foundations Chapter

Building on the terminology introduced in the previous chapter, Chapter 3 introduces elements of KSP. The introduction starts by positioning Knowledge Societies policy within the Sustainable Development approach. Later it presents the vision, principles, stakeholders, networks, governance and evolution, as key elements of public policies for Knowledge Societies.

This Handbook defines a vision of Knowledge Societies policy as the multi-stakeholder aspiration of what a government, together with other social agents, aims to accomplish in the future (in the short, medium or long term) in a comprehensive policy for Knowledge Society, considering above all the wellbeing of its population.

The role of the government is to foreknow the needs and interests of the different social actors, to coordinate the diverse stakeholders´ actions and initiatives, to create operative articulations among them, and to generate and enforce relevant legislation and control through a legal framework, as well as through explicit public policies.

Knowledge Societies goals may be formulated and implemented following seven vital overall guidelines: the UN 2030 Sustainable Society Agenda; the 2003, 2005 and 2015 World Summit for Information Society (WSIS) Declaration; objectives established by regions, e.g. Arab States, Asia and the Pacific, Latin America and the Caribbean, Europe, North America, East, West and Central Africa; principles and goals established by North-South, North-North and South-South cooperation programmes between regions; macro-regional development objectives; national development goals; regional (provinces, federal states within a country) development goals; and local innovation and development goals.

Engaging in multi-stakeholder processes have become crucial to address issues affecting Knowledge Societies. The full potential of ICT, as relevant enabling tools to support the process of development, can be utilized only if the ICT policies are effective. An essential element to make Knowledge Societies effective is to ensure the active participation of stakeholders in government, the private sector, civil society, ICT users and eventually international organizations in the formulation and implementation of Knowledge Societies.

It is important to reflect on the relationships among the diverse stakeholders. Stakeholders get together through, e.g. public-private partnerships, public-private-people, government-academia, government-nonprofit, private-users, and other partnerships to put together complementary capabilities, competencies and resources.

Some of the main stakeholders are the following:

- Public sector entities, and especially governments, play the most important role in the formulation of ICT policy. They decide how countries, regions and cities are able to take advantage of technical opportunities available to them and exploit them for good. They comprise central, regional and local governments, government entities like parliaments, ministries and agencies, public administrations and other publically owned entities (except in the education and research sector). Governments should help frame and guide, though their Knowledge Societies Policies, the initiatives undertaken by other stakeholders, such as companies, the science and technology sector, civil society, etc. Governments' role as coordinators of other social actors is to be carefully planned and implemented.
- Private sector entities comprise firms, companies, entrepreneurs, SMEs, corporates, and other profit seeking organizations operating in the market and private sector, including the commercial ICT and technology sectors, as well as the representatives of these stakeholders such as employers' and trade organizations. The business sector accomplishes an essential role in the establishment of a Knowledge Economy. International, national and local IT enterprises can promote the formulation, updating or changes of Knowledge Societies. It is a strong actor that frequently leads technological and organizational innovations.
- Education and research entities are vital agents in building Knowledge Societies as they provide highly qualified human resources, researchers, and the necessary knowledge. Such entities encompass schools, colleges, universities, research institutes, and research and innovation labs of all types, technology parks whether in the public, private or civil sectors. Education and lifelong learning are viewed as conditions to keep pace with continuously changing societies, global job markets and technologies.
- The civil society comprises both non-profit formal organizations like NGOs, charities, foundations, associations, trades unions and social entrepreneurs when not profit-seeking, as well as more informal communities, interest groups and movements, citizens and ICT users. Basically, civil society means community groupings or networks, and their activities. The role of civil society in Knowledge Societies is multiple. It includes assessing the impacts of technologies in society, to defend the users´ interests, to contribute to public policies from the point of view of citizenship, and to guide technological applications to the goal of sustainable development.
- ICT users are individuals and groups who use computers, mobile devices, cellular technologies and IT tools, in their inter-organizational and interpersonal interactions. These technologies shape who they are as organizational representatives, what they can do in terms of exchange, important aspects of their

interactions with other actors (e.g. speed, complexity), and influence the perceptions of other actors and the nature of reciprocal engagements, as well as social actors' perceptions about themselves. ICT users can influence the design of technological devices, or software, by modifying them or giving them unforeseen uses. It is important to stress that in Knowledge Societies all stakeholders can potentially become both ICT producers and users.

- International organizations include international government organizations made up by independent states like e.g. UN, OECD or WTO, and international non-governmental organizations that operate internationally like e.g. International Committee of the Red Cross, Doctors without Borders and others. The role of international organizations in domestic and international public policies is not to be ignored. International organizations frequently trigger regional and national initiatives to develop national information and knowledge society policies. They also provide assessments and best practices of ongoing Knowledge Societies policies.

In this Handbook, governance is defined as connected to the processes of interaction and decision-making among the actors involved in a collective problem that lead to the creation, reinforcement, or reproduction of social norms and institutions, as well as public policies and strategies.

Multi-sectorial policies are a challenging point in Knowledge Societies governance. Diverse sectors and stakeholders hold various and often opposing positions and interests. Negotiating with the sectors to achieve a common policy is an art which requires political mastership, and which often depends on the agency and individuals in charge of formulating a policy. Coordination mechanisms need to be put in place in order to ensure the formulation, implementation, assessment and updating of the policies and strategies.

Governance for KSP should stress the need for quality, quantity and prompt delivery of public services. They also need to emphasize the importance of equality and equity in their provision and greater access to them, also leveraging ICT in innovative ways.

Policy features are subject to the quality of government institutions such as the institutionalization of congress, the independence of the judiciary, the quality of the civil service, and the institutionalization of political parties. Hence, to materialize Knowledge Societies benefits, it is useful to invest in increasing governments' capabilities. Government capabilities are important for better policy features. Countries that have more capable bureaucracies, more institutionalized congresses, independent judiciaries, and institutionalized political parties tend to have policies that are more stable, adaptable, coherent, efficient, and public regarded.

The strategies and policies of developing countries' governments need to be aimed at turning those nations into forerunners in terms of technological, social and economic organization and innovation. In order to achieve this, it is necessary to focus on technological and scientific production, innovation, education, specialized training, knowledge management and the use of existing brains, avoiding "brain drain" and encouraging "brain gain", through coordination plans with science and technology centers abroad.

Knowledge Society policies and strategies need continuity across diverse governments and administrations. It is frequent that a given policy or plan is dismantled by the following government, which would like to make a fresh start, with its own plans and its own staff. Sometimes, within the same government or political party, internal struggles among diverse groups result in destroying valuable and effective policies. Therefore, when formulating a Knowledge Society policy, it is important to have it approved as a Law that ensures that the policy will survive and thrive across several governmental periods. Building institutionalization, particularly in emerging and developing countries, is essential to grant the success and durability of KSP.

According to WTO, Intellectual Property Rights are "the rights given to persons over the creations of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time". Intellectual property rights are customarily classified into two main areas: a) Copyright and rights related to copyright, encompassing the rights of authors of literary and artistic works (books and other writings, musical compositions, paintings, sculpture, computer programs and films. b) Industrial property, including two main areas: i) the protection of distinctive signs, mainly trademarks and geographical indications. ii) Other types of

industrial property are protected primarily to stimulate innovation, design and the creation of technology.

There is a lively debate on intellectual property and the right to access intellectual production. In Knowledge Societies, information and knowledge can be accessed in larger ways than in traditional industrial societies. Creative Commons is a nonprofit organization that has created diverse kinds of licenses to allow individuals to choose which type of copyright protection best suits them and their work. Creative Commons licenses allow their holders to grant broad permission to others to share, remix, use commercially, or otherwise use their work without having to ask specific authorization for each use. A Policy for Knowledge Societies needs to debate about the different options of Intellectual Property, and to explicitly define the country's, regions', city's choices

In order to encourage citizens to get integrated into Knowledge Societies and reap their benefits it is necessary to provide them with e-services designed to make their life easier. For example, as e–government grows and more public sector services are available via digital technologies, citizens will realize the advantages of time-saving online services, such as to access city information on the go, report issues, submit service requests and get follow up notifications. Other applications allow users to search development projects, apply for permits, track progress through the process, schedule inspections, and pay for services, and register for municipal activities. Also, small and medium enterprises (SMEs) are perceiving the value of using digital technologies to serve their clients.

Mobile devices, such as smart phones, are crucial for developing countries' populations to access and appropriate the benefits of Knowledge Societies. The majority of the population in developing countries does not own computers, but an increasing number use mobile phones that connect them to the Internet. It becomes important to consider the use of mobile devices in KSP. It is relevant to consider the production of specific contents (educational, commercial, management of money and banking, agricultural news, public health, etc.) accessible from these devices.

The governmental and non-governmental provision of telecommunication infrastructure and connectivity services contributes to the people e-readiness. Cybercafés, information kiosks, community technological centers, telecentres, public libraries, schools, and cell phones nowadays represent the access door to cyberspace for a large number of Latin American, Asian and African people.

Networking for KSP means exchanging information and experiences among stakeholders, between the specific sectors involved, and among geographical regions. Electronic networks, virtual or face-to-face workshops, seminars, communities of knowledge, communities of practice, databases and websites allow diverse stakeholders to interact. Though networking regional cooperation can become a mechanism to address public policy issues such as legal framework, norms and standards, and can help to introduce innovative procedures in different regions and countries' policies.

Knowledge Societies are emerging around the world but in many ways are witnessing the initial stages, even prehistory, of this concept. Looking at the past and attempting to draw predictions, this Handbook examines the evolution of the concept of Knowledge Societies. People around the world are facing new needs. These new needs, coupled with fast technological innovation, result in the necessity to foresee the policies that we will have to generate in the short and medium run. While future needs for public policies are multiple, this Handbook mentions just a few: policies for e-Inclusion, education, and lifelong learning; policies to preserve multilingualism on the Internet; policies for digital citizenship; policies for digital preservation; and policies for green technologies, among many others.

0.3. Conceptual Framework Chapter

Chapters 2 and 3 provided the contextual background to the understanding and development of information and knowledge societies and their basic foundations in terms of visions and principles. In contrast, chapter 4 builds on this by applying an overarching conceptual framework as a basic tool to structure and then implement Knowledge Societies policy. The overall conceptual framework is designed as a set of heuristic models to be both simple but also robust and effective in describing the main elements of KSP and their interrelationships. The framework enables both analysis, i.e. understanding how each element functions individually, and synthesis, i.e. understanding how they operate together.

A societal architecture model can show how Information Societies transformed the Industrial Societies that preceded them, and then how Information Societies themselves are being transformed into Knowledge Societies. This involves the development and incorporation of transformed organizations, institutions, infrastructures, and of systems of thought and culture, into the overall structure of society. Compared to the four basic Industrial Societies' components (i.e. society, economy, environment and governance), Information Societies incorporate a new Information and Communication (InfoComm) component defined as the ability to use ICT to create new information and dramatically increase communications. In turn, Knowledge Societies further recognize two additional components related to education and research, on the one hand, and the generation and application of knowledge itself on the other. This results in a Knowledge Societies model made up of seven components. It is also possible for pre-Industrial Societies, such as some developing countries, to by-pass the traditional Industrial Societies stage and jump straight to Information and Knowledge Societies.

These seven components of Knowledge Societies, however, are not important for their own sake, but rather as "means" to the important "ends" of global sustainable development, consisting of the three dimensions of economic development, societal development and environmental protection. In this context, it is possible to directly map the 17 Sustainable Development Goals, agreed by the United Nations and Member States in September 2015 as part of the global 2030 Agenda, against each of the seven components making up the Knowledge Societies Architecture.

Taking the four main stakeholder groups introduced in Chapter 3, it is possible to draw an analogy with how DNA produces living cells in biology by twisting these together as intertwining strands that intimately interact with each other to produce new forms of knowledge and innovation. This is generally known as the "quadruple helix" model consisting of 1) public sector entities, 2) businesses, 3) education and research entities, and 4) civil society. Researchers and practitioners have now also added a fifth helix comprised of the natural environment to form the quintuple helix model which for the first time incorporates the "socio-ecological transition" necessary for full sustainable development. This combines all sources and kinds of knowledge and know-how, including from the natural environment, and provides the wisdom needed to deliver all the Sustainable Development Goals, including the environmental underpinning.

Such knowledge and know-how are used in different ways and combinations, as well as by different stakeholders and different stakeholder combinations, to undertake innovation. Innovation itself can be defined as the creation and application of new knowledge and know-how to meet specific needs, in many different ways and for a myriad of purposes. These range from traditional top-down innovation undertaken by large hierarchical organizations, through technology and business model innovation and the increasing involvement of the users of goods and services in user-driven innovation, to so-called open innovation characterized as being bottom-up and fully open to the involvement of all stakeholders.

Six of the seven components of knowledge societies, based on the five components of the quintuple helix plus InfoComm, can be envisaged as six interacting sub-systems which together form the knowledge societies system as the seventh overarching component. Traditionally, each sub-system is envisaged, organized and operated independently from the others, but this dissipates their beneficial impacts and can in many situations work

against both sub-system and whole Knowledge Societies system impacts. Where there is interaction between sub-systems, these can often be exploitative or damaging, as for example when the economy sub-system pollutes the environment sub-system. Instead, an effective Knowledge Societies policy has as one of its prime objectives to ensure that together these sub-systems operate in a mutually supportive, interactive and highly synergistic manner, both through the direct intervention of the policy itself and by ensuring that overall system and sub-system mechanisms can self-adjust as necessary.

In this conceptual model, the six sub-systems interact together through the circulation of knowledge leading to the creation of different types of capital within each. For example, human and science capital, economic capital, natural capital, technology capital, and social and cultural capital, and thereby to different types of innovation. If an input of knowledge is taken into one of the sub-systems, an exchange of knowledge takes place creating new knowledge and/or new inventions, products and services, which are then fed to other sub-systems in the form of new know-how. Each of the six sub-systems can stimulate innovation which directly impacts Sustainable Development, but this impact is progressively increased through the combined effect of two or more sub-systems, and ultimately the whole Knowledge Societies system.

The critical issue for both Information and Knowledge Societies policy is, in practice, whether and how people and organizations use these tools, information and knowledge they have at their disposal. Five levels of their use, deployment and exploitation can be conceived, which are typically cumulative and progressively increase their impact on sustainable development:

1. Access and availability: for example to InfoComm in the form of ICT including the Internet, broadband, computers, mobile devices, relevant online services including social media and content, etc.

2. General and basic skills and opportunities: of the people involved as individuals or in groups and organizations. For example, whether they are actually able in terms of their skills, capabilities and motivation, and have appropriate opportunities, to deploy the available tools, information and knowledge.

3. Human resources and development: of the people involved as individuals or in groups and organizations, for example in terms of their education, occupation, labour market status and income, also taking account of their demographic characteristics like gender and age.

4. Beneficial use: by the people involved, as individuals or in groups and organizations, of tools, information and knowledge, for example whether and how they are deployed appropriately to provide the benefits intended.

5. Beneficial participation and co-production/co-creation: in developing new or improving existing tools, information and knowledge by the people involved, as individuals or in groups and organizations, in an active or even proactive manner.

Levels and 1 and 2 basically represent supply-side issues and are subject to Knowledge Societies policy initiatives over the relatively short-term. As such they can be seen as quick wins, although they are not necessarily easy or inexpensive. Levels 3 to 5, on the other hand, represent demand-side issues which are also subject to Knowledge Societies policy initiatives but over the relatively longer-term. Although typically requiring both levels 1 and 2, it is first during levels 3 to 5 that widespread sustainable development impacts are achieved. These levels, and in particular levels 3 to 5, also highlight how digital and socio-economic divides become serious barriers to sustainable development. The pace of change means that there is a constant danger that the poorest, the least well educated and those living in remote areas become doubly cut-off from the potential benefits that ICT and Knowledge Societies can deliver. Knowledge Societies policies thus become critical, both to bridge such divides but also to ensure that all members and aspects of society are able to develop and prosper in sustainable, equitable and fair ways.

0.4. Process Chapter

Chapter 4 provided an overarching conceptual framework as a basic tool for the processes needed to plan, structure and implement knowledge societies policies, which Chapter 5 then builds upon. Any level of government which has policy-making powers over the territory it represents, whether international, national or sub-national including at city level, can prepare, implement and sustain a KSP developed in relation to the territory's specific needs and future aspirations. This should also be undertaken taking account of its regional and global context, and the imperative of embedding the KSP strongly within and as part of the government's existing overall policy portfolio for the territory.

A successful and well implemented KSP will put any government in a much better position to tackle both large and small scale societal challenges, whether these be climate change, poverty and inequality, demographic change, food and water security, biodiversity, education, health, jobs, habitat or infrastructure. It will also ensure that such challenges are seen as strongly interdependent requiring a coordinated and integrated, rather than a siloed or piecemeal, response.

The process framework presented in Chapter 5 for building a KSP is a structured and interrelated checklist of important issues and activities, rather than a rigid or prescriptive plan of operation. Every government territory is unique, has its own starting point and specific potential and requirements. It is also important to appreciate that each process component outlined in this approach, despite the sequence followed, can also lead back to a re-assessment of previous components, as part of a feed-back process, although too much of this could lead to delay and procrastination. The overall focus must be on moving forward steadily if not rapidly, experimenting, testing and adjusting on a small scale along the way, but always making progress.

As described in the following, seven components make up the process framework, the first five of which constituent the policy cycle as relational steps in a logical sequence, whilst the last two are components which are on-going throughout the duration of the KSP and need to be continuously deployed.

- Component 1 – Contextualizing and diagnosing, typically starts the policy cycle and addresses, first the territory's global and regional context, second its specific needs and aspirations, and, third embeds it in the government's policy portfolio.
- Component 2 – Visioning and goal-setting, continues the policy cycle and draws on all relevant stakeholders and interests to create an overarching vision for the medium- to long-term of what the KSP should be and how it should be achieved. This takes place through the generation and deployment of new types of knowledge, know-how and innovation, prioritizing what is most important and translating this into strategy development and goal-setting.
- Component 3 – Analyzing and designing, is the third step of the policy cycle concerned with establishing governance structures and stakeholder roles, including multi-stakeholder configurations, to support the preparation of detailed policy designs through an analytical process leading to coordinated programs of policy intervention. Each of the latter require specific objectives and actions, for which necessary inputs, activities, outputs and outcomes are planned and assessed for financial and operational feasibility, in the context of Component 6, for successful contribution to the KSP goals.
- Component 4 – Implementing, represents the fourth policy cycle component and develops and operates detailed action plans to meet project and program objectives, ensuring that all inputs and activities are carried out as intended. Appropriate professional and transparent management and coordination tools and techniques are deployed which also protect legitimate rights, ensure inclusivity and fairly balance competing interests.
- Component 5 – Updating and sustaining, closes the policy cycle and has the objective of updating either

the whole KSP process and/or individual components of that process, and thereby aims to achieve longer-term sustainability. This takes place both in response to the KSP's implementation experience and how this is monitored and evaluated by Component 6. It also assesses changes in the societal and global environment of the KSP, in particular whether and how to response to new opportunities or threats and to ensure the KSP remains relevant and sustainable.

Sequential policy components 1 to 5 are divided into three overall policy phases: 1) the preparation phase, 2) the formulation phase, and 3) the implementation and sustaining phase. Each is punctuated by two or three milestones which can be used to plan and structure the KSP process and ensure that it is on track to meet its objectives. There are also continuous feedback loops ensuring that these objectives are adjusted as necessary to remain the right ones, even when new opportunities or threats appear during the duration of the policy, or the external environment changes in ways which might affect it.

- Component 6 – Monitoring and evaluation, is an ongoing component throughout the whole policy cycle supporting all others through its provision of the rationale and tools for the systematic measurement and evaluation of the KSP's inputs, activities, outputs, outcomes and impacts, as well as maximizing its continued efficiency, effectiveness, utility and sustainability.
- Component 7 – Communication, is also a component ongoing throughout the whole policy cycle linking all others to the wider society and external stakeholders and interests, including to the general public as the broader stakeholder base. It consists of two-away communication enabling the KSP to disseminate information and raise awareness, on the one hand, and encourages public consultation and engagement on the other. It thus combines communication, awareness-raising and outreach strategies.

Ongoing components 6 and 7 together ensure that the KSP retains overall relevance, coherence and effectiveness, by both feeding off and feeding in new knowledge and know-how. This approach also makes it possible to prioritize and scale policy cycle components 1 to 5 according to need in a timely and flexible.

0.5. Adaptation and Transfer Chapter

Chapter 6 considers how a public policy for Knowledge Societies, developed considering the concepts described in Chapters 2 and 3, and following the process outlined in Chapter 4, could be adapted to different social, economic, cultural, institutional, etc. contexts, how the policy can be transferred from one context to another, and what are the role of different responsible agenda in adaptation and transfer activities.

This Handbook considers the governmental officers and civil servants of the national or local state structures, which face the challenge of initiating, reviewing and/or updating the process of the elaboration of a public policy for Knowledge Societies.

The roles of career bureaucrats in public policy-making, mostly in policies and strategies related to Knowledge Societies, are prestigious, but they also constitute an issue of contradictory and differing interpretation, practice, and direction. While higher public servants have always played a major part in shaping public policy, the extent of their involvement has subsided and flowed in response to legal, structural, and political changes at the macro-regional, federal, state, and local government levels.

There are several issues to be taken into consideration by the agents responsible for leading and coordinating the process of Knowledge Society policy development:

- Political will: In order to formulate a Knowledge Societies policy, it is necessary that governments fully acknowledge that ICT are a matter for public policies (Guerra, Hilbert, Jordán, & Nicolai, 2008). Although in many countries the political and technical civil servants in charge rotate in different positions, the designation of the people in charge of promoting this process, as well as their capacity of management and negotiation with the government and other actors, will have a fundamental impact in the Knowledge Societies future (UNESCO, 2009).
- Hierarchy: The process of coordinating the development of Knowledge Societies will be more fruitful if the responsible agent is located high in the government hierarchy. The higher the level, the stronger the support for the policies proposed, and the higher the possibility of implementing them concretely.
- Interaction Strategy: The scope of information policy is very broad; it overlaps with four policy fields: technology, industry/economy, telecommunications and media.
- Sectoral interactions: It becomes relevant to reflect on the achievement of the agent's goals regarding the Knowledge Societies considering the participation of government and other stakeholders in economic and societal affairs, as well as other public policies and plans regarding related issues, such as education, health, urban and regional planning, telecommunications infrastructure, science and technology, innovation for development policies, and others.
- Organization building: The governmental agent in charge needs to be sure that he/she maintains the right organizational structure to operate in a truly effective way, given that Knowledge Societies deals with national, regional, and/or local aims as well as with global interests and contexts.
- Leadership development: The government and other stakeholders must be sure that they have the right leadership model for the agent charged with Knowledge Society development.

How can a public policy for Knowledge Societies adapt to a given context and vice versa? There are many factors to be considered:

- Political and economic factors: External factors are exogenous to political decisions on Knowledge Society strategies; the strategies' designers and decision-makers do not have decision power over them.
- International organizations: International organizations frequently trigger regional and national initiatives to develop Knowledge Societies. They also provide assessments and best practices of Knowledge Society Policies.
- Commercial alliances or partnerships strongly influence national policies and strategies.
- Awareness of political groups: If a government is informed and willing to build Knowledge Societies it will be probably supportive of and receptive to the changes proposed by the policy.
- ICT Infrastructure and services: The most obvious thematic topics of Knowledge Society strategies focus on the building of the digital infrastructure and services. Policies should be aimed at fostering universal access and use of the technology by providing a basic minimum of connectivity for the whole of society.
- National and regional regulatory frameworks are key elements in the formulation of public policies for Knowledge Societies. The regulation of the telecommunications industry and the strengthening of ICT markets are some key policy areas.

An enabling regulatory environment, a favorable investment climate and cooperation and funding of the international community are fundamental elements for the overall development of the knowledge society agenda.

Developing Knowledge Societies in a given context, or adapting a successful policy initiative to it, also means assessing the economic, social, human and technological conditions of a country, region, or city regarding its e-readiness and the existing Knowledge Societies in place. Studies and research will have to be conducted and used. In some cases, these studies may be produced by chambers of IT enterprises; the institutions responsible for

statistics and censuses can also provide helpful findings.

What factors need to be taken into account when evaluating the cross-national or cross-regional transferability of Knowledge Society policy initiatives? How are Knowledge Societies transferred among diverse national, regional, or local contexts?

- Cross-national experience has an increasingly powerful impact upon decision-makers within the private, public and third sectors. Policy transfer and lesson-drawing is a dynamic activity where knowledge about policies, administrative arrangements or institutions is used across time or space in the development of policies, administrative arrangements and institutions elsewhere (Stone, 2001).
- Networking is an important element in policy transfer among contexts. Networks that join policy makers, governments, researchers, practitioners, entrepreneurs, etc. facilitate the circulation of policy cases and models, and may help policy makers to adapt such cases and models into their own contexts.
- Policy transfer should not be taken casually. Policy makers should be aware of the characteristics of the environments they are going to operate, the demands of the local population, their historical and geographical contexts, their local culture, and their level of e-readiness before transferring external models that may not respond to local needs.
- It is important to identify the obstacles and positive factors that can influence policy transfer. The most common obstacles could be: historical and cultural, e.g. resistance to change; the countries' diverse development levels, managerial obstacles; political obstacles, e.g. power struggles, institutional factors: infrastructural factors; geographical factors; insufficiency of human resources, etc.
- The obstacles identified for each one of the proposed goals can be removed by the impulse of accelerating or facilitating factors. Accelerating factors are measures or actions taken at institutional and political levels; they entail coordinated operations between the diverse actors involved. Accelerating factors need financial investments, specialized human resources, communication strategies and training strategies.

The implementation of a KSP may require institutional transformations: changes in the legislation, regulation norms, standards, or even new governmental institutions, such as a Knowledge Society Agency. In some cases, these changes may generate conflicts of interest among the diverse actors taking part. The coordinating team or agency should be alert and organize as necessary a debate about each conflictual issue.

0.6. Platform and Community Chapter

The chapter describes the UNKSOC.ORG Platform – the digital face of the Knowledge Societies Policy Handbook and Library. It starts by addressing the Platform's content and functionality and how it can be used; profiles of the expected users; and the ways the Platform might be used by the different user profiles.

The chapter also focus on the expected role of the UNKSOC.ORG Platform on promoting the emergence and consolidation of a community of interest and practice around the Knowledge Societies Policy Handbook. Such community involves practitioners (individuals participating in policy-making processes related to the knowledge societies, either as elected politicians or technical staff), researchers, educators, experts and citizens. The action of the members of this community will be central on shaping the evolution of the UNKSOC.ORG Platform. This evolution will also be influenced by what initiatives the promoters of the Knowledge Societies Policy Handbook will launch in order to foster the acceptance and application of the Handbook.

1.

Introduction

According to UNESCO, “Knowledge Societies are societies in which people have the capabilities not just to acquire information but also to transform it into knowledge and understanding, which empowers them to enhance their livelihoods and contribute to the social and economic development of their communities.” (Engida, 2016). The cornerstone of this vision is the use of knowledge to further human condition. The vision is built upon the principles of freedom of expression, cultural and linguistic diversity, universal access to information and knowledge, and quality education for all. In turn, this vision is enabled by the spread of digital technology and particularly upon Internet Universality principles of human rights, openness, accessibility and multi-stakeholder participation (UNESCO, 2015). The plurality of Knowledge Societies explicitly recognizes the diversity of contexts where knowledge is applied to inform societal-scale decisions.

In order to systematically apply knowledge to address the needs, further the aspirations, and enhance self-development capacities of societies, communities and individuals, the development of Knowledge Societies require guidance and coordination from the State, and its legislative, executive and judicial branches. The State is also needed to empower businesses, nonprofits, academia, other non-state actors and the whole industrial sectors to contribute to the development and sustainability of the locally-appropriated Knowledge Societies. The main instruments through which the State can act to guide, coordinate and empower are public policies for Knowledge Societies.

Such policies consider the overall responsibility of the State in steering and coordinating the construction and permanent development of Knowledge Societies suited to each national or local context’s specificities, needs, and potentials. As such policies articulate the intentions, objectives, targets and responsibilities assigned to various state and non-state actors concerning the development of locally-appropriated Knowledge Societies, they allow public assessment of the achievements of these actors against policy goals and targets. In turn, this assessment is part of public engagement to evolve and align the design and implementation of such policies with the realities and experience on the ground.

Responding to the scarcity of methodological support in this area, the Knowledge Societies Policy Handbook is dedicated to the principles and practice of policymaking for Knowledge Societies. The Handbook aims to equip its readers that include policymakers, government officials, researchers, business and community leaders, and other contributors to policy processes for Knowledge Societies with systematic knowledge and practical tools to facilitate their contributions. The accompanying Knowledge Societies Policy Library further substantiates and illustrates the use of such knowledge and tools with case studies, evidences and relevant research and policy

literature. In addition, the Handbook is meant to build the common understanding and enhance the collective capacity of different local or national stakeholders to learn from each other, to work across organizational, sectoral and thematic boundaries, and to coordinate action towards locally-appropriated Knowledge Societies. To this end, the accompanying Knowledge Societies Policy Platform is intended to support coordination, sharing and learning as part of locally-appropriated policymaking processes, and in turn support the growth of the Knowledge Societies Policy Community.

The Handbook starts by building the terminology and conceptual underpinnings of Knowledge Societies, and explains the nature of policymaking for Knowledge Societies in general and in different contexts: local versus national, national versus international, research versus practice, etc. Next, the Handbook explains constituent elements of public policies for Knowledge Societies including vision, principles, stakeholders, networks, governance and evolution, and grounds the concept in the Sustainable Development Goals framework. Building upon the foundation, the Handbook puts forward possible structure for Knowledge Societies policymaking – a Knowledge Societies system model with governance, economy, environment, civil society, education and research, and infocomm dimensions. It also elaborates major policy concerns in terms of this model – how people and organizations should be prepared for Knowledge Societies in terms of access, skills and opportunities, human resource development, beneficial use and beneficial participation. The process of building public policy for Knowledge Societies is explained next, in terms of seven stages (or components): contextualizing and diagnosing, visioning and goal-setting, analyzing and designing, implementing, updating and sustaining, monitoring and evaluating, and communicating. Each component is supported with concrete ready-to-use techniques. Following the process, the Handbook explains how public policies for Knowledge Societies can be adapted to different contexts and how such instruments can be transferred from one context to another. Finally, the digitization (Platform) and socialization (Community) of the Handbook are outlined.

The rest of this document is structured as follows. Chapter 2 (Background) explains how to understand Knowledge Societies. Chapter 3 (Foundations) provides constituent elements of policymaking for Knowledge Societies. Chapter 4 (Conceptual Framework) introduces a structure on public policy for Knowledge Societies. Chapter 5 (Process) explains how such policies could be systematically built. Chapter 6 (Adaptation and Transfer) focuses on the localization of policymaking for Knowledge Societies. Chapter 7 (Platform and Community) explains the digitization and socialization of the Handbook. The final Chapter 8 provides some conclusions, and set of references closes the Handbook.

2.

Background – Understanding Knowledge Societies

This chapter introduces the concepts that are used alongside the Handbook, and illustrates them with examples from around the world. The chapter builds the concept of Knowledge Societies in Section 2.1, explains the nature of public policy that guides the development of Knowledge Societies in Section 2.2, and grounds the policy concept in different local, national, international and thematic contexts in Section 2.3.

2.1. Knowledge Societies

This section explains the constituent terms for Information and Knowledge Societies – data, information, knowledge, technology and innovation (Section 2.1.1); what is knowledge management (Section 2.1.2) and knowledge transfer (Section 2.1.3); how technologies are converging (Section 2.1.4) and information is socialized (Section 2.1.5); in what sense the development of Information Society (Section 2.1.6) leads to the emergence of Knowledge Societies in different local, national and international contexts (Section 2.1.7); how the concepts of Information and Knowledge Societies complement each other (Section 2.1.8); what is the role of Knowledge Societies to advance development (Section 2.1.9) and sustainable development (Section 2.1.10); and how important is long-term planning in both (Section 2.1.11).

2.1.1. Basic Concepts

By data we basically mean facts about the world. Data can be used to calculate, analyze and plan (Cleveland, 1982). It can be produced or stored in physical or digital forms. We need data to produce information, which comprises contextualized, organized and categorized data. Finally, knowledge is information organized for specific context or applied to address specific need. Figure 1 depicts the relationships between data, information and knowledge.

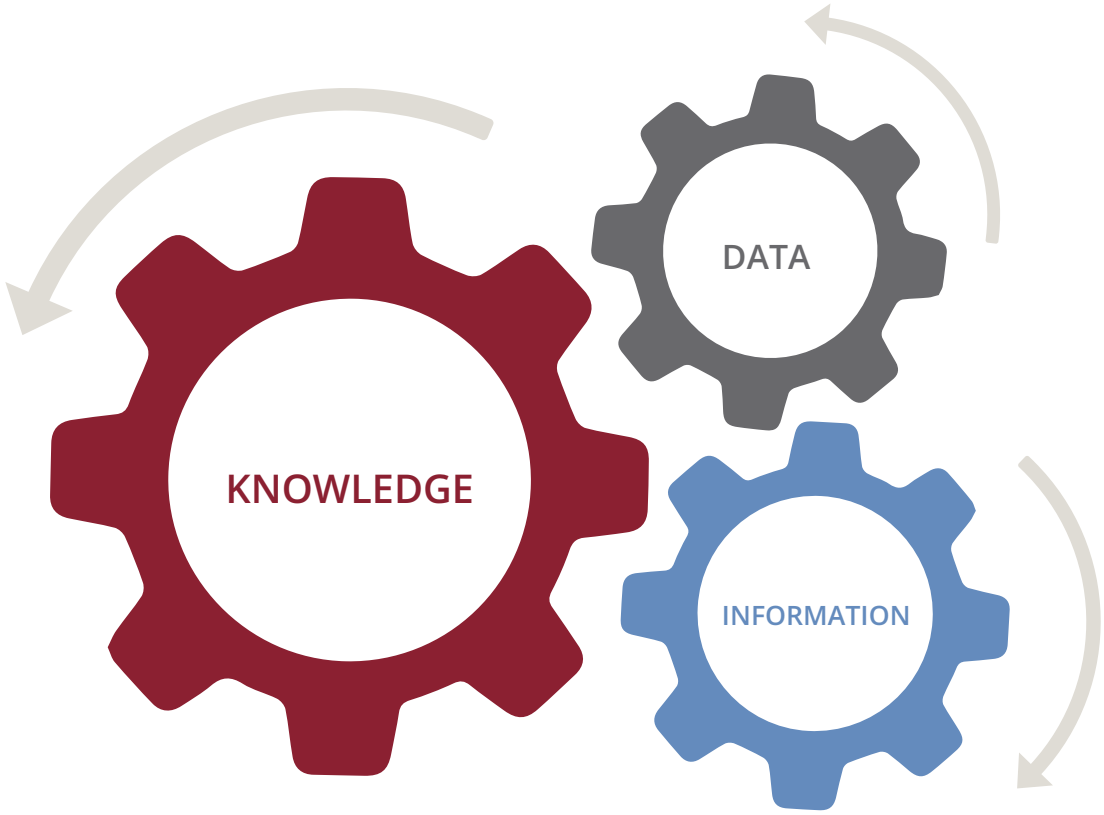

Figure 1: Relationships between data, information and knowledge

At least two types of Knowledge are identified in this Handbook:

1. K1 knowledge refers to knowledge related to understanding regularities or patterns on things that surround us. Such patterns are identified as a result of processing data, in which data normally stands for any records of observations we might have.

   The evolution and dissemination of Information and Communication Technology (ICT) led to the existence of a dramatic increase in the recording of data and information. At present, we make records of whatever it is; we are in the era of big data, this is, extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions. The evolution and dissemination of ICT also led to extremely powerful tools that automatically perform inductive processing upon those records and lead to the identification of patterns. This process is similar to the research process, during which researchers collect data and use it to draw and justify the patterns and regularities in the phenomena they are addressing. Knowledge, in this first sense, is therefore close to scientific knowledge (science) and to its discovery process.

2. K2 knowledge refers to know-how, sometimes associated to technology. This type of knowledge results from invention processes. Many of the resulting inventions lead to nowhere; a few of them lead to some economic value, normally associated to innovation. The role of ICT here is not as obvious as in K2 knowledge. ICT, mainly through its communication feature, might contribute to the dissemination of this type of knowledge, or they can support collaborative processes that stimulate the upsurge of new ideas. However, ICT do not play a role in the production of knowledge as in the other case (K1).

K1 and K2 knowledge are related, since the understanding of the world phenomena (K1) might lead to new ideas, new technology, and new forms of acting upon the world (K2). However, it should be kept in mind that generating K2 from K1 is not a matter of applying ICT. It involves creative processes that benefit from interaction, socialization, and others.

Technology plays an important role in the production and management of data, information, and knowledge. In turn, technology is defined by Merriam Webster as the practical application of knowledge. It also means a capability given by the practical application of knowledge. Another meaning refers to a manner of accomplishing a task especially using technical processes, methods, or knowledge.

When data, information, knowledge and technology work together, they often generate innovations. There are many definitions of innovation, including "specific function of entrepreneurship, whether in an existing business, a public service institution, or a new venture started by a lone individual in the family kitchen. It is the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth" (Drucker, 2002). Innovation is substantial change resulting from an outcome of research work or a project.

Innovation is not limited to the productive sector. It may be understood as a social process, developed everywhere, with the support of different social actors (governments, academia, enterprises, and citizens, among others). Focusing solely on innovative processes or products in business or enterprises entails disregarding innovations such as new forms of social organization, open source software, and even the Internet. Moreover, innovation is not limited to products and services. There are innovative organizations, innovative ways of production and different ways to accomplish a given task.

Knowledge and innovation both work together and are inseparable from each other. They steer economies around the world. Innovation is the application or transmission of knowledge through a process from research to development to application. In turn, sharing knowledge through collaborative innovation becomes more and more important.

Figure 2: Relating data, information, knowledge, technology, and innovation

2.1.2. Knowledge Management

Knowledge Service, or Knowledge Management (KM) has been defined by (Davenport, 1994) as: "Knowledge management is the process of capturing, distributing, and effectively using knowledge." A later definition was provided by (Duhon, 1998): "Knowledge management is a discipline that promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers."

According to the electronic journal KM World[2] both definitions share an organizational, corporate orientation. KM, is primarily about managing the knowledge of and in organizations. The most critical advantage in any group or environment (either public sector, private sector, NGOs, Academia, etc.) is what its people know. This knowledge, also called intellectual capital, is the organization's primary competitive strength. Knowledge Management provides the tools for ensuring that this intellectual asset is captured, organized, analyzed, interpreted, and customized for maximum return to the organization.

Policies for Knowledge Societies need to take into account the ways of using Knowledge Management to profit from the existing knowledge and skills, explicit or tacit, in the country, region, or cities in which these policies are going to be applied.

2.1.3. Knowledge Transfer

Knowledge transfer (KT) is a term used to include a very broad range of activities to support mutually beneficial collaborations between universities, businesses and the public sector[3] , all of them preeminent stakeholders in Policies for Knowledge Societies.

According to Wikipedia[4], knowledge transfer is the practical problem of transferring knowledge from one part of the organization to another. Like knowledge management, knowledge transfer seeks to organize, create, capture or distribute knowledge and ensure its availability for future users. It is considered to be more than just a communication problem. If it were merely that, then a memorandum, an e-mail or a meeting would accomplish the knowledge transfer. Knowledge transfer is more complex because knowledge resides in organizational members, tools, tasks, and their subnetworks and much knowledge in organizations is tacit or hard to articulate.

ICT are valuable tools for knowledge transfer between different social agents, as well as for knowledge management.

2.1.4. Converging Technologies

ICT refers to all the technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions. In other words, ICT is an umbrella term that encompasses many technologies and devices: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing, e-mails, streaming – digital distribution of multimedia through a network of computers, social media, e-learning platforms, and many others.

2 http://www.kmworld.com/Articles/Editorial/What-Is-.../What-is-KM-Knowledge-Management-Explained-82405.aspx

3 See more at: http://www.cam.ac.uk/research/news/what-is-knowledge-transfer#sthash.WK7XSOHC.dpuf

4 https://en.wikipedia.org/wiki/Knowledge_transfer

As explained by Technopedia (BDNA Corporation, 2015), although ICT is often considered a comprehensive synonym for IT, its scope is more far-reaching. ICT has been used to describe the convergence of several technologies and the use of common transmission lines carrying diverse data and communication types and formats.

Converging technologies that exemplify ICT include the merging of audiovisual, telephone and computer networks through a common cabling system. Internet Service Providers (ISP) commonly provide Internet, phone and television services to homes and businesses through a single optical cable. The lack or the high costs of the fixed telephone networks has provided huge economic and social incentives to implement this convergence, which eliminates many of the costs associated with cabling, signal distribution, user installation, servicing and maintenance costs. The impressive development of these technologies facilitated the diffusion and infusion of ICT in society, enabling people to appropriate and leverage on ICT to facilitate daily issues and improve the quality of their lives.

2.1.5. Socializing Information

The freedom and capacity to receive and communicate information is a basic human need and right, as asserted by the Article 19 of the Universal Declaration of Human Rights, proclaimed by the United Nations General Assembly in Paris on 10 December 1948. Access to information is fundamental to all aspects of our lives – at work, at study, in enjoying entertainment, in our personal relationships, in having lifelong training, in staying healthy, in being aware of our individual and collective rights, in being familiar with our history, in maintaining our cultures and languages, and in participating actively in democratic societies (Bindé & Matsuura, 2005). Documents adopted during the WSIS in 2003 and 2005 show a clear connection between the human and the broader societal, cultural and economic dimensions of information access and use.

Thus the concept of "Information for all" (Karol Jakubowicz, 2009) could mean:

- Information literate communities, where "people in all walks of life are empowered to seek, evaluate, use, and create information effectively to achieve their personal, social, occupational and educational goals."
- All people have access to "information services," including the media, ICT and in whatever other form they present themselves.
- Community libraries, archives and community information centers accessible to all.
- Qualified information professionals staffing libraries and archives.
- Accessible, available and affordable information resources relevant to communities.
- Digital access (computers, Internet) in all community libraries.
- Mobile phones and tablets being used for information creation and access.
- People with computer literacy (ICT skills) and media literacy.
- Facilities for storing and preserving information in analogue or digital forms for all.
- School libraries (learning resources) accessible to all children.
- Online libraries and archives accessible to all on the Internet.
- Online search tools available to all, including multilingual searching.
- "Open access" to scientific and educational information and resources .
- New literacies (information, computer, and media) incorporated in education.

While knowledge and information are pivotal elements in all modes of development, "the term informational indicates the attribute of a specific form of social organization in which information generation, processing, and transmission are transformed into the fundamental sources of productivity and power, due to the new technological conditions", "For the first time in history, the human mind is a direct productive force, not only a decisive element of the production system." (Castells, 2000).

2.1.6. Information Society

The expression "Information Society" defines a society in which the creation, distribution and treatment of information, based on the use of ICT, have become the most significant economic and cultural activities. An Information Society is often contrasted with societies in which the economic foundation is primarily industrial or agrarian. "Information for all", according to UNESCO/IFAP, could mean information-literate communities, where "people in all walks of life are empowered to seek, evaluate, use, and create information effectively to achieve their personal, social, occupational and educational goals." A realistic strategy to provide information for all must take account of the existence of a wide range of sources of information used by individuals and societies, including traditional media and information distribution channels and the ICT, comprising the Internet. Information and knowledge policies must therefore be oriented to developing all these media and channels.

The digital divide remains a global challenge. Around 40% of the world population has an Internet connection today, according to the Internet World Stats 2015. In 1995, it was less than 1%. Despite the growth in Internet penetration in the world, the distribution of access between developed and developing countries, between urban and rural communities and even between different age groups and genders is still inequitable. The resources required to bridge all these divides is far beyond the means of UNESCO and UNU, and many governments view this outside their means as well. This Handbook does not intend to solve this problem, but to highlight the priorities identified in it. It is assumed that governments and other social agents will continue to seek solutions that provide all citizens with digital connectivity, education and lifelong learning, so they will be able to appropriate the advantages of Knowledge Society, both individually and socially.

2.1.7. Knowledge Societies

Knowledge Societies are identified as societies based on the creation, dissemination and utilization of information and knowledge. They are societies with economies in which knowledge is acquired, created, disseminated and applied to enhance economic and social development (GESCI, 2012). The OECD speaks of "knowledge-driven economies" to signify the complex and all-encompassing change leading – though at a different pace in different parts of the world – to the emergence of the Knowledge Societies and Economies.

Knowledge Societies can also be defined as human-structured organizations based on contemporary knowledge and representing new quality of life support systems. This implies the need for understanding of distribution of knowledge, access to information and capability to transfer information into knowledge (Afgan & Carvalho, 2010). In short, Knowledge Society refers to a society in which the conditions for generating knowledge and processing information have been greatly changed by a technological revolution focused on information processing, knowledge generation, and information technologies.

There is not a single model of what a Knowledge Society is or should be. The concept "encompasses much broader social, ethical and political dimensions. There is a multitude of such dimensions which rules out the idea of any single, ready-made model, for such a model would not take sufficient account of cultural and linguistic diversity, vital if individuals are to feel at home in a changing world. Various forms of knowledge and culture always enter into the building of any society, including those strongly influenced by scientific progress and modern technology. It would be inadmissible to envisage the information and communication revolution leading – through a narrow, fatalistic technological determinism – to a single possible form of society" (Bindé & Matsuura, 2005).

Every society has its own knowledge advantages and strengths. It is hence necessary to work towards connecting the forms of knowledge that societies already possess, including traditional knowledge, and new forms of development, acquisition and spread of knowledge valued by the knowledge economy model and supported by ICT. This is why this Handbook refers to the plural concept of Knowledge Societies.

2.1.8. Information and Knowledge Societies

In the literature, there is a predisposition to use the terms Information Society and Knowledge Society interchangeably. However, this Handbook adopts the view that there is a key difference between information and Knowledge Societies, as discussed below.

(Castells, 2000) states that the element that defines the present technological revolution is not knowledge and information themselves, but rather the application of knowledge and information to knowledge generation and information/communication processing devices, in a cumulative feedback circle between innovation and the uses of innovation. He assures that the dissemination of technology amplifies its power when its users appropriate it and redefine it. ICT are not merely tools to be applied, but rather processes to be developed.

One of UNESCO's main contributions to the Information Society debate is the concept of Knowledge Societies. This draws attention to the impacts of the Information Society, especially through: knowledge creation, knowledge preservation, knowledge dissemination and knowledge utilization. These four pillars are based on the principles of inclusion and pluralism, which in turn derive from underlying human needs and rights. Thus information society is considered as a necessary previous step to build Knowledge Societies.

Abdul Waheed Khan (former Assistant Director-General for Communication and Information of UNESCO) states: "Information society is the building block for Knowledge Societies. Whereas I see the concept of "information society" as linked to the idea of "technological innovation", the concept of 'Knowledge Societies' includes a dimension of social, cultural, economic, political and institutional transformation, and a more pluralistic and developmental perspective. In my view, the concept of 'Knowledge Societies' is preferable to that of the 'information society' because it better captures the complexity and dynamism of the changes taking place. (...) the knowledge in question is important not only for economic growth but also for empowering and developing all sectors of society."

A similar concept is sustained by GESCI: "Information Society emphasizes the amount of information available and accessible. It emphasizes technology (ICT). Knowledge Societies are identified as societies where information is used and applied in various fields for learning and development" (GESCI, 2012).

Knowledge Societies are not to be confounded with Information Societies. Whereas the idea of the Information Society is based on technological breakthroughs, Knowledge Societies contribute to the well-being of individuals and communities, and encompass social, ethical and political dimensions (Bindé & Matsuura, 2005).

2.1.9. Knowledge Societies and Development

It is vital to bear in mind that ICT are the facilitating tools of Knowledge Societies in terms of empowering people and building capacities. If used appropriately, ICT are powerful means for social and economic inclusion and empowerment of all social, economic, and ethnic groups. "To remain human and livable, Knowledge Societies will have to be societies of shared knowledge. The plural here sanctions the need for an accepted diversity" and "The simultaneous growth of the Internet, mobile telephony and digital technologies with the Third Industrial Revolution – which, at first in the developed countries, has seen much of the working population migrate to the service sector – has revolutionized the role of knowledge in our societies. These technologies play an important role not only in economic development (through the spread of innovation and the productivity gains they bring about), but also in human development" (Bindé & Matsuura, 2005).

Below we present the examples of three countries that leverage on Knowledge Societies for development – Estonia, Finland and South Korea.

Table 1: Knowledge Societies for development, example from Estonia

Before the Second World War, Estonia's economy was based on agriculture, but there was a significant knowledge sector, with the university city of Tartu known for scientific contributions, and a growing industrial sector, similar to that of bordering Finland. The Union of Soviet Socialist Republics (USSR) annexation of Estonia in 1940 and the ensuing Nazi and Soviet destruction during World War II crippled the Estonian economy. Before the war, Estonia and Finland had a relatively similar standard of living. By 1987, capitalist Finland's GDP per capita reached 14,370 USD, while communist Estonia's GDP per capita was around 2,000 USD.

After Estonia became an independent capitalist economy in 1991, it emerged as a pioneer of the global economy. Oil shale energy, telecommunications, textiles, chemical products, banking, services, food and fishing, timber, shipbuilding, electronics, and transportation are key sectors of the economy. The GDP (PPP) per capita of the country was $23,631 in 2012 according to the World Bank. Because of its economic performance Estonia has been termed one of the Baltic Tigers. (Source: Wikipedia)

Nowadays Estonia's economy relies heavily on knowledge as defined by its Research and Development and Innovation (RDI) strategy. The overall aim of the development of RDI is to create favourable conditions for an increase in productivity and in the standard of living, for good-quality education and culture, and for the longevity and development of Estonia. This strategy establishes four main objectives for Estonia: 1) Research in Estonia is of a high level and diverse; 2) Research and development (RD) functions in the interests of the Estonian society and economy; 3) RD makes the structure of the economy more knowledge-intensive; and 4) Estonia is active and visible in international RDI cooperation.

Source: (Estonian Ministry of Education and Research, 2014)

Table 2: Knowledge Societies for development, example from Finland

In Finland, the 1960s and 1970s were times of drastic change as the country evolved from an agrarian society to a Scandinavian welfare state. Indeed, the country transformation to a Knowledge Society started in 1960s. A few decades later, the Finnish model is equally dynamic in technological and economic terms, but combines the information society with the welfare state. Nokia, the Finnish telecommunications enterprise, has become one of the world's leading telecommunications companies; Linux has become the biggest challenger to Microsoft in the operating systems market. According to (Halme et al., 2014), the development of the Finnish Knowledge Economy followed four stages: 1) Reform of basic structures (from 1960); 2) Technology push (from 1980); 3) Out of recession (1990s); and 4) Knowledge economy in a globalizing world (from 2000). The latest stage is characterized for considering globalization as the foundations for policy operations, focusing on innovation and innovation ecosystems based on multi-stakeholder engagement, and with interventions at the national and local levels. One of the main objectives is the creation of growth companies, and the representative instrument of the policies is the creation of strategic centers for science, technology and innovation.

Strategic Centers for Science, Technology and Innovation (SHOKs) "are public-private partnerships for speeding up innovation processes and bringing together academic research and private R&D activities". As examples, in October 2013, six SHOKs were in operation. One of them, "DIGILE SHOK" seeks to create new ICT-based ecosystems to support opportunities for global growth of new business for DIGILE's owners and partners, involving private, academic and public organizations. In practice, "DIGILE organizes research programs for selected research areas in collaboration with stakeholders." By January 2016, DIGILE has planned or ongoing five research programmes: 1) Internet of Things; 2) Data to Intelligence; 3) Need for Speed; 4) Cyber-trust; and 5) Co-Creative Intelligence.

Source: (SHOK, 2016) and (Digile SHOK, 2008)

Table 3: Knowledge Societies for development, example from Republic of Korea

Over the past four decades South Korea has demonstrated incredible growth and global integration to become a high-tech industrialized economy. In the 1960s, the GDP per capita was comparable with levels in the poorer countries of Africa and Asia. A scarcity of natural resources has motivated South Korea to look at its human capital as its biggest endowment, and the country has invested heavily in education, science and technology, and a "knowledge-based" economy.

Through state-led research and education and corporate research and development (R&D), South Korea has developed a robust science and technology capacity. The country is currently emphasizing R&D in the areas of green technologies, value-added services, and technology convergence—merging telecommunications and network technologies into a single device, for example. The government also ensures that, through its support of industry-oriented research centers, there is a central locus of research geared towards the development of platform and infrastructural technologies (fundamental technologies that enable subsequent creation of other products and processes).

In 2004, South Korea joined the trillion-dollar club of world economies, and is currently the world's 12th largest economy. The "Miracle on the Han River" is a term used to refer to South Korea's postwar export-fueled growth, including rapid industrialization, technological achievement, and education boom, large rise in living standards, rapid urbanization, modernization, successful hosting of the 1988 Summer Olympics and co-hosting of the 2002 FIFA World Cup. This growth was accompanied by a democratization and globalization that transformed the country from the destruction of the Korean War to a wealthy and developed country with a globally influential economy and prominent multinational conglomerates such as Samsung, LG, and Hyundai.

Source: (Gupta, Healey, Stein, & Shipp, 2013)

The Knowledge Economy, also called digital economy, is developing swiftly worldwide. It is the single most important and universal driver of innovation, competitiveness and growth. How well and how rapidly national, regional, and local economies adopt digital technologies will be key for their growth. According to the European Commission (http://ec.europa.eu/growth/sectors/digital-economy/importance/index_en.htm), digital trends such as cloud computing, mobile web services, smart grids, and social media, are drastically changing the business landscape, reshaping the nature of work, the boundaries of enterprises and the responsibilities of business leaders. These trends empower more than just technological innovation. They spur innovation in business models, business networking and the transfer of knowledge and access to international markets.

2.1.10. Knowledge Societies and Sustainable Development

Generating and developing Knowledge Societies are a key element for Sustainable Development, as defined in the 2030 Agenda for Sustainable Development adopted by the United Nations in 2015. The new Agenda is guided by the purposes, and principles of the Charter of the United Nations, including full respect for international law. It is grounded in the Universal Declaration of Human Rights; international human rights treaties, the Millennium Declaration and the 2005 World Summit Outcome Document. It is informed by other instruments such as the Declaration on the Right to Development.

The Agenda decides, between 2016 and 2030, to end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of the planet and its natural resources. It has been also resolved to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities.

The 17 Sustainable Development Goals are:

1. End poverty in all its forms everywhere.
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure availability and sustainable management of water and sanitation for all.
7. Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
10. Reduce inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient and sustainable.
12. Ensure sustainable consumption and production patterns.
13. Take urgent action to combat climate change and its impacts.
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

How can Knowledge Societies contribute to the achievement of these goals? According to (Afgan & Carvalho, 2010), the accumulation of knowledge is intrinsic to science and technology development. It represents quality and quantity description and understanding of our perception of material, social and cultural life. The link between diverse quality of life support systems is vital. During the course of human history the knowledge structure has been formed leading to the formation of its division into the specific branches devoted to individual entities. With the development of ICT in hardware and software forms, a new opportunity was opened for the further systematization and organization of available knowledge. The knowledge base becomes a powerful tool for knowledge organization and for making its potential for economic, cultural, and technological development available. The authors remark that the life support systems are essential pillars of human society development. Knowledge Societies represent a new paradigm for future development and it is strongly related to sustainable development. The sustainability paradigm of the Knowledge Societies is a potential frame for human society development leading to social cohesion, economic competitiveness and stability, use of resources and economic development, safeguarding biodiversity and the ecosystem.

Knowledge Societies can also contribute to providing lifelong and equitable quality education at all levels, as well as technical and vocational training. It contributes to build strong economic foundations for all our countries. As stated by the 2030 Agenda, sustained, inclusive and sustainable economic growth is essential for prosperity. This will only be possible if wealth is shared and income inequality is addressed. Knowledge Societies can help to build dynamic, sustainable, innovative and people-centred economies, promoting youth employment

and women's economic empowerment and decent work for all. It can contribute to, as stated by the 2030 Agenda, strengthening "the productive capacities of least-developed countries in all sectors, including through structural transformation, and adopt policies which increase productive capacities, productivity and productive employment; financial inclusion; sustainable agriculture, pastoralist and fisheries development; sustainable industrial development; universal access to affordable, reliable, sustainable and modern energy services; sustainable transport systems; and quality and resilient infrastructure" (UNGA, 2015).

2.1.11. The Importance of Long-term Planning

Technological, economic, and social change are advancing at the fastest pace known in History. It is indispensable to consider that planning a KSP is an exercise with a long-term projection, which will comprise many years and will probably have to survive a succession of governments with diverse political tendencies. Hence the need to plan for long-term strategies, to set the required goals, and to build the capabilities to achieve them.

Determining a strategic plan to accomplish long-term policy's goals helps you and your country, region or city to keep up focus on the future. A strategic plan provides guidance during each stage of policy development and serves as a reminder of the objectives needed to build a successful policy. Distinctly stating realistic long-term objectives in your policy brings you one step closer to realizing your goals.

It is important to include a list of long-term goals when working on KSP. Long-term objectives may include the e-inclusion of the whole population; promoting the use of ICT to mitigate the impact of climate change and broadening the use of technologies for natural disaster and emergency prevention, alleviation and response; driving research, technological development and productive innovation in the country/region/city, etc. Long-term objectives can take anywhere from ten to twenty years to accomplish.

Regarding KSP formulation, it is useful to ask the following questions: How will the international economic, technological, political, social context evolve in 20 or 30 years? What place do you want for your country, region, city in this future scenario? Which steps are necessary to accomplish this goal?

Policies need to include also short and medium term goals, which will produce results visible to the actors involved and to the general population. The distribution of laptops among the students' population, as well as training students and teachers on ICT use, such as the Ceibal Plan in Uruguay and the Conectar Igualdad Plan in Argentina, and therefore making noticeable progress in e-inclusion, are examples of short-term strategies.

How can we calculate the long-term effects of a given KSP? It is important to consider that generally there is no data available to consider the long-term effects of the KSP. Therefore, further than the accurate evaluation of the KSP's implementation results, a complete analysis or monitoring during several years can be necessary. It is also important to build prospective scenarios to foresee the advances and possible impacts of Knowledge Society Policies in the short, medium, and long runs.

Table 4: Long-term planning for Knowledge Societies, example from Latin America

eLAC is a regionally concerted strategy for Latin America and the Caribbean that conceives of ICTs as instruments for economic development and social inclusion. It is a strategy with a long-term vision (until 2015) in line with the MDGs and those of the WSIS, which is concentrated on short-term action plans with concrete qualitative and quantitative goals to be achieved.

A regional dialogue was launched in 2000 on the information and knowledge society in Latin America and the Caribbean (LAC), in which the countries affirmed their willingness to design and implement programmes for access to and use of ICT. Later, after some regional meetings, the first version of the Plan of Action for the Information Society in Latin America and the Caribbean (eLAC 2007) was approved as a regional vision and a political commitment to reduce the digital divide and promote access to and use of ICTs as development tools. This process continued with the eLAC 2010 and eLAC 2015 plans, adopted at San Salvador in 2008 and at Lima in 2010, respectively, at the second and third ministerial conferences. eLAC 2015 was reaffirmed in Montevideo and a work plan was agreed upon with specific actions for 2013-2015. The preparatory meeting for the fifth Ministerial Conference on the Information Society in LAC was held in San José, from 5 to 7 November 2014, with the purpose of discussing the proposed digital agenda eLAC2018, in order to take stock of the agreements in place and resume the policy dialogue with a view to the post-2015 world, incorporating the emerging challenges of the digital revolution and their impact on public policy.

Source: DIGITAL AGENDA FOR LATIN AMERICA AND THE CARIBBEAN (eLAC2018), http://conferenciaelac.cepal.org/sites/default/files/15-00757_elac_digital_agenda.pdf

2.2. Public Policies for Knowledge Societies

The section explains the role and nature of public policies in guiding the development of Knowledge Societies, from the nature public policies (Section 2.2.1), through knowledge policies in organizational and social dimensions (Section 2.2.2), to public policies for Knowledge Societies (Section 2.2.3), including their features (Section 2.2.4) and possible implementation strategies (Section 2.2.5).

2.2.1. Public Policies

Public policies are the execution framework under which government and non-government organizations work to resolve or rectify the social, economic or political issues of a society, or to attain new goals. They design objectives to meet and define the roles and responsibilities of various agents in the system and the assignment and distribution of human, technological, and financial resources to resolve the issues.

Public policies set some societal norms for behavior, and also strive to improve the quality of life for people. They are set in place primarily by elected officials, who are voted into office for a fixed period of time by citizens. Public policies affect short-term issues as well as complex and intractable issues that occur in multiple locations and are carried out across generations. They are crucial because their impacts and consequences propagate through the entire society directly or indirectly, sometimes for years, decades, or even generations. The policies take the form of providing incentives that encourage certain behavior over another or restraints to discourage particular actions.

2.2.2. Knowledge Policies

Knowledge policies are becoming a progressively significant element of Knowledge Societies, and the knowledge economies. Such policies make available institutional grounds for creating, managing, and using organizational knowledge as well as social foundations for harmonizing global competitiveness with social order, social welfare,

environmental sustainability and diverse cultural values. Knowledge policies can be observed from a number of viewpoints: the required linkage to technological evolution; relative rates of technological and institutional change; as a control or regulatory process; obstacles posed by cyberspace; and as an organizational policy instrument.

For instance, organizational knowledge policies outline the institutional aspects of knowledge creation, administration, and use within the framework of an organization's mandate or business model. Social knowledge policies represent equilibrium between technological evolution, and advancement in the knowledge economy to promote global competitiveness with social values, such as transparency, equity, unity, freedom of expression, and the well-being of citizens.

2.2.3. Policies for Knowledge Societies

A KSP can be defined as a plan or roadmap for the inclusion and appropriation by governments, institutions, communities and individuals, of the benefits derived from the construction and permanent development of Knowledge Societies at the local, national or international levels.

Technological change and knowledge is advancing and is being propagated at the fastest pace known in history. Consequently, governments have to keep up with this pace, elaborating not only long-term policies, but also strategies for short and medium-terms, which will produce results visible to the actors involved and to the general population.

Within this context, it is important to implement access to information and knowledge for all, so all persons and organizations will be able to profit from the advantages of Knowledge Societies, including co-creating knowledge. A realistic strategy to provide information for all must take account of the existence of a wide range of sources of information used by individuals and societies, including both traditional media and information distribution channels and the ICT, including the Internet as an ever increasing information means. For that reason, information and knowledge policies and strategies must be oriented to developing all these different kinds of media and channels.

Looking at the many efforts around the world, there is no general or unique formula for successful ICT policies and e-strategies. Government officers, experts' teams and policy makers in diverse development countries may identify examples of successes or best practices either within their own territories, regions, or in other countries with similar conditions, and adjust them as needed to fit their local unique circumstances.

This Handbook is offered as a tool to assist in developing public policies for Knowledge Societies. Public policy for Knowledge Societies is a collaborative, open, and permanent process, not a finished product. It is a highway, not a harbor. In order to travel through, the highway must be visualized, planed, built, and made travelable to all citizens.

2.2.4. Features of Public Policies for Knowledge Societies

Chuaire & Scartascini (2014) put forward a number of features of public policies, which are quite relevant to KSPs:

- Policy Stability – While some countries seem capable of sustaining most policies over time, in others, policies are frequently reversed, often in response to minor changes in political winds. Having stable policies does not mean that policies cannot change at all, but rather that changes tend to respond to changing economic conditions or failure of previous policies, rather than changes in government or other political shocks.
- Policy Adaptability – Countries should be able to change policies when they are clearly failing, adapt policies in response to changing economic conditions and international learning about best practices. Policy adaptability can be hindered by a policymaking process prone to gridlock, or by rigidities introduced explicitly to avoid opportunistic policy manipulation, which limits volatility at the cost of reducing adaptability. Low adaptability leads to inadequate response to shocks and a propensity to keep sub-optimal policies for extended periods of time.

- Policy Coordination and Coherence – Public policies are often the outcome of actions taken by multiple actors in the policymaking process. While these actors should coordinate their actions to produce coherent policies, this does not always occur. Lack of coordination, which may occur among different agencies within the central government or between different levels of government, often reflects the non-cooperative nature of political interactions.
- Policy Implementation and Enforcement – A policy could be well thought out and pass through the legislative body, and yet be completely ineffective if it is not well implemented and enforced. Poor enforcement of public policies is associated in part with the lack of capable and independent bureaucracies and judiciaries. To an important degree, the quality of policy implementation and enforcement depends on the extent to which policymakers have incentives and resources to invest in policy capabilities.
- Policy Efficiency – Whatever policy direction a government decides to follow (redistribute to the poor, clean the environment, promote non-traditional exports, etc.), it can do so with varying degrees of efficiency, i.e. by making better or worse use of its human and economic resources. Efficient policies imply, for example, that public spending is not wasteful and that all efforts holistically contribute to ensure sustainable development.
- Public-Regard – Public-regard refers to the extent to which policies produced by a given system promote the general welfare and resemble public goods, i.e. are "public-regarding", or tend to funnel private benefits to certain individuals, factions, or regions. In particular, while the private sector may be the powering force behind the development of the Knowledge Societies, governments and organizations should remember that private initiatives, as valuable as they may be, are market driven and may not necessarily consider the needs of the whole population, particularly in developing and least developed countries.

2.2.5. Strategies for Knowledge Societies

A government strategy is a mechanism for implementing public policies. We illustrate below a strategy for National Knowledge Society in Finland.

Table 5: Strategy for Knowledge Societies, example from Finland

During 2006, a National Knowledge Society Strategy for 2007-2015 has been drafted as part of the implementation of Finnish Government´s Information Society Programme. The Strategy outlines a national vision and strategic intent concerning the kind of Information Society Finland wants. In addition to the current state of the Finnish Information Society in 2006, the strategy describes changes in the national and international operating environment. The Strategy includes a concrete implementation programme extending to the next Government's term of office and several proposals for measures, including possible responsible parties.

The Strategy has been drafted to support the emergence of a Finland phenomenon, in other words, the transformation of Finland into an internationally attractive, human-centric and competitive knowledge and service society. Development of skills and creativity, bold renewal of structures and operating models, and efficient utilization of technology will make this possible, even under conditions of increasing global competition. Two previous national information society strategies have been published: Finland – Towards an Information Society, A National Outline (Finance, 1995) and Quality of Life, Knowledge and Competitiveness (Fund, 1998).

The strategy was developed in cooperation with actors and decision-makers from various sectors of society, and with other strategy processes already in progress. Preparation of the Knowledge Society Strategy required stakeholders to exchange opinions concerning the kind of future desired for Finland, the strategic priority areas for information society development, and how the viewpoints presented during strategy preparation can be developed into a common national vision and strategic intent.

Source: (Finnish Prime Minister's Office, 2006)

2.3. Context for Public Policies for Knowledge Societies

In order to guide the development of Knowledge Societies, public policies must be grounded in specific contexts. This section explains such grounding to national and local contexts (Section 2.3.1), international context (Section 2.3.2), Internet evolution context (Section 2.3.3) and research and practice context (Section 2.3.4).

2.3.1. National, Regional and Local Context

Public policies essentially show the intentions of government. Without policies, there can be no governance. To govern there must be a set of guidelines, and public policies to provide those guidelines. Policies enable the public to measure the achievements of the government. If there is an explicit public policy, it can be appraised or criticized by citizens. A policy document lists out the intentions or objectives of the government for a particular department or government area.

The fact of discussing a KSOC makes governments, as well as the other stakeholders, associate, access and social appropriate ICT with public policy-making. As mentioned before, knowledge society policies are those which consider the overall development of governmental responsibility in the construction and permanent development of an information society suited to each country's context, specificities, needs and potentials.

This Handbook considers that a country has a KSP when such a policy is explicit in an official document, or implicit in a higher hierarchy document, such as a national development plan. The same is true for regions and cities: actions alone are crucial, but they are not sufficient; governments and other social agents have a KSP when these actions are specified, planned and coordinated in official documents.

Considering the national, regional and/or local contexts involves analysing and diagnosing national politics and economy, as well as the country's e-readiness, and linkages with the international context, to interpret the information situation and identify development issues to be addressed. Some of the issues to be considered are:

1. The degree of awareness and engagement of the political groups regarding Knowledge Society: If a government is informed and willing to build a KSP to fully build its specific Knowledge Society, it will be supportive of and receptive to the transformations proposed by the KSP.
2. The State agency in charge of the KSP: An important issue to contemplate is the hierarchical level held by the agency, group or person mandated to lead the national strategy. The higher the hierarchical level, the stronger will be the support for the policies proposed by this agency or group and the higher the possibilities to implement them concretely. The working procedures and the special coordination of the participants´ work are also to be considered.

3. Infrastructure and generic ICT services: The most obvious thematic topics of Knowledge Societies strategies focus on the building and distribution of the ICT infrastructure and services. Depending on the characteristics of each country's infrastructure and ICT services, and the number and location of the underserved population, policies should be aimed at fostering universal access and use of the technology by providing a basic minimum of connectivity for the whole of society, with special emphasis on marginalized groups, such as rural inhabitants, ethnic minorities, women, the disabled and elderly people (ECLAC, 2003).

4. Regulatory frameworks: National regulatory frameworks are key elements in the formulation of KSP. They need to be established or adjusted in order to ensure the concrete implementation, assessment and renovation of national policies. The regulation of the telecommunications industry and the strengthening of hardware and software markets are key policy areas (ECLAC, 2003).

5. Human capital and e-skills: Knowledge Societies are based on knowledge. Knowledge is found, among other repositories, in people. Competitiveness, innovation and job creation in Knowledge Societies are progressively more being driven by the use of ICT. This must be supported by a qualified workforce with the knowledge and skills to use these technologies competently. Shortages and disparities in e-skills negatively affect growth, competitiveness, innovation, employment and social organization in many countries. As technologies develop rapidly, the skills required to use them become more and more complex and need to be continuously updated. Individuals with creativity, innovation and higher-level conceptual skills are increasingly in demand. Improving the level of e-skills in the labour force requires action at national, regional, and local levels in education, training, research, industrial and labour policies, and also in areas such as immigration and taxation policies. It is then necessary to analyse and diagnose the existence of human capital related to Knowledge Society and to Knowledge Economy (e-skills). In other words, it is necessary to know which skills are available and which skills need to be built though education and training. Researchers, engineers, computer scientists, technicians, but also economists and political scientists, among others, are key elements for building a KS.

6. Improving education systems: Most countries have recognized the urgent need to reform their education systems and enable lifelong learning to create and constantly update e-skills. Yet implementation of these improvements is still uneven, within countries and between countries. Priorities include:

   Investing on education at all levels, and creating opportunities and incentives for private sector investment on education and lifelong training in e-skills. E-skills mean the effective application of ICT systems and devices. They vary from ICT specialists who have the ability to develop, operate, and maintain ICT systems, to basic ICT users, who are capable users of the mainstream tools needed in their working life.

   Focusing governmental interventions on key issues of quality, relevance, impact of education, and access for all.

   Integrating formal, informal, technical, adult and distance education and training to provide a greater range of opportunities for life-long learning.

   Creating policy and regulatory frameworks, including certification schemes, which may make lifelong learning opportunities attractive and easy for people to pursue.

Table 6: Promoting Knowledge Societies at the regional level, example from Europe

In order to increase the supply of ICT practitioners by 2015 and to ensure there are a sufficient number of skilled people to meet future demand for ICT skills, the European Commission launched the Grand Coalition for Digital Jobs at the conference on 'e-Skills and Education for Digital Jobs' in March 2013 in Brussels. It is a multi-stakeholder partnership that facilitates collaboration between businesses, education providers, and public and private actors to attract young people into ICT education, and to retrain unemployed people.

As part of the Grand Coalition for Digital Jobs, the European Commission organized e-Skills Week in March 2012 to raise awareness of e-skills and the demand for jobs. The week saw 2 235 events taking place in over 37 European countries and involving over 1.8 million participants.

In 2014, a new campaign, 'e-Skills for Jobs' was launched. Its aim is also to raise awareness of the need for citizens to improve their ICT skills for work. The e-Skills for Jobs High-Level Conference and the e-Skills for Jobs Grand Event were organized as part of this initiative. Similar campaigns are planned for 2015-2016.

Source: Grand Coalition for Digital Jobs, https://ec.europa.eu/digital-single-market/en/grand-coalition-digital-jobs

2.3.2. International Context

In specific fields, such as telecommunications, it is not possible to form policies at the national or regional level alone. International institutions such as the WTO, the International Telecommunication Union (ITU), the World Intellectual Property Organisation (WIPO) and the Internet Corporation for Assigned Names and Numbers (ICANN) are determining the rules for global participation. With the globalization of communications, such organizations will progressively determine the frameworks for effective participation in public policies for Knowledge Societies. Therefore, it has become increasingly important to invest intellectual resources in influencing these agendas and their outcomes. This is particularly relevant to represent the interests of developing countries and emerging economies.

Table 7: Knowledge Societies in international context, example of WSIS

The WSIS was a unique two-phase UN summit that began with the goal of achieving a common vision, desire and commitment to build a people-centric, inclusive and development-oriented Information Society where everyone can create, access, utilize and share information.

The first phase of the WSIS took place in Geneva in 2003 and the second phase took place in Tunis in 2005. The WSIS is a key event in the history of the Internet. It recognized that it is not only governments who should have a say in the development of the Internet's future, but also businesses, civil society, engineers, academics, and everyone who can play a role in its future. It also defined a set of targets, recommendations and commitments to build an inclusive, people-centric and development-oriented Information Society.

In December 2015, the United Nations General Assembly reviewed whether sufficient progress has been made to achieving the WSIS goals over the past 10 years and considered the future of the WSIS process beyond 2015. This is often called the "WSIS+10 Review" and culminated in a High-level Meeting on 15-16 December at the UN Headquarters in New York.

The draft resolution submitted to the President of the General Assembly (United Nations, 2015) calls for closer alignment between the WSIS process and the 2030 Agenda for Sustainable Development and highlights interventions and issues in 5 areas: 1) ICT for development, and issues including bridging digital divides, enabling environment and financial mechanisms; 2) Human rights in the information society; 3) Building confidence and security in the use of ICT; 4) Internet Governance, including enhanced cooperation; and 5) Follow-up and review.

Source: (Internet Society, 2016)

With respect to visions, the documents resulting from the WSIS are particularly relevant because they have emerged from a participative world process. The Geneva Declaration of Principles adopted by governments, with significant contributions from civil society, expresses in its first article:

> "We... declare our common desire and commitment to build a people-centered, inclusive, and development-oriented Information Society, where everyone can create, access, utilize, and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights."

On the other hand, the Civil Society Declaration (2003) states:

> "We are committed to building information and communication societies that are people-centered, inclusive, and equitable. Societies in which everyone can freely create, access, utilize, share and disseminate information and knowledge, so that individuals, communities, and peoples are empowered to improve their quality of life and to achieve their full potential."

Afterwards, this Declaration adds the principles of social, political, and economic justice, as well as full participation and capacity-building of the peoples; it highlights the objectives of sustainable development, democracy, and gender equality; and it evokes societies where development acts as a setting for fundamental human rights and is oriented to attain a more equitable distribution of resources (Abramson, 2006).

The history and antecedents of Knowledge Societies, even if rich in content and organizational schemes, were still relatively young and scarce until the beginning of the new millennium[5]. The WSIS 2003 Plan of Action declared that "Development of national e-strategies, including the necessary human capacity building, should be encouraged by all countries by 2005, taking into account different national circumstances" (WSIS, 2003).

In 2005, the WSIS Tunis Commitment (WSIS, 2005b) expressed: "We also recognize that the ICT revolution can have a tremendous positive impact as an instrument of sustainable development. In addition, an appropriate enabling environment at national and international levels could prevent increasing social and economic divisions, and the widening of the gap between rich and poor countries, regions, and individuals—including between men and women", and acknowledged the central role of public policy in setting the framework in which resource mobilization can take place.

Paragraph 84 of the Tunis Agenda for Information Society (WSIS, 2005a) stated: "Governments and other stakeholders should identify those areas where further effort and resources are required, and jointly identify, and where appropriate develop, implementation strategies, mechanisms and processes for WSIS outcomes at international, regional, national and local levels, paying particular attention to people and groups that are still marginalized in their access to, and utilization of ICT.".

2.3.3. Internet Evolution Context

The use of the Internet has increased and developed in multiple forms so much that some recent research has started to consider that it is becoming an extension of the human mind. Within such fast evolutionary context, the need for public policies for Knowledge Societies has increased. According to the Internet Society Statement at WSIS Forum 2015 (WSIS, 2015): "The Internet is constantly evolving and while some issues get closure, new issues arise or older ones get exacerbated. The question is how to address those issues without breaking the very nature of the Internet itself."

Nevertheless, in assessing the properties that make the Internet valuable and are worth preserving, (Internet Society, 2012) came up with a number of invariants:

5 It is not the intention of this Handbook to describe all the national, regional, and international organizations that have played an active role in the history of UNKSOC. However, if readers are interested to deepen this subject, they may consult similar/complementary approaches adopted by the World Bank, the World Economic Forum, European Institute for Cooperation and Development, European Community, e-LAC, ASEAN, African Union, etc.

- Global reach – any endpoint on the Internet can reach any other.
- General purpose – the Internet supports a wide range of services; irrespective of the carrier of its signals.
- Permission-less innovation, also called Open Innovation – there are no gatekeepers for new ideas or services to be deployed on the Internet.
- Accessible – anyone, anywhere can get on the Internet to consume but also to create.
- Interoperable – open standards that allow for voluntary adoption have led to a high degree of interoperability.
- Collaboration – collaboration between willing and engaged stakeholders helps address issues more effectively.

A further relevant issue, as mentioned by the Internet Society (Internet Society, 2012), is the need to use the Internet as a key tool to empower societies in a sustainable way. There is an enormous potential of stakeholders that act locally while thinking globally. It is at the local level where through collaboration, trust is built and implemented. It is at the local level where the visions and leadership of individuals can be seeds for global implementation. The Internet Society states that "Cooperation and collaboration remain the essential factors for the Internet's prosperity and potential."

Additional relevant issues to be examined are written in the unanimously adopted Connect 2020 Agenda at the ITU 2014 Plenipotentiary Conference (ITU, 2014). This Agenda is intended to guide the efforts of the ITU and its member states during the next years, according to a shared vision: "An information society, empowered by the interconnected world, where telecommunication/ICT enables and accelerates socially, economically and environmentally sustainable growth and development for everyone". The four main agreed upon goals are (http://giplatform.org/events/wsis-forum-2015):

- Growth – to enable and foster access and increased use of telecommunication and ICT.
- Inclusiveness – to bridge the digital divide and provide broadband to all.
- Sustainability – to manage the challenges.
- Innovation and Partnerships – to lead, improve and adapt to the changing telecommunication and ICT environment.

2.3.4. Research and Practice Context

While in 2009 some national governments had not yet built their national public policies for information societies, by 2015 almost all the countries have done so. Many of them have published their second or even third public policy update. Moreover, regional and local governments have conceived their own digital agendas, either explicit or implicit, which can be or not coordinated with the national Knowledge Societies plans. Therefore, this Handbook contemplates the needs, not only for national Knowledge Societies, but also for macro-regional, regional and local policies.

Despite government efforts, in 2015, there is a paucity of literature and research about public policies for Knowledge Societies. While there's a relatively abundant literature about methodologies for public policies, mainly for their assessment and solid literature for KS sectors such as e-government and e-education, there is lack of methodologies concerning public policies for developing Knowledge Societies as a whole. This Handbook attempts to fill this gap by helping governments and other social actors generate, execute, and upgrade agendas to develop those policies and relevant legislations.

3.

Foundations – Elements of Knowledge Societies Policy

Building on the terminology introduced in the Chapter 2, this chapter introduces elements of the public policy for Knowledge Societies. The introduction starts by positioning Knowledge Societies policy within the Sustainable Development approach (Section 3.1). Subsequently it presents the vision (Section 3.2), principles (Section 3.3), stakeholders (Section 3.4), networks (Section 3.5), governance (Section 3.6), e-services (Section 3.7) and evolution (Section 3.8) elements of public policies for Knowledge Societies.

3.1. The Sustainable Development Approach

According to Mansell and Tremblay (UNESCO, 2013), the vision of Knowledge Societies for peace and sustainable development (see the 2030 UN Agenda) requires an extra move to stress the need to assemble partners from the private and public sectors and civil society to enlighten persistent problems and to create processes and actions that will address them. Both UNESCO and UNU-EGOV are well-positioned to lead in present and future work aimed at promoting Knowledge Societies that are inclusive and equitable.

Chapter 4, and particularly Section 4.2 in this Handbook presents the reasons why the development of Knowledge Societies and public policies that guide such development should not be seen themselves as objectives, but rather as important transformational means (mechanisms) to achieve the desirable ends (impacts) of sustainable development.

3.2. Vision

This Handbook defines a vision of Knowledge Societies policy as the multi-stakeholder aspiration of what a government, together with other social agents, aims to accomplish in the future (in the short, medium or long term) in a comprehensive policy for Knowledge Society, considering above all the wellbeing of its population.

Table 8: Vision for Knowledge Societies, example from Seychelles
The National ICT Policy is aligned to the following vision statement: A Seychelles that will be globally competitive, with a modern ICT enabled economy and a knowledge-based Information Society where strong, efficient and sustainable improvements in social, economic, cultural, good governance and regional integration are achieved through the deployment and effective application of ICT. Source: National ITC Policy for Seychelles (Government of Seychelles, 2007)

Some visions are more general. They specify Knowledge Society policies as part of an economic strategy.

Table 9: Vision for Knowledge Societies, example from Qatar
Qatar National Vision 2030 states: "Comprehensive development is our main goal in striving for the progress and prosperity of our people." The Qatar National Vision document affirms that "Qatar is at a crossroads. The country's abundant wealth creates both previously undreamt of opportunities and formidable challenges. It is now imperative for Qatar to choose the best development path that is compatible with the views of its leadership and the aspirations of its people." Regarding the vision for Qatar suitable economic diversification, it is envisioned as "A diversified economy that gradually reduces its dependence on hydrocarbon industries, enhances the role of the private sector and maintains its competitiveness through: 1) expansion of industries and services with competitive advantages derived from hydrocarbon industries; 2) design and development of economic activities in which Qatar can specialize, including the technical and human requirements of these activities; and 3) a knowledge-based economy characterized by innovation, entrepreneurship, excellence in education, a world-class infrastructural backbone, the efficient delivery of public services, and transparent and accountable government. Source: Qatar National Vision 2030 (Qatar Higher Authorities, 2008)

The fundamental role of ICT as enabler and tool for the definition and implementation of an ambitious vision of the information and knowledge society is widely recognized, as is the fact that there is unequal distribution and sharing of this technology and of access to information. According to ITU, many KS policy visions include the following elements:

- Universal service: It is considered the first and most important principle for the information society. In a background where information and knowledge are vital to social and economic development, access to information and the means to use that information needs to be extended to everyone, everywhere. For this reason, universal access or universal service are an essential point of all declarations, in particular with reference to the needs of developing countries, where the information society both opens up great potential for development and poses new risks, broadening disparities between and within countries.
- Equality of opportunity: The physical existence of infrastructures is indispensable but not enough for development of the knowledge society. Factors such as gender, level of education and literacy, household income, language, race and ethnicity are all critical determinants of ICT utilization and access within countries. Consequently, there is a need to promote equality of opportunity to citizens, and in particular to encourage the participation of weaker categories in the use of ICT.
- Content diversity: Content is a central element for the utilization of ICT, and crucial to promote the production and uploading of contents from diverse cultures, languages and countries. Advancement of local content on the Internet is a means to ensure a culturally and linguistically diverse cyberspace. This diversity, including multilingualism, is a significant part of our cultural heritage and needs to be protected.

ICT provide new channels for the expression of this diversity and for the worldwide propagation of locally created content. Suitable content would also help the utilization of ICT for educational purposes, training and human resources development.

- Freedom of expression and freedom of access: Communications can be a vehicle for the implementation of the principle of freedom of expression, as stated in Article 19 of the United Nations Universal Declaration of Human Rights: "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers." For the building of Knowledge Societies, it is indispensable to defend plurality of opinions, and to sponsor open access to networks for service and information suppliers and free expression of ideas. According to ITU, this freedom should then be joined with the right of the public to have access to information in all media including new multimedia systems.

In addition to their fundamental role, ICT are seen by different bodies of the international community as being (Sarrocco & Kelly, 2002):

- A tool for economic and social development.
- A tool for people inclusion and empowerment.
- An engine for growth.
- The central pillar for the construction of a knowledge-based economy and society.
- An opportunity for countries to free themselves from the tyranny of geography.
- A bridge between developed and developing countries.

Table 10: Science, technology and innovation policy, example from Israel

Israel focuses its Knowledge Society policy on Science and Technology development. While there is no national plan or strategy for Science, Technology and Innovation (STI), several reports and policy documents provide orientations. Certain areas have been identified for policy attention: biotechnology, nanotechnology, clean technology sectors and improving the performance of low-technology industries. Attention is also paid to improving the quality of human capital.

According to the OECD, several measures support business Research and Development (R&D) – for example, about 80% of the R&D budget goes to SMEs. The R&D Fund was specifically created to reduce risks for industrial innovators. It approves projects of all types of firms – start-ups and SMEs but also large firms – based on industry experts' advice and systematic project evaluations. It has been instrumental in the successful development of the ICT sector and now mainly focuses on new priority fields such as biotechnology.

Support for start-ups is an important dimension of the Israel's STI policy. The Technological Incubators programme supports early-stage technological entrepreneurship by providing support for turning innovative ideas into potentially successful commercial products. The programme's budget is about USD 40 million. The Programme also supports innovative technological entrepreneurship at the pre-seed stage by helping to prepare patent applications and evaluating the initiatives' technological and financial feasibility.

The main STI issues are: 1) leveraging the scientific and technological labour force by supporting entrepreneurship and better linking scientific research and private industry; 2) improving the evaluation and monitoring of STI policy; and 3) strengthening capacity in fields such as clean technologies, computer science and biotechnology.

Evidently, every country, government, and diverse social agents will have their own proposals for the policies vision. Policy-makers will have to mediate between diverse and often contradictory interests and ideologies.

3.3. Principles

This section presents a system of principles underpinning the development of public policies for Knowledge Societies. The principles include and the following sections elaborate upon: contextualization (Section 3.3.1), human rights (Section 3.3.2), gender equality (Section 0), indigenous and traditional knowledge (Section 3.3.4), and freedom of expression (Section 3.3.5), as well as policy targets (Section 3.3.6), developing country focus (Section 3.3.7) and the role of government (Section 3.3.9).

3.3.1. Contextualizing Knowledge Societies

The UNESCO/IFAP "Public Policies for Information Society. A Template" (UNESCO, 2009) was conceived when many countries had yet to build their national policies for information societies. However, Knowledge Societies are fast developers. In the first decade of the century the Internet had already permeated almost every human activity, but it was difficult to predict that Knowledge Societies would have evolved in the way it did.

It is necessary to consider not only the changes that the world has undergone in these years, it is also essential to foresee possible changes at least in the short term, i.e. within a 2020 horizon. Present problems, such as increased and unequal urbanization, economic crisis, displaced populations, massive international migrations, multicultural societies, enlarged necessity for multilingualism, ageing populations, increasing need for cybersecurity, a still existing information and knowledge unbalance, the need to generate innovation for development, the requirement to build environmentally sustainable societies, and unceasing technological change, are transforming the world we live in, and reveal the necessity for new approaches to Knowledge Societies. As mentioned previously, generating and updating public policies for Knowledge Societies is a never ending task, which runs together with the evolution of the Internet.

According to (Kingston, 2007), the evolution of a KSP orienting the development and consolidation of the Information Society inclusively and equitably is one of the main challenges of the present-day globalized world. For that reason, Knowledge Societies goals may be formulated and implemented following seven vital overall guidelines:

1. The UN 2030 Sustainable Society Agenda.
2. The 2003, 2005 and 2015 WSIS Declaration.
3. Objectives established by regions, e.g. Arab States, Asia and the Pacific, Latin America and the Caribbean, Europe, North America, East, West and Central Africa.
4. Principles and goals established by North-South, North-North and South-South cooperation programmes between regions.
5. Macro-regional development objectives. It becomes mandatory for regions, e.g. Asia and the Pacific, Europe and North America, Africa, Latin America and the Caribbean, Arab States, as well as for macro-regional organizations, such as the European Union, ASEAN, or Mercosur to identify key regional priority areas for a global Knowledge Societies agenda from a regional perspective. Supra national organizations, such as the European Union, or UNASUR in South America, are working in their own Knowledge Societies' goals. It is necessary to underline the need to adapt global goals to regional and national ones.
6. National development goals, as stated in national development plans. According to the Tunis Agenda for Information Society: "National e-strategies, where appropriate, should be an integral part of national development plans, including poverty reduction strategies, aiming to contribute to the achievement of

internationally agreed development goals and objectives, including the MDG" (WSIS, 2005a).

7. Regional (provinces, federal states within a country) development goals. In many countries provinces and states have built their own Knowledge Societies agendas. It is key for national government agencies to enhance the provincial or local government initiatives toward the development of Knowledge Societies, to assist with their sectoral programs and with the development of decentralization and de-concentration of policies and procedures.

8. Local innovation and development goals. While in the late 1990s it was accepted that ICT-based development and innovations could only be bred in metropolitan areas, intermediate cities and even relatively small cities are developing innovation environments, producing and exporting ICT-based goods and services. It is therefore important to consider local objectives and possibilities for development in Knowledge Societies.

3.3.2. Human Rights in Knowledge Societies

Bindé & Matsuura (2005) highlights the importance of human rights in Knowledge Societies: "The human-development and empowerment-centered approach, implicit in the concept of Knowledge Societies, should ensure that human rights and fundamental freedoms are implemented more fully, while making for greater effectiveness in the fight against poverty and the framing of development policies."

UNESCO and UNU-EGOV research have shown that the emerging Knowledge Societies cannot limit themselves to putting forward a few reforms to reduce inequalities of access to the global information society and to combat the economic and educational disparities that underlie them. They must also include, among their main constituent principles, the safeguarding and promotion of the rights and freedoms proclaimed by universally recognized international human rights instruments – foremost among them the 1948 Universal Declaration of Human Rights and the 1966 International Covenants on Civil and Political Rights and on Economic, Social and Cultural Rights (Bindé & Matsuura, 2005). As UNESCO emphasized at the WSIS, "the use of information and communication technologies to build Knowledge Societies should tend towards human development based on human rights."

For example, in 2010, the Government of the Province of San Luis, Argentina, has included in its Constitution the right to free access to Internet by broadband as a human right. It is the first constitution in the world to grant free access to the Internet to its whole population. According to the University of La Punta (INFO ULP, 2012), Internet penetration in the Province of San Luis has reached 98% in 2012.

3.3.3. Promoting Gender Equality

The UN Sustainable Development Agenda states as its Goal 5 "Achieve gender equality and empower all women and girls". Gender Equality is one of UNESCO's two universal priorities, along with education. UN and UNESCO are committed to promote equality between women and men across the Organization's mandate. Gender Equality is not only a fundamental human right, but a necessary foundation for the creation of sustainable and peaceful societies.

While there is recognition of the potential of ICT as a tool for the promotion of gender equality and the empowerment of women, a "gender divide" is reflected in the lower numbers of women accessing and using ICT compared with men. Unless this gender divide is specifically addressed, there is a risk that ICT may exacerbate existing inequalities between women and men and create new forms of inequality. If, however, the gender dimensions of ICT – in terms of access and use, capacity-building opportunities, employment and potential for empowerment – are explicitly identified and addressed, ICT can be a powerful catalyst for political and social empowerment of women, and the promotion of gender equality (UNDP, 2011).

Women's ability to take advantage of ICT depends on appropriate policies, on enabling environment in their countries to extend communications infrastructure to where women live, and on increased educational levels. Active efforts will be needed to take advantage of the opportunities offered by WSIS and the UN Sustainable Development Agenda to bridge the gender divide which is already ostensible within the emerging Knowledge Societies. To help achieve this, UNESCO wishes to foster the broadest possible participation of decision-makers, professional communities, and representatives of civil society, bilateral and multilateral partners, and the private sector in order to:

- Discuss ongoing initiatives on gender and ICT.
- Raise awareness on gender-related barriers to ICT access.
- Include women as leaders and decision-makers.
- Facilitate better understanding of the needs within the framework of gender and ICT.
- Render assistance.
- Support local solutions and content.
- Take forward the commitments made at previous UN conferences and summits.

In short, Knowledge Societies policies need to take into account the gender equality issues in order to implement successful initiatives. According to (UNDP, 2005), gender issues need to be identified and addressed in all aspects of development and implementation of ICT policy and regulatory frameworks. Such frameworks include a range of issues, including the development of a national communication infrastructure (including technology choices), Government information services, and tariffs and pricing, which influence women's access to and use of ICT. Policies and regulatory frameworks, including legal protection and the right to privacy and anonymity in transactions, interaction and expression, directly affect the rights and security of users, and are of concern to women as well as men.

Some positive examples have been developed. A number of countries in Africa, namely Côte d'Ivoire, Guinea and South Africa have taken valuable steps towards gender equality in ICT policy. For example, the Telecommunications Act of South Africa includes provisions to redress gender imbalance and other areas of disadvantage. In Asia, the Republic of Korea has set an important precedent by establishing a proactive ICT policy towards gender equality (United Nations Division for the Advancement of Women, 2005).

Table 11: Promotion of gender equality through ICT, example from India

As women became involved in the Baduria ICT Centre in West Bengal, India, they reported that they gained more respect in their local communities as a result of the ICT skills acquired at the center, i.e. learning to use a computer and accessing and distributing information to local people. This resulted in greater respect at both the family and community levels. Younger women felt they were able to approach the job market with greater confidence. There was also an emergence of solidarity; since women learned to use computers together at the ICT Centre, they often discussed their problems, creating a sense of unity among them and bringing forth leadership qualities.

Source: (United Nations Division for the Advancement of Women, 2005)

3.3.4. Preserving Indigenous and Traditional Knowledge on the Internet

An important challenge for the Post-2015 Development Agenda is maintaining universality while identifying and addressing the needs of specific peoples and persons facing structural disadvantages due to gender, age, race, ethnicity, nationality migratory status, disability, geographic location or other characteristics. Respect for human rights and social inclusion require promotion of equality and non-discrimination by acknowledging social differences and cultural diversity and addressing these properly in dissimilar national contexts.

According to UNESCO (2013) indigenous and traditional knowledge is essential in building pathways to develop innovative processes and strategies for locally-appropriate sustainable development. This knowledge is integral to a cultural complex that also comprehends language, systems of classification, resource use practices, social interactions, ritual and spirituality. These unique ways of knowing are important facets of the world's cultural diversity, and provide a foundation for comprehensive Knowledge Societies.

There is an increasing concern about the loss of culture. At the same time, there is a cumulative acknowledgment that indigenous peoples have the right to practice and revitalize their own cultural traditions, customs and knowledge, and incorporate and apply ICT on their own terms. This includes the right to create and share cultural content in their own languages and to design initiatives and programmes related to the achievement of the MDG and the 2030 Agenda. There are numerous examples of the ways in which ICT, when appropriate and under the control of indigenous peoples, can be supportive of their languages and culture while also opening new doors and career opportunities through the development of ICT skills and knowledge. ICT can also be used to extend learning opportunities to indigenous students who live in isolated areas.

According to (UNESCO, 2011), ICT may be viewed as a two-edged sword that has the potential to accelerate the erosion of indigenous culture and knowledge. On the other hand, the new digital technologies offer the potential to empower and support the creation of new culturally responsive learning resources and environments for indigenous children.

There are many models across the world that show how ICT can be applied by indigenous peoples to strengthen and reinforce indigenous knowledge and culture and provide more culturally responsive learning resources and environments for their children.

Table 12: Promotion of indigenous culture through ICT, example from the USA

The 4Directions Project involved 19 schools serving indigenous children in all parts of the United States of America. It demonstrated the benefits of indigenous communities partnering with universities and other organization to explore ways ICT can be used to help develop culturally responsive curriculum. Features of this programme included:

- Restructuring curricula to incorporate local cultures and values.
- A strong school-home and school-community focus.
- Collaborating across sites through on-site training, online tutoring, and cooperative teaming.
- Creating networked "virtual communities" of indigenous teachers and students.
- Encouraging life-long learning by extending technology support to communities surrounding project schools.
- Maintaining a network database of culturally appropriate teaching, assessment, professional development, and student-created resources.
- Creating a research-based evaluation model.

As the core of this project, each school developed an advisory team consisting of students, parents, teachers, para-professionals, elders and other community members. The teams developed authentic learning tasks that were relevant to students and drawn from the unique cultural context of each indigenous community. These tasks were then developed into "thematic cycles", central components of core curricula that allowed the presentation of subject matter within a cultural context and integrated the cultural theme into other subjects. All members of the team, parents, and community members, were involved in the development of curricula and in the evaluation of the project and its relevance to the traditions of the community. Targeted curriculum areas included art, mathematics, science, social studies, economics, geography, language arts, and fine arts.

Source: UNESCO – IITE Policy Brief, Paris, 2011.

3.3.5. Ensuring Freedom of Expression in Knowledge Societies

Freedom of expression (both online and offline) is a human right that assumes growing importance as humanity moves more and more towards a knowledge society (Bindé & Matsuura, 2005). Freedom of expression infers freedom of opinion, freedom of speech and of the written word, freedom of the press, free access to information, and the free flow of data and information. Without freedom of expression, there can be no Knowledge Society. Freedom of expression, which is directly linked with the essential freedom of scientific research and artistic creation, is the only protection against the global information society becoming a global misinformation or disinformation society (Bindé & Matsuura, 2005).

Progress in peace, democracy and development, for individuals, communities and countries, and in regard to gender and developing countries, will be led by the free flow of information and ideas, and by people's abilities to convert these resources into knowledge and subsequently facilitate development.

Progress in research, innovation, and learning, as well as social inclusion, depend on freedom of expression. In order to reach such progress at a global scale it is necessary that no region or country or part of the world, or any social group, or gender, is deprived of freedom of expression. Policies for Knowledge Societies need to guarantee that international standards are respected, and to ensure that every human being can exercise her or his freedom of speech.

3.3.6. Targets of Public Policies for Knowledge Societies

In analyzing the WSIS process regarding public policies for Information Society in developing countries, it becomes evident that the entire procedure had been crossed by two separate approaches (Abramson, 2006) which can be briefly summarized as follows:

- In the first approach, the concept of information society refers to a new development paradigm that assigns technology to a causal role in the social order, designating it as the drive of economic development. However, for the developing countries, this discourse implies that the transition towards the information society is essentially a matter of time and of political decision to create adequate "empowering conditions". Something similar occurred with regard to the social sectors affected by the digital gap, which would have to be included via universal access programs. By positioning technology at the core of this model, the informatics and telecommunications industry are convoked to lead this development; while the industry that produces services and digital content assumes a previously unheard of influence.

- The second approach accepts that the new phase of human development is characterized by the predominance of information, communication, and knowledge in the economy as well as human activities. According to this perspective, technology is the support that has released the acceleration of this process; but it is not a neutral factor, since technological progress is guided by games of interest between diverse social actors (Abramson, 2006). Following this perspective, policies for Knowledge Society building and development should focus on societies, on human beings, and should be created in terms of their needs and within a benchmark, not only of technological initiatives, but above all of human rights and social justice. In other words, for this approach, what is fundamental is not "information" but rather "society". While the first approach refers to data, transmission channels, and storage space, the second talks about human beings, cultures, forms of organization and communication. The information is determined in terms of society and not the inverse.

Table 13: Emergence of Information Economy, example from Ireland

In Ireland the emergence of information economy related activity was generated and implemented through inward investment and the indigenous sector in one of Europe's most peripheral regions. Ireland's policy makers seek to ensure that both skills and infrastructural requirements are adequately provided in order to solidify Ireland's attractiveness for investment while, at the same time, encouraging the growth of indigenous high technology companies. Internationally traded services sectors such as software, financial services, telemarketing and shared services have expanded considerably in recent years.

Source: (Grimes, 2003)

Table 14: Actions for developing Information Society, example from Lithuania

The framework strategic document for information society development actions – Lithuania's Digital Agenda approved on March 2014 – focuses on 3 major areas: skills and motivation of the Lithuanian citizens to use the ICT, development of electronic content and evolvement of the ICT infrastructure in Lithuania.

In the areas of broadband development, Lithuania's Digital Agenda focuses on providing incentives for investments in broadband infrastructure and intervenes where market operators fail to satisfy the demand for broadband access due to a low degree of economic viability. It also gives a high priority to stimulation of the demand for fast Internet access as well as the digital literacy of Lithuania's people. Implementing strategic objectives defined in the Agenda, Lithuania's Next Generation Internet Access Development Plan defines State's goal in this area – to develop new generation Internet access infrastructure in the areas in which the market fails to ensure development of this infrastructure and provision on Internet services, and to induce competition in broadband market and use of broadband services.

Source: (European Commission, 2016)

3.3.7. Ensuring respect for Intellectual Property Rights

According to the WTO, Intellectual Property Rights are defined as "the rights given to persons over the creations of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time"[6]. Intellectual property rights are customarily classified into two main areas:

6 See more at WTO, https://www.wto.org/english/tratop_e/trips_e/intel1_e.htm

- Copyright and rights related to copyright, encompassing the rights of authors of literary and artistic works (books and other writings, musical compositions, paintings, sculpture, computer programs and films) which are protected by copyright, for a minimum period of 50 years after the death of the author. Also protected through copyright and related rights are the rights of performers (e.g. actors, singers and musicians), producers of phonograms (sound recordings) and broadcasting organizations. The main social purpose of protection of copyright and related rights is to encourage and reward creative work.
- Industrial property, including two main areas: i) the protection of distinctive signs, mainly trademarks and geographical indications. The protection of such distinctive signs is oriented to stimulate and ensure fair competition and to protect consumers, by enabling them to make informed choices between various goods and services. The protection may last indefinitely, as long as the sign in question continues to be distinctive. ii) Other types of industrial property are protected primarily to stimulate innovation, design and the creation of technology. This category includes inventions (protected by patents), industrial designs and trade secrets. The social intention is to provide protection for the results of investment in the development of new technology, thus giving the incentive and means to finance research and development activities.

A functioning intellectual property regime should also facilitate the transfer of technology in the form of foreign direct investment, joint ventures and licensing. The protection is usually given for a finite term (typically 20 years in the case of patents). WTO reminds that the exclusive rights given are generally subject to a number of limitations and exceptions, aimed at fine-tuning the balance that has to be found between the legitimate interests of right holders and of users.

There is a lively debate on intellectual property and the right to access intellectual production. In Knowledge Societies, information and knowledge can be accessed in larger ways than in traditional industrial societies. Creative Commons[7] is a nonprofit organization that has created diverse kinds of licenses to allow individuals to choose which type of copyright protection best suits them and their work. The goal of Creative Commons, according to its website, is "to increase the amount of creativity (cultural, educational, and scientific content) in the 'commons'—the body of work that is available to the public for free and legal sharing, use, repurposing, and remixing." Creative Commons licenses allow their holders to grant broad permission to others to share, remix, use commercially, or otherwise use their work without having to ask specific authorization for each use. This makes it "easier for people to share and build upon the works of others, consistent with the rules of copyright."

A Policy for Knowledge Societies needs to debate about the different options of Intellectual Property, and to explicitly define the country, region, city choices.

3.3.8. Public Policies for Knowledge Societies in Developing Countries

The urge to build and update explicit Public Policies for Knowledge Society is not a local isolated impulse, but an international process that can be followed through international events and documents. The discussion and debate process that took place at national and international levels, triggered by the WSIS events, have deepened the perception about the need to construct and update Knowledge Societies.

Concerning principles that are vital to developing Knowledge Societies, a series of questions are raised:

- How the building of inclusive, equitable and innovative Knowledge Societies is to be ensured by the different social actors in developing countries?
- What elements should be attracting priority efforts of governments, the private sector and civil society to

7 http://creativecommons.org/

implement Knowledge Societies?

- What sources of financing to ensure the implementation of these policies should be encouraged?
- What are the conditions required to ensure that multi-stakeholder participation in the creation and implementation of Knowledge Society Policies becomes a reality?

Although strategies for developing local ICT sectors in developing countries date back to the 1980s (Singapore, India, Brazil were among the pioneers), a development application only emerged in the late 1990s. The expectations raised by the turn of the Millennium contributed additional support to this shift in focus. With the support of new global public-private partnerships, such as the G-8 Digital Opportunity Task Force (DOT Force), and the UN ICT Task Force, countries shifted from random pilot experiences to more comprehensive policy approaches with national ICT for Development (ICTD) strategies as the cornerstones. The goals set in this context ranged from identifying applications for ICT in development, to the development of wholly new domestic ICT industries (Brazil, India, Ghana, Argentina, and Uruguay, among others).

The last two decades have witnessed significant increase in the development of ICTD strategies. In Africa alone in 2003, more than 35 countries have completed, or are in the process of completing, related efforts (Zambrano, Raul and Browne, 2004). Nevertheless, (Zambrano, Raul and Browne, 2004) state that:

> "although more than 90 developing countries had already embarked on the design of national ICTD strategies before 2005, the results have been far from optimal. There is an urgent need to streamline approaches. Many of the strategies have a technological focus and aim at promoting the development of a local ICT industry (mostly software). Others are over-ambitious and lack the credibility to attract the required financial resources for implementation. Yet others do not identify concrete priorities and/or adequate implementations plans and are, for the most part, government driven, excluding all other sectors from the process. Moreover, most of them are not linked with national development agendas, such as poverty reduction and the MDGs".

Table 15: Knowledge Societies policy for development, example from Uruguay

The Digital Agenda for Uruguay (ADU) is a road map encompassing the different initiatives related to Information Society which area is a priority for the country. Since year 2007, and over several administrations, Uruguay has developed its digital policy with a continuous, systematic and evolutionary work linked to the country's institutional strengths and which is reflected in the three issued versions of the Digital Agenda for Uruguay.

The ADU is not a government plan; it is a country commitment, a multi-stakeholder agreement between representatives of government, the academia, the private sector and civil society organizations. All stakeholders are involved in its orientation, implementation and monitoring, through a National Council for the Information Society.

Perhaps the most significant aspect is that agreements are not limited to a national technology plan; its focus is on social inclusion and strengthening the national capacities through ICT. While previous versions were mainly focused on setting up the necessary infrastructure to make new objectives achievable, the third and current edition emphasizes on offering direct and concrete benefits to the citizenry.

The ADU has 59 concrete and measurable goals that correspond to 15 objectives that emerge from six areas of action (in line with WSIS and eLAC): access; education and Culture, Electronic Government, productive development; health; and environment.

Already in 1999, the United Nations Economic and Social Commission for Asia and Pacific (UNESCAP) identified the factors affecting the formulation of national ICT policies in developing countries. That study stated that "the importance of ICT policies is understood at the highest political level in many developing countries, and some

countries have already adopted their own policies (…). The effectiveness of an ICT policy in one country does not guarantee that the same recipe would work in another and many developing countries face similar constraints that need to be taken into account when ICT policies are formulated." (UNESCAP, 1999). (UNESCAP, 1999) also sustains that "the ICT evolution will take place with or without a systematic, comprehensive and articulated policy". However, it also points out that the lack of a coherent policy is liable to contribute to the development (or prolonged existence) of ineffective infrastructure and a waste of resources.

Table 16: Knowledge Societies policy for development, example from Kenya

Public policies to encourage the use of mobile devices: Kenya has comparatively low-priced mobile services for Africa, with monthly costs averaging KES 161 (US$1.90) for 30 calls and 100 SMS text messages. The average user pays about US$36 per month for 1-2 Mbps of unlimited data services and US$37 for unlimited Internet through a USB dongle (3G modem). These relatively affordable costs are in large part the result of strong regulatory interventions that have led to the implementation of the lowest mobile termination rates across the continent. Data bundles are available for prepaid mobile customers, while mobile broadband subscriptions on GPRS, EDGE and 3G networks have also continued to increase. The growth in mobile Internet subscriptions can be attributed to competitive mobile Internet tariffs, special offers and promotions, and the rise in social media use, particularly among the youth population.

Source: (House, 2015)

Here are some of the aspirations that ICT policies in developing countries often try to meet:

- Increasing the benefits from information technology.
- Facilitating physical access to ICT. In developing countries this is a dimension in which there is a clear difference between urban centres and rural areas.
- Enabling economic access to ICT, that is, the availability of financial resources so that people from different income levels can connect to the Web, covering the cost of the connection, which includes the costs of telecommunications, Internet access and the ICT terminal (personal computer, cell phone, etc.) (UNECLAC, 2005).
- Overcoming the digital divide, considering the evidence that the level of education, ethnic origin, gender and age influence patterns of access.
- Providing information and communication facilities, services and management at a reasonable or reduced cost.
- Providing individuals and organizations with a minimum level of ICT knowledge, and the ability to keep it up to date.
- Helping people and organizations to adapt to new circumstances and providing tools and models to respond wisely to challenges posed by ICT.
- Attaining a specified minimum level of IT resources for educational institutions, cultural facilities, and government agencies.
- Sponsoring e-inclusion through education, distributing and extensively using Knowledge Society tools and equipment.
- Promoting the education, training and lifelong learning to prepare human resources to work in the Knowledge Economy.
- Improving the quality of ICT-based services and products.

- Encouraging innovations in technology development, use of technology and general work flows.
- Promoting productive innovation for national, regional, and local development
- Encouraging networking between governments, enterprises and the science and technology sector.
- Promoting and disseminating the benefits of e-government and Open Government.
- Promoting information sharing, transparency and accountability and reducing bureaucracy within and between organizations, and towards the public at large.
- Identifying priority areas for ICT development (areas that will have the greatest positive impact on programmes, services and customers).
- Supporting the concept of lifelong learning.
- Helping to understand information technology, its development and its cross-disciplinary impact.

Capacity building is essential for building Knowledge Societies. In order to benefit from the opportunities provided by Knowledge Societies, citizens should be prepared for the current economic, social, cultural and technological advances. To this effect, the following elements, among others, are needed:

- Access to ICT infrastructures: hardware, software, connectivity; fast, free or low-cost access to Internet.
- Integrating ICT in education programmes from the earliest stages.
- ICT training (not only technological literacy, but also education in technical issues, business management and organizations using ICT); life-long education and training in courses, professions and skills related to Knowledge Societies.
- Capacity building, through formal and informal education, and lifelong learning.
- Information and social organization to demand from governments the ICT infrastructures, innovative education systems, legislation and public information necessary to benefit from the opportunities offered by the Knowledge Societies.
- Effective ICT use: the capacity and opportunity to integrate successfully ICT into the accomplishment of self or collaboratively identified goals.

It should be considered that the “digital divide”, which generally refers to inequities in the access to new ICT, particularly Internet, is not the cause but the expression of the existing social, economic and political breaches, at global, national and local levels. Focusing only on the digital divide will not help communities to improve their living conditions, surmount poverty or have a more equitable access to goods and services. In developing countries, it is needed to develop a new economy — Knowledge Economy, adapting it to the needs, advantages, challenges, obstacles and potentialities of the region and of each country.

Mobile devices, such as smart phones, are crucial for developing countries’ populations to access and appropriate the benefits of Knowledge Societies. The majority of the population in developing countries does not own computers, but increasing number use mobile phones that connect them to the Internet. It becomes important to consider the use of mobile devices in KSP. It is relevant to consider the production of specific contents (educational, commercial, management of money and banking, agricultural news, public health, public safety, etc.) accessible from these devices.

The governmental and non-governmental provision of telecommunication infrastructure and connectivity services contribute to the people e-readiness. Cybercafés, information kiosks, community technological centers, telecentres, public libraries, schools, and cell phones nowadays represent the access door to cyberspace for a large number of Latin American, Asian and African people.

Table 17: Use of smart phones in emerging and developing countries, Pew statistics

A Pew Research Center survey on 32 countries shows that Internet access differs substantially across the 32 emerging and developing countries polled, with the lowest rates of internet use in South Asian and sub-Saharan African nations. Within countries, computer owners, young people, the well-educated, the wealthy and those with English language ability are much more likely to access the internet than their counterparts. To access the internet, people increasingly use smartphones rather than more cumbersome fixed landline connections and computers. Around the world, both smartphones and basic-feature phones alike are used for sending messages and taking pictures.

A small but growing number of people use internet-capable smartphones – a median of 24% in emerging and developing countries own this type of device. Only in two of the countries polled do more than half have a smartphone – 58% in Chile and 55% in China, on par with the 58% of Americans who report owning this kind of device. A third or more of people in 10 countries say they own a smartphone, including 48% in Lebanon and 47% in Malaysia. About 10% or fewer Tanzanians, Bangladeshis, Ugandans and Pakistanis own smartphones.

Source: Pew Research Center, 2015, http://www.pewglobal.org/2015/03/19/1-communications-technology-in-emerging-and-developing-nations/

Table 18: Impact of mobile Internet on developing versus developed countries

A 2014 survey of 5,500 people across the globe commissioned by Juniper Networks reveals that 97% of people in developing countries say mobile Internet access has been transformative in their lives, versus 78% in the richest countries, including the United States. 52% of people in developing countries say mobile Internet access has been a key change agent for how they work, versus 26% in the richest countries. Also, 40% of people in developing countries report that connectivity has improved their earnings power, compared with 17% in rich countries. 24% of people in developing countries use the mobile Internet for educational purposes, versus 12% in the richest countries. People in rich countries use the mobile Internet more for tasks rich people can do: shop (41%), bank (51%), and (increasingly) control gadgets in our homes. In poor nations, 33% shop via mobile and 40% bank via mobile. Home automation is relatively unknown in developing countries; instead, the mobile Internet focus is more on communication, research (such as on foodstuff prices, weather, and traffic), and education.

Source: Info World, http://www.infoworld.com/article/2855602/mobile-technology/mobiles-gift-to-the-world-in-poor-countries-its-life-changing.html

It is necessary to provide relevant services to the population, based on surveys about real population's needs, and to integrate such services into Knowledge Societies.

3.3.9. The Role of Government

The role of the government in part is to foresee the needs and interests of the different social actors, to coordinate the diverse stakeholders´ actions and initiatives, to establish operative articulations among them, and to generate and enforce relevant legislation and control though a legal frame, as well as though explicit public policies.

The strategies and policies of developing countries' governments need to be aimed at turning those nations into pioneers in terms of technological, social and economic management. In order to achieve this, it is necessary to focus on technological and scientific production, innovation, education, specialized training, knowledge

management and the use of existing brains, avoiding "brain drain" and promoting "brain gain", through coordination with science and technology centers abroad.

These policies and strategies need continuity across diverse governments and administrations. It is frequent that a given policy or plan is dismantled by the following government, which would like to make a fresh start, with its own plans and its own staff. Sometimes, within the same government or political party, internal struggles among diverse groups result in destroying valuable and effective policies. Therefore, when formulating a Knowledge Societies policy, it is important to have it approved as a law that ensures that the policy will survive and thrive across several governmental periods. Building institutionalization is essential to grant the success and durability of the KSP.

Above all, the role of the government is not only in response to the new trends, but also in anticipating them as concerns the legal framework, regulations, strategies, and actions. In short, it is necessary and urgent for governments to implement integral policies in the sectors of telecommunications, informatics and ICT in general, aimed at coordinating the technological, economic and scientific development strategies with initiatives for social, cultural and communications development.

3.4. Stakeholders

A stakeholder is an entity that has something to gain or lose through the outcomes of a planning process or project. In many spheres, these are called interest groups and they can have a powerful bearing on the outcomes of political processes. The word also refers to persons, groups or organizations that must in one way or another be taken into account by leaders, managers and frontline staff.

This Handbook adopts multi-stakeholder (Section 3.4.1) and inter-sectorial (Section 3.4.2) approaches and considers as stakeholders: public sector entities (Section 3.4.3), private sector entities (Section 3.4.4), education and research entities (Section 3.4.5), civil society (Section 3.4.6), ICT users (Section 3.4.7) and international organizations (Section 3.4.8).

3.4.1. Multi-Stakeholder Approach

According to UNESCO (2013), multi-stakeholder processes have become an essential and unique approach to engagement in addressing issues affecting the knowledge and Information Societies. The full potential of ICT, as relevant enabling tools to support the process of development, can be utilized only if the ICT policies are effective. An essential element to make Knowledge Societies effective is to ensure the active participation of stakeholders in government, the private sector, civil society, ICT users and eventually international organizations in the formulation and implementation of Knowledge Societies.

The Tunis Agenda for Information Society (WSIS, 2005b) states in its paragraph 80: "We encourage the development of multi-stakeholder processes at the national, regional and international levels to discuss and collaborate on the expansion and diffusion of the Internet as a means to support development efforts to achieve internationally agreed development goals and objectives, including the MDG." For making this a reality, a transparent and non-discriminatory ICT policy is necessary.

The same document states that building an inclusive development oriented Information Society will require unremitting multi-stakeholder effort", and acknowledges that multi-stakeholder participation is indispensable to the successful building of a people-centred, inclusive and development-oriented Information Society and that governments could play an important role in this process.

Table 19: Multi-Stakeholder approach, Summits of the Americas example

Civil society organizations, indigenous peoples, youth, private sector, labor unions and other social actors play an essential role in the Summits Process. They provide recommendations on the thematic areas to the Member States in preparation for future Summits and assist in the implementation of initiatives in the development of the hemispheric agenda.

The Summits Process encourages the participation of social actors throughout the Hemisphere. At previous Summits, the Heads of State and Government recognized the importance of including social actors and encouraged governments to cooperate with them in the formulation and implementation of development policies and programs. The Summits of the Americas Secretariat (SAS) promotes civil society participation in the Summits Process by creating different areas for their engagement. In order to facilitate the contributions of social actors through the various stages of the Summit, an active exchange with Member States has become an integral part of the process.

The Summits of the Americas Secretariat, in cooperation with other areas of the Organization of American States (OAS), has developed a number of initiatives to create opportunities for participation of social actors. These include:

- Regional forums/discussions on thematic issues within the Summits agenda and presentation of its outcomes to Member States.
- Mobilization of resources to finance projects by social actors in support of mandate implementation.
- Establishment of strategic networks of Civil Society Organizations (CSOs), governments, and inter-American and international organizations.
- Dialogues between social actors and senior government officials to exchange views on implementation and fulfillment of Summit mandates.
- Virtual forums and discussion groups on the Summits Virtual Community.

Source: (States, 2016)

It is important to consider stakeholders, not just as independent players, but to reflect on the relationships among them. Stakeholders get together through, e.g. public-private partnerships, public-private-people, government-academia, government-nonprofit, private-users, and other partnerships to put together complementary capabilities, competencies and resources.

According to (Adam, Wanjira, & James, 2007) partnerships between the public sector, the private sector, the education and scientific sector and civil society in promoting Knowledge Societies are a relatively new venture. The mechanisms, management and governance of such partnerships, from loose arrangements to more formal mechanisms, are still relatively new and not always fully understood. As explained earlier, policymakers need to consider practical issues for the establishment of a multi-stakeholder process for KSP and study how multi-stakeholder partnerships work, what has been successful and what has not, and offers some practical suggestions on how to make them more effective.

The main ingredients of KSP comprise a range of areas that need to be addressed – an enabling policy and regulatory environment, access to basic infrastructure, accelerated development of basic Knowledge Societies tools abilities, development of appropriate content, ICT applications for sustainable development, and cutting-edge research and development to provide innovative solutions applicable in developed and developing country contexts, among many others. Such an extensive range of requirements needs strategic alliances between different actors at national, regional and international levels. No single sector in society can provide services to neither address the complexities of sustainable development; nor can public initiatives alone meet Knowledge Societies challenges. As a result the multi-stakeholder approach has become preferred to a traditional top-down

approach for promoting policy changes and managing accountability in the implementation of ICT programmes (Adam et al., 2007).

The perception that the "voices of the commons" are a strong catalyst for change and a key for meeting these ICT for development challenges has given rise to the increasingly pivotal role of civil society organizations drawn from non-governmental organizations, faith based institutions, grassroots organizations, professional associations, trade unions, consumer groups, research institutes, think tanks and the media. Their involvement in multi-stakeholder processes with the private sector and policy-makers has given rise to a new form of multi-stakeholder partnership that has created a positive force for driving forward ICT policy and ICT for development (ICT4D) programmes around the world. Some governments have launched their own partnership programmes, reaching out to other stakeholders in order to enhance their work in ICT policy, planning and programme implementation (Adam et al., 2007).

According to the Global Knowledge Partnership (GKP, 2007), different types of organizations view multi-stakeholder partnerships in different ways:

- Public Sector Perspective – In the background of the dual forces of economic liberalization and the increase of (or demand for) democratic decision-making, open government, and public transparency, both national and local governments and public entities find it increasingly challenging to accomplish the right balance between their civic duties relating to Knowledge Societies and Sustainable Development. The regulation of the free-market should ensure corporate responsibility, promote external investment to encourage employment opportunities, social inclusion, environmental protection, and promote the provision of affordable public services and responsive governance. In this context, there are increasing examples of government departments seeking partnering opportunities with business and civil society organizations, as well as with the Science and Technology sector, in order to enhance their capacity to administer the challenges of Knowledge Society for sustainable development (GKP, 2007).

- Business Perspective – From the business perspective, no single company can deliver the countless expectations surrounding Knowledge Societies and Sustainable Development articulated by all its stakeholders: staff, shareholders, customers, suppliers, regulators and local communities. The reputation of the business, its ability to manage non-commercial risks, its capabilities to meet both internal and external requirements for corporate social responsibility, and its ability to generate occasions for development that benefits those socially excluded, will all depend on business models that fully exploits its core competencies, whereas simultaneously partnering with other organizations who can bring the necessary complementarities to form more complete solutions. From this perspective, multi-stakeholder partnerships for Knowledge Societies and Sustainable Development are thus no different in many of their principles from conventional business-to-business strategic alliances. Moreover, businesses, chiefly those that market, source or operate in more than one country, are under pressure to embrace the globalization of social responsibility together with the globalization of business opportunity. And yet they often lack the experience and capabilities to manage this aspect of their operations, especially in regions with which they are unfamiliar. Strategic partnerships with government agencies and civil society groups more familiar with these "foreign" business environments make commercial sense (GKP, 2007).

- Civil Society Perspective – The dimensions and influence of the Civil Society, also called "third sector" has been growing in the last decades. With the help of ICT, civil society organizations have become more empowered and better organized in pursuit of their advocacy goals; they also use intensively and extensively the electronic social networks to disseminate their movements, achieve productive fund-raising and mobilize people. Many civil society organizations are participating in Open Source software movements, right to information, Science and Technology public policies, etc. Civil society groups can either play an advocacy or campaigning role, or they can become part of the solution, drawing on their local knowledge, capacity for innovation and trust of the general public to contribute in partnership to sustainable solutions. Often these organizations build partnerships with local governments, enterprises, and the education and academic sector. With the public sector frequently perceived as unhurried and

unresponsive, and many business sectors characterized by greatly efficient, but socially indifferent commercial models, there is genuine opportunity for stakeholders from civil society to transform the ability of business and government to contribute to KSP and their implementations (GKP, 2007).

This Handbook adds three other perspectives: education and research entities (also known as the academic sector), ICT users, and international organizations:

- Education and Research Entities – This group plays a key role in many Knowledge Societies policy processes, as facilitators, consultants and researchers during policy-making and implementation. In many cases, their knowledge and expertise is needed to gather evidence in support of specific key KSP issues (GKP, 2007), or to monitor and asses a given Knowledge Societies policy. In some countries they also are a "core" of secondary players who remain present when politicians and key government decision-makers are replaced due to changing political situations. Schools, colleges, universities, research institutes, technological and scientific parks, and research and innovation labs of all types, frequently build partnerships with all the other stakeholders. Education entities, either private or public, often construct partnerships with public sector entities, particularly for implementing Knowledge Societies education programs, connecting schools to the Internet or distributing free netbooks to students and teachers, as in the Uruguayan "Ceibal Plan" or the Argentine "Conectar Igualdad" Programmes. Universities and research centers build partnerships with private enterprises to provide them with human resources or deliver specific research. Public-private partnerships among local governments, universities and private sector enterprises (including NGOs) are booming for the creation and development of scientific parks or technological poles.

- ICT Users – ICT policies have a wide range of end-users and beneficiaries who are not apparent (or generally included) in the policy formulation process. Consumers and consumer groups are increasingly taken into account in KSP discussions. There is growing awareness that consumer rights need to be considered in a more visible manner, particularly regarding affordable pricing, access to connectivity, levels and reach of service provision in underserved areas, and quality and process of IT devices, among others. While policies often involve the supply side institutions and businesses such as telecommunications and ICT companies, the demand side institutions and beneficiaries are not involved on equal terms, if at all. Some ICT users build partnerships with the Civil Society sector, as well as the research entities.

- International Organizations – They act frequently as policy advisors, and facilitators of financial resources, information and knowledge to national and local governments, research centers, and NGOs for generating and implementing policies on Knowledge Societies. Partnerships in this case often include international organizations, domestic or local public entities, and science and technology entities. Moreover, commercial alliances or partnerships strongly influence national policies and strategies. A given government may wish to protect its alliances with a regional block (for example, MERCOSUR or the European Union), adopting measures for a common or coherent information society scheme. On the contrary, external commercial alliances may exclude or economically harm countries or regions, which will hence adopt policies that try to compensate for this exclusion.

For the purpose of this Handbook, we discussed in details all the stakeholders introduced above grouped into the following categories. First, we consider four main groups of local stakeholders whose participation is key to a successful Knowledge Societies formulation and implementation – public sector entities, businesses, educational and research entities, civil society and ICT users. Second, we explain the role and relevance of international organizations. The four groups of local stakeholders are depicted in Figure 2.

Figure 3: Four stakeholder groups – public sector, business, education, research, civil society

3.4.2. Inter-Sectorial Approach

In this Handbook, roles are defined for each of the participating institutions, setting up a clear competence and specific commitment (institutions, like groups or individuals involved in the formulation of a public policy, are considered stakeholders). Strategies and actions are formulated, and individuals or organizations are assigned to carry them out.

This perspective indicates as "sectors" not only the customary ones from governmental organizations (executive, legislative, education, infrastructure, regulation of the telecommunications, etc.), but it also refers to the logic of the collective action and to mechanisms of social coordination. Therefore, the intersectoriality refers to building bridges between the public sector, the social sector, the enterprise sector, the academic sector, etc.

This model of coordinated intersectoriality can be applied with variables according to each country's social, economic and political context. There are countries where the state can lead this process. In other countries the original impulse comes from the market or from social organizations, although sometimes the government assumes the initiatives as its own. In yet other countries, the intersectoriality and multi-stakeholder approach are transformed into a political objective in themselves. Each state will be able to find different levels of institutional development of the sectors mentioned and, therefore, create conditions and capacities for their involvement and joint action.

The intersectoriality concept refers, in principle, to the integration of diverse sectors with a view to the definition of policies or the solution of social problems. However, according to what it is understood by "sector" it is possible to find shades or differentiated connotations.

According to (Cunill-Grau, 2014), two premises conceptually delimit the intersectoriality:

- Integration between sectors allows for the differences of interest among them can be productively used to solve social problems. From this perspective the intersectoriality is consistent with the idea that creates better solutions because it allows sharing resources that are specific to each sector.
- Intersectoriality is one of the factors that can determine the success or failure of the initiatives. Indeed, the success will depend on the cooperation between the different sectors and their respective actors, which will make possible the joint search of solutions. In this study, sector is defined as a part or division, as of a city or a national economy, i.e. the manufacturing sector.

In the formulation of a multi-sectoral and multi-stakeholder strategy it is fundamental:

- To define which individuals and organizations can, or should, assume responsibilities and commitments in the different stages of a Knowledge Societies.
- To define and assign roles and tasks to each of the involved actors (institutions or individuals), establishing specific capacities and resources.
- To consider the broader kinds and numbers of possible actors who might support and be involved in the different processes, e.g. state, market, i.e. enterprises and entrepreneurs, civil society, university, citizens, etc.
- To contemplate not only the usual public sector "areas" related to a knowledge society such as telecommunications, infrastructure, science and technology, but also other instances within the executive authority, e.g. education, social development, health, legislative branches, regulators, etc.
- Intersectoriality implies appealing to different modalities to link the public sector, the social sector, the private sector and the academic sector in a productive network. All of those agents may impel within their own institutions internal consensual policies. Each of those institutions will show diverse levels of development, conditions and capabilities for their participation and joint actions.
- To understand that the roles can vary, e.g. in many countries, the generation of Knowledge Societies has been the result of a government with strong leadership role, whereas in others, it has arisen as a corporate initiative, or by strong campaigns from the civil society sector.
- To respect the essence of each actor and its own activities. With this in mind, it will be possible to preserve the independence of each actor with respect to the others.

3.4.3. Public Sector Entities

Public sector entities, and especially governments, play the most important role in the formulation of ICT policy, and thus, they decide how countries, regions and cities are able to take advantage of technical opportunities available to them and exploit them for good. They comprise central, regional and local governments, government entities like parliaments, ministries and agencies, public administrations and other publically owned entities (except in the education and research sector).

It is important to consider that governments should help frame and guide, though their Knowledge Societies Policies, the initiatives undertaken by other stakeholders, such as companies, the science and technology sector, civil society, etc. Governments' role as coordinators of other social actors are to be carefully planned and implemented. Public Policies for Knowledge Societies need to provide a legal and normative framework for other stakeholders to develop their actions, as well as to stimulate their proactive participation in the construction of Knowledge Societies.

Governments are also responsible for the distribution of connectivity, access to the Internet, and computers for schools and students, in social groups or geographic regions where enterprises find that there is no profit: low-income groups, remote villages, etc.

Public sector entities at every level are not only the generators and coordinators of Knowledge Public Policies: they are also main users of ICT, for example in electronic government, open government, smart cities, sustainable development, and consequently, they act as models or referents to be emulated by societies.

It should be reminded that policy features are not exogenous. They are subject to the quality of government institutions such as the institutionalization of congress, the independence of the judiciary, the quality of the civil service, and the institutionalization of political parties. Therefore, to materialize Knowledge Societies benefits, it is convenient to invest in increasing governments' capabilities. Government capabilities are important for better policy features. Countries that have more capable bureaucracies, more institutionalized congresses, independent judiciaries, and institutionalized political parties tend to have policies that are more stable, adaptable, coherent, efficient, and public regarded (Chuaire & Scartascini, 2014). These authors add that a strong, independent and professional bureaucracy appears as the most natural channel for the flexible enforcement of political agreements via delegation. An effective and skilled bureaucracy is likely to increase the quality of implementation of public policies, as well as their coordination across ministries. It may also decrease the probability that policy will be susceptible to political opportunism, and it could increase policy adaptability to changing circumstances by relying on technical expertise.

A number of characteristics of policymaking processes and political institutions have been found to matter to promote more cooperative policymaking and hence policies of high quality, including (Chuaire & Scartascini, 2014):

- Well-institutionalized political parties – especially parties that have national, programmatic orientations – Institutionalized programmatic parties tend to be consistent long-term players. A political system with a relatively small number of institutionalized parties (or coalitions) is more likely to generate intertemporal cooperation, and to lead to the emergence of consensual sustained policy stances on crucial issues.
- A legislature with strong policymaking capabilities – Legislatures are the ideal arenas for striking efficient political bargains. Policies tend to be better when legislatures develop policymaking capacities and constructively engage in national policymaking, rather than when they simply adopt a subservient role of rubber-stamping the wishes of the executive (or blindly non-constructively opposing).
- An independent judiciary – A well-functioning and independent judiciary can be a facilitator of exchanges, fostering bargains among political actors by providing enforcement that binds them to their commitments, and by ensuring that none of the players oversteps its boundaries.
- A well-developed civil service – A strong and technically-competent civil service can contribute to the quality of public policies by making policies more stable, by enhancing the overall quality of implementation, and by preventing special interests from capturing the benefits of public policy.

National, regional or local strategies include the combination of a wide range of thematic concerns. Governments can prioritize thematic areas, or orient a whole national strategy around key issues, such as infrastructure and connectivity, bridging the digital divide, e-government, open data, e-education, e-health, education and training of human resources for the ICT sector, among others.

ICT issues are subjects totally related to public policy (Guerra et al., 2008). The governmental bodies and officers in charge of the Knowledge Societies process may rely, according to positive experience in different countries, on the support and collaboration of a team of experts. Defining the development of an inter-sectoral strategy for the identification and call for reliable actors will be key to achieve the success of this stage. On what factors does this call for actors depend? On political decisions, the social agents' participation in the elaboration and political decision making, their responsibility in regard of negotiation terms, their cooperation will, and naturally, on the existing priorities within each country.

ECLAC, through the Digital Panorama of Latin America and the Caribbean 2007 (Guerra et al., 2008), expresses the helpful idea to put into practice diverse aspects of the public agenda to present arranged social actions: "Political will does not arise spontaneously and exclusively in the state, but it is constructed from the society. However, the main obstacle that interrupts the process constitutes the capacity to represent the social preferences as well as individual preferences."

Governmental entities will be able to resort to the support of an expert team or group. The development of an inter-sectoral strategy for the identification and call for excellent actors will be fundamental to achieve the success of a KSP.

3.4.4. Private Sector Entities

Private sector entities comprise firms, companies, entrepreneurs, SMEs, corporates, and other profit seeking organizations operating in the market and private sector, including the commercial ICT and technology sectors, as well as the representatives of these stakeholders such as employers' and trade organizations.

The business sector performs an essential role in the establishment of a Knowledge Economy. International, national and local IT enterprises can (and often do) promote the elaboration, updating or changes of Knowledge Societies. It is a strong actor that frequently leads technological and organizational innovations. Its main role is to generate, produce and distribute technological products and services, and to produce technological innovations, alone or associated with other stakeholders, as well as to work, together with governments, on the implementation of ICT infrastructures.

Although Information Society and Knowledge Societies policies are formally led and executed by governments, the diverse stakeholders and in particular the private sector contributes inputs into the policy process and can affect its outcomes. Companies are generally interested in public legislation concerning the ICT sector, information and open data about local markets, training of qualified human resources, networking with governments and the academic sector, and sustainable development (mainly environmental preservation) through the use of "green" technologies, among other elements. They are often keen in interacting and collaborating with governments and the academic sector for conceiving and implementing public policies.

In the context of globalized markets, large and rich corporations are often more powerful than developing countries' governments, a power that allows them to shape the policy-making process. However, it should be taken into account that while private-sector leadership is unquestioned in the process of building ICT environments, the public sector has to strive to complement its work.

Corporate Social Responsibility (CSR) is one of the main motives that cause ICT enterprises to collaborate in public policies for Knowledge Society. CSR has spread rapidly among ICT enterprises. There is no clear-cut definition of what CSR encompasses. It may be defined as the permanent commitment by corporations and enterprises to behave ethically and contribute to economic development while improving the quality of life of the workers and their families as well as the local community and society at large.

CSR is one of the newest management strategies where companies try to create a positive impact on society while doing business. Evidence suggests that CSR taken on voluntarily by companies will be much more effective than CSR mandated by governments. Every company has different CSR objectives though the main motive is the same. All companies have a two-point agenda — to improve qualitatively (the management of people and processes) and quantitatively (the impact on society). The second is as important as the first and stakeholders of every company are increasingly taking an interest in "the outer circle" — the activities of the company and how these are impacting the environment and society. The other reason behind this is that the companies should not be focused only on maximization of profits (Wikipedia, 2016).

Table 20: Private section engagement, United Nations Global Compact example

Launched in 2000, the UN Global Compact brings business together with UN agencies, labor, civil society and governments to advance ten universal principles in the areas of human rights, labor, environment and anti-corruption. Through the power of collective action, the Global Compact seeks to mainstream these ten principles in business activities around the world and to catalyze actions in support of broader UN goals. With over 4,100 participating companies from more than 100 countries, it is the world's largest voluntary corporate citizenship initiative.

Source: www.unglobalcompact.org

Small, Medium and Micro Enterprises (SMMEs) are key actors in the elaboration of public policies for Knowledge Societies. (Phet Sayo, 2004) recommends that "National policies must take into account the challenges and public and private sector deficiencies faced by SMMEs. Equally important, the government, through policy, should make clear the linkages between enterprise development and human resource development by developing knowledge based workforce in support of the needs of enterprise for adopting, maintaining and innovating with ICT."

3.4.5. Education and Research Entities

Education and research entities are important agents in building Knowledge Societies since they provide highly qualified human resources, researchers, and the necessary knowledge. Such entities comprise schools, colleges, universities, research institutes, and research and innovation labs of all types, IT parks whether in the public, private or civil sectors.

Education and lifelong learning are regarded as conditions to keep pace with continuously changing societies, global job markets and technologies. Preparation for lifelong learning encompasses an accent in primary and secondary schools, on learning general skills and competencies, such as communication, mathematics and science skills, new literacy skills, problem-solving and interpersonal skills, as well as abilities needed to learn other subjects. At tertiary level, the requirement is to build capacity in Science and Technology, discipline-specific skills, research, and development.

Education is perceived as contributing to all other sectors by providing the required skills and know-how for social and economic development. As such, it is not limited to formal education in traditional structures, but also encompasses the broader societal learning necessary for development (GESCI, 2012).

Education is of vital importance in the Knowledge Societies, as a source of basic skills, as a basis for development of new knowledge and innovation, and as an engine for socio-economic development. Education is, consequently, a critical prerequisite in creating Knowledge Societies that can stimulate social equality, development, economic growth, and prosperity. It is not only the means by which individuals become skilled participants in society and the economy, but is also a key driver expanding ICT usage. It also trains Knowledge Society citizens, human resources, future scientific researchers, technicians. In turn, the academic sector provides constantly new contents to be introduced in the curricula, as well as innovative visions on education. Therefore, rather than considering education, and science and technology as separate stakeholders required for building support to Knowledge Societies, one may view education and science & technology as interrelated drivers for socioeconomic development (GESCI, 2012).

Science is the mother of the digital age (OECD, 2015). Science and technology play an increasing part in everyday life and in public debate. The spread of a genuinely scientific culture is crucial for sustainable governance. Unless such a culture becomes general, there will inevitably be greater disparities and inequalities between individuals, genders, generations, social groups and nations according to their endowment of the scientific knowledge needed

in the dynamic environments that characterize Knowledge Societies. (Bindé & Matsuura, 2005).

Another relevant issue concerns the relationships between universities, high technology enterprises, and research programs. Permanent interaction between these three entities is vital for ICT development. At times when boundaries between research and innovation policies are fading, scientific and technological research should be accompanied by supporting measures to facilitate the translation into successful products and services.

According to OECD (OECD, 2015), science advice is playing an increasing role in the formulation of policy and decision-making. Governments need scientific evidence in a wide range of situations, from long-term policy development to urgent crisis management. The most appropriate source and nature of scientific and technical advice depends upon the purpose for which it is to be used. Consequently, many different approaches and processes have been developed for its production and delivery. This diversity is also a product of the different national and cultural contexts in which advice must operate.

OECD warns that the scientific advice and advisory process has been exposed to serious pressures in recent years. In the field of prediction and assessment of risks, a series of legal cases have raised concerns about adverse personal consequences of providing advice to governments — effects that can extend to civil or even criminal liability. At the same time, the contribution of scientific advice on sensitive issues, relating to people's health and safety or to the environment, has stimulated heated societal debate and confrontation. While many of these issues cross national borders and science itself is an international enterprise, cooperation between countries on scientific advice is inadequate.

Later, OECD states that scientific experts can be implicated in either providing advice on Science and Technology policies - "policy for science"— or in providing scientific advice on regulatory or general policies — "science for policy", as is the case of Knowledge Societies. The difference between these two areas is important, since the advisory and decision-making requirements and processes are usually different. However, it is acknowledged that a clear demarcation between the two areas cannot always be made.

Scientific advice plays an important role in the development of policies in most countries. On some issues, well established routines for linking scientific expertise to decision-making processes are in place. This is often the case in regulatory domains. Nonetheless, many of the problems and challenges facing societies are of a complex nature, and decision makers have to consider many other factors than scientific evidence. Scientists find themselves in a policy arena where the interests of a variety of stakeholders have to be balanced: scientists, policy and law makers, regulators, industry, NGOs, the public at large. Furthermore, because of the multifaceted character of many policy issues, scientific advice itself often requires the input of more than one discipline, frequently combining natural sciences and social sciences.

3.4.6. Civil Society

Essentially, civil society means community groupings or networks, and their activities. Civil society is an expression of shared democratic values and resources which is distinct from, but which intersects with, those of democratic political institutions or businesses. The civil society comprises both non-profit formal organizations like NGOs, charities, foundations, associations, trades unions and social entrepreneurs when not profit-seeking, as well as more informal communities, interest groups and movements, citizens and ICT users.

Civil society acts for the public good, in the space between the state and market sectors. Civil society organizations are increasingly participating in information society issues, mainly on access to information, right to information, connectivity, telecommunications universal service, multilingualism in the Internet, among other areas. The concerns and of civil society organizations need to be addressed at the highest policy-making level.

The role of civil society entities is manifold. It includes assessing the impacts of technologies in society, defending the users' interests, contributing to public policies from the point of view of citizenship, and guiding technological

applications to the goal of sustainable development. The responsibilities of civil society organizations often include fostering the use of ICT and knowledge in peoples' everyday lives and in social and community relations, as well ensuring that democracy, empowerment, inclusion and equity are developed and applied bottom-up.

Formal civil organizations like NGOs, charities and associations defend and safeguard that the interests of specific social groups are represented, and often act as intermediaries for vulnerable and disadvantaged groups. With new forms of ICT like social media and other participatory tools, all civil society stakeholders are also increasingly producers of ICT and of all types of knowledge in their own right.

Table 21: Civil society engagement, example from Argentina

The Clementina Foundation, created in 2012 in Buenos Aires, Argentina, owes its name to "Clementina", the first computer that entered Argentina in 1960; it is integrated by well-known scientists and technicians, ICT entrepreneurs, and members of other NGO's. The Foundation has positioned itself as a virtual and physical space to debate technology-related public policies, which are not in the usual National Government's agenda. The monthly debates are not held exclusively between technologists, but among people who have knowledge about ICT and are concerned with social issues.

One of the policies debated in the Clementina Foundation concerns the implementation of a unified medical history. The idea is to provide people with a card and a private number which will allow doctors to read each one's particular heath characteristics. Another of the debates involves the necessary regulations about authors' rights in the Internet.

Source: (Palloti, 2012)

3.4.7. ICT Users

ICT users are individuals and groups who use computers, cell phones, IT devices, in their inter-organizational and interpersonal interactions. These technologies shape who they are as organizational representatives, what they can do in terms of exchange, important aspects of their interactions with other actors (e.g. speed, complexity), and influence the perceptions of other actors (ascribed identities) and the nature of reciprocal engagements, as well as social actors' perceptions about themselves (as variously represented). ICT users can influence the design of technological devices, or software, by modifying them or giving them unforeseen uses (OECD, 2015). It is important to stress that in Knowledge Society all stakeholders can potentially become both ICT producers and users.

However, at present not all the ICT users have the knowledge or the skills to participate in open technological innovations, and to generate technological change in a deliberate and conscious way. Nevertheless, the number of proactive users will grow in the next years, due to the fact that increasingly the education systems, both in developed and developing countries, are consciously geared to increasing this still further, e.g. making coding in schools compulsory and seeing it as being just as basic as reading and writing.

Moreover, ICT users are increasingly participating in open science projects. According to (OECD, 2015), open science commonly refers to efforts to make the output of publicly funded research more widely accessible in digital format to the scientific community, the business sector, or society more generally. Open science is the encounter between the age-old tradition of openness in science and the ICT tools that have reshaped the scientific enterprise and require a critical look from policy makers seeking to promote long-term research as well as innovation. On the one hand, the Internet and online platforms are creating new opportunities to organize and publish the content of research projects, scientific publications and large data sets, so as to make them immediately available to other scientists and researchers as well as potential users in the business community

and society in general. On the other hand, ICT allows the collection of large amounts of data and information that can be the basis of scientific experiments and research, contributing to make science increasingly data-driven. It is time that public policies consider citizen´s participation in open science, not only to legislate about it, but mainly to make it more accessible for ICT users and to use their outputs in updated policies.

Table 22: ICT user engagement, example from Finland

In 2014, the Ministry of Education and Culture launched the Open Science and Research Initiative (ATT) aiming at creating a national open access and open science policy and building the needed infrastructure. ATT aims to make open and collaborative science more visible to innovation system actors, and to promote: 1) open access to research data and publications; 2) transparent and collaborative research; and 3) the skills, knowledge and support services necessary to achieve these goals. In the framework of ATT, the Ministry plans to organize a yearly "Open Science and Research Forum" to gather all relevant stakeholders and promote fruitful discussion about ATT and its implementation.

Source: (OECD, 2015).

Table 23: ICT user engagement, example from the United Kingdom

In the United Kingdom, open access constitutes a key component of the Department for Business, Innovation and Skills (BIS) contribution to the UK Government Transparency Agenda. The guidelines developed by BIS were informed by the UK National Working Group on Expanding Access to Published Research Findings. BIS is also active in developing metrics and analysis to assess the costs and benefits of open access policies.

Source: (OECD, 2015).

Table 24: ICT user engagement, example from Canada

Launched in December 2014, the revised ST&I strategy commits to open science policies and practices for publicly funded research by increasing public access to the results of government-funded research. An implementation plan will be developed to promote open science, including both open access and open data initiatives, within the activities of science-based departments and agencies as well as those of granting councils and the International Development Research Centre (IDRC).

Source: (OECD, 2015).

3.4.8. International Organizations

International organizations comprise international government organizations made up by independent states like e.g. UN, OECD or WTO, and international non-governmental organizations that operate internationally like e.g. International Committee of the Red Cross, Doctors without Borders and others.

The role of international organizations in domestic and international public policies is not to be ignored. International organizations frequently trigger regional and national initiatives to develop national information and knowledge society policies, as it was shown in the processes leading to the WSIS process, and E-LAC 2007 and 2010, among others. They also provide assessments and best practices of ongoing Knowledge Societies policies.

Present-day domestic policy making within many policy fields, including Knowledge Societies and Sustainable Development, takes place within a larger context of international or supra-national institutions that exercise

economic and political authority beyond the boundaries of the state. Some of these institutions, like the World Trade Organization, exercise `hard' or legally binding powers over member countries. Other institutions, such as UNESCO, ILO, IDB, OECD, or international NGOS such as IDRC, and by multinational processes such as WSIS or the Summit of the Americas. There are of course many other players in this process, such as transnational NGOs, individual governments through their technical assistance programs, think tanks and foundations. However, international organizations possess unique advantages in spreading ideas and credit lines. According to (LA Pal, 2003), first, they have a prestige and visibility that obscures that of most governments, even that of the United States. Second, they have superior financial resources through which to induce acquiescence by governments, and attract talent from outside, e.g. as consultants. Third, they have a global reach that is only seldom possible for single governments or other non-governmental transnational actors. Fourth, they are superior sites of knowledge generation, which coupled with their prestige, gives them an edge in persuading reforms (Leslie Pal, 2006).

Domestic policies for Knowledge Societies are strongly influenced by the policies of international organizations, financial credits, and knowledge, and their contributions to domestic policies can be extremely valuable. Nevertheless, public entities responsible for the generation and implementation of public policies for Knowledge Societies need to examine the advised policies to assess if they do not collide with national or local interests.

Table 25: International cooperation, SFIC example from European Commission

The Strategic Forum for International Science and Technology Cooperation (SFIC) is an advisory group to the Council and the European Commission in the field of International Cooperation in Science & Technology (S&T). SFIC main tasks include:

- Systematically sharing and structuring information on S&T cooperation activities and objectives (whether ongoing or planned) of the various partners.
- Pooling relevant knowledge concerning third countries, in particular analyses of their S&T resources and capabilities.
- Ensuring regular consultation between the partners in order to identify their respective objectives and common priorities in terms of S&T cooperation with third countries ("what and with whom?").
- Where appropriate, coordinating activities of a similar nature implemented by member states and the European Union (with variable geometry).
- If necessary, proposing initiatives to be implemented with appropriate ways and means.
- Networking of member states' and the Commission's scientific advisors in key third countries.

Table 26: Regional cooperation, RELAC example from Latin America and the Caribbean

The Regional Platform for Electronic Waste in Latin America and the Caribbean (RELAC Platform), is a Civil Society, non for profit Project, implemented by the NGO SUR Corporation in Chile, and supported by IDRC, Canada; a partnership between a civil national society organization and an international organization.

RELAC goal is to encourage, articulate and disseminate initiatives to promote solutions for the prevention, adequate management, and correct final treatment of PCs electronic waste in Latin America. Electronic waste in this region must be dealt with by the different social actors involved and in its many dimensions. Sustainable, environmentally responsible solutions must be sought, which take regional contexts into account, explore business opportunities offered by the recycling process, and incorporate available resources, as developed by the social projects devoted to PC refurbishing in LAC.

The activities of the project are developed in three areas:

- Applied research — for generating information, planning strategies and building intervention tools
- Capacity building — for advancing the legal framework, the creation of a waste management system, the design of a business model to support this management, and the training of specialized professionals in the field.
- Communications management — for articulating the initiative and partnerships and, for disseminating information about the project's initiatives.

Source: (Corporation & Studies, 2007)

3.5. Networks

According to the Business Dictionary, networking means creating a group of acquaintances and associates and keeping it active through regular communication for mutual benefit. Networking is based on the question "How can I help?" and not with "What can I get?"[8]

Social networking is utilized in everyday life by using Internet-based social media programs to make connections with loved ones, friends, family, classmates, colleagues, customers and clients. Social networking can be performed for social purposes, business purposes or both. The programs show the associations between individuals and facilitate the acquisition of new contacts. Examples of social networking include Facebook, Twitter, LinkedIn, and Trip Advisor, among others.

Social networking programs assembly individuals by interests, hobbies, political preferences, geographic places, types of work, employers, schools and other shared aims. Social networking is also a significant target area for marketers seeking to engage users[9].

The expression Network Society was created in Norway by Stein Braten in his book (Braten, 1981). It was related to the social, political, economic and cultural changes caused by the spread of ICT. In his book "The Rise of The Network Society: The Information Age: Economy, Society and Culture" (Castells, 2000), Manuel Castells stated that networks organize the new social morphology of our societies. Castells defined the network society as a society where the key social structures and activities are organized around electronically processed information networks. The term "Network Society" has been used sometimes as a version of "Information Society". This society it is not just about networks or social networks, since in the history of humanity social networks have been ancient forms of social organization. It is about social networks which process and manage information and are using micro-electronic based technologies. For Castells, networks have become the basic units of modern society.

Networking can be done through working with communities of practice. A community of practice is basically a group of people who share a concern or a passion for something they do, and learn how to do it better as they interact regularly and exchange information and experiences. This definition echoes the essentially social nature of human learning. In this case, communities of practice could be integrated by a number of local governments or civil servants interested in developing and implementing public policies for Knowledge Society in order to provide

8 http://www.businessdictionary.com/definition/networking.html#ixzz3r70dkddl

9 Read more: Social Networking Definition | Investopedia http://www.investopedia.com/terms/s/social-networking.asp#ixzz3rB2fxtOm

citizens with more and better services, a group of engineers who learn how to design better devices, or a group of companies who seek to design new products adapted to the social demand.

Networking may also be achieved through clusters. A local government's cluster is a geographic concentration or coalition of interconnected local governments in a given region working on shared interests. A business cluster is a geographical agglomeration of interconnected businesses, suppliers, and associated institutions in a specific field. Clusters are considered to increase the productivity with which companies and organizations can compete or cooperate, nationally and globally.

Networks embody an informal and gradual means for the international diffusion and dissemination of ideas and policy paradigms. Networks enable actors to operate beyond their domestic context. They are the means by which organizations individually and in coalition can project their ideas into policy thinking across states and within global or regional fora. Active participation in policy networks provides one mechanism to achieve transfer between diverse actors. Through networks, participants can build alliances, share discourses and construct consensual knowledge. From this basis, policy entrepreneurs can work to shape the terms of debate, networking with members of a policy making community, crafting arguments and "brokering" their ideas to potential political supporters and patrons (Stone, 2001).

Networking for KSP means exchanging information and experiences among stakeholders, between the specific sectors involved, and among geographical regions. For example, exchange of information and experience are amid the main objectives of regional coordination, which is focused on generating and undertaking public policies on the knowledge society and allowing the sharing of experience among countries in a given region on responding to the changing needs of the digital era.

Electronic networks, virtual or face-to-face workshops, seminars, communities of knowledge, communities of practice, databases and websites allow diverse stakeholders to interact. Though networking regional cooperation can become a mechanism to address public policy issues such as legal framework, norms and standards, and can help to introduce innovative procedures in different regions and countries' policies.

Concerning the private sector, several studies have shown that one of the most efficient ways for SME to adapt and deal with the new needs, demands and forms of competitiveness in Knowledge Societies is through the organization of companies in local, regional or national area networks. The importance and increasing necessity of information exchange and learning is even greater in enterprises that make intensive use of ICT and knowledge, like the software or the bioinformatics industries.

The process of software and informatics services development is achieved through a joint effort of creation. Its results depend directly on the people, organizations and procedures used in its creation and advance, as well as on the exchanges among them. Debates on public ICT policies discussed over sectoral networks are useful to turn on new ideas and to identify common interests and goals, to find new markets and to undertake joint actions.

The science and technology sector has been utilizing electronic networks for academic cooperation, at national and international levels, so it is already familiar with the practice of communities of knowledge and information, and discussing S&T public policies. NGOs have also been engaged in networking activities to disseminate their actions and their fund raising activities. The main challenge consists in having the diverse sectors networking using ICT facilities, which becomes possible as common interests grow important.

Table 27: Networks for Knowledge Societies, UCLG example from European Commission
On 28 January 2015, the EC and the Global Network of Cities, Local and Regional Governments (UCLG) signed the first partnership agreement on development cooperation. The networks of local and regional governments who signed this political agreement commit to take actions based on common values and objectives in order to tackle global poverty and inequality, and to promote democracy and sustainable development. This new partnership represents an important step forward for the involvement of local and regional governments in development policies. It acknowledges the role of municipalities, towns, cities and regions as decision-makers in defining policies and contributing to addressing global challenges, as well as implementing shared global agendas at local level. Source: (European Commission and UCLG, 2015)

Table 28: Networks for Knowledge Societies, example from Argentina
The Governments of the cities of Tandil, Bahia Blanca, Junín, and Mar del Plata (all of them in the province of Buenos Aires), together with the cities of Rosario and Santa Fe, in the neighboring province of Santa Fe, have established an informal network to collaborate together in public policies concerning productive innovation activities. All these cities have important universities and ICT parks that have as their goal to enhance the production and export of informatics goods and services. The exchange of information and experiences, through electronic exchanges as well as through conferences and seminars has improved the development of their public policies, as well as their local industries. Source: Research conducted –by Finquelievich and team, 2015

Regarding public policies, macro-regional, regional and national networking are inevitably intertwined to global networking. According to (Tuomi, 2004), "Knowledge society is internationally networked. The well-being of Europeans depends on what the shoppers in China choose today, and what the factories in Brazil make tomorrow." A strategy for globalization is therefore an integral part of the regional, national and local knowledge society strategies and policies. Global networking has become ever easier, and strategic investments are increasingly grasping this opportunity.

3.6. Governance

Governance refers to "all processes of governing, whether undertaken by a government, market or network, whether over a family, tribe, formal or informal organization or territory and whether through laws, norms, power or language." (Bevir, 2013).

The Business Dictionary defines it as the "Establishment of policies, and continuous monitoring of their proper implementation, by the members of the governing body of an organization. It includes the mechanisms required to balance the powers of the members (with the associated accountability), and their primary duty of enhancing the prosperity and viability of the organization"[10].

10 http://www.businessdictionary.com/definition/governance.html#ixzz3rlDQiu00

In this Handbook, governance is defined as connected to the processes of interaction and decision-making among the actors involved in a collective problem that lead to the creation, reinforcement, or reproduction of social norms and institutions, as well as public policies and strategies (Hufty, 2011).

As in any public policy, responsiveness and accountability are needed in public policies for Knowledge Society. The 2015 World Public Sector Report (WPSR) analyses responsiveness and accountability as two fundamental principles of governance which are key, cross-cutting enablers of development.

Responsiveness to people needs studies and diagnosis to identify present necessities, as well as to foresee future needs, and to plan policies and strategies to satisfy them. Governance is about nurturing relationships of accountability among citizens, government institutions, and private or public suppliers. Therefore, it affects the efficiency and effectiveness of how policies are formulated and how resources are allocated.

Table 29: Governance for Knowledge Societies, example from the United Nations

In August 2015, United Nations Member States reached an agreement on the outcome document that will constitute the 2030 Agenda for Sustainable Development – the development framework beyond the MDG target date. At the request of General Assembly, the Secretary-General gave a report that synthesized the full range of inputs as a contribution to the intergovernmental negotiations in the lead up to the Summit on Sustainable Development held in New York in September 2015. This synthesis report underscored the importance of strengthening effective, accountable, participatory and inclusive governance among key elements required for implementing a universal agenda for the next 15 years.

The 2015 WPSR, titled Responsive and Accountable Public Governance, presents the need for public governance to become more responsive and accountable in order for the state to lead the implementation of a collective vision of sustainable development. Social and technical innovations are providing an opportunity for the social contract between the state and the citizenry to shift towards more collaborative governance.

Accountability is one of the main factors included in governance. We define accountability as the obligation of a government or organization to account for its activities, accept responsibility for them, and to disclose the results in a transparent manner. It also includes the responsibility for funds or other entrusted property.

One of the most debated ethical considerations concerning accountability in Knowledge Societies governance concerns the tension between the need of privacy and anonymity in citizens' and organizations´ data, and the need for accountability. This opposition evidently transcends national geographic and cultural boundaries, but balancing privacy and anonymity against accountability and transparency is vital in times of fighting money laundering and terrorism. This presents challenges to governments, particularly in developing economies.

For example, the Council of Europe treaties relating to the Internet establish common international law standards which help governments align domestic legislation and co-operation with each other across borders in areas such as: protection of personal data, fight against cybercrime; protection of children; prevention of terrorism; and fight against counterfeit medical products and similar crimes involving threats to public health.

Participation is another main feature of governance. Citizens, as well as civil society organizations, need to be involved in the formulation, design and evaluation of public policies, programs, legislation and services related to Knowledge Societies, using diverse tools: meetings, virtual forums, social networks, etc. The agencies in charge of public policies for Knowledge Societies need to carry out public participation processes that are transparent, accessible, accountable, supported by factual information and inclusive of the wide diversity of inhabitants. It would also be advisable for these agencies to be additionally dedicated to reporting back to citizens on how their views have been considered in the decision-making process.

Multi-sectorial policies are another challenging point in Knowledge Societies governance. Diverse sectors and stakeholders hold various and often opposing positions and interests. Negotiating with the sectors to achieve a common policy is an art which requires political mastership, and which often depends on the agency and

individuals in charge of formulating a policy. Coordination mechanisms need to be put in place in order to ensure the formulation, implementation, assessment and updating of the policies and strategies.

Table 30: Governance for Knowledge Societies, example from Canada

The Policy Statement and Guidelines for Public Participation provides a policy tool for all Department of Justice managers and officials to frame the Department's public participation activities. The Policy Statement outlines a commitment on the part of the Department of Justice to involve Canadians in the development of legislation, policies, programs and services through adequately resourced processes that are transparent, accessible, and accountable, supported by factual information, and are inclusive of Canada's diversity.

In recognition of the varied nature of issues addressed by the Department, these policy commitments are meant to apply to areas where public input will make the greatest contribution to the policy development process. The Policy assigns various roles and responsibilities for making decisions with regard to which issues are to be addressed through public participation processes and for ensuring that the Policy's commitments are applied as outlined and assigned.

The Canadian Department of Justice is committed to providing resources adequate for effective public participation functions, expanding opportunities for departmental officials to enrich their knowledge and expertise in public participation and supporting the development of new public participation techniques and technologies. In addition, the Department is committed to promoting a consultative culture across all Sectors, Branches and Divisions of the Department by ensuring adherence to departmental guidelines.

Governance for KSP should stress the need for quality, quantity and prompt delivery of public services. They also need to emphasize the importance of equality and equity in their provision and greater access to them, also leveraging ICT in innovative ways. Additionally, they need to ensure that the policies highlight the importance of competence, professionalism, ethics and diversity within the public service; coherence between formal and informal organizations within societies; as well as multi-sectored partnerships and multiple-stakeholder engagement and participation in decision-making (UNDESA, 2015).

Finally, Knowledge Societies need to consider the governance work of international organizations working on Internet policies, such as for example ITU – the United Nations specialized agency for ICT; the Centre for International Governance Innovation (CIGI) – an independent, non-partisan think tank on international governance[11]; and the ICANN – a nonprofit organization that is responsible for coordinating the maintenance and methodologies of several databases, with unique identifiers, related to the namespaces of the Internet, and for ensuring the network's stable and secure operation.

3.7. e-Services for Citizens

In order to encourage citizens to get integrated into Knowledge Societies and reap their benefits it is necessary to provide them with e-services designed to make their life easier. For example, as e–government grows and more public sector services are available via digital technologies, citizens will realize the advantages of time-saving online services, such as to access city information on the go, report issues, submit service requests and get follow up notifications. Other applications allow users to search development projects, apply for permits, track progress through the process, schedule inspections, and pay for services, and register for municipal activities.

11 www.cigionline.org

Besides, SMEs will see the value of using digital technologies to serve their clients. This will enable a much–needed understanding of the value/need of ICT to their business today and in the future through the extension to the global market for products and services. As well, as the public is enabled to access both data and services through e–government, they will begin to demand the same of SMEs. This will drive the adoption of the technologies. Therefore, the first place to start is with government data and services.

Table 31: Mobile identity card, example from Estonia

There are innovative services, such as the Mobile Identity card implemented in Estonia. The Mobile-ID is a mobile signature solution which enables Estonian citizens to conduct a broad range of services and transactions either online or from their mobile. Citizens and residents with Mobile-ID can access private health records, register a business, declare their taxes and sign legal contracts all through the legally binding PKI-based signature functionality of their SIM card. Banks in Estonia were among the first entities to adopt Mobile-ID, and have continued to be some of the product's most active proponents.

Source: Mobile-ID, https://e-estonia.com/component/mobile-id/

Table 32: Mobile banking and e-money, example from Latin America

In Latin America banking penetration, though high, is focused in middle and upper urban class. The prospect of reaching many poorer, unbanked citizens away from large towns remains the promise of an alternative infrastructure beyond the banking system: electronic money (or e-money). Electronic money is a financial instrument that stores value electronically against the receipt by the issuer of the equivalent funds. It is accepted as a means of payment by third parties other than the issuer, and may be transferred between users and converted back into cash. The value is stored on an electronic device that may be an Internet wallet, a pre-paid payment card or other smart cards such as a mobile phone card. In this latter case, e-money is sometimes referred to as 'mobile money'. The first wave of pro-poor expansion was led by Brazil in the early 2000's, where banks adopted retail networks as agents to reach more people. Other countries (Perú, Colombia, Mexico) followed since, leading to different forms of agent banking models (some focused on payments, others on decongesting branches). The second wave is likely to happen with the adoption of mobiles as the central transactional device where a person from all walks of life (including very poor) can easily store, transmit, exchange, and in general manage their economic assets. Given the depth of the banking system, and the sophistication of commercial banks, one can only imagine (for now) the possibilities if everyone had true access to an affordable, easy to use, super-connected mobile account. In the Latin American context, the daily lives of many would be touched.

One of the key changes that might accelerate this "second wave" is enabling non-banks to issue electronic money (eMoney). This will allow a non-bank company to offer an electronic wallet (in many cases associated with mobile) where a person could store money, pay and exchange money with others, similar to how a banked customer uses a current account attached to a card. Although today, even without eMoney regulation, a number of bank-telco partnerships are out there with live products in a number of markets, partnerships across large players with seemingly different interests and market strategies are hard to cement and often lack the nimbleness needed to penetrate the market effectively. Three markets are leading the pack allowing non-banks to issue eMoney — Bolivia, Perú and Brazil. Three other countries have prepared drafts for this and are already into the process of consultation — Colombia, El Salvador and Paraguay.

Source: A new wave of e-money in Latin America, 2013, http://www.cgap.org/blog/new-wave-e-money-latin-america

3.8. Evolution

Knowledge Societies are emerging around the world but in many ways are witnessing the initial stages, even prehistory, of this concept. Looking at the past and attempting to draw predictions, this section examines the evolution of the concept of Knowledge Societies, starting from the vision for this evolution in Section 3.8.1, and followed by policy initiatives that may determine the future shape of Knowledge Societies: policies for e-inclusion, education, and lifelong learning (Section 3.8.2); policies to preserve multilingualism on the Internet (Section 3.8.3); policies for digital preservation (Section 3.8.4); policies for digital citizenship (Section 3.8.5); and policies for green computing (Section 3.8.6).

3.8.1. Visioning the Evolution

There is a deep change of political institutions in the Knowledge Societies. According to (Mulgan, 2006), a new form of the state is rising, which will gradually replace the nation-states of the industrial era. They relate this tendency to globalization, which is the formation of a network of global networks than link selectively across the planet all functional dimensions of societies. Because the network society is global, the state of the network society cannot operate only or primarily in the national context. It has to engage in a process of global governance but without a global government.

However, since global governance of some sort is a functional need, nation-states are finding ways to co-manage the global processes that affect most of the issues related to their governing practice. To do so, they increasingly share sovereignty while still proudly branding their flags. Countries conform networks of nation-states, as the EU. But they are around the world a number of state associations more or less integrated in their institutions and their practice that structure specific processed of transnational governance. Moreover, nation-states have encouraged a number of formal and informal international and supranational institutions that in fact govern the world: the UN, and several military alliances, the IMF, the World Bank, the G-8 club of leading countries in the world (with the permission of China), and a number of ad hoc associations (Mulgan, 2006).

When considering KSP, it is necessary to contemplate that local and regional interests (those of cities, regions, particular cases such as Catalonia) are rising to be powerful factors of political and economic influence, as well as historically and culturally important to their peoples. Therefore, in a landscape where regional interests, as well as supranational interests, are prevailing, it is possible to draft the hypothesis that national policies for Knowledge Societies will probably lose importance in face of local and supranational policies.

People around the world are facing new needs. New needs, coupled with fast technological innovation, result in the necessity to foresee the policies that we will have to generate in the short and medium run. Some of these policies will simply be innovative ways to face present issues, while others will be forced to contemplate new or still unforeseen topics. While future needs for public policies are multiple, this Handbook will mention just a few.

3.8.2. Policies for e-Inclusion, Education, and Lifelong Learning

According to (Tuomi, 2004) “In the core of a knowledge society is its system of learning. When the processes of knowledge production and appropriation change, also the system of learning changes. Education is rapidly becoming international and intertwined into individual life careers. The historical role of universities as institutions of knowledge production is about to change. A new system of learning is about to emerge, and it depends on us what it will do and how it will look like.”. In fact, new systems of learning have already emerged around the world.

Tuomi adds that the world is becoming a world of parallel systems of meaning. Life opportunities increasingly depend on individual skills in communication and conceptualization. Therefore, digital divides are not aligned with the boundaries of technology. Instead, access to economic and social resources and the opening of new channels for meaningful communication will be essential. People who cannot participate in the processes of information understanding and discrimination, knowledge and meaning creation, skills for the new ICT-based markets, will be left outside the divide.

Therefore, new policies will still have to deal with decreasing the digital gap, insisting on e-inclusion measures: e-education, lifelong training, preparing people to be permeable to innovation and to be capable of creating social and technological innovations in turn, will be increasingly developed. In addition to the need for training in their use, ICT also help to promote learning: as participating in the knowledge based economy requires new skills, openness and creativity, acquired through life-long training. Consequently, there is the necessity to provide citizens with the tools to learn in Knowledge Societies, by means of advanced multimedia information services. Education will take new forms, which will change the whole educational system.

New and successive waves of technological innovations will also create new disabilities, which social and individual costs will increase if they are not mended in time. Technologies that enhance the development of thinking, creativity and communication skills will have major social consequences. Technologies that support and augment the cognitive capabilities of aging people, and that ensure their relative independence and care using ICT devices will be ever more needed.

3.8.3. Policies to Preserve Multilingualism on the Internet

The old “digital divide” has been replaced with the new “knowledge divide”, which is about people knowing how to use digital tools productively. In order to become real citizens of a knowledge society, this knowledge divide must be overcome. The language barrier is an issue that still keeps many of these citizens from becoming productive cyber-citizens and enjoying universal access to information (Susana Finquelievich, 2014). According to (UNESCO, 2013), Knowledge Societies should seek to ensure full respect for cultural diversity, and that everyone has the right to express themselves, to create and disseminate their work in the language of their choice.

Languages are powerful instruments for preserving and developing culture. ICT can help not only to encourage linguistic diversity and multilingual education but also to increase awareness and transmission of linguistic and cultural traditions throughout the world, and to motivate solidarity between diverse peoples. However, at present less than one hundred languages are represented in the digital world. Language presence in cyberspace is insufficient in view of the increased importance of the role of cyberspace for access to education and information, and the construction of inclusive Knowledge Societies. Indigenous peoples need to access cyberspace in their own languages, and to contribute their own world vision, in order to become full citizens, to participate in productive innovation processes, and to preserve indigenous languages and culture.

Macro regions, countries and regions are faced with the need to implement public policies to enhance multilingualism in the Internet. Online multilingual education is increasing in importance in developed and developing countries. Increasingly these plans are including contents about indigenous languages and cultures. However, this tendency is recent. The impacts on the educational community have not been studied in depth yet.

The inclusion of multilingual and multicultural contents in education, either at school or in cyberspace, has been interpreted often as giving place to oral traditional stories and to local folkloric manifestations. However, bilingual intercultural education means much more than the reevaluation and dissemination of folkloric displays. What is necessary for intercultural education is to strengthen the cultural identity of indigenous peoples, not to enhance their confinement in their own traditions, or to facilitate to better sell their folklore, but to generate symmetric conditions of reciprocal interactions and exchange with the dominant culture.

3.8.4. Policies for Digital Preservation

Policies will increasingly deal with the need for digital preservation policies. The colossal growth in the construction and dissemination of digital objects by governments, authors, publishers, corporations, academicians, and others, has highlighted the speed and ease of short-term dissemination. Nevertheless, little concern has been paid yet to long-term preservation. Digital information is characteristically more delicate and insubstantial than traditional technologies such as paper, photographs, or microfilm. It is more easily corrupted or altered, without detection**.** Digital storage media have shorter life spans and require access technologies that are changing at an ever increasing pace. The time frame between the creation of an object and the need for its preservation becomes shorter. We risk the loss of valuable information without an adequate infrastructure for digital archiving and preservation (Finquelievich & Rodríguez, 2012).

According to (UNESCO, 2006) digital preservation can be defined as the process and activities which stabilize and protect reformatted and digital authentic electronic records in forms which are retrievable, readable and usable over time. It involves a number of organized tasks associated with a variety of technical approaches or strategies for ensuring that digital resources are not only stored appropriately, but also adequately maintained and thus consistently usable over time It involves the processes of maintaining accessibility of digital heritage materials over time, for as long as they are needed (UNESCO, 2003).

3.8.5. Policies for Digital Citizenship

Digital citizens will have to be strongly considered in new public policies: according to (Gurstein, 2015), "To a degree, talking of the "digital citizen" is simply a re-casting of what is already widely accepted in those societies with the widespread use of the digital as the basis for public (and other service) delivery. However, by talking of the "digital citizen" and the rights of the citizen to the full advantages of the digital sphere one shifts the discussion concerning for example the Digital Divide from one of ad hoc initiatives and voluntarist programs to becoming an obligatory element in the activities of the modern state.". This concept simply reflects the emergent significance of the digital sphere in relation to the activities of the state. Gurstein reminds that it is also a necessary corollary of those jurisdictions such as where digital actions have become a necessary element for active participation in civic life or even as is the case in several jurisdictions where Internet rights (or the Right to the Internet) has become enshrined in constitutions.

Gurstein remarks that "digital citizenship" is a newer and evolved form of citizenship and moreover one which is necessary to and appropriate in the Knowledge Societies. This new form of citizenship has multiple aspects but the two most noticeable elements are that with this new form of citizenship goes certain rights – at a minimum to be able to have access to and to effectively exercise citizenship rights in a digital age; and on the part of the state the obligation to ensure that the citizen is in a position to exercise their digital citizenship in an appropriate and effective way. Policies regarding digital citizenship will have to consider the universal right to Internet access and at a speed and quality sufficient to be an active and effective citizen, equally it implies sufficient digital (and other) literacy to make effective use of this access in support of effective digital citizenship and it includes the assurance of technology designed and linked directly to legal and rights based structures of anti-discrimination associated with disability, age, ethnicity, language, etc. to ensure that there is no discrimination in the opportunity for use.

3.8.6. Policies for Green Computing

Societies around the world need to enhance their capacities to predict and track climate changes, develop appropriate management and adaptation strategies, and plot a course toward better environmental management. The Internet and ICT are key technologies for environmental preservation: through their potentials they maximize users' capacity to create and adapt. Examples of such transformation comprise using ICT to monitor air and water pollution; improve practices in agriculture and forestry; facilitate disaster warning and relief; improve the efficiency of the energy, transportation, and goods and services sectors; and enhance social networking for transformative change.

At the same time, the sustainability of these technologies must also be managed to avoid unintended consequences such as augmented consumption and environmental damage from electronic waste. The International Institute for Sustainable Development[12] examines the relationship among ICT, innovation and the environment in terms of: 1) the first-order or direct effects, which arise from the design, production, distribution, maintenance and disposal of ICT goods and services by the ICT industry; 2) the second-order or indirect effects, which arise from the application and use of ICT throughout the economy and society, and in government and public institutions; and 3) the third-order or systemic effects, which arise from the changes in economic and social structures and conduct enabled by the availability, accessibility, application and use of ICT goods and services.

Many public policies have focused on green computing, aiming to reduce the carbon footprint generated by ICT businesses while allowing them to save money. Green computing includes ICT which design or use can reduce the negative effects of human activity on the environment. The main development axes of green computing are: 1) the use of green products with low energy consumption. Public policies are encouraging manufacturers of ICT products to intensify their efforts to market products that consume less energy and intelligent software that can manage resource utilization in real time; and 2) the implementation of virtualization of servers and workstations to lessens the number of machines while providing processing power, scalability and cost control.

However, green computing is not just focused on decreasing the impact of the ICT industry and ICT use. It is also concentrated on using the services of ICT to help reduce the overall carbon footprint. According to (OECD, 2008), if correct policies were adopted by all countries, even the low stabilization target of 450 ppm CO2-eq by 2050 could be met at a cost equivalent to a reduction in annual GDP growth of about 0.1 percentage points per annum on average. The report acknowledged the key role that "eco-innovation" can play in reducing GHG emissions to sustainable levels. To this end, it suggested that OECD countries should take the lead in strengthening international cooperation with a wider group of emerging economies. Finally, KSP considering environmental issues are of the outmost importance for the present and the near future.

12 http://www.iisd.org

4.

Conceptual Framework – Structuring Knowledge Societies Policy

This chapter presents a conceptual framework for structuring the development and implementation of Knowledge Societies Policy (KSP) drawing upon important empirical and theoretical sources, many of which have been outlined in Chapters 2 and 3. The framework is designed as a set of heuristic models to be simple as well as robust and effective, showing the main elements of KSP and their interrelationships. The framework enables both analysis, i.e. understanding how each element functions individually, and synthesis, i.e. understanding how they operate together. In this way the conceptual framework outlined in this chapter provides a template for structuring and analyzing the case studies presented in (UNESCO/IFAP and UNU-EGOV, 2016c), as well providing the operational basis for the process of building KSP in Chapter 5.

The remainder of this chapter is organized as follows. Section 4.1 puts forward an architecture for societal transformation, culminating in Knowledge Societies. Section 4.2 considers how Knowledge Societies support Sustainable Development transition, in particular by knowledge-based innovation which is outlined in Section 4.3. A system model for Knowledge Societies in presented in Section 4.4 and the readiness of people and organizations for transformation into Knowledge Societies is examined in Section 4.5.

4.1. Transforming Societal Architectures

Chapter 3 outlined how Information Societies transformed the Industrial Societies that preceded them, and then how Information Societies themselves are being transformed into Knowledge Societies. These transformations can also be conceptualized as transitions in societal architectures, i.e. the development and incorporation of transformed organizations, institutions, infrastructures, and of systems of thought and culture, into the overall structure of society. The main features of this transition are sketched in Figure 3.

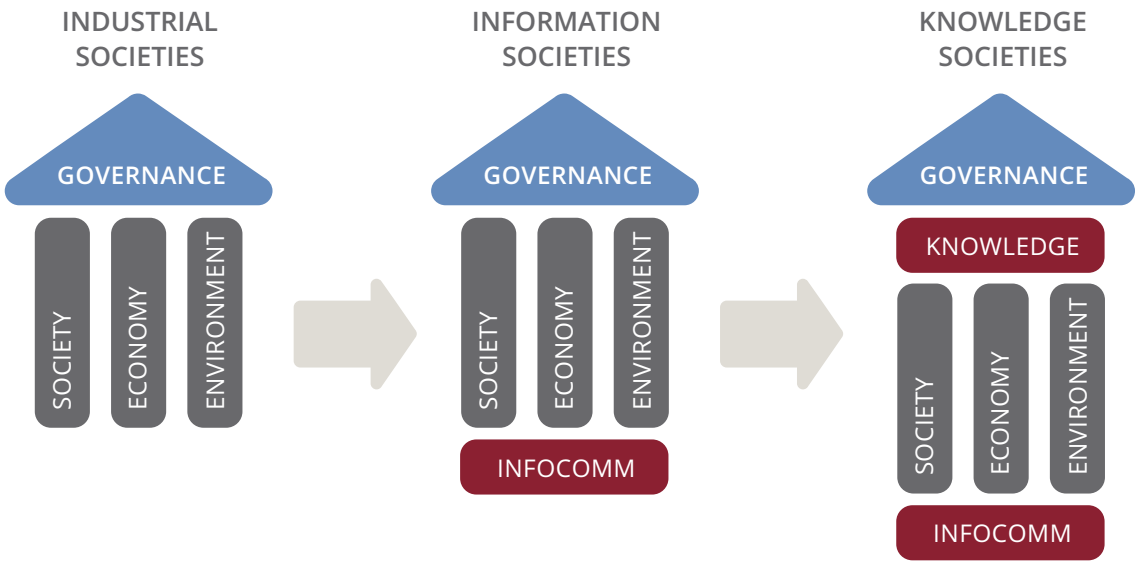

Figure 4: Transformation from Industrial to Information to Knowledge Societies

Figure 3 shows the main features of the architecture of industrial societies, made up of three vertical pillars: society itself (civil society), the economy and the environment, held together by the coordinating and controlling framework of the governance capstone. The important transformation brought by Information Societies over the last fifty years has been the underpinning of these three pillars by a horizontal layer termed InfoComm. This is the huge increase in ability to create information and to enhance communications, directly enabled and driven by ICT. Information Societies are concerned, not just with data as facts about the world as had historically been the case, but increasingly with information as contextualized, organized and categorized data.

More recently, a new transformation from Information Societies to Knowledge Societies has started to become visible. This adds two new features to the societal architecture. First, education and research is the fourth vertical pillar reflecting a major increase in the importance and impact of learning, research and science. The tremendous growth in resources invested in education in the last thirty years has significantly stimulated the capacity to turn information into knowledge and knowledge into know-how and innovation. These are being increasingly used to provide ever deeper understanding and insight into specific application areas in science, technology and society.

In turn, this is dramatically accelerating innovation in areas like health, new products and services, addressing environmental issues and social change, and even how improvements can be made to governance itself. This is the critical transformation of information into knowledge and innovation. Thus, the second new feature of Knowledge Societies' architecture is knowledge as an additional horizontal layer in Figure 3. This is positioned on top of the four vertical pillars as it serves to integrate and, increasingly, to bind these together. However, the knowledge layer is positioned beneath the governance capstone which retains its overarching coordinating and controlling role, but which is also itself using knowledge more and more to undertake these tasks. The figure now shows seven sub-systems in total which together make up the whole knowledge society system. An illustration of the important differences between Information and Knowledge Societies is that the latter specifically promotes and enables for the first time broad societal participation in science, technology and innovation. This can be seen, for example, through the co-creation of knowledge between multiple stakeholders, citizens as knowledge prosumers (i.e. producers as well as consumers) and wiki culture.

It must also be stressed, however, that it is possible for pre-Industrial Societies, such as some developing countries, to by-pass the traditional Industrial Societies stage and jump straight to Information and Knowledge Societies.

It is important to note that when describing the transformation, first to Information Societies and then to Knowledge Societies, this does not mean that information and knowledge have not existed, nor indeed been important, before. The reason for using the terms Information and Knowledge Societies is that for the first time they mark a point in history where massive and conscious efforts and resources, particularly in the education pillar, have been made in developing and deploying information and knowledge. In this sense, therefore, information and knowledge play a decisive new and critical role in society. They become goals and commodities in their own right and not, as before, simply outputs of other processes. They become transmitters and integrators across the pillars, rather than stand-alone by-products within each specific pillar.

4.2. Knowledge Societies and Sustainable Development Transformation

Given the increased recent understanding of the transformational role of knowledge in societies, government policies to promote Knowledge Societies around the world are highly important. Indeed, although government is the main actor in the governance capstone in Figure 3, other governance functions in Knowledge Societies are being undertaken by a range of stakeholders, including but not limited to governments but which governments can influence. However, Knowledge Societies and the policies that promote them should not be seen themselves as goals, but rather as important transformational 'means' (i.e. the processes and mechanisms) to achieve the desirable 'ends' (beneficial impacts) of Sustainable Development, as sketched in Figure 4. It is also important to note in this figure that, as outlined in Chapter 5, such policy and actions do not operate in a vacuum but are subject to external and contextual factors which are beyond the direct control of the government and other KSP stakeholders, but which influence their ability to achieve Sustainable Development.

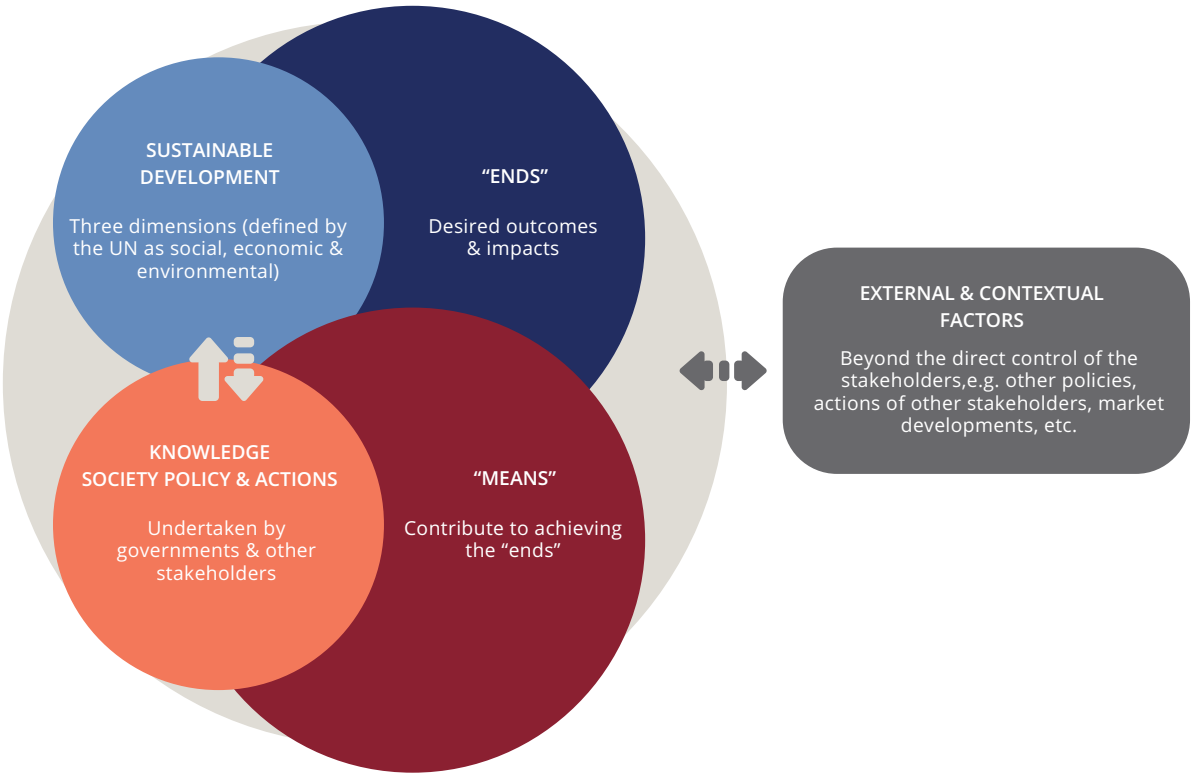

Figure 5: The role of Knowledge Societies policy and actions to Sustainable Development

In principle, there is no interest in Knowledge Societies policy and actions for their own sake but rather as a powerful transformational strategy to achieve the 'ends' of Sustainable Development in line with the United Nations 2030 Agenda. This was agreed by all Member Countries at the UN General assembly in September 2015[13] to "meet the needs of the present without compromising the ability of future generations to meet their own needs". (See also Chapter 2). The United Nations defines Sustainable Development as the guiding principle for balanced long-term global development consisting of the three dimensions of economic development, social development and environmental protection, so that if any one dimension is weak then the system as a whole is unsustainable[14]. In order to ensure this balanced approach, the 2030 Agenda also includes for the first time a focus on implementation means, institutional development and governance, in Sustainable Development Goals (SDGs) 16 and 17, to help achieve the other goals. In fact, the Knowledge Societies architecture illustrated in Figure 3 can be directly aligned with all seventeen SDGs, as enumerated from 1 to 17 in Figure 5.

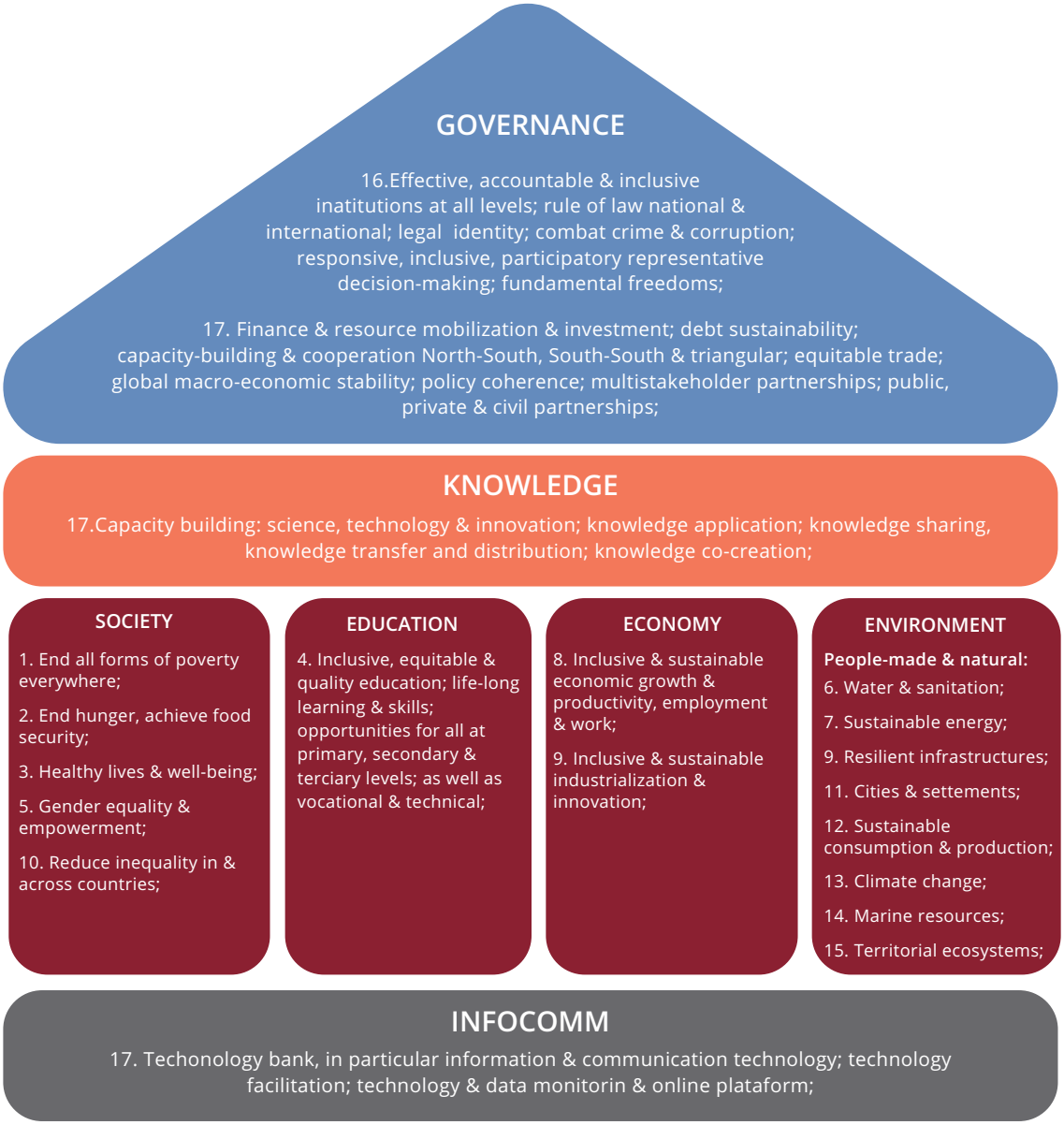

Figure 6: Knowledge Societies architecture and the Sustainable Development Goals

13 http://www.undp.org/content/undp/en/home/mdgoverview.html

14 http://www.un.org/en/ga/president/65/issues/sustdev.shtml

Figure 5 shows the close coherence between the SDGs and all the elements of the Knowledge Societies architecture. It can be noticed that SDGs 1-15 are all covered by the four vertical pillars as the main 'ends' of Sustainable Development, whilst different parts of SDGs 16 and 17 characterize the horizontal elements of governance, knowledge and InfoComm as important 'means' for achieving these 'ends'.

4.3. Knowledge and Innovation

A key element in Knowledge Societies advancing Sustainable Development is how knowledge produces innovation. This section presents the creation of different types of knowledge (Section 4.3.1) and how such knowledge enables innovation (Section 0).

4.3.1. Creating Different Types of Knowledge

As shown above, it is possible to characterize the transformation to an Information Society and then to a Knowledge Society by the incorporation, first, of the InfoComm layer and then the knowledge layer in the societal architecture. In this section of chapter 4, how knowledge is created, the roles and relationships of the different stakeholders involved, and how this accelerates innovation, are outlined. Fundamental to this is how different types of knowledge and know-how are recognized and combined.

According to (Carayannis, Barth, & Campbell, 2012), "knowledge (for example about how to develop green technology) is key to the success of Sustainable Development. Today nation-states that concentrate on the progress of society, higher competitiveness of their economies, or better and sustainable quality of life have to apply the resource of knowledge. In the transformation to a knowledge-based society, it is possible to generate new and usable knowledge in conjunction with sustainable development." "The resource of knowledge, therefore, turns into the "most fundamental resource" (Georghiou, 1993), created through creative processes, combinations, and productions in so-called 'knowledge models' or 'innovation models' and thus becomes available for society."

(Carayannis et al., 2012), drawing on a large amount of related work, sketch the transformation to Knowledge Societies which emerges from the cumulative extension of successive sources and types of knowledge and know-how previously separated. In an analogy with how DNA produces living cells in biology, they term these different sources and types of knowledge 'helices' (the plural form of 'helix'), which twist together as intertwining strands intimately interacting with each other. In total, five helices of knowledge production are proposed by the authors, each of which can be termed a 'sub-system' as they are parts of the knowledge society system as a whole. The first four helices are shown in Figure 6 and described as follows:

1. The earliest, and thus first, helix of knowledge production was provided by academia and universities in the education sub-system. This resulted in the single helix where knowledge and innovation are only produced by this sub-system and which historically focused only on the traditional role of university research.

2. The second helix is industry and business (the commercial market) as the economic sub-system. This resulted in the double helix during the industrial revolution formed by the combination of the education sub-system and the economic sub-system to produce new knowledge. This is a bilateral relationship without direct government involvement.

3. The third helix is government and the public sector as the governance sub-system. This leads to the triple helix where (Carayannis et al., 2012) recognize the arrival of the information society. Here, the state has a

strong role in developing national and regional innovation systems to support both industry and academia for the purposeful application of information to economic development

4. The fourth helix is the civil society sub-system. This results in the quadruple helix model of knowledge and innovation as the basis for the knowledge society, which incorporates civil stakeholders, art and culture into the innovation mix. For example, resulting in the creative industries, leading also to the diversification of life styles, self-expression, and social and inclusive types of innovation.

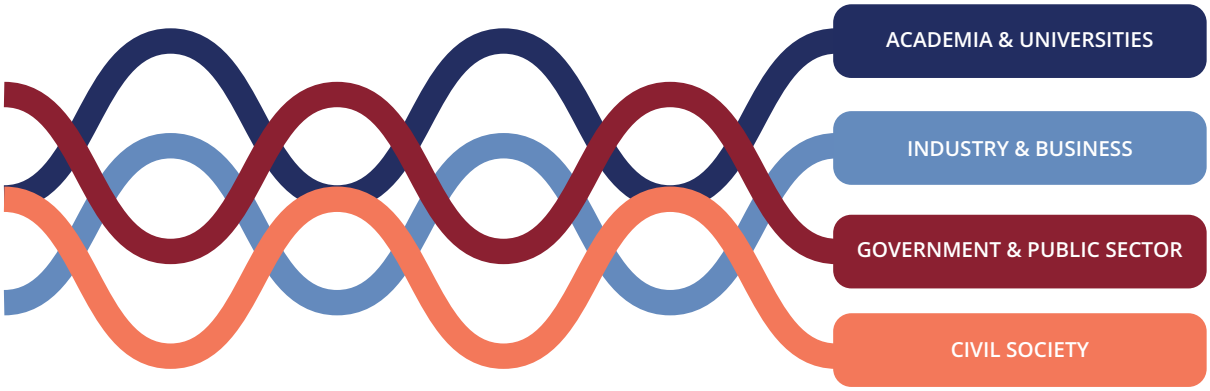

Figure 7: The quadruple helix model as a basis for Knowledge Societies

The above four helices, forming sub-systems of the whole Knowledge Societies system, are represented by the four main types of societal stakeholder, as introduced in Chapter 3:

- Public sector entities: central, regional and local governments, inter-governmental organizations, government entities like ministries and agencies, public administrations and other publically owned entities, except in the education and research sector.
- Businesses: firms, companies, entrepreneurs, Small and Medium-Size Enterprises, corporates, and other profit seeking organizations operating in the market and private sector, including the commercial ICT and technology sectors, as well as the representatives of these stakeholders such as employers' and trade organizations.
- Education and research entities: schools, colleges, universities, research institutes and research and innovation labs, whether in the public, private or civil sectors.
- Civil society: comprises both non-profit formal organizations like NGOs, charities, foundations, associations, trades unions and social entrepreneurs when not profit-seeking, as well as more informal and loosely organized communities, citizens, interests groups and movements.

However, (Carayannis et al., 2012) also propose a fifth helix as an important missing element and the next step towards the development of sustainable Knowledge Societies:

5. The fifth helix is comprised of the natural environment for society. This leads to the quintuple helix as a relatively new type of knowledge generation and innovation captured by the term socio-ecological transition in Figure 7 which is necessary for Sustainable Development.

The progression from the triple helix, through the quadruple helix and to the quintuple helix is sketched in Figure 7, modified from (Carayannis et al., 2012). According to (Carayannis et al., 2012): 'The Quintuple Helix Model is interdisciplinary and trans-disciplinary at the same time: the complexity of the five-helix structure implies that a full analytical understanding of all helices requires the continuous involvement of the whole disciplinary spectrum, ranging from the natural sciences (because of the natural environment) to the social sciences

and humanities (because of society, democracy and the economy). Thus, the goal of the Helix-Conception is accomplished through the resource of knowledge which produces additional value for society in order to lead in the field of sustainable development."

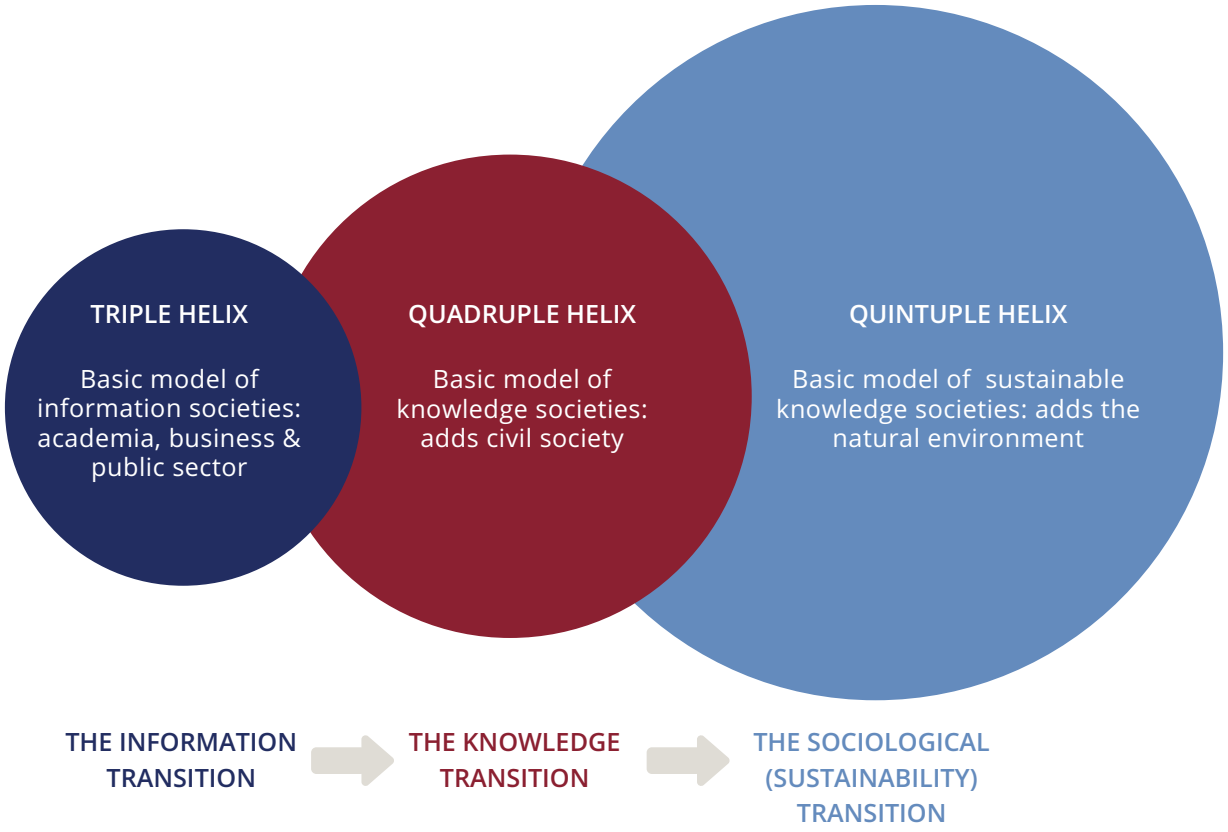

Figure 8: Helix Model and transition to sustainable Knowledge Societies

Thus, (Carayannis et al., 2012) are also proposing the next possible step, building on Knowledge Societies towards a "socio-ecological transition". This combines all sources and kinds of knowledge and know-how, including from the natural environment, and provides the wisdom needed to deliver all the Sustainable Development Goals, including the environmental underpinning. Note, this environment sub-system of the whole Knowledge Societies system is not provided by a specific type of stakeholder, as are the first four helices, but by the 'natural environment' itself.

As discussed above and shown in Figure 3, it is also necessary to take account of the important role of the InfoComm sub-system as a tool enabling and creating knowledge, know-how and innovation. This relates directly to (Perez, 2009) notion of ICT as today's general purpose technology underlying all aspects of a modern economy and society and without which most if not all other technologies would not be possible. It is important to understand the particular role of ICT technology and how it handles and processes data into information and information into knowledge when used by people and organizations. In this context, a distinction can be made between explicit and tacit knowledge, the former being formalised and codified often in computer software and hardware, and the latter highly contextual to complex situations and not easily codified in the technology. (Polanyi, 1966) and (Amin & Wilkinson, 1999) Tacit, or experiential, knowledge, in contrast, requires more than the technology itself but also different organizational and locational environments, where face-to-face and/or frequent contacts to ensure its successful development, use and transmission, are very important. On this basis, two different types of knowledge and innovation can be discerned (Millard, 2006):

- Knowledge and innovation which is embodied in the technology itself, such as in the hardware and

software, tend to be explicit and codified, and thus easily moved around between sectors and places, which can lead to geographic dispersal and decentralisation. Such embodied knowledge and innovation provide important value added through large-scale information distribution and dissemination effects, though they may be hard to contextualise.

- Knowledge and innovation which is embodied in people as individuals and in their organisations and networks, rather than in the technology, tend to be tacit and non-codified. This can only be easily moved around between sectors and places to the extent that people as individuals, groups or organisations can be moved around, i.e. much less easily than the technology itself. Such disembodied knowledge and innovation provides a great deal of value added and is often associated with sectoral and locational concentration.

Thus it is clear that ICT underpins the Knowledge Society and is a powerful tool for Sustainable Development, for example by changing the economy at a fundamental level with profound impacts on the way organizations operate, on how individuals work and the jobs they do, and on how groups of people organize their operations both internally and externally. However, it is also clear that ICT has greatest value for most if not all activities which are routine, which manipulate, match and mine data, and which require access to information and systematized intelligence. Such activities can become codified and automated by ICT, resulting in the squeezing out of direct human involvement, as is seen today in the automation of manufacturing and increasingly also in service sectors.

On the other hand, and artificial intelligence notwithstanding, there remains a huge range of activities which humans are innately better equipped to do than machines, especially related to the use and creation of implicit and tacit knowledge. These areas include care, teaching, consulting, counselling, advising, controlling and coordinating, decision- and policy-making, creating, innovating, brainstorming, empathizing, socializing, etc. In each case, powerful ICT systems support such human-centered activity. The uncertainty is that the boundary between what can be codified and captured by ICT and what cannot is constantly moving. What we think of as 'routine' is part of a dynamic cycle in which new activities, knowledge and processes are created and older types which were themselves once new now become 'routinized'. Thus, the boundary between what machines do best, especially in the context of robotics and artificial intelligence, and what people do best is constantly shifting, as both change, also in response to each other (Bianchi et al., 2006).

4.3.2. Enabling Innovation

Knowledge and know-how are used in different ways and combinations, as well as by different stakeholders and different stakeholder combinations, to undertake innovation. Innovation itself can be defined as the creation and application of new knowledge and know-how to meet specific needs, in many different ways and for a myriad of purposes, such as but not limited to (the following are examples only and are not mutually exclusive):

- Traditional top-down innovation, where goals, targets and even methods are determined and controlled from above and centrally. Top-down innovation is normally for the purpose of meeting a very specific requirement, such as in industry in order to keep ahead of the competition.

- Technology innovation, where the innovation is led by the development of new technologies. Examples include ICT, new machine processes, production methods, instruments or tools, and which can in turn lead to new markets, organizational forms, etc.

- Science innovation, where new scientific theories and concepts are developed, across all the natural and social sciences. This can be through both basic and applied scientific research. In the former, scientific research pushes back the frontiers of knowledge in, for example, particle physics or anthropology, but without any conscious or immediate application. Applied scientific research, on the other hand, can directly support, for example, a new production process, a new instrument or the reorganization of the labor market based on empirical studies of its dynamics.

- Business model and organizational innovation, where businesses and other organizations innovate their ability to survive and thrive in a rapidly changing world in terms of their business model arrangements as the sustainability of their financial, organizational, human resources as well as supply and delivery chains. This might also include business models for knowledge creation and use as well as for business innovation.
- Public sector innovation, where the public sector innovates its organization, internal and external relations, and the services it provides and how it makes policy, law and regulation. For example, new digital services, new collaborative partnerships with non-public sector stakeholders, collecting and using public sector data to improve its performance and make it available to other stakeholders as open data to drive their innovation, and policy modeling techniques.
- User-driven innovation, where the potential users of an innovation are directly involved in designing and perhaps delivering an innovation in any area. This can both improve the applicability and acceptability of an innovation through better targeting and personalization precisely for specific groups or needs, as well as thereby potentially increasing the types and scope of innovations as more inputs and testing environments are available.
- Open innovation is characterized as being bottom-up and open to the involvement of all stakeholders. It goes beyond just using external sources of innovation such as users/customers, rival companies, and academic institutions, and can be as much an innovation in the use, management, and employment of intellectual property as it is in the technical and research driven generation of intellectual property. In this sense, it is understood as the systematic encouragement and exploration of a wide range of internal and external sources for innovative opportunities. Examples include the development of the free and open source computing operating system Linux, crowdsourcing in journalism where anybody can contribute to an article, and in developing the Wikipedia open encyclopedia (Chesbrough, 2006).
- Social innovation is a form of open innovation that meets a social need in new ways and which also involves direct collaboration with, and empowerment of, the beneficiary. This is instead of just doing something to her or him, for example by improving their capability to meet their own social needs in future. Social needs vary widely, but are distinct from commercial, scientific or public policy needs, although they might indirectly contribute to these, for example creating a job, better education or healthcare, and in addressing poverty or loneliness.
- Inclusive innovation is similar to social and other forms of open innovation, but where the focus is on including everybody, and especially those in poverty and/or who are excluded or marginalized in some way. For example, the first micro-financing initiative in Bangladesh, very simple but secure mobile banking in Kenya, and innovating new goods and services targeted at poor people, as well as directly involving them, as in the Bottom-of-the-Pyramid approach (Prahalad, 2006).
- Frugal innovation is similar to other forms of open innovation, but the focus is on doing it frugally, both to cut, for example, production and delivery costs, as well as to ensure that the poor and excluded can benefit. Examples include the Tato Nano car in India, and the Raspberry Pi microprocessor developed in the UK (Mashelkar, 2015).

4.4. Knowledge Societies System Model

Leading on from the above and for the purposes of developing and implementing Knowledge Societies policies, the Knowledge Societies system can be understood as composed of six interacting sub-systems as illustrated in Figure 8, modified from (Carayannis et al., 2012). This reflects the quintuple helix model with the addition of the InfoComm sub-system. Traditionally, each sub-system is envisaged, organized and operated independently from the others, but this dissipates their beneficial impacts and can in many situations work against both sub-system and whole Knowledge Societies system impacts. Where there is interaction between sub-systems, these can often be exploitative or damaging, as for example when the economy sub-system pollutes the environment sub-system. Instead, an effective Knowledge Societies policy has as one of its prime objectives to ensure that together these sub-systems operate in a mutually supportive, interactive and highly synergistic manner, both through the direct intervention of the policy itself and by ensuring that overall system and sub-system mechanisms can self-adjust as necessary.

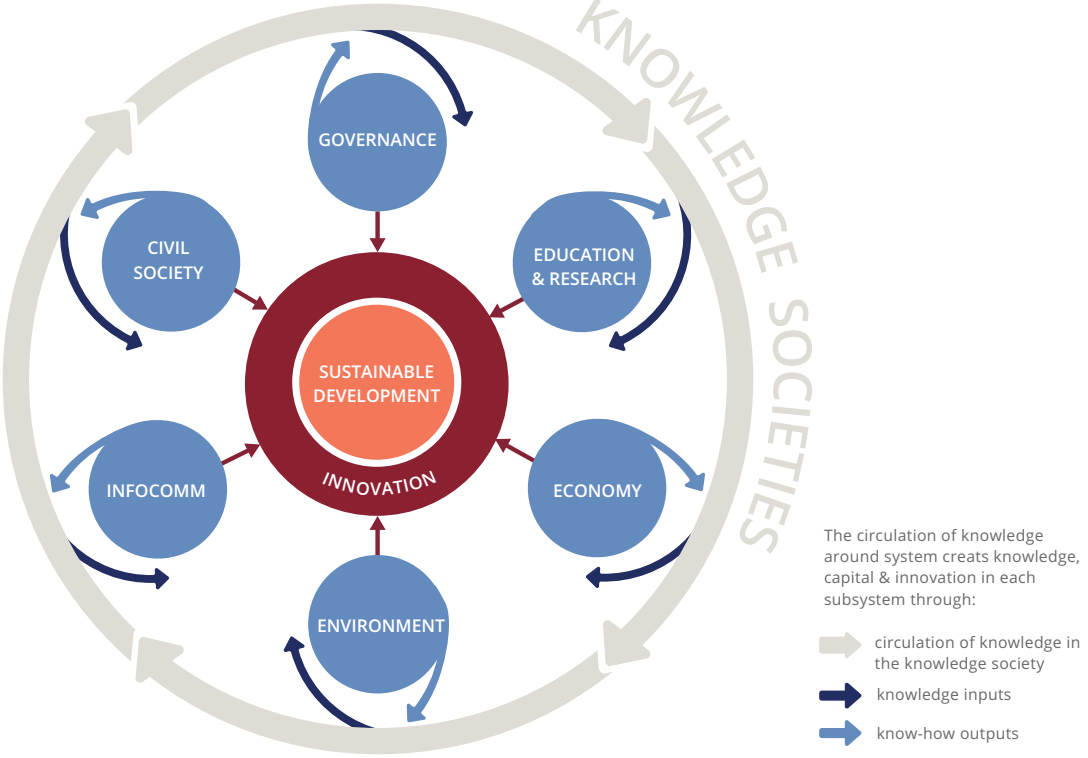

Figure 9: Six sub-systems of the Knowledge Societies system

In a modified version of that described in (Carayannis et al., 2012), the six sub-systems of the knowledge society are as follows[15]:

1. Governance sub-system: formulates the state's intentions through laws, regulations, financing, policy and administration, and creates political and legal knowledge and capital.

2. Education and research sub-system: composed of the activities of education and especially higher education stakeholders, academia, universities and research institutes, and creates human knowledge and capital as students, teachers, researchers, scientists, academic entrepreneurs, etc.

15 Note, the order of presentation of the six sub-systems is not significant.

3. Economy sub-system: consists of industry, firms, entrepreneurs and banks, and creates economic knowledge and capital in the form of entrepreneurship, machines, products, services, technology, finance, etc.

4. Environment sub-system: consists of the 'natural' environment and resources, including raw materials and the biosphere, which together create natural knowledge and capital.

5. InfoCommm sub-system: consists of all forms of ICT and technology infrastructures and services, as well as media such as newspaper, TV and radio, social media, etc., and creates both ICT technology and informational knowledge and capital such as news, communication, social networks, etc.

6. Civil society sub-system: composed of citizens, communities and non-profit organizations, creating social and cultural knowledge and capital including values, norms, identity, life styles, self-expression, etc.

In this conceptual model, these six sub-systems interact together through the circulation of knowledge, as depicted in Figure 8, leading to the creation of different types of capital within each sub-system. If an input of knowledge is taken into one of the sub-systems, an exchange of knowledge takes place creating new knowledge and/or new inventions, products and services, which are then fed to other sub-systems in the form of new know-how. In this context knowledge transfer as well as creation and exchange takes place, and this could be undertaken as a specific service by appropriate stakeholders. Each of the six sub-systems can stimulate innovation which directly impacts Sustainable Development, but this impact is progressively increased through the combined effect of two or more sub-systems, and ultimately the whole Knowledge Societies system.

Table 33 summarizes some typical relationships between each of the Knowledge Societies sub-systems and the knowledge and capital as well as innovation types to which each is mainly associated when functioning in isolation; note, these are indicative only and not mutually exclusive. One goal of any Knowledge Societies policy is likely to be developing synergies between these different types, and thereby creating completely new types of knowledge, capital and innovations.

Table 33: Example types of knowledge, capital and innovation associated with KS sub-systems

KS sub-system type	Types of knowledge & capital	Types of innovation
Governance	Political & legal capital	Public sector, public policy innovation & open governance
Education & research	Human & science capital	Human resource, science innovation & open science
Economy	Economic capital	Business model, organizational & open innovation
Environment	Natural capital	Sustainable development innovation for the socio-ecological transition
InfoComm	Technology & informational capital	Technology, user-driven & open innovation
Civil society	Social & cultural capital including traditional knowledge	Open innovations like social, cultural, inclusive & frugal innovation

4.5. Preparing People and Organizations for Knowledge Societies

The critical issue for both Information and Knowledge Societies policy is, in practice, whether and how people and organizations use the tools, information and knowledge they have at their disposal. (Millard, 2015) recognises five levels in their use, deployment and exploitation, which are typically cumulative and progressively increase their impact on sustainable development:

1. Access and availability: for example to InfoComm in the form of ICT including the Internet, broadband, computers, mobile devices, relevant online services including social media and content, etc. This is a supply side issue and reflects the level of development of the country or region, private investment in infrastructure and services, and is amenable to Knowledge Societies policy initiatives. The issues of access and availability are elaborated in Section 4.5.1.

2. General and basic skills and opportunities: of the people involved as individuals or in groups and organizations. For example, whether they are actually able in terms of their skills, capabilities and motivation, and have appropriate opportunities, to deploy the available tools, information and knowledge. See Section 4.5.2.

3. Human resources and development: of the people involved as individuals or in groups and organizations, for example in terms of their education, occupation, labour market status and income, also taking account of their demographic characteristics like gender and age. See Section 4.5.3.

4. Beneficial use: by the people involved, as individuals or in groups and organizations, of tools, information and knowledge, for example whether and how they are deployed appropriately to provide the benefits intended. Such beneficial use typically increases with increasing human resource development at level 3. See Section 4.5.4.

5. Beneficial participation and co-production/co-creation: in developing new or improving existing tools, information and knowledge by the people involved, as individuals or in groups and organizations, in an active or even proactive manner. For example, whether and how they are actively engaged themselves in contributing to or developing InfoComm products and services, new information and/or applying this information in new ways or contexts to achieve new types of benefits. See Section 4.5.5.

Levels and 1 and 2 basically represent supply-side issues and are subject to Knowledge Societies policy initiatives over the relatively short-term. As such they can be seen as quick wins, although they are not necessarily easy or inexpensive. Levels 3 to 5, on the other hand, represent demand-side issues which are also subject to Knowledge Societies policy initiatives but over the relatively longer-term. Although typically requiring both levels 1 and 2, it is first during levels 3 to 5 that widespread sustainable development impacts are achieved. Figure 9, modified from (Millard, 2015), illustrates the general cumulative nature of these levels, each one typically building on the level before, and through the size of the oval emphasizes that each level potentially has progressively greater sustainable development impact.

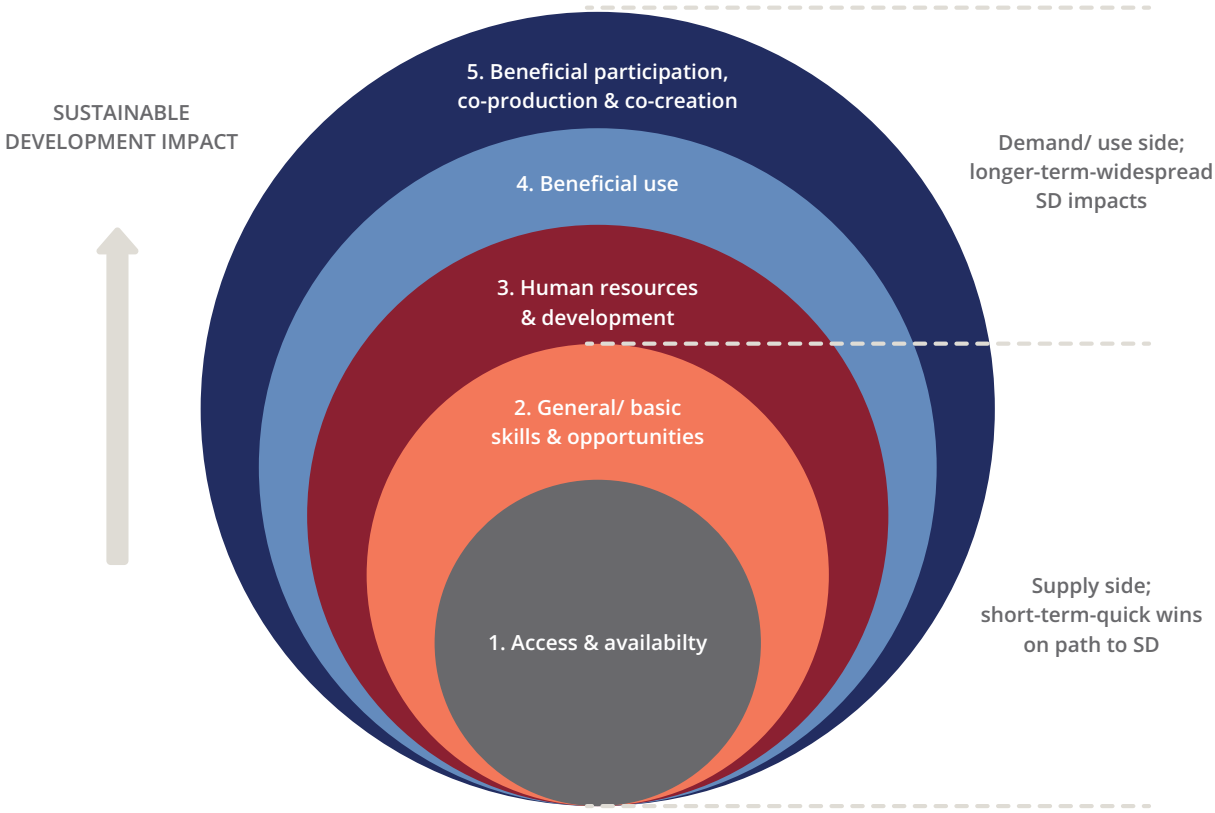

Figure 10: Preparing people and organizations for Knowledge Societies

These levels, and in particular levels 3 to 5, also highlight how digital and socio-economic divides become serious barriers to sustainable development. Developing countries typically have a greater challenge than more developed countries in shifting between levels 1 and 2, on the one hand, and levels 3 to 5 on the other. The pace of change means there is a constant danger that the poorest, the least well educated and those living in remote areas become doubly cut-off from the potential benefits that ICT and knowledge societies can deliver. Knowledge Societies policies thus become critical, both to bridge such divides but also to ensure that all members and aspects of society are able to develop and prosper in sustainable, equitable and fair ways.

The five levels are further elaborated in relation to KSP in the coming sections.

4.5.1. Access and Availability

In terms of Level 1, access to and availability of InfoComm tools, information and knowledge, important determinants include cost and quality factors as well as the awareness of potential users. (Millard, 2015) found that these issues are statistically more important than human resources and development in determining the use of InfoComms and new forms of information and knowledge[16], and this observation can provide a strong basis for the design of Knowledge Societies policies. In other words, simply providing access and availability can give a huge boost to knowledge societies, so even people with low educational and income levels can obtain substantial benefits. In addition, access and availability can be implemented over a relatively short time horizon as relatively 'quick' policy wins, although this is not necessarily easy or inexpensive. In contrast, developing human resources at level 3, although ultimately leading to greater sustainable development impact, requires much longer time

16 Although also recognizing that these factors are often inter-dependent.

scales and cooperation with a larger number of stakeholders.

4.5.2. Skills and Opportunities

At Level 2, general and basic skills and opportunities are, alongside access and availability, the most important determinants statistically for determining the use of InfoComms and new forms of information and knowledge. For example, such basic and general user skills can be learnt and developed relatively quickly given motivation, opportunity and technology availability, and as such are only weakly correlated to socio-economic characteristics like education, income and occupation (Millard, 2015). The rapid take up and beneficial use of mobile phones in most countries around the world, regardless of such characteristics, tends to exemplify this.

An additional dimension at this level is that there is strong evidence that if an individual does not her- or himself have the requisite skills nor indeed access, they might still benefit through an intermediary who uses InfoComm on their behalf. For example, intermediaries can be family members, friends, neighbours, community as well as more formal organisations, like NGOs, public libraries, or tele-centres. It was accepted in Europe in the mid to late 2000s that, given that still 20-30% of people would not be online at least for the next ten years, that they could anyway benefit from InfoComm through such strategies, which might also include better use in the back-offices of governments and companies in order to better target services. In other words, not everybody needs to use InfoComm themselves straightaway to get the benefits of it, though of course there is a need to move towards that in the medium to longer term.

Indeed, European data from earlier research reported by (Millard, 2015) showed that, in relation to e-Government, only 53% of users use InfoComm for their own purpose, 51% as part of their job, and 42% on behalf of family or friends[17], the latter thus being termed 'social intermediaries'. Moreover, each social intermediary on average assists 2.6 other individuals who are not themselves direct InfoComm users, thereby dramatically extending the actual impact of InfoComm.

Interestingly, the profile of social intermediaries also differs from that of InfoComm users generally who tend to be younger and/or in employment, in that they tend to be older and perhaps retired, often unemployed and living in a country or region with poor or expensive InfoComm availability. This seems to be because this group as a whole is generally less InfoComm literate, but that the small subset of them that are literate are better able to relate to their peers and assist in InfoComm use. The profile of individuals receiving assistance from social intermediaries also strongly mirrors that of non-InfoComm users generally, i.e. having low e-skills and e-attitudes, unemployed or in unskilled occupations, lower income and educational levels, in higher age groups including retired, and also living in countries or regions with undeveloped InfoComm. Overall, it is clear that social intermediaries considerably extend the benefits of InfoComm to individuals who otherwise are not being reached, and that such a policy can be considered as a powerful and relatively 'quick' win.

In summary and especially in a developing country context, levels 1 and 2 can together provide substantial knowledge society impacts over a relatively short-term period. They also provide fundamental building blocks for levels 3, 4 and 5, and although they can only support sustainable development to a limited level, this is still highly significant statistically and does not rely on the longer term need to develop human resources.

17 Note the percentages total more than 100% because most ICT users act in more than one capacity.

4.5.3. Human Resources and Development

Level 3 human resources and development, although largely only amenable to long-term policy interventions, are nevertheless highly important for widespread sustainable development impacts. For example, (Millard, 2015) shows that ICT users compared to individuals not using ICT are significantly more likely to:

- be in employment
- be well educated
- have medium to high income
- be aged 25-34
- be male.

These characteristics in themselves demonstrate the digital divide which tends to permeate all InfoComm related usage as also, for example, documented by the (United Nations, 2014) and (Pew, 2012). Further, looking at some of these individual characteristics, income emerges as the most important access factor, assuming InfoComm is available, whilst educational level is the most important for beneficial use and the intensity of use. This is a general conclusion also reached by the (United Nations, 2014). According to a study quoted in this source, the probability of an individual using the Internet everyday increases by 2.4 times in Europe and by 3.6 times in Korea if s/he has a university degree or above. As mentioned above, however, improving human resource characteristics like these is a long-term policy strategy, but ultimately the most significant factor of all for widespread sustainable development.

4.5.4. Beneficial Use

Levels 4 is where the deployment and use of InfoComm, information and knowledge start to have direct and widespread sustainable developmental benefits. InfoComm, information and knowledge are not magic bullets. As depicted in Figure 4, they do not themselves provide such benefits nor indeed improve human development characteristics and skills, but if these are all brought together and deployed in the right contexts they become powerful tools for achieving sustainable developmental goals, as sketched in Figure 5.

At Level 4, impacts are made through the beneficial use of InfoComm, information and knowledge – simply having access to these and basic skills and resources, does not in itself guarantee benefits. In other words, in a sustainable developmental context, are they being successfully deployed to improve, for example, the quality of life, provide jobs and income, better services and better infrastructures? Such beneficial impacts typically require new mindsets, the ability to act innovatively, to create new business and financial models, etc., within a conducive framework of regulation, incentives, and open markets which allow local innovators to earn money, perhaps through developing micro-payment reward systems as in Kenya (World Bank, 2012). In particular, there is a need to think about how these contextual conditions will impact beneficial outcomes. It is often also important to include a broad range of stakeholders, not only from government but also from the ecosystem of commercial companies and especially small and medium sized enterprises (SMEs), civil society organizations, hacker communities and interest groups, where there is huge potential for generating innovations using InfoComm, information and knowledge.

Building on Levels 1, 2 and 3 to achieve impacts at Level 4 is the critical transition, not traditionally addressed by information or Knowledge Societies policies. This shift has been more or less successfully achieved in many European countries by political priority, adequate funding and appropriate frameworks both at the EU as well as Member State Levels (European Commission, 2000) and (European Commission, 2010). This has been documented, for example by (Millard, 2015) in the context of e-Government who showed the decisive shift over

just three years between 2007 and 2009 between a preoccupation with access initiatives, to first an emphasis on skills training and then to a focus on beneficial service use for socio-economic impact. This resulted not in the neglect of access initiatives, but in a synergistic balance between all three aspects, as illustrated in Figure 10 modified from (Millard, 2015).

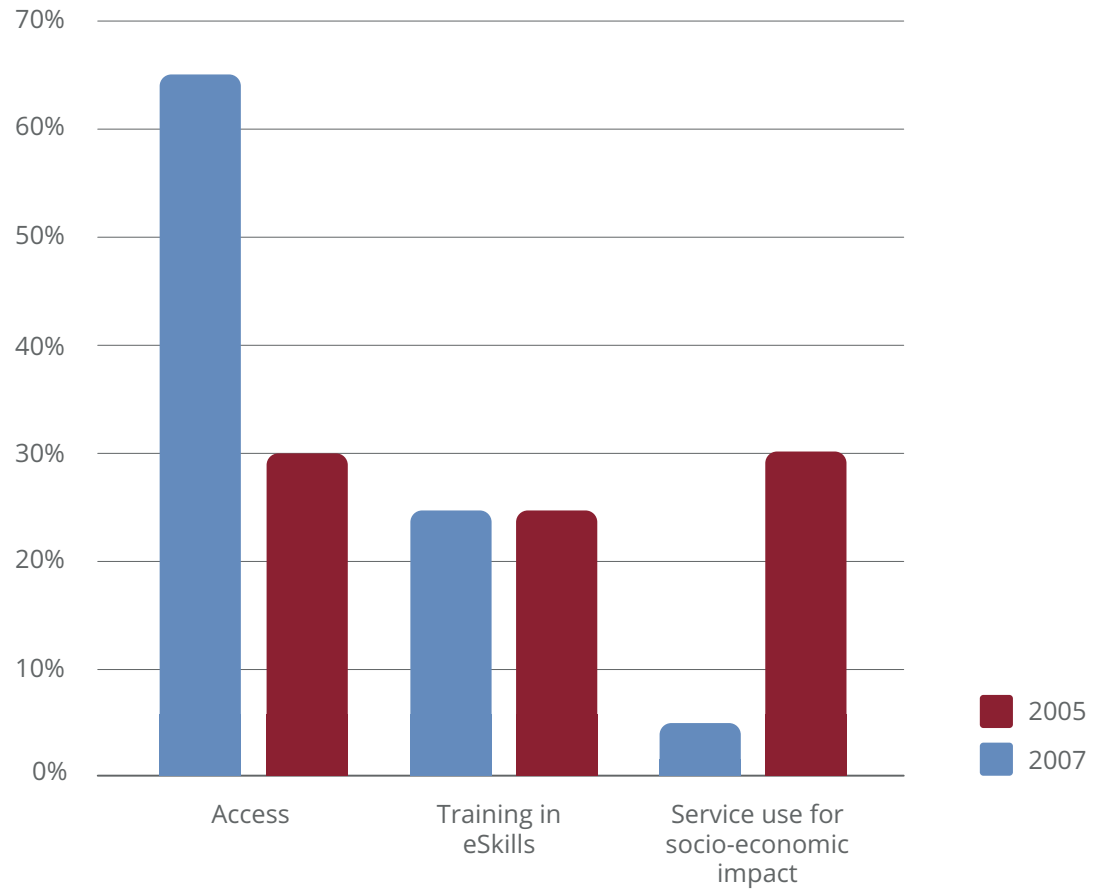

Figure 11: The shifting focus of inclusive e-government activities in Europe, 2005-2007

4.5.5. Participation, Co-Production and Co-Creation

The participation and co-production/co-creation focus of Level 5 is an important next step on from Level 4. It demonstrates the significance of the pro-active contribution by people and organizations themselves to InfoComm, information and knowledge, rather than their more passive use at Level 4. Thus, reaching Level 5 is where the greatest sustainable development impact is likely to be found building on the foregoing levels 1 to 4. This can, for example, be in the form of adding and editing content, developing apps and widgets and even programming, and co-creating or own-creating new or enhanced products, services or other innovations. It is here that the real potential of open and big data, data mining and analytics, and the potential this has for smarter products, services and governance is to be found. This is the level of open, active and 'crowd-levered' knowledge creation and innovation. It is currently very much linked, for example, to Web 2.0, networks and cloud computing, open source and crowdsourcing InfoComm, for example where erstwhile consumers also become producers as so-called 'prosumers'.

In the KSP context, these trends are starting to lead to the breakdown and blurring of traditional roles and relationships of all stakeholders and shows that it is important not to assume that a given stakeholder continues

to only have their traditional roles. For example, users of products and services become producers and suppliers, companies become designers and deliverers of public services, citizens become scientists, consumers make their own products using open access 3D printing, and student peers learn together as both teachers and pupils when studying, e.g. “Massive Open Online Educational Courses (MOOCs)”.

Such developments, although still quite small even in the more developed countries, are growing extremely fast in all countries and regions. They can bring advantages to Knowledge Societies of huge innovation surges, as well as agility, scalability and cost effectiveness. However, there are also serious challenges related to quality and performance standards, patchy and uneven development when the more prosperous individuals and organizations are able to race ahead, as well as the growing need for cyber security to address the rapid increase in threats to identity and of cybercrime. As discussed above, there are also immense dangers of digital and knowledge divides aligning with traditional socio-economic and political divides, so that KSP must also give this challenge utmost priority, as reflected in the SDGs. Realizing these potentially huge benefits, whilst tackling the serious challenges, calls for ambitious as well as realistic Knowledge Societies policy (Millard, 2015).

5.

Process – Building Knowledge Societies Policy

Any level of government which has policy-making powers over the territory it represents, whether international, national or sub-national including at city level, can prepare, implement and sustain a Knowledge Societies Policy (KSP). This territory (whether state, city, locality, etc.) should be developed based on three overriding considerations:

- The territory's specific needs and future aspirations,
- The regional (i.e. near-neighbourhood) and global context of the territory,
- The imperative of embedding the KSP strongly within and as part of the government's existing overall policy portfolio for the territory.

Indeed as described in Chapters 3 and 4, a KSP impacts most if not all of a territory's societal characteristics, interests and needs, and should be one of the leading policy tools a government possesses. A KSP, if developed sensitively, pragmatically as well as ambitiously, has the potential to transform the government's territory away from the traditional industrial society of the 20th Century through two main transformations, as outlined in Chapter 4:

- First, to an Information Society that innovatively uses ICT, new media and other technologies and tools, characteristic of the second half of the 20th Century.
- Second, into a Knowledge Society ubiquitously using these tools to create and deploy new forms of knowledge for the purposes of inclusive and sustainable development the 21st Century. It thus clear that policies for Knowledge Societies take their point of departure from existing policies and infrastructures, rather than being built independently from them.

Developing a KSP will assist any government prepare a comprehensive understanding of the issues and opportunities it faces as it works towards creating a self-sustaining society and economy. As this handbook demonstrates, there is a large number of ways in which the application of ICT and other new technologies is helping all stakeholders diversify, adapt to and better address global changes.

A successful and well implemented KSP will put any government in a much better position to tackle both large and small scale societal challenges, whether these be climate change, poverty and inequality, demographic change, food and water security, biodiversity, education, health, jobs, habitat or infrastructure. It will also ensure that such challenges are seen as strongly interdependent requiring a coordinated and integrated, rather than a siloed or piecemeal, response.

A strategic approach will provide a starting point in allowing governments the opportunity to identify development priorities amenable to a KSP approach based on a sound and objective analysis of their needs, strengths, opportunities and resources. Each government has its own particular characteristics in terms of the way people, communities and businesses live and work, and the planning of a strategy must take account of its wider development objectives to achieve maximum impact.

The framework presented in this chapter should be seen more as a structured and interrelated checklist of important issues and activities, rather than a rigid or prescriptive plan of operation. Every government territory is unique, has its own starting point and specific potential and requirements. It is also important to appreciate that each process component outlined in this approach, despite the sequence followed, can also lead back to a re-assessment of previous components, as part of a feed-back process, although too much of this could lead to delay and procrastination. The overall focus must be on moving forward steadily if not rapidly, experimenting, testing and adjusting on a small scale along the way, but always making progress. Firm but flexible leadership is thus required to inspire all stakeholders involved and ensure that real progress is actually being made.

Seven components make up the process framework, the first five of which constituent the policy cycle as relational steps in a logical sequence, whilst the last two are components which are on-going throughout the duration of the KSP and need to be continuously deployed.

Figure 11 shows the seven policy components presented and explained in this chapter, and illustrates their interrelationships.

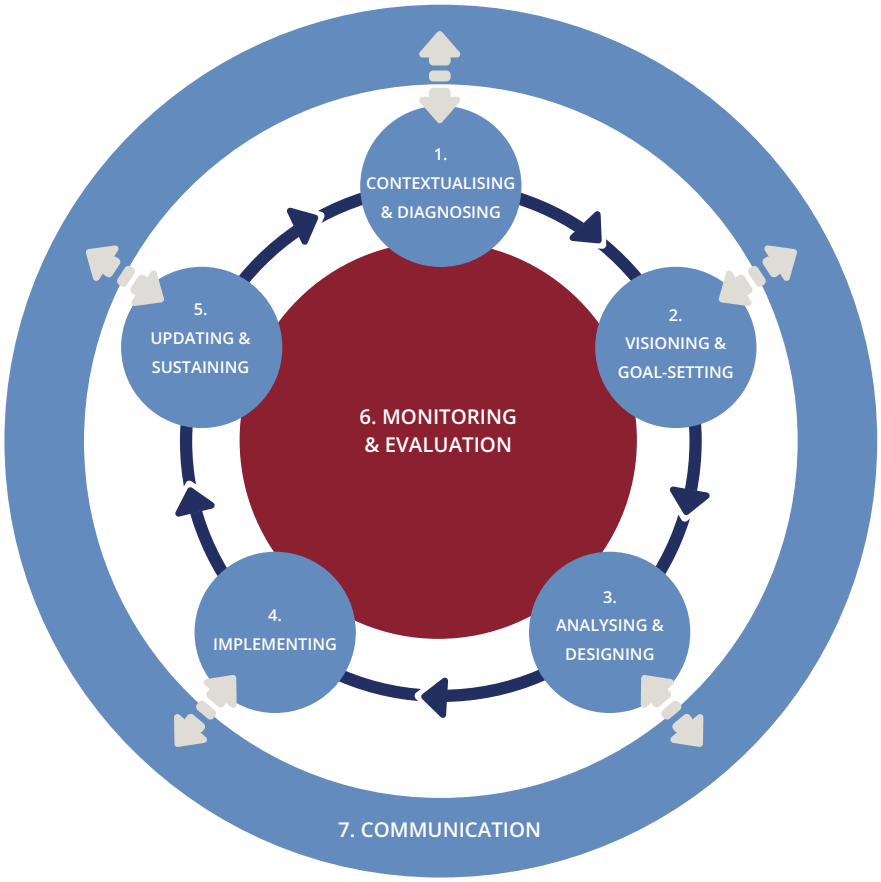

Figure 12: Process components of the Knowledge Societies policy

The components are described as follows:

- Component 1 – Contextualizing and diagnosing, typically starts the policy cycle and addresses, first the territory's global and regional context, second its specific needs and aspirations, and, third embeds it in the government's policy portfolio.
- Component 2 – Visioning and goal-setting, continues the policy cycle after Component 1 and draws on all relevant stakeholders and interests to create an overarching vision for the medium- to long-term of what the KSP should be and how it should be achieved. This takes place through the generation and deployment of new types of knowledge, know-how and innovation, prioritizing what is most important and translating this into strategy development and goal-setting.
- Component 3 – Analyzing and designing, continues the policy cycle after Component 2, and is concerned with establishing governance structures and stakeholder roles, including multi-stakeholder configurations, to support the preparation of detailed policy designs through an analytical process leading to coordinated programs of policy intervention. Each of the latter require specific objectives and actions, for which necessary inputs, activities, outputs and outcomes are planned and assessed for financial and operational feasibility, in the context of Component 6, for successful contribution to the KSP goals.
- Component 4 – Implementing, continues the policy cycle after Component 3, and develops and operates detailed action plans to meet project and program objectives, ensuring that all inputs and activities are carried out as intended. Appropriate professional and transparent management and coordination tools and techniques are deployed which also protect legitimate rights, ensure inclusivity and fairly balance competing interests.
- Component 5 – Updating and sustaining, closes the policy cycle during or subsequent to Component 4, for the purpose of updating either the whole KSP process and/or individual components of that process, and thereby aims to achieve longer-term sustainability. This takes place both in response to the KSP's implementation experience and how this is monitored and evaluated by Component 6. It also assesses changes in the societal and global environment of the KSP, in particular whether and how to response to new opportunities or threats and to ensure the KSP remains relevant and sustainable.
- Component 6 – Monitoring and evaluation, is an ongoing component supporting all others through its provision of the rationale and tools for the systematic measurement and evaluation of the KSP's inputs, activities, outputs, outcomes and impacts, as well as maximizing its continued efficiency, effectiveness, utility and sustainability.
- Component 7 – Communication, is a component linking all others to the wider society and external stakeholders and interests, including to the general public as the broader stakeholder base. It consists of two-away communication enabling the KSP to disseminate information and raise awareness, on the one hand, and encourages public consultation and engagement on the other. It thus combines communication, awareness-raising and outreach strategies.

As illustrated in Figure 12, the first five components are more or less sequential parts of the policy cycle, starting with Component 1 and cumulating with Component 5. In contrast, Components 6 and 7 are continuous activities over the whole policy cycle. They both feed the cycle in terms of informed decision-making (Component 6) and provide mechanisms for public and wider stakeholder awareness raising and engagement (Component 7). Together they ensure that the KSP retains overall relevance, coherence and effectiveness, by both feeding off and feeding in new knowledge and know-how. This approach also makes it possible to prioritize and scale policy cycle components 1 to 5 according to need in a timely and flexible manner.

Figure 12 shows how the seven components of the KSP link together in terms of their process flow. The figure marks out the three overall policy phases, how these are punctuated by six major milestones, and the iterations between the first five policy cycle components with both the monitoring and evaluation component and the

communication component. It also depicts the feedback thereby enabled, as well as the important feedback loop from the updating and sustaining component back to the start of the KSP process.

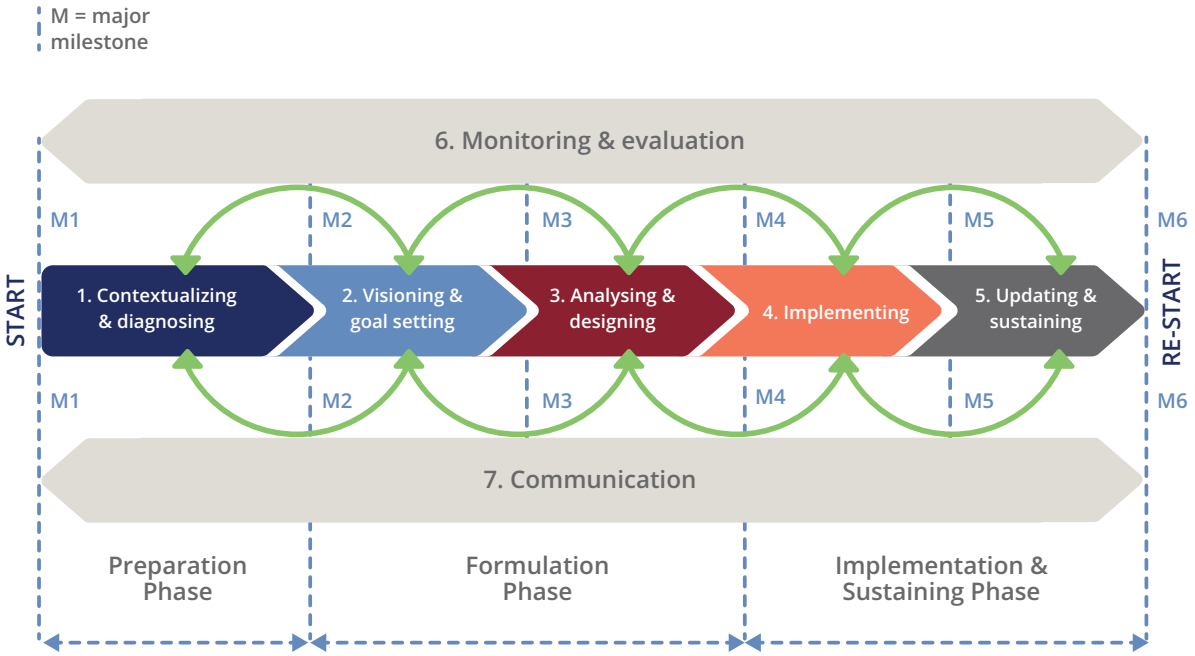

Figure 13: Process flow of the Knowledge Societies policy components

The three phases of the Knowledge Societies Policy are as follows:

- Preparation Phase: The phase consists of Component 1 and commences with Milestone 1 at the beginning of the KSP. It concludes with Milestone 2 which checks that satisfactory progress is being made before the next phase and component start. During this phase, Component 1 obtains feedback on progress from Component 6 in relation to the overall monitoring framework, and also iterates with Component 7 by providing information and receiving feedback resulting from wide stakeholder consultations.
- Formulation Phase: The phase commences after Milestone 2 with Component 2 which itself subsequently transitions into Component 3. There are two milestones in this phase. First, an intermediary Milestone 3 between Components 2 and 3 during which the status of progress is assessed, and second Milestone 4 which assesses the status of the KSP before handover to the next phase. During the phase, both Components 2 and 3 obtain feedback on progress from Component 6 in relation to the overall monitoring framework, and also iterate with Component 7 by providing information and receiving feedback resulting from wide stakeholder consultations.
- Implementation and Sustaining Phase: The phase commences after Milestone 4 with Component 4 which itself subsequently transitions into Component 5. There are also two milestones in this phase. First, an intermediary Milestone 5 between Components 4 and 5 during which the status of progress is assessed, and second Milestone 6 which assesses the status of the KSP at the end of the whole KSP process. During this final phase, both Components 4 and 5 obtain feedback on progress from Component 6 in relation to the overall monitoring framework, and also iterate with Component 7 by providing information and receiving feedback resulting from wide stakeholder consultations.

Finally, towards the end of the KSP process, a major assessment of the KSP is undertaken and provides an important feedback input (green arrow) into any future or revised KSP.

The remainder of this chapter provides details of the seven components of the KSP process: Component

1 – contextualizing and diagnosing in Section 5.1, Component 2 – visioning and goal-setting in Section 5.2, Component 3 – analyzing and designing in Section 5.3, Component 4 – implementing in Section 5.4, Component 5 – updating and sustaining in Section 5.5, Component 6 – monitoring and evaluating in Section 5.6 and Component 7 – communicating in Section 5.7.

5.1. Component 1 – Contextualizing and Diagnosing

This first policy cycle component addresses how to prepare for the development of a KSP in a specific government territory. It has two overall tasks addressed in the following:

- To establish a small Steering Board and a larger Board of Representatives drawn from relevant stakeholders.
- To develop an overall view, consensus and political commitment for developing a KSP taking account of, and diagnosing, the territory's specific needs and potential capabilities over the medium- to long-term.

These two tasks are elaborated in Section 5.5.1 and Section 5.5.2 respectively.

5.1.1. Establish a KSP Steering Board and Board of Representatives

The first task after a political decision has been made to develop and launch a KSP is to establish a small KSP Steering Board (KSP-SB). Membership should probably comprise a maximum of ten members, drawn from the appropriate government authorities as well as appointed by the main non-government stakeholders. It should have political and financial authority to undertake consultations and consider evidence in order to make high-level decisions about the purpose and type of the KSP as well as its means of implementation.

The KSP-SB should be made up of high-level politicians and decision-makers drawn from the four main stakeholder groups who both represent the interests of their group as well as have special expertise of value to the team. It should be chaired by the head of state (or equivalent) through her/his representative, and be directly responsible to the highest levels of government and the main policy making organs.

It is important to identify the key stakeholders (both individuals and organizations) as members of the KSP-SB, and to ensure their commitment. The KSP-SB should aim to provide knowledge and information, firm but flexible leadership, political backing and to ensure that the KSP will be able to secure the necessary finance and other inputs needed. The KSP-SB should be able to call on evidence and advice from any relevant source, including internationally, and it may decide to set up specialist task forces to address specific issues. It should also be supported by civil servants and non-government experts or interests to carry out administrative tasks.

The KSP-SB will also formally consult a Board of Representatives (KSP-BoR) drawing on a broader range and larger number of stakeholders, with flexible membership depending on need. Although, the KSP-BoR should only meet occasionally, perhaps no more than every three months initially and every six months once the KSP has been agreed and launched, it should be able both to be consulted by the KSP-SB, and to make representations to the KSP-SB, on matters of interest and importance.

It is important to note that care should be taken when setting up the KSP-SB and KSP-BoR as they may become

inefficient if there are too many members. One way to mitigate this danger could be to identify and engage 'champions' from each stakeholder type.

The KSP-SB should be tasked with directly executing Components 1 and 2 of the KSP, but only oversee the rest of KSP development, implementation and sustainability, which will be undertaken mainly by civil servants, experts and specialist stakeholders. See Figure 22 on this handover and for a generic organizational diagram.

Although all types of stakeholders are relevant and eligible to be permanent or occasional members of the KSP-BoR, some might be more directly valuable at least in initial stages:

- The main ICT, media and technology users in the territory, such as private businesses including both SMEs and any larger enterprises, the public sector itself, the education and research sector, civic groups and NGOs, prominent individuals and champions, etc. Companies and organisations represented in the region which already use KS tools and approaches explicitly to develop new forms of knowledge, know-how and innovation, or have a potential to do so, should be considered.
- The main ICT, media and technology providers in the territory, including manufacturers, infrastructure operators, ISPs, service and application providers, equipment vendors, technology security specialists, etc., should be considered. These may not just the in business sector as other stakeholders are also becoming suppliers and producers like non-profit civil groups, social and tech entrepreneurs and start-ups, as well as local authorities, government research labs, universities and non-profit incubation labs, maker spaces, etc.
- The important mediators who can assist in bringing the interests of technology users and technology providers together for the purposes of creating new forms of knowledge, know-how and innovation. These case include, for example, relevant local, regional and national authorities, planning agencies, labour market organisations, employers' organisations, trade unions or employee staff associations, chambers of commerce and similar, educational and training organisations, academics and researchers, consultancies, marketing specialists, etc.
- The technology and other types of funders, investors or donors, if necessary, for needed investment that is unlikely to be forthcoming from the stakeholders already represented.

One of the purposes of the KSP-SB will be to build a consensus, whereby the interests of all parties can be taken into account and promoted, through the encouragement of partnerships which can work together to further the aims of Knowledge Society. In this context, it is thus clearly sensible to:

- Work with and through existing organisations where possible.
- Develop consensus, cooperation and coordination, at all levels including the political.
- Identify and harness the energy, enthusiasm and trust of champions (i.e. key individuals who can persuade others, provide context-specific leadership, etc.).
- Combine the skills, enthusiasm and resources across the territory (bottom-up) with appropriate know-how, connections and resources from the government itself or from outside its territory, including internationally (top-down).

At the outset there is a need to consider, as part of the KSP:

- The roles and responsibilities of each of the stakeholders (it may be useful, for example, to appoint specialised task forces).
- The level of Knowledge Society and technology knowledge and understanding, both of the stakeholders, and of the wider community where relevant, and thus the extent to which these need to be upgraded.
- The level of ambition as part of a future vision of what the totality of Knowledge Society development initiatives in the territory is aiming at, how the specific technology and knowledge initiatives should fit in

with this, and how in general terms it is proposed to get there.

- The overall long-term agenda and the time horizon envisaged depending upon the above considerations.

5.1.2. Achieve Consensus and Political Commitment for Developing a KSP

A number of different strands of activity should take place in order to achieve consensus and political commitment for developing a KSP. Firstly, the KSP-SB should examine what it can learn internationally about Knowledge Societies and take account of the territory's global and near-neighbor context. By using mainly international sources and consultations it should rigorously identify and examine:

- Existing case studies for example as good practices, meta studies, reports and benchmarks, particularly those which place the territory itself in an international Knowledge Society context and/or provide information directly relevant to the territory. For example, the Open Government Partnership provides many good examples in the public sector context of how national open government action plans are developed through international cooperation, and evaluated through open peer review.
- Information from international organizations and research institutes.
- Information from donors and potential investors.

Second, looking internally within the territory, the identification and examination should also take place of:

- Existing case studies, meta studies, surveys, data, legislation, etc.
- Gaps or potential gaps in information needed about the territory, which might be referred back to international sources that could provide relevant evidence because of similarities in the current status or similarities in policy aspirations. If such gaps are seen as important to further diagnosis the territory's needs and possibilities for developing KS, the KSP-SB could designate a specific task force or other group of experts to examine the issue, as discussed above.

The following considerations and activities, described in subsequent sections, can be adopted to achieve these objectives: understanding possible roles of KSP (Section 5.1.2.1), understanding how KSP can be developed (Section 5.1.2.2), aligning with the territory's Sustainable Development Goals (Section 5.1.2.3), developing territorial profiles (Section 5.1.2.4), undertaking a SWOT Analysis (Section 5.1.2.5) and policy linking within the territory's total policy portfolio (Section 5.1.2.6).

5.1.2.1. Understanding Possible Roles of KSP

The KSP-SB should understand and take account of different purposes the development of an explicit and publicized ISP or KSP can have after (Heeks, 2006):

- Accountability to stakeholders in particular and to society in general: enabling governments to be held to account for the resources they have invested in the KS. Ministries of Finance will share an interest in this purpose.
- Retrospective achievement: helping policy makers know in comparative terms how their territory has performed in the past in KS-related issues.
- Prospective direction and priority setting: assisting policy makers with strategic decision making about KS.

A policy will also be able to provide guidance at the tactical level of individual projects, for example, offering lessons learned or best practices for such projects.

Specifically, (Heeks, 2006) stresses the importance of understanding that the need for and type of KSP varies in accordance with the policy lifecycle, and that this also clarifies the means of doing it:

- For policy makers entering the awareness stage, the developing an explicit KS might initially have the role of promoting understanding of what KS are.
- For policy makers at the agenda-setting stage, developing a KSP might help in changing or adapting existing government policies, for example by focusing on the carrot of good news/benefits stories and the stick of poor comparative benchmark performance.
- At the policy preparation stage, policy makers will likely demand an understanding of alternatives and priorities, comparisons with other countries and best/worst practices.
- Finally, at the evaluation stage, policy makers may demand both comparative performance data and the reasons behind that comparative performance in order to move to learning and improved future policy-making.

5.1.2.2. Understanding how KSP can be Developed

Much has been written about how development and particularly sustainable development takes place, and much practical experience has been gained. There has been a general reorientation of economic and social policy away from 'top down' sectoral instruments towards 'bottom up' local and stakeholder-led development strategies, e.g. through measures such as support for entrepreneurship, developing human capital, spreading innovation and building regional institutions and networks of firms. This approach is based upon 'sustainable development', i.e. development with the objective of maximising human welfare, and providing a sound economic, social and environmental base for both present and future generations. The OECD suggests six stages (Mountford, 2009):

1. Create/adjust development structures: the framework and stakeholders necessary to undertake the development activity are identified and co-opted (See Component 1).
2. Identify / adjust the vision, objectives and strategy: the objectives and strategy of the development activity are agreed (See Component 2).
3. Mobilise relevant people and organizations to deliver projects: prepare and activate stakeholders and identify specific projects (See Component 3).
4. Select and find funding for projects that meet objectives: identify and allocate funding for appropriate projects and implement them (See Component 4).
5. Monitor and evaluate outcomes: on-going - on-going evaluation of projects being implemented (See Component 6).
6. Feedback into structures and strategies: ensure project results feedback into overall structures and strategies, so that the process can start again building on the progress made (See Component 5).

5.1.2.3. Aligning with the Territory's Sustainable Development Goals

As described in Section 4.2, almost all countries agreed to the United Nations' 2030 Sustainable Development Agenda in September 2015, and most have designed or are designing or aligning their own policies to meet these commitments. It is important in this context that the territory's KSP is also aligned with their SDG policies as both are potentially highly mutually supportive.

The matrix in Figure 13 can be used to map the current status of SDG plans and/or commitments and how these might be supported and/or support the design of the KSP:

- The first two columns list, respectively, the KS architectural elements and the SDGs linked to those elements which are relevant to the territory (it is unlikely that all will be). See Figure 5 for possible SDG linkages to architectural elements.
- The third column provides information on the current and/or likely future status of SDG planning and/or implementation in the territory.
- The final column elicits information on how these SGD plans/commitments might be supported and/or support the design of the KSP.
- Note that this matrix is an overview table, whilst the actual mapping is likely to require detailed description and analysis.

Element of the KS architecture	Sustainable Development Goals (SDGs) for fuller description see Figure 5	1)	2)
Governance	16: Institutions		
	17: Capacity, partnerships		
Knowledge	17: Capacity, science, tech, innovation, knowledge sharing & co-creation		
Society	1. End poverty		
	2. End hunger		
	3. Health & well-being		
	5. Gender equality		
	10. Reduce inequality		
Education	4. Inclusive, equitable, quality education life-long, all levels, tech & vocational		
Economy	8. Sustainable growth, work		
	9. Sustainable industry		

Element of the KS architecture	Sustainable Development Goals (SDGs) for fuller description see Figure 5	1)	2)
Environment (person-made & natural)	6. Water & sanitation		
	7. Sustainable energy		
	9. Resilient infrastructures		
	11. Cities & settlements		
	12. Sustainable consump-tion & production		
	13. Climate change		
	14. Marine resources		
	15. Territorial ecosystems		
InfoComm	17. Tech bank & facilitation, ICT, online platform		
KS architecture synthesis			

1) Current and/or likely future status of SDG planning and/or implementation in the territory

2) How these SGD plans/commitments might be supported and/or support the design of the KSP

Figure 14: Territorial alignment with Sustainable Development Goals

5.1.2.4. Developing Territorial Profiles

There could be up to three main elements in constructing an overall Knowledge Society profile. It may not always be appropriate to undertake full profile surveys due to cost, time and relevance. However, sample surveys could be undertaken, and/or a representative task force appointed by the KSP-SB to undertake mainly qualitative assessments, supplemented with data where available. Much information may also be already available prepared for other policies or initiatives. It is also the case that many developing countries probably have a lack of capacity for producing reliable statistics, which can perhaps be partially addressed through North-South as well as South-South partnerships, as well as with international organizations that can help in the analysis of what other countries are doing and learn from them.

1. Historical and contextual profile

    - What is the preceding history of policy making and initiatives relevant to Knowledge Societies, and what development path has the territory followed over the last 10 to 30 years.
    - What are or have been the drivers and barriers in moving from an agricultural to an industrial and thence to an Information/Knowledge Society.

2. Standard socio-economic-environmental profile

    Much of this might be readily available from existing development studies and the normal work of the

territory's planning, policy-making and statistical authorities and should cover, in principle, all relevant aspects given the inter-linked nature of the Knowledge Societies:

- Socio-demographic characteristics (age, gender, health, education, social care, unemployment, etc.).
- Economic structure and prospects (sectors and their geography, competition, trade, investment, future growth and decline prospects, etc.).
- Business and employment (firm structure and linkages, types, costs, profitability, etc.).
- Labor market conditions, the workforce and human capital, including skills, qualifications and competencies, social partners, relationships, plus employment, participation and wage rates, etc.
- Infrastructures (built environment, utilities, transport, housing, etc.).
- Services and facilities, including education/training, health, etc.
- Land use and infrastructure, including utilities.
- Natural environment, biodiversity, pollution and climate change, etc.
- Administration and government.

The above should be support by a statistical profile of as many items as possible.

3. Standard new technology profile: ICT and other new technologies

This will probably be much more difficult to construct than the standard socio-economic-environmental profile as it is unlikely that any centralised overview of new technology supply and demand in the territory exists. In some cases, therefore, a survey of the characteristics, needs and plans both of the supply and user sides could be useful. The new technology profile should attempt to ascertain the existing state of the following, plus likely developments over, say, the next five years in the absence of any specific initiatives:

- Standard data such as Internet and mobile penetration (split between 'smart' and 'dumb' phones if possible), number of computers and other devices (such as tablets), etc.
- Much data like this, if not available domestically, can be obtained from international benchmark surveys covering most countries, as well as for some cities and regions. These include at national level, the ITU Information Society annual benchmark, the ITU Partnership on Measuring ICT for Development, the World Economic Forum's Networked Readiness Index, and UNDESA's biennial e-Government benchmark.
- Existing supply of standard as well as new technology infrastructure and services available, including market structure and players, cost structures and prognoses.
- Existing services, applications and equipment used by the main types of user.
- Special facilities or activities (such as telecentres, TechLabs, incubation centres, hacker events, open and big data initiatives, etc.).
- Incipient, established and potential networks and partnerships exploiting new technologies with potential to do so, including PPPs (public-private-partnerships), clusters, ecosystems, NGOs (Non-Governmental Organisations) and other interest group involvement, etc.
- New technology business model trends, such as mobile, sharing and collaborative economy, digital fabrication (e.g. 3D printing and 'maker' groups), etc.
- Existing policy and regulatory situation affecting particularly new technology.

Good international benchmarks are also available for most countries, as well as for some cities and region. These include at national level, the ITU Information Society annual benchmark, The World Economic Forum's Networked Readiness Index and UNDESA's biennial e-Government benchmark.

4. Knowledge Society system profile

Again, this will be much more difficult to construct than the standard socio-economic-environmental profile, so in most cases a survey of the characteristics, needs and plans both of the six KS sub-systems, plus likely developments over, say, the next five years in the absence of any specific initiatives. Please also refer to Section 4.4 regarding basic definitions and content of the following six KS sub-systems.

The matrix in Figure 14 can be used to map the current status and likely future trends of each of the six KS sub-systems in relation to the operational definition of the KS as the deployment of InfoComm in the production and application of:

- New knowledge as intangible outcomes: for example scientific and technology research, business and market intelligence, better evidence for public policies and services, better evidence about social trends and the environment, etc.
- New know-how as the application of new intangible knowledge to produce tangible outcomes: e.g. for new products, services, applications, experiences, solutions, applied policies and regulations, etc.
- New innovation and innovation processes: i.e. using new intangible knowledge and new tangible know-how to support and drive new and better types of innovation, such as described in Section 4.4.

KS sub-system	1) Overview of current status of KS new knowledge, know-how & innovation: important issues and examples	2) Overview of existing plans and future potential of KS new knowledge, know-how & innovation: important issues and examples (give time horizons)
Governance		
Education & research		
Economy		
Environment		
InfoComm		
Civil society		
KS whole system synthesis		

Figure 15: Mapping sub-systems of Knowledge Societies

5.1.2.5. Undertaking a SWOT Analysis

Once the various parts of the KS profiled have been surveyed and developed, a strengths, weaknesses, opportunities and threats (SWOT) analysis can be undertaken based on the information obtained. SWOT is a decision-support system, which should be seen as part of an overall learning process.

First there is a need to articulate a draft vision (see definition of a vision in Component 2) for the KS. A generic example, which needs contextualising to the territory in question, might be stated as "the promotion of a KS in territory X (both quantitatively and qualitatively) to directly support and drive Y features of sustainable development over the short-, medium- and long term". Such a draft vision, at least as a working concept at this stage, is necessary in order to provide a yardstick against which to assess the four elements of the SWOT analysis (Karppi, Kokkonen, & Lähteenmäki-Smith, 2001):

- Strength is an internal resource or capacity the territory has which it can use to achieve its draft vision: strategies and actions should aim to build on strengths.
- Weakness is the territory's internal limitation or defect that will keep it from achieving its vision: strategies and actions should aim to eliminate weaknesses.
- Opportunity is any favourable situation in the territory's external environment which might assist it in achieving its draft vision: strategies and actions should aim to exploit opportunities (opportunities are similar to drivers, i.e. conducive factors which, if they become more important, increase the likelihood of developing a KS).
- Threat is any unfavourable situation in the territory's external environment that is potentially damaging to its draft vision: strategies and actions should aim to mitigate the effect of threats (threats are similar to barriers, i.e. detrimental factors which, if they become more important, decrease the likelihood of developing a KS).

In developing a KSP, the SWOT instrument is used to make concrete those dominant and determining factors, both within and outside the territory in question, which are likely to influence the chances of achieving its vision, as well as to produce relevant strategic guidelines. Simply put, the aim of SWOT is to increase the level of information about the KS and thus reduce uncertainty.

The following five stages can be used in deploying a SWOT analysis:

1. Prepare the territorial profiles, including of KS sub-systems (as above) as statements of the current situation.
2. Prepare a description of the territory's medium- to long-term sustainable development goals and strategies. If the territory does not have a formal sustainable development strategy, draw upon its strategies which are relevant to sustainable development.
3. In relation to moving from 1 to 2 over the medium- to long-term, prepare an inventory of the internal factors which are at least partly under the direct control of the territory's decision-makers, and which will strongly influence the achievement of such a move.
4. In relation to moving from 1 to 2 over the medium- to long-term, prepare an analysis of external opportunities and threats. This might comprise an inventory of the external factors not under the direct control of the territory's decision-makers, but which will strongly influence the achievement of such a move.
5. Taking account of stages 3 and 4, articulate in as much detail as possible draft goals for the territory (see full definition of a goal in Component 2). Goals are here defined as desirable and potentially measurable future conditions which can promote sustainable development through a KSP, and some might relate to building on strengths, eliminating weaknesses, exploiting opportunities and mitigating threats.

The SWOT analysis could usefully be laid out using a generic schema as in Figure 15.

Stage	SWOT analysis	
1	Territorial profiles: 1. Historical and contextual profile 2. Standard socio-economic-environmental 3. Standard new technology profile: ICT and other new technologies 4. Knowledge society system profile	
2	A description of the territory's medium- to long-term sustainable development goals and strategies	
3	Strengths · 1 · 2 · 3 · etc.	Weaknesses · 1 · 2 · 3 · etc.
4	Opportunities · 1 · 2 · 3 · etc.	Threats · 1 · 2 · 3 · etc.
5	Articulate draft goals for the territory	

Figure 16: SWOT analysis for developing Knowledge Societies Policy

5.1.2.6. Policy Linking Within the Territory's Total Policy Portfolio

Finally, a comprehensive policy review needs to take place across all potentially relevant policies and strategies the government has or is developing through internal consultations at all levels. The territorial profiles undertaken, plus the SWOT analysis, should be used to match and link the emerging ideas and consensus in the KSP-SB and KSP-BoR with these existing and planned policies:

- To ensure policy compatibility,
- To avoid policy conflicts, i.e. when two or more policies undermine each other,
- To reduce policy overlap and thus the potential waste of effort and resources, and
- To actively build policy coordination and synergy, so that policies as far as possible work together both to maximize the use of resources and increase potential impacts.

The output of Component 1 is used as direct input to Component 2, and should consist of at least the following:

- An initial KSP organizational infrastructure with political, financial and planning authority, and including buy-in from the main non-government stakeholders.
- Completed territorial and KS profiles, a SWOT analysis and draft goals related to the medium- and long-term sustainable development plans of the territory.

5.2. Component 2 – Visioning and Goal-Setting

Visioning and goal-setting is the second policy cycle component and has two main tasks:

- To identify and work with all relevant stakeholders and interests to understand and establish procedures for visioning, goal-setting and strategizing.
- To create an overarching vision for the medium- to long-term of how the territory should develop as a knowledge society which generates, deploys and gets the benefit of new types of knowledge, know-how and innovation, prioritizing what this vision should be and translating this into strategy development and goal-setting.

The remainder of this section explains the nature of visioning and goal-setting activities (Section 5.2.1), present a particular method for visioning and goal-setting (Section 5.2.2) and presents a method or strategizing and prioritizing from the vision (Section 5.2.3).

5.2.1. What is Visioning and Goal-Setting

The outputs of Component 1 as an established organizational infrastructure, territorial profiles, a SWOT analysis and draft goals, will together form the building blocks for building an aspirational future vision, as well as the goals and strategies necessary for deploying a KSP for the purposes of sustainable development.

The KSP Steering Board (KSP-SB) and the Board of Representatives (KSP-BoR) established in Component 1, will continue their work in this Component 2. The opportunity should be taken for utilizing the KSP-BoR to further extend the breadth and depth of stakeholder consultation, based in the first instance on the outputs of Component 1.

Now that the KS is on the territorial agenda, there can be even greater focus on the InfoComm KS sub-system, as well as the KS system as a whole, especially as these concepts and issues are likely to be relatively new and unfamiliar for many stakeholders. This situation can also be addressed through the communication, awareness-raising and outreach strategies of Component 7.

The following operational definitions are used:

- Vision: A vision is a desired future state, normally expressed in a short (and preferably inspiring) statement of what the territory is able and wishes to achieve over the medium- and/or long-term in relation to the KS, as well as to sustainable development more generally. It is necessary, as far as possible, for a shared vision to be established of what the territory should be in the future. A vision statement should be prepared to establish a sense of purpose and direction for the rest of the planning and implementation process, and should be based on the values and principles articulated in sections Section 5.2.2 and Section 5.2.3.

A generic vision in the present context consists of "… the multi-stakeholder aspiration of what a government, together with other stakeholders, aims to accomplish in the future (in the short, medium or long term) in a comprehensive policy for Knowledge Society, considering above all the wellbeing of its population as expressed through its sustainable development goals…" (Section 3.2). Above all, the vision should be clear, ambitious but also achievable, whilst retaining its long-term and visionary nature. Examples of relevant vision statements can also be obtained from sources like the WSIS, eLAC, etc.

Once the vision, as a short statement, is prepared and agreed, more tightly focused goals can be specified and the first stages of a strategy for achieving the goals in line with the vision can be developed:

- Goal: A goal is an observable end-result which contributes specifically to realizing the vision, and has the potential to be measured through one or more specific objectives. The vision is more broad ranging and aspirational than a goal, and normally consists of several or many goals which each cover specific areas of the vision. In turn, a goal is likely to be made up of two or more objectives, which are specific and measurable within a given timeframe and given inputs (Component 3). Collectively, the goals should be able to achieve the vision and should be forward looking (i.e. medium- and long-term) and synergetic (i.e. complement each other), but there must not be too many goals otherwise resources and effort will be spread too thinly. Draft goals should have arisen out of the SWOT analysis in Component 1.
- Strategy: A strategy is a planning framework aimed at achieving a vision through its goals. It describes the overall components, steps and milestones (which can provide progress control points), and how they are to be achieved. Depending on the details of the strategy, this might lead from individual actions, through objectives to goals, and then to vision. Thus, each goal is operationalized by designing a strategy as a more or less detailed description of measurable objectives and actions, as described in more detail in Component 3.

The overall goals of a Knowledge Society need to expressed in terms of its ultimate impacts in the context of the vision and are at the macro or societal level, and encompass what concretely a Knowledge Society should contribute to, for example putting the following in the context of sustainable development:

- Economic growth
- Jobs
- Competitiveness
- Inclusion
- Democracy and citizenship
- Quality of life
- Universal human rights

These societal-level impacts are here not specific to Knowledge Societies, but are general policy goals to which the Knowledge Society goals should contribute in relation to the long-term sustainable development of the territory. The Knowledge Society vision and goals will thus need to be integrated within these wider sustainable development goals the process of policy linking, as described in Component 1.

A generic method can be used for visioning[18], goal-setting and strategizing.

18 Adapted from http://www.sswm.info/content/visioning

5.2.2. A Method for Visioning and Goal-setting

Developing a KSP needs to be seen as a trade-off between a backward looking approach of evidence-based policy-making and the forward visioning of KSP. Visioning is a method that is used to support a group of stakeholder in developing a shared vision of the future they desire. It involves asking the group to appraise where they are now and where they can realistically expect but also wish to be in the future. The purpose of visioning is to develop statements of the long-term goals and strategies. Visioning is typically done at the beginning of the policy development and planning process but after achieving overall consensus about the need for a KS and the preparation of the territory's profiles (as in Component 1).

Building on the results of Component 1, the KSP-SB supported by the KSP-BoR, will participate in one or more visioning, goal-setting and strategizing workshops and activities. The purpose is to define so-called State A (i.e. where are we now?) and then describe State B (i.e. where do we want to be?), as sketched in Figure 16.

Figure 17: Visioning and goal-setting for Knowledge Societies Policy

Ideally, representatives of all key stakeholders should participate, with facilitators to guide the activity and ensure that the purpose and methods are clear, the process is kept on track and relevance to developing visions for a KSP for the territory is kept uppermost. Various techniques can be used, for example face-to-face workshops with small group brainstorming might be appropriate, as can online consultations and the use of Delphi methods with expert stakeholders, and/or public meetings and online open consultations with citizens. In each case, facilitators should summarize, clarify and communicate key points and any emerging majority consensus, as well as recording minority views. Facilitators should also combine and draft the emerging vision, goals and strategy ideas.

5.2.3. A Method for Strategizing and Prioritizing from the Vision

One of the most frequent reasons for ineffective strategic planning is failure to think strategically. In such cases, those planning a policy, its design and implementation typically mistake policy efficiency (i.e. the internal working of the policy process) with policy effectiveness (i.e. whether the policy successfully achieves its societal goals). See Component 3. This means it is imperative to conduct a solid strategic analysis, such as a SWOT analysis (see Component 1) and then follow up with a sound visioning and goal-setting process where as many relevant and legitimate voices as possible are heard.

One of the key steps in strategizing is to prioritize by contrasting what is desirable or nice to do, on the one hand, with what can in practice be achieved by the Knowledge Society strategy given the resources available, the level of ambition and the likely risks of failure or sub-optimal results, on the other hand. See Component 3 where this is addressed systematically. This will then enable the preparation of an overall strategic framework:

a. What is desirable to do: provided by the vision and its goals, plus strengths and opportunities from the SWOT analysis.

b. What can be in practice be achieved: provided by analyzing the weaknesses and threats from the SWOT analysis, analyzing the inputs and resources realistically available to the strategy, and comparing this to (a).

c. The results of comparing (b) with (a) should be developed into an overall strategic framework which shows both relevant and feasible relationships between the vision and its goals plus the overall steps and components needed to realise these. In Component 3, this will be used to specify objectives and the means for achieving them via actions and the inputs and activities required for implementation.

The output from Component 2 is used as direct input to Component 3, and should consist at least of the following three elements:

- A clear, ambitious but also realizable medium- to long-term vision.
- A set of goals as observable and potentially measurable end-results, which together contribute specifically to realizing the vision.
- A prioritized strategic framework for designing and implementing the KSP, but which is sufficiently flexible to cater for adjustments and changes found necessary in Component 3.

5.3. Component 3 – Analyzing and Designing

Analyzing and designing is the third policy cycle component and has five main tasks:

- To establish governance structures and stakeholder roles, including multi-stakeholder configurations, for analyzing and designing the KSP.
- To undertake the preparation of detailed policy designs through an analytical process leading to coordinated programs of policy intervention.
- To design specific objectives and actions, for which necessary inputs, activities, outputs and outcomes are planned and assessed for financial and operational feasibility.
- To analyse the KS sub-systems and sectors to be targeted, as well as the relevant stakeholders and their roles and relationships.
- To draw up the overall KSP design logic framework and validate the planning process for successful contribution to the KSP goals and vision in collaboration with Component 6.

The remainder of this section elaborates on these five tasks: setting up governance structure for the KSP (Section 5.3.1); policy design principles (Section 5.3.2); designing policy components (Section 5.3.3); analysing stakeholders, roles and Knowledge Society sub-systems (Section 5.3.4); and designing the policy logic framework (Section 5.3.5).

5.3.1. Setting up a Detailed Governance Structure for the KSP

The KSP Steering Board (KSP-SB), supported by the Board of Representatives (KSP-BoR) first needs to establish a governance and operational structure for the policy analysis and design phase of the KSP. A KSP Design and Analysis Team (KSP-DAT) should be established to carry out policy analysis, design and planning, itself supported by relevant specialist teams to undertake specific tasks depending on the strategic framework articulated in Component 2. However, the KSP-SB should retain overall political and financial responsibility and have an on-going supervisory role supported by the KSP-BoR (See Figure 22).

The KSP-DAT should be drawn from the stakeholders identified and incorporated in Component 1, but now extended beyond high level political and decision-makers to analysis, design and planning experts. As appropriate to the vision and goals articulated in Component 2, these should be drawn from key coordination and implementation organizations from the four stakeholder groups:

- Public sector entities
- Businesses
- Education and research entities
- Civil society entities

5.3.2. Overall Policy Design Principles

There needs to be both an analysis and design process when developing the policy in detail. The policy components in policy design are of two main types: the policy goals themselves, i.e. what the policy aims to achieve (Component 2), and the policy means, i.e. how these goals can be achieved (Component 3).

The policy means can be envisaged as operating on three levels:

- High-level abstractions and preferences at the macro level related directly to a government's overall policy framework articulated through the vision and its goals.
- The meso-level of programme formulation which prepares for policy operationalization by developing a series of objectives to achieve the goals. These might also be grouped together for operational convenience into programs.
- Specific implementation measures at the micro level in terms of actions or projects and action plans as part of the overall strategic framework.

A mix of top-down and bottom-up policies needs to be considered. Given that KSP are by definition (in the context of this Handbook) public policies, many will have strong top-down elements being designed and initiated by government. However, given the nature of the Knowledge Society which such public policies are defined to promote, there are also by definition important roles for the other three stakeholder groups, and many of these are likely to involve important bottom-up elements, both within the framework of the government's KSP as well as independently but in the spirit of such policy.

This could include, for example:

- The promotion of a more innovative and knowledge-based economy driven largely bottom-up, in situ and in specific contexts by the economic stakeholders.
- The development of improved social and cultural competencies driven 'bottom-up' by citizens and civil society more generally leading to greater quality of life and behaviors more conducive to sustainable development.

The overall mix of stakeholders, and their interrelated roles and relationships in the top-down and bottom-up mix which these general examples illustrate is an important component of Knowledge Societies policies.

5.3.3. Designing Policy Components

As described in Component 2, a strategy is a planning framework aimed at achieving a vision through its goals. It describes the overall steps and components, and how they are achieved. Depending on the detail of the strategy, this might lead from individual actions, through objectives to goals, and then the vision. Thus, each goal is operationalized by designing a strategy as a more or less detailed description of measurable objectives which, in turn, are designed to be achieved through a number of actions. It may be useful to consider developing strategies to cover three time horizons, for example:

- Short-term (1-2 years): focusing on the here and now and what can be initiated and implemented quite rapidly. This will build immediately on the Knowledge Society profile (Component 1) to exploit existing assets and opportunities which are likely to be able support the longer term development and impact of the Knowledge Society. Identifying and then implanting short-term so-called 'quick wins' as visible and significant achievements, can be very important for retaining political and financial support as well as for galvanizing and mobilizing broader support in the stakeholder communities which thereby can see the benefits the KSP brings.
- Medium-term (3 to 10 years): Based on the building blocks established over the short-term and objectives which take a number of years to develop and deliver results, the medium-term strategy should endeavour to make substantial progress towards the long-term vision of the KSP (see Component 6). If this does not happen, it is probably appropriate to consider a substantial revision of the KSP or, at least the way it is being carried out through its vision, goals, objectives and actions. This may also be necessary given the likelihood of changing requirements and external factors, so that an iteration through Components 1 and 2 may be necessary.
- Long-term (more than 10 years): The Knowledge Society is by definition a vision that can only be realized over a lengthy time period, which needs to be served by and guide successive short- and medium-term strategies, but which is itself both ambitious and feasible, as well as being relevant to the territory and its needs.

Figure 17 shows the overall relationship between the components making up a strategy. Note that this is an elaborated scheme – it may not be necessary to implement all steps.

Figure 18: The relationship between components making up a strategy

In the strategy there are a number of goals supporting the vision. In Component 2, a goal was defined as an observable end-result which has the potential to be measured through one or more specific objectives within a more or less fixed timeframe. Goals need to be able to achieve the vision and should be forward looking (i.e. medium- or long-term) and synergetic (i.e. complement each other), but there must not be too many otherwise resources and effort will be spread too thinly.

Each specific goal needs to be operationalized by detailed description of:

- Objectives: are realistic, measurable targets of how and when each goal, or part of a goal, is to be achieved over a specific time period. Objectives should be realistic, feasible and measurable, so it is possible to know whether or not they have been achieved, and again there should not be too many objectives for each goal.
- Actions: are manageable chunks of effort each with its own time horizon, resources (inputs including funding), activities and outputs which can be measured against the objective it serves. Actions may be broken down into sub-actions, or tasks, and are designed to transform the opportunities and resources which the territory has into achieved objectives and hence goals.
- Budgeting: needs to take place using two approaches. First, bottom-up, each action should be costed over its duration and the source of the finance (or in-kind inputs) necessary should be identified. This should be undertaken by civil servants and experts. Second, top-down, an overall investment budget needs to be agreed by the KSP-SB comprising state finances as well as contributions from non-state actors, as well as for example from donors, investors and banks, etc. These two approaches then need to be aligned and reconciled, and adjustments made as appropriate. It is important that at least the short-term strategy is fully and accurately budgeted and the finances fully accounted for before the KSP is implemented. Medium-term budgets also need considerable specification and agreement, and the same is the case for longer-term budgets. However, during the design and planning phase the latter might be more tentative, given that new opportunities as well as threats are likely to appear over the longer-term so a redesign of the KSP and its budgeting, or at least an adjustment, is likely.

As a brief example of (part of) a KSP in a country:

- Vision: Within fifteen years, the agricultural sector will become fully knowledge-based, provide well-paid jobs and contribute positively to the nation's economic, social and environmental development, adding considerably to GDP without increasing environmental impact.
- Goal (one of several serving the vision): Improve agricultural productivity and output by collecting data on existing activities using new technology and applying modern farming principles based on analysing what works and what does not in comparable conditions and environments.
- Objective (one of several serving the goal): Increase agricultural productivity three-fold by 2025 and then double this again by 2030.
- Action (one of several implementing the objective): Develop, carry out and monitor the results of three rounds of intensive training courses, of three years duration each, in modern farming methods and techniques, supported by new technology, along the agricultural supply chain from farmers, collectives, transporters as well as wholesale and retail distributors.

This and other actions will require the detailed specification of inputs, activities and outputs, in relation to intended outcomes at the objective level, as described below.

Given the vision and goals specified in Component 2, a detailed analysis needs to be carried out for validating the goals and then specifying the required objectives and actions to achieve them. These will, in turn, be implemented by drawing up and executing one or more detailed action plans (see Component 4). This is undertaken by first analysing the Knowledge Society sub-systems and sectors to be targeted, as well as the relevant stakeholders and their roles and relationships, and then designing the overall policy logic framework. These are described below.

5.3.4. Analyzing Stakeholders, Roles and KS Sub-systems

As an input to the detailed design and planning process, it is necessary to undertake thorough analyses of the KS sub-systems to be targeted and developed, plus of the specific stakeholders, their roles and relationships, which need to participate in the KSP.

There are a large number of relevant tools and methods which can be deployed, including both quantitative and qualitative surveys, evidence assessments, scenario analyses, cost-benefit analysis, and similar. As a basic minimum, two sets of detailed surveys and analyses should be undertaken, as outlined in the following.

Figure 18 demonstrates how the participation of the four stakeholder groups in the different Knowledge Society sub-systems can be mapped and analyzed:

- The cells of the matrix can be used to describe the stakeholders, both actively involved, and potentially involved in each of the six sub-systems.
- The last row should be used to summarize, compare and evaluate the overall active and potential stakeholders in turn across all sub-systems.
- The last column should be used to summarize, compare and evaluate the overall composition and functioning of each sub-system in relation to stakeholder active and potential involvement as well as multi-stakeholder relationships and dependencies.
- Note, the second column is used to provide an overall sub-system description, and this is an overview table outlining the principle, whilst the actual survey and analysis is likely to require detailed separate description and analysis.

		Stakeholder group				
KS sub-system	Overall sub-system description	Public sector entities	Businesses	Education & research entities	Civil society entities	Sub-system summary
Governance	overall sub-system description	stakeholder description in sub-system a) & b)	stakeholder description in sub-system a) & b)	stakeholder description in sub-system a) & b)	stakeholder description in sub-system a) & b)	summary & evaluation
Education & research						
Economy						
Environment						
InfoComm						
Civil society						
Stake-holder summary		summary & evaluation a) & b)	summary & evaluation a) & b)	summary & evaluation a) & b)	summary & evaluation a) & b)	Overall KS summary & evaluation

Figure 19: Mapping the status of stakeholders across Knowledge Societies sub-systems

Figure 19 below depicts a matrix that shows how the different roles of the stakeholders to be involved in the KSP can be mapped, namely:

- The cells can be used to describe the stakeholders and explain their roles.
- The last row of the matrix should be used to summarize, compare and evaluate the overall role of each stakeholder in turn.
- The last column should be used to summarize, compare and evaluate the different roles undertaken, including multi-stakeholder collaboration and relationships.
- The second column is used to provide a general role description.

		Stakeholder group				
Roles (examples only)	General role description	Public sector entities	Businesses	Education & research entities	Civil society entities	Role summary
Legislation, regulation, administration	general role description	stakeholder role description	stakeholder role description	stakeholder role description	stakeholder role description	summary & evaluation of the role, including stakeholder relationships
InfoComm producer						
InfoComm user						
Other producer						
Other user						
Investor, funder						
Intermediary						
Technical community member						
Etc.						
Stakeholder summary		summary & evaluation	summary & evaluation	summary & evaluation	summary & evaluation	Overall KS summary & evaluation

Figure 20: Mapping the status of Knowledge Societies stakeholders and their roles

Finally, Figure 20 below illustrates how the preparedness levels of the people and organizations in the main stakeholder groups might be mapped in relation to Knowledge Societies so that their needs can be incorporated into the KSP. The different levels are described and explained in detail in Section 4.5.

		Stakeholder group				
Preparedness level	General description	Public sector entities	Businesses	Education & research entities	Civil society entities	Level summary
Level 1: access	overall level description	stakeholder description at level a) & b)	stakeholder description at level a) & b)	stakeholder description at level a) & b)	stakeholder description at level a) & b)	summary & evaluation at level a) & b)
Level 2: socio-economic						
Level 3: Skills						
Level 4: beneficial deployment						
Level 5: Participation						
Preparedness summary		summary & evaluation a) & b)	summary & evaluation a) & b)	summary & evaluation a) & b)	summary & evaluation a) & b)	Overall KS summary & evaluation a) & b)

Figure 21: Mapping the preparedness of stakeholders in relation to Knowledge Societies

In Figure 20:

- The cells of the matrix can be used to describe the stakeholders both in terms a) of current preparedness, and b) potential preparedness in relation to each of the five levels.
- The last row should be used to summarize, compare and evaluate the overall current and potential of the stakeholders in turn across all levels.
- The last column should be used to summarize, compare and evaluate the overall current and actual preparedness levels of each stakeholder as well as multi-stakeholder relationships and dependencies.
- Note that the second column is used to provide an overall level description; and this is an overview table outlining the principle, whilst the actual survey and analysis is likely to require detailed separate description and analysis.

5.3.5. Designing the Overall Policy Logic Framework

The underlying generic framework involved in the design of a KSP is based on a simplified logic model which links and explains each structural component to the overall objectives of the policy, and also provides a means of ongoing monitoring as well as final evaluation of the policy. The framework is depicted in Figure 21, modified from (Millard, 2008).

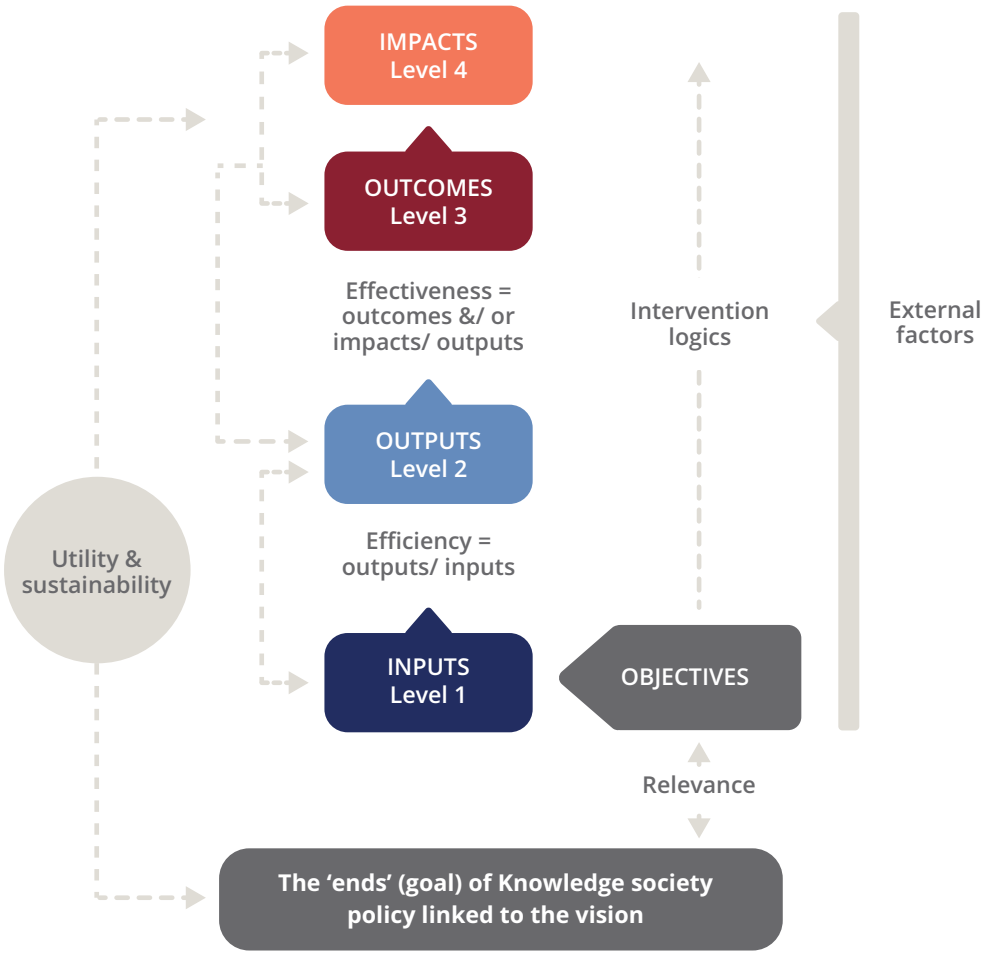

Figure 22: Generic logical framework for Knowledge Societies Policy

Figure 21 provides a robust nomenclature given that many terms are often used inter-changeably in the literature. This generic approach does not need to be operationalized in its entirety, as specific parts or levels can be considered on their own depending on the policy, but at the very least it should be used as a conceptual logical framework for understanding the more holistic context of specific policy implementations.

The figure shows:

1. How the objectives of a given policy need to be derived from identified 'ends' or goals (themselves linked to the vision), and evaluated for relevance in this context.
2. That the objectives need to be operationalized through a number of components, first in terms of the inputs and resources needed to produce a set of outputs through one or more actions and their activities, and second outputs as the immediate consequence of the inputs used by action's activities.

3. It can be seen that the efficiency of the policy can in principle be assessed by relating the outputs produced to the inputs deployed.

4. The outputs should themselves lead to outcomes defined as benefits experienced by one or more stakeholders.

5. The outcomes should contribute, perhaps alongside other actions, to achieving the policy impacts which should directly reflect the goals originally specified.

6. Outcomes and impacts together constitute the 'ends', here defined as Sustainable Development, to be achieved by the Knowledge Societies 'means'.

7. It can also be seen that both outcomes and impacts should then be evaluated against the outputs to determine the policy's overall effectiveness.

8. The whole sequence of inputs to impacts, derived from the original objectives and goals is linked by one or more intervention logics articulated as the rationale for their specification and inter-relationships.

9. The overall utility and sustainability of the policy's impacts can be related back to the needs originally identified.

It is important to stress that the four levels to the KSP logic framework (Figure 21) represent a coherent and linked system. They therefore need to be iterated together rather than separately or in sequence, so that the outcomes and impacts planned link directly back to, and help to achieve, the goals. Further explanation and examples of this process are given in Component 6 describing setting up a monitoring and evaluation system.

Finally, although the generic logic framework in Figure 21 is depicted as essentially closed, important external factors should not be ignored. These are defined as beyond the immediate control of the policy makers and practitioners implementing the policy. These external or contextual factors, or 'noise', need to be temporarily excluded from the model otherwise it becomes too complex, even though this ultimately distorts reality.

However, this is justified if overall understanding, and thereby the ability to develop policies and act in ways which lead to desirable impacts, is improved. This also means that relatively accurate monitoring and measurement can be made which helps predict the consequences of any interventions to be made. Therefore, although external and contextual factors over which stakeholders do not have immediate control are initially excluded, the likely occurrence of these also needs to be analysed. This should be done both in terms of the risk that they will not function in the way expected and as well as of their potential importance to disrupting the model if this happens.

An important point to note is that the framework is both a conceptual and operational tool. It provides a comprehensive framework for conceptualizing policy development and implementation, as well as the role of impact measurement as part of this. It shows that impact measurement should not be a separate add-on after the fact of policy-making.

As the very least, the framework provides a checklist for understanding policy impacts and how they can be measured. Its operationalization enables a fuller understanding of what is being implemented, monitored and evaluated, and points to any gaps, inconsistencies and thus likely failures or sub-optimal policy performance so that adjustments can be made in a timely manner. It also allows an appreciation of the operational difficulties of measurement, including the use of surrogates, logistical challenges and the cost involved. This might include a requirement for surrogates, compromises or shortcuts which might need to be taken as long as this is adequately explained and done transparently.

Conceptualising the components of a KSP in this way also allows the policy gaps to be identified and thus potentially filled, as well as caveats and risks of making decisions and any trade-offs to be made transparent, so that a judgement can be made about whether or not the value and usefulness of the overall policy is undermined. It thus helps to attune the mindset and appreciation of those designing, implementing and benefiting from the policy.

The generic logic framework is able to:

1. Be policy relevant, by explicitly linking the four levels to the overall policy goals through one or more intervention logics/processes which attempt to show the connection between actions and desired impacts. In fact the policy may lose focus and purpose if there is no clear understanding of how the various combinations of factors have produced the impact.

2. Facilitate policy design, analysis and measurement, by identifying steps or levels of the process of KSP development which are operationally amenable to these purposes. Without this, there is no conceptualisation of different types or levels of impacts or of the difficulties of measurement, and no idea of any causality of the impacts being analysed.

3. Take direct account not only of factors over which KSP makers and practitioners have control, but also of 'external factors' over which they have little or no control given that these can also be significant in determining whether or not high level policy impacts and goals are, in fact, achieved.

4. Understand for whom the policy and its design and implementation are for and how they will be used. For example, impact measurements are likely to be very different and used in different ways by:

    - Policy-makers, e.g. for designing and implementing policy and in which policy interventions to invest.
    - Researchers, e.g. theorising and empirically testing policy interventions.
    - Practitioners, e.g. for understanding how to use and exploit the Knowledge Society for their own purposes.
    - Citizens and civil society, e.g. for understanding how, why and for whom policies are developed and use public resources, and thereby be able to participate in the policy and ensure their voices are heard; see also Component 5.

Component 6 shows how this logic framework can be used for monitoring and evaluation.

The output from Component 3 is used as direct input to Component 4, and should consist at least of the following:

- A governance structure for analyzing and designing the KSP, fully ready to be operationalized and incorporate an appropriate management structure for the implementation of the KSP.
- Detailed policy designs, including the specification of objectives and actions to meet the goals, together with a full specification of inputs, activities and outputs needed and a rationale for how these will deliver outcomes and impacts.

5.4. Component 4 – Implementing

Implementing is the fourth policy cycle component and has two main tasks:

- Setting up a policy management and coordination structure and tasks for the KSP implementation phase.
- Developing and operating action plans for the KSP.

These task are outlined in Sections 5.4.1 and 5.4.2 respectively.

5.4.1. Setting up the Policy Management and Coordination Structure and Tasks

The overall purpose of the management and coordination structure is to ensure that the KSP is carried out as intended, with appropriate and timely adjustments in light of day-today experience. Professional and transparent management and coordination tools and techniques should be used which also protect legitimate rights, ensure inclusivity and fairly balance competing interests.

Figure 22 shows a generic model of what a fully developed organizational might look like. It builds on the organizational entities already established in the first three components.

Management and coordination should be guided by the overall vision and goals (Component 1) for the future, and incorporate monitoring and evaluation procedures (Component 6) to assess the progress of the action plans as they are implemented, particularly in relation to the resources being consumed and the results they are achieving.

A KSP Management and Coordination Unit (KSP-MCU) should be set up staffed by professional project and program managers, and assisted by experts and other specialist staff as necessary, either on an ad hoc basis or by permanent or semi-permanent appointment. The KSP-MCU should be under the authority of the KSP-SB and also supported by the KSP-BoR.

Figure 22 shows a highly simplified overall organizational structure with the basic functions necessary for preparing, designing and implementing the KSP. The KSP-MCU should be supported by at least two specialized teams:

- Monitoring and Evaluation Team (KSP-MET)
- Communication Team (KSP-CT)

The activities and roles of these are described in Components 6 and 7 respectively. The KSP-MCU also manages and coordinates a number of Implementation Teams, each set up and staffed in order to undertake particular components of KSP implementation, for example specific actions.

The KSP-MCU needs to be led by an experienced project and program manager, as KSP-MCU Manager, responsible for day-to-day KSP management. The main purpose of the KSP-MCU is to provide both strong and at the same time flexible management, which incorporates significant quality assurance and risk mitigation activities as an on-going task over the duration of the KSP. This will be necessary to ensure that the KSP is flexibly responsive to the evolving needs of the territory and all stakeholders, whilst maintaining a strong sense of purpose and vision that is essential to successful achieve KSP goals.

This calls for effective and rigorous management in order to ensure successful dovetailing, sequencing and timely task termination, and to cost-effectively orchestrate the KSP's many elements. In addition to the need to coordinate the probably large number of stakeholders and people participating in, or collaborating with, the KSP,

it will need to interface with numerous other internal and externals interests.

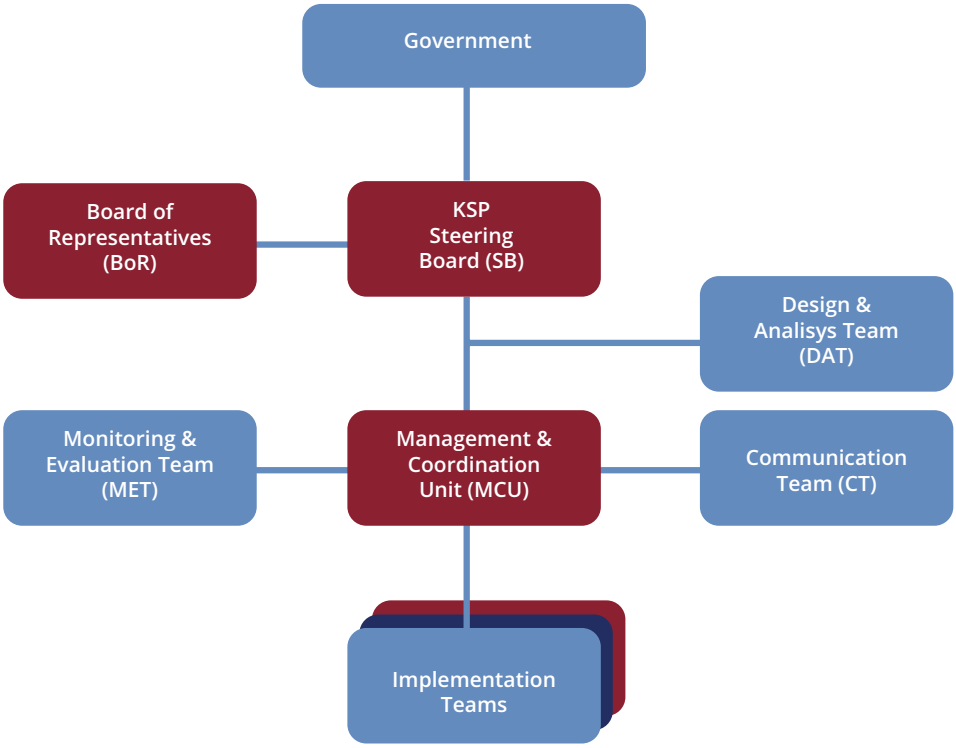

Figure 23: Organizational structure and functions of the Knowledge Societies Policy

In a comprehensive and probably complex KSP, it is important that project management and coordination are undertaken in a visible and effective manner so that overall goals are kept clearly in sight and each stakeholder and Implementation Team does not function in isolation. All involved will need to know what they should do, the standards and quality required and the deadlines they need to meet.

The KSP-MCU Manager and her/his support staff will need to undertake the following management functions:

- Day-to-day decision-making, consulting as necessary, within the remit of the overall strategic framework and agreed action plans.
- Responsibility to the KSP-SB for content, financial and administrative matters.
- Coordination of relationships between stakeholders and other interests.
- Human and other resource management.
- Responsibility for overall financial management, including budgeting, resource allocation and dispersion, all expenditures, and financial control and audit at the KSP level. Depending on their set up, Implementation Team Managers will probably need to exercise similar functions at their level.
- Responsibility for the overall coordination, review and audit meetings and processes required by the KSP-SB to meet the goals of the KSP as it is implemented.
- Undertake all necessary legal and ethical responsibilities and ensure gender issues are respected, under the guidance of the KSP-SB and KSP-BoR.

- Under the guidance of the KSP-SB and KSP-BoR, prepare and supervise stakeholder agreements which reflect the overall goals and terms of the KSP.
- Organise and run management and coordination meetings, with Implementation Teams, the KSP-CT and the KSP-MET. both online and offline as appropriate, as well as meetings with the KSP-SB and KSP-BoR, and provide subsequent meeting notes or minutes on decisions taken, the reasons for these plus, as appropriate, to execute such decisions.
- Ensure on-going and effective decision-making procedures, including the resolution of disputes.
- Documentation and reporting on KSP progress, both to the KSP-SB and KSP-BoR, as well as to relevant stakeholders. The KSP-MCU should also liaise with the KSP-CT to provide material for the communication activities.
- Knowledge management and IPR are key activities, since the KSP will involve the generation of a significant amount of new knowledge which needs to be carefully handled and appropriate IPR attributed and protected. In principle, it is recommended that as much knowledge as possible be made openly available, but there are likely to be legitimate IPR interests which must be respected. The KSP-MCU should devise and set up a clear model and plan for knowledge management and IPR, including knowledge and IPR registries, and, where necessary, seeking permission for re-use or dissemination.

5.4.2. Developing and Operating Action Plans

Implementation involves developing detailed action plans composed of individual actions designed to achieve the objectives set. Actions are manageable chunks of effort each with its own time horizon, resources (inputs including funding), activities and outputs which can be measured against the objective it serves. Actions may also if necessary be broken down into sub-actions, or tasks. The policy design logic framework described in Component 3, or a similar approach, should guide the design of specific actions and the development of action plans.

Action plans will need to be developed to determine in detail how the strategies will be implemented. An action plan should include, in as much detail as possible, the cost(s) involved, main responsibilities and the time scales for starting and finishing individual actions and tasks. Unless the action is of short or minor duration, it should also include one or more milestones as intermediate measurable steps between the start and the expected termination of the action, to be used for progress monitoring.

The action plan should seek the achievement of practical results so it is important to ensure that each action or phase is feasible; i.e. can it be done with the resources available, by the actors responsible, and will it achieve desired results which lead successfully to the next stage? Are all the stages cumulative? For example, for each stage and action, as well as for the action plan as a whole, are the following resources available:

- Human resources.
- Financial resources.
- Community and commercial cooperation, partnerships and commitment.
- Entrepreneurial spirit.
- ICT infrastructures and services.

A costed action plan should be prepared as a public document which gives:

- Details of the overall management structure .

- The background and reason for the plan and the strategy it is designed to implement.
- A summary of the KS profiles developed in Component 1.
- A summary of how sustainable development is expected to be promoted through KS, referring for example to earlier experiences, experiences in other territories, existing initiatives and plans, etc.
- The vision, goals, objectives and strategies proposed.
- The actions and tasks involved in each stage.
- The stages in the action plans.
- The inputs and resources required (including finance, actors and responsibilities).
- The expected outputs, outcomes and impacts and how these can be confirmed or measured against the strategy's objectives based on the assumed intervention logic(s).
- The assumptions upon which this is based.
- A timetable.

The process of implementing the action plan should be based on cooperation and partnership involvement both within and outside the territory. Networking with all the relevant stakeholders who can support the strategy is a key to successful implementation, as is the continuous development of the resources available and continuous review of the overall goals and vision within which the strategy and its action plans are based.

Successful implementation will depend greatly upon how well the steps described in the overall KS strategy process have been carried out. However, different territories, as well as different Knowledge Societies and ICT more generally, are dynamic and typically in a constant state of change, so that sound implementation, evaluation and management procedures are also necessary if the strategy is to be effectively and efficiently realised.

5.5. Component 5 – Updating and Sustaining

Updating and sustaining is the component that closes the policy cycle, and has two tasks:

- Updating in relation to the progress of the implementation of the KSP.
- Sustaining in relation to changes in the KSP's and the territory's internal and external environments.

These tasks are elaborated in Section 5.5.1 and Section 5.5.2 respectively.

5.5.1. Updating the Progress of the KSP Implementation

Updating the progress of KSP implementation should take place in response to its implementation experience and the outcomes of monitoring and evaluation by the Management Coordination Unit (KSP-MCU) in liaison with the Monitoring and Evaluation Unit (KSP-MET), linking to Component 6. Based on this experience, updating can take place of either the whole KSP process and/or individual components of that process, for the purposes of correcting and/or improving KSP performance.

In addition to inputs from Component 6, two main functions can be used: quality assurance and risk assessment and mitigation.

Quality assurance: Whereas the management, coordination and decision-making functions, outlined in Component 4, are concerned in efficiently operating the KSP, the purpose of quality assurance is to ensure that it is as effective as possible, i.e. that the overall KSP and its components and task-specific objectives are the right ones, remain so in light of changing circumstances and requirements, and have the intended outcomes and impacts.

Inputs to this function will come from the KSP-MET in Component 6, but this needs to be owned, managed and coordinated by the KSP-MCU as it impacts directly on short-term as well as longer-term management issues. The objectives of the quality assurance are to:

- Anticipate bottlenecks and problems and either deal with them early on or, if this is not possible, initiate adjustments to the progress of the KSP after the agreement of relevant stakeholders and the KSP-SB and KSP-BoR if so required.
- Undertake objectives-oriented planning and monitoring.
- Ensure that the KSP is achieving its goals in a timely and cost-effective manner and is able to respond to rapid changes in both internal and external environments.
- Undertake regular quality review and assurance together with the KSP-MCU.

In relation to the last point, a formal quality assurance procedure should be established at the outset of the implementation of the KSP which could consist of, for example:

- Day-to-day supervision by the KSP-MCU Manager and ongoing validation by the KSP-SB, consulting the KSP-BoR as necessary.
- Quality control of individual actions and of the work of each Implementation Team, as necessary, conducted by Team Leaders in cooperation with the KSP-MCU Manager, specifically in relation to the achievement of milestones and objectives.
- Feedback and validation, perhaps including formal peer-reviews, from recognised experts and networks throughout the duration of the KSP, as well as from the wider public and society, mediated by Component 7.
- The milestones of the strategic framework which provide control points for the KSP-MCU Manager to ensure progress is on track and that quality is maintained, and to take remedial action if this is not the case. The milestones are also points where decisions are taken about the next phase of work until the next milestone.

Risk assessment and mitigation: It can be anticipated that issues will arise during KSP implementation putting both the quality and timing of progress at risk. Risk mitigation solutions are therefore necessary to identify these as early as possible and to ensure successful and timely updating. In the event of significant deviations from the overall strategy and the detailed action plans and their milestones, the KSP-SB should be informed by the Project Manager without delay. Risk assessment and mitigation can be based on the process shown in Figure 23 and linked to the quality assurance procedures outlined above.

Figure 24: Risk assessment and mitigation of Knowledge Societies policy implementation

In particular:

- Risk Planning is concerned with identifying and establishing risk management procedures and responsibilities.
- Risk Identification is about uncovering risks before they turn into problems. Like risk planning, risk identification is an iterative process. The first phase of risk identification can take place during the KSP design phase (Component 3). Further risk identification will take place during KSP implementation and continue throughout its duration. All KSP stakeholders, including the KSP-SB and KSP-BoR, should be involved in identifying and mitigating risks.

Risk identification techniques can include pre-existing checklists and brain storming activities based on evidence of progress, for example from the KSP-MET. A risk register should be drawn up describing the conditions that are causing concern and their consequences which could damage the smooth running of the KSP (its efficiency) as well as its impact (effectiveness). Unless a risk is written down, there is a good chance that it will not be managed.

- Risk Analysis is the most detailed phase of the entire risk assessment and contingency planning process. It involves evaluating the risk attributes, and prioritising (ranking) the risks. Evaluating the attributes of a risk involves establishing values for probability (the likelihood the risk will occur) and the impact (in terms of significance for the project). This is also considered in Component 6.
- Risk Response is the process of deciding what, if anything, should be done with a risk, i.e. drawing up a mitigation strategy, and then implementing this strategy. Risk response answers two key questions of who owns the risk (responsibility) and what can/should be done (scope and actions).
- Risk Monitoring is the process of keeping track of the risks and evaluating the effectiveness of mitigation (response) actions. Monitoring may also provide a basis for developing additional response actions and identifying new risks. This should take place continuously through KSP implementation in liaison with the KSP-MET.

5.5.2. Sustaining the Relevance and Impact of the KSP

It is important to ensure that the KSP remains relevant to the changing needs of the territory and of the stakeholders, as both their internal and external environments develop and change, in order to achieve longer-term sustainability. This can be done by assessing changes in the societal and global environment of the KSP, in particular how to respond to new opportunities or threats and to ensure the KSP remains relevant and sustainable.

All Knowledge Societies are unique and different, as are the policies promoting them, so it is not possible to assign any particular periodicity to assess changes. However, at the outset of a KSP, major milestones will be set (see Components 2, 4 and 5) and these are likely to be good opportunities to undertake such assessment.

Knowledge Society strategies and actions need to be seen as part of an on-going process of sustainable development. How can the success and failures of the policy, program or action be followed up in the future? Achievements which have been made need to be built upon, especially if their long-term sustainability is to be ensured, and failures need to be used positively to ensure that similar mistakes are not repeated in the future. In particular, reviewing and updating the territorial profile and the SWOT analysis from Component 1 are likely to be useful on a regular basis.

Consideration can also be given to revising the overall vision (Component 2) if necessary, although this is unlikely unless fundamental conditions change. More probable is the need to re-assess and re-cast the goals and objectives which are designed to achieve the vision. Again, particular emphasis should be given to integrating

these into overall sustainable development efforts. An on-going pro-active strategy of awareness of changes, new needs and trends is needed, drawing on both Components 6 and 7.

In order to keep up to date, it is important:

1. To learn more about the Knowledge Societies and Sustainable Development, both in terms of impacts and technical capabilities and what this means for different types of stakeholder, different types of territory and different types of sustainable development strategy.
2. To consider fundamental questions like:
    - What is distinctive about the territory? What are the things it could do and could not do?
    - What can a Knowledge Society do for the territory? What can it do now and what can it do in the longer term?
    - How can a Knowledge Society strategy be integrated into the overall Sustainable Development strategy for the territory? Perhaps it needs to be adapted to exploit new technologies or business models?
    - Where are the finance and other inputs coming from?
3. Be ambitious, but realistic; think long-term, but act step-by-step. And never forget that the issue is not ultimately about the technology or the Knowledge Society, but how these can be used to promote and sustainably develop the territory.

Most valuable of all is networking with contacts, interest groups and other territories doing similar things, as this can identify not just what is available but also provide favourable gateways and knowledge about how best to obtain and exploit resources, the types of strategies being followed and the success or otherwise of actions.

It order to address these changes and changing interpretations of the Knowledge Society and the appropriate policy response, the need for new stakeholders, partnerships, sources of finance and other inputs should be regularly reviewed.

5.6. Component 6 – Monitoring and Evaluating

Monitoring and evaluation is the first of two components which are more or less continuous over the whole policy cycle (see Figure 11). They both feed the cycle in terms of informed decision-making (Component 6) and provide mechanisms for stakeholder and public awareness raising and engagement (Component 7). Together they ensure that the KSP retains overall relevance, coherence and effectiveness, by both feeding off and feeding in new knowledge and know-how. This approach also makes it possible to prioritize and scale the main policy cycle components according to need in a timely and flexible manner.

Monitoring and evaluation is an ongoing component supporting all others through its provision of the rationale and tools for the systematic monitoring and evaluation of the KSP's inputs, activities, outputs, outcomes and impacts, as well as maximizing its continued efficiency, effectiveness, utility and sustainability.

This section addresses eight issues:

1. The purpose of monitoring and evaluation and the approach adopted – Section 5.6.1.
2. Applying the logic framework for monitoring and evaluation – Section 5.6.2.

3. Monitoring policy effectiveness – Section 5.6.3.
4. Monitoring policy efficiency – Section 5.6.4.
5. Monitoring policy utility, sustainability and transferability – Section 5.6.5.
6. Operationalizing the monitoring and evaluation framework – Section 5.6.6.
7. Synoptic measurement of Knowledge Societies progress – Section 5.6.7.
8. Complementary approaches for monitoring and evaluation – Section 5.6.8.

5.6.1. Purpose and Approach

There is a strong need for evidence to inform the KSP, as well as more general evidence-based policy making using accurate and appropriate data. As mentioned in section 5.2.2, developing a KSP needs to be seen as a trade-off between a backward looking approach of evidence-based policy-making and the forward visioning of KSP. Thus, a simple, clear and distinct monitoring and evaluation system and procedure should be implemented that regularly assesses progress in relation to the KSP's vision, goals and objectives. This should be a regular agenda item for both the Management and Coordination Unit (KSP-MCU) and the Steering Board (KSP-SB), based on reports from the Monitoring and Evaluation Team (KSP-MET) in the form of presentations as well as written reports. These progress reviews should be made at critical milestones during the strategy and action plans, for example after each stage and action.

The progress reviews should examine: the internal efficiency of the KSP's design, organization and implementation processes; the external effectiveness of the KSP in achieving the goals it has set itself derived from its vision; and the overall utility, sustainability and transferability of the KSP.

Some of the following questions the progress review should address include:

- Has the action made a real positive difference to the KSP that will be sustainable in the future?
- What went wrong and what was successful, and why was this?
- What lessons have been learned about developing strategies and implementing actions to promote the KSP?
- Should the vision, goals and objectives be changed, and if so how?
- What about the time scale?
- What about the stakeholders and their roles and responsibilities?
- What about resources, particularly finance?
- How did the action fit in with other aspects of the KSP and with wider sustainable development policies?
- What specific and general lessons have been learned about the KS and how it can best be used to promote sustainable development?

This approach is described in detail below so that remedial or other appropriate action can be quickly taken if things start to go wrong or if improvements are to be made.

5.6.2. Applying the Logic Framework

As described in Component 3 (Section), the logic framework is used to design a KSP based on the following four levels, starting with the lowest, which aim as much as possible to directly meet the goals of the KSP:

1. Inputs as resources, activities and processes for implementation, leading to
2. Outputs, as the immediate consequences of L i.e. 1, leading to
3. Outcomes (also termed 'results'), as benefits for specific stakeholders, leading to
4. Impacts, which should directly satisfy one or more goals of the KSP.

These levels are articulated in more detail in the following: L i.e. 1 in Section 5.6.2.1, L i.e. 2 in Section 5.6.2.2, L i.e. 3 in Section 5.6.2.3 and L i.e. 4 in Section 5.6.2.4.

5.6.2.1. Level 1 – Inputs and Activities

This level consists of policy-defined inputs which can be used as monitoring criteria, e.g.:

- ICT
- Finance and budgets
- Human resources (people and skills)
- Organizational resources (leadership, management, administration, organizational capacities, organizational knowledge resources, etc.)
- Legislation and regulation
- Other materials and facilities, such as property, infrastructures, etc.
- Stakeholder cultures (mind-sets and ways of working)

Inputs are used by policy-defined activities (like ICT procurement, software and hardware development, training courses, institution building, studies, consultation with and between stakeholders, development of support networks, running awareness campaigns, etc.), in order to deliver the outputs required defined by the overall logic framework.

Inputs and activities could, in principle, feed directly into any upper level, not just the output. For example, particular inputs and activities may need to be deployed to link between the output level and the outcome level. However, in practice inputs and activities feed mainly into this first level, so that for reasons of simplicity they are only shown doing this in logic framework figure in Component 3.

5.6.2.2. Level 2 – Outputs Resulting from Level 1

Outputs are the detailed changes or operations which should be produced by the inputs and resources at level 1, if the intervention logic (A1) works well (see below for explanation). Level 2 consists of policy-defined outputs which can also be used as monitoring criteria, for example:

- HW, SW systems up and running

- Access to and use of the digital infrastructure.
- Changed working procedures related to the implemented ICT systems.
- Back-office business processes re-engineered.
- Organisational changes.
- Interoperability and integration established between technology, information and data, processes, services and organisations.
- Completed training courses.
- Production of knowledge goods and services.
- New know-how developed.
- New types of innovation and innovation methods developed .
- Involvement of all relevant stakeholders.
- Completion of KS studies and surveys.
- Implementation of awareness raising and outreach campaigns (See Component 7).

Outputs are thus any stakeholder-internal process change or the availability of stakeholder-external products, services, knowledge or know-how. These are the building blocks of Knowledge Society and take place through the conversion and management of inputs at any scale, whether local, national, regional or international.

5.6.2.3. Level 3 – Outcomes Resulting from Level 2

Outcomes are what a specific Knowledge Society implementation should achieve from the outputs delivered at level 2, if the intervention logic (A2) works well. Level 3 consists of policy-defined outcomes which can also be used as monitoring criteria, for example:

- Successful access to and use of KS products, services and knowledge.
- New knowledge and know-how successfully applied giving stakeholder benefits.
- New types of innovation and innovation methods successfully applied giving stakeholder benefits.
- Cost reduction, resource rationalisation.
- Time savings.
- Greater productivity.
- Greater efficiency.
- Human resources that are more competent and skilled in their jobs and thus achieve greater output, etc.
- Less bureaucracy and administration.
- More convenience.
- More transparency, accountability, etc.
- Increased user satisfaction.

Knowledge Society outcomes thus deliver real tangible benefits to stakeholders. They should arise from the outputs of L i.e. 2, but this is not guaranteed. For example, a training course may be successfully completely, but the training received may not be appropriate or useful for the trainees, so they are not able to translate this output into a real benefit. External factors beyond the control of the KSP or the stakeholders may have changed and render an otherwise well designed and appropriate training program no longer useful if, for example, there is a change in economic circumstances or if a particular problem has been solved in another way.

5.6.2.4. Level 4 – Impacts Resulting from Level 3

Impacts are at the macro or societal level, and encompass what benefits the KSP should contribute to through the outcomes delivered at L i.e. 3, if the intervention logic (A3) works well. Level 4 consists of policy-defined impacts which can also be used as monitoring criteria, for example:

- New or enhanced knowledge-based economic sectors created, expanded and providing jobs
- New or enhanced InfoComm knowledge and expertise becoming more ubiquitous across the economy and/or civil society and/or the environment, supporting sustainable growth, increased welfare and improved quality of life for all.
- Sustainable economic growth.
- Competitiveness.
- Sustainable development.
- Inclusion.
- Democracy and citizenship.
- Quality of life.
- Universal human rights.

These impacts are typically not specific only to the KSP but typically represent general policy goals often articulated as 'public value' impacts to which the KSP can contribute. Public value is a slippery concept but can be defined in the present context as directly reflecting the policy vision and goals from Components 1 and 2.

The successful progress from level 3 outcomes to level 4 impacts has the potential to be even more heavily affected by external factors beyond the control of the KSP and the stakeholders. This is because the impacts sought can typically only be achieved by many different policies and programs, and changes in any one of these, or background changes to the socio-economic-environmental context, might mitigate the achievement of a given impact and the goal it relates to regardless of the good performance of the KSP.

5.6.3. Monitoring Policy Efficiency

Monitoring policy efficiency comprises three areas covered in subsequent sections: relating inputs to outputs (Section 5.6.3.1), understanding policy implementation conditions (Section 5.6.3.2) and KSP process efficiency measurement criteria (Section 5.6.3.3).

5.6.3.1. Relating Inputs to Outputs

The generic logic framework (Component 3) indicates that its lower levels are basically concerned with internal process efficiency. As shown by the (OECD, 2007), converting inputs to outputs is about process efficiency through a series of activities and initiatives. This means comparing the quantity and quality of outputs with the quantity and quality of inputs, and with the manner in which the conversion of inputs to outputs took place through activities. If inputs and activities are used between other levels, evaluation of efficiency could also examine these conversion processes.

In principle, the fewer resources used compared with a given set of outputs, the more efficient the policy can be said to be. However, it should be remembered that both inputs and outputs should be looked at both quantitatively and qualitatively. In the former case, there are often issues about choosing the 'best' measures, and in the latter case it can be extremely difficult to measure the quality of outputs, especially when this might vary according to the stakeholder concerned.

Note, efficiency is not concerned with whether these outputs are the 'right' ones or not, but simply examines whether they have been achieved or not, and 'how well' they have been achieved. Thus, efficiency is concerned with 'how well' each level achieves its own objectives, not whether this contributes to the next level through the intervention logic. These latter issues are instead the concern of the policy effectiveness evaluation.

5.6.3.2. Understanding Policy Implementation Conditions

As indicated, evaluating process efficiency is notoriously difficult since it does not involve, for the most part, numerically quantifiable data but rather qualitative and often highly subjective information. The external factors and conditions, e.g. legal, regulatory, economic, social, and cultural and others conditions in which the policy is implemented can often be as important as the policy and its implementation itself.

When analysing public policy, there is a need to go beyond policy justification and explicit rationales to understand complex interactions among individuals and organisations involved in the process and critically examine the roots – which are often hidden – of policy conflicts. From the variety of theories on the policy process, practitioners can develop an awareness of the complexity involved in policy formation and implementation.

Each policy environment is characterised by its own set of institutions and stakeholders. When assessing, and especially comparing KSPs, it is necessary to attempt to identify the fundamental problems that need addressing and the objectives that have to be pursued.

In the real world, policy problems are seldom clearly defined technical issues in search of a straightforward rational solution. Instead, policy-making emerges as a complex process in which contrasting ideas are formulated, debated and sometimes further developed and applied. One of the main issues to confront is the different types, roles and interests of the different stakeholders involved in policy design and implementation.

5.6.3.3. KSP Process Efficiency Measurement Criteria

Based on the considerations outlined above, the following criteria are suggested for monitoring KSP process efficiency:

1. Internal efficiency (involves measuring outputs compared to inputs quantitatively and qualitatively) – Is the policy cost-efficient in delivering its outputs? Is the policy cost-efficient in delivering at the other levels?

2. Leadership and management – Was the policy implementation process led efficiently and effectively? Was the policy implementation process managed and coordinated efficiently and effectively?
3. Human skills and knowledge – Does the policy efficiently allocate and exploit available human and knowledge resources?
4. Legislation and rules – Is the rule set appropriate, conducive and non-restrictive in relation to the KSP? Can it easily be changed to be so, and which resources can be used to do this?
5. Monitoring and quality control – Are there adequate monitoring and quality control procedures and tools in place and how efficient have they been?
6. Financial resources – Have sufficient financial resources for start-up and on-going activities, to cover one-off and recurrent costs, been obtained and are they secure?
7. Financial control – Are there adequate financial control procedures and tools in place and how efficient have they been?
8. Systemic Efficiency – How efficiently does the KSP interact with other policies? Is there efficiency or sub-optimality in this respect? This relates to the potential duplication and thus waste of outputs produced, and whether this KSP or another policy is more efficient in producing the outputs. It can also refer to a given policy imposing unintended costs on another, thus reducing the latter's efficiency.
9. Adaptive Efficiency – To what extent do the results from monitoring feed back into policy design and implementation? Does policy design ensure a sufficient degree of flexibility enabling it to respond to the need for change?

5.6.4. Monitoring Policy Effectiveness

Monitoring policy effectiveness covers four areas outlined in the following sections: relating outputs to outcomes and impacts (Section 5.6.4.1), policy intervention logics (Section 5.6.4.2), external factors including drivers and barriers (Section 5.6.4.3), and policy effectiveness measurement criteria (Section 5.6.4.4).

5.6.4.1. Relating Outputs to Outcomes and Impacts

The generic logic framework figure in Component 3, also shows that the upper levels of the policy monitoring and evaluation hierarchy are basically concerned with external policy effectiveness in terms of policy delivery. As shown by the (OECD, 2007), converting policy outputs to policy outcomes and/or impacts is about policy effectiveness.

A policy that is evaluated as efficient is not necessarily effective. Policy effectiveness is concerned with ensuring that the objectives of the policy are the 'right' ones in relation to the goals and vision and problems it addresses (the external 'demand'), that they remain the 'right' ones, and that they actually deliver the policy impacts and goals intended.

5.6.4.2. Policy Intervention Logics

Policy effectiveness is specifically concerned with success in successfully achieving the output, outcome and impact levels. It is important to note that the levels hierarchy shown in the figure is linked together by its so-called

intervention logics. Policy effectiveness is thus also concerned with ensuring that both the individual intervention logics (A1, A2 and A3 in the figure), as well as the overall intervention logic that links them together (A), are rational, logical, understandable, meaningful, achievable and measurable.

An example of a policy intervention logic between outputs and outcomes (A2) could be that the staff who participate in a training program are actually able to use their new skills to develop new knowledge-based products and services with strong market demand at level 3. The logic here is that the training courses are well designed and successfully executed, and the staff involved have the appropriate pre-existing skills, attitudes, motivation and opportunity to enable them to benefit from the training.

This may seem a mundane and obvious example, but it illustrates that if the objective is to develop new knowledge products and services, but staff do not have the requisite skills, one solution is to provide appropriate and good quality training, but it is also necessary that this training is the 'right' training for the specific purpose, rather than other purposes.

Further, other solutions than training could be considered, such as recruiting new staff with the appropriate skills, entering into partnerships with other organizations that can provide these skills, outsourcing the work needed to these other organizations, or developing a network with other agencies and firms which can do this. Thus in many situations it is important to examine how effective (successful in doing what is intended) different options are, and this may require experimentation for example using pilots.

5.6.4.3. External Factors – Drivers and Barriers

The generic logic framework figure in Component 3 also shows that external factors have the potential to disrupt or enhance the successful transition from one level to the next. Such external factors are defined as being beyond the immediate control of the KSP policy and/or of the stakeholders involved.

These are usually factors not originally included in the policy design and its intervention logics but which have nevertheless been found important in disrupting or enhancing the process. This may have been because these factors were initially not thought important, or because the stakeholders involved in the intervention have no control over them, or because their inclusion would have made the policy and its intervention logic too complex to understand. Investigating them now as external factors is simply a way of (belatedly) recognizing their importance and attempting to re-introduce them to the intervention logic.

Drivers are not normally a problem, although better understanding how to exploit them could improve policy design and implementation. However, barriers can cause serious disruption and might even lead to the abandonment of an action or program.

This could be for any of three reasons:

1. The intervention logic is faulty, in which case it needs to be re-designed.
2. A barrier resulting from other actions or policies, which are necessary to successfully make the transition to the next level, are typically beyond the immediate control of the particular policy stakeholders, and may not even be directly related the KSP. For example, other government policies related to economic development, infrastructure, education and training, policies by other economic stakeholders, actions by consumers, civil society, etc.
3. Not transitioning to the next level due to the fact that structural or other factors are not in place or are not conducive. These factors can be both beyond the immediate control of the stakeholders concerned with the KSP, as well as important, and perhaps critical, for ensuring that the achievements of a given level are realised. For example, missing or non-conducive political, institutional, cultural and economic

conditions, legal framework, sector and market conditions, organisational size, etc., affecting the ability of a stakeholder to benefit from the KSP.

Situation (1) is largely under the control of the policy makers and stakeholders, but (2) and (3) are not, and can thus be termed external factors which are recognised through the assimilation of a number of assumptions and risks. In assuming that the necessary conducive policies and factors are in place, it is important to ascertain two things:

- Which policies and factors are important for reaching the next level.
- For those policies and factors that are important in this way, the risk of them not being conducive.

For policies and factors that are both important and high risk, an analysis should be made of whether the stakeholders can exert any control to make them conducive. Where the possibility of such control is minimal, consideration needs to be given as to whether there is an adequate link between the levels, and thus whether the policy should take place at all.

One example of how a policy can successfully take account of and understand these externalities, in order to move successfully between levels, is by articulating the assumptions necessary to do so. For example:

- An assumption between inputs (at level 1) and outputs (at level 2) could be that suitable ICT systems can be procured, adapted and installed, i.e. that such systems are in the market place at an appropriate price.
- Examples of assumptions between outputs at level 2 and outcomes at level 3 could be the availability of certain labour market skills at a given price, etc.
- Examples of assumptions between specific outcomes at level 3 and impacts at level 4could be a relatively low interest rate and thus background investment, growth and demand in the economy for knowledge products and services.
- Other types of assumption at this level could be wider economic conditions (e.g. that oil prices do not go too high), or political (e.g. the EU interoperability framework is successfully rolled out).

Therefore, for each assumption, policy makers need to measure:

- Importance, i.e. how much damage the assumption not being fulfilled would inflict on the ability to proceed successfully from one level to the next,
- The risk that the assumptions will not be fulfilled, and
- The direct control exercised by the involved stakeholders over the assumption, i.e. so-called own control.

Skill and precision are needed by policy makers in specifying a number of important, directly relevant and plausible assumptions as part of an intervention logic. It is not worth specifying assumptions which have low importance or low risk of not being fulfilled. Interest is only in assumptions which are important and where the risk of non-fulfilment is high. Such specification means that the risks are clearly recognised and articulated, and that actions could be taken to minimise or mitigate the risk, for example as described in Component 5, depending on the level of control and the cost and effort involved in so doing.

Measuring assumption importance, risks and (own) control should be done by the policy maker using ordinal, i.e. categorical, data applied subjectively (although methods do exist to make such measurement as objective as possible), such as in each case:

1. Very high.
2. High.

3. Medium.
4. Low.
5. Very low.

Policy-makers would normally only be interested in the first three scores for importance and risk, but in all five in the case of control. Measurement can be undertaken in the order of importance, risk and finally control. Thus, only important assumptions are then analysed for risk, and only relatively important and high risk assumptions are analysed for control.

To summarise, the generic logic framework represents three step basic steps between four levels, i.e. inputs, outputs, outcomes and impacts. In some models, these three can also be combined into two, i.e. just outputs and outcomes, where the latter also subsumes impacts. It all depends on the level of sophistication required for the policy in question, but it is essential to operate with at least two levels and one step.

Once the number of levels and steps is determined, it is also important to recognise that the policy maker is able to measure both each level and each step (by specifying assumptions and their importance, risk and control).

This could be displayed in an external factors assumption diagram, as in the example in the Figure 24. Additional columns could be added by the policy maker, for example, action taken to minimise risks, the results of these actions, etc. See also Component 5.

		Step assumptions for proceeding between levels			
Levels	Level Indicators	Assumption descriptor	Assumption importance	Assumption risk of non-attainment	Assumption own control
Impacts	Indicator x	Assumption A	Very High	Medium	Very Low
Outcomes	Indicator y				
		Assumption B	High	High	Medium
Outputs	Indicator z				

Figure 25: External factor assumptions for policy effectiveness: importance and risks

Interpreting the results of such a table, once completed, enables the outputs, outcomes and impacts of KSP interventions to be measured using operationalized indicators (both quantitative and qualitative). It also enables the values of these indicators to be properly interpreted by examining and measuring the conditions (assumptions) which provide the context within which they have been realised. The output/outcome/impact measurement dimension and the externalities dimension for interpretation of assumptions should be used. One dimensional models, which only measure outcomes/impacts, are not very useful operationally or politically. Both dimensions provide credibility.

5.6.4.4. Policy Effectiveness Measurement Criteria

Some policy effectiveness measurement criteria can be derived from the above, for example:

1. Were the 'right' objectives developed that could meet the needs or goal originally identified, by developing

a levels hierarchy linked by intervention logics or similar?

2. Were objectives changed in light of changing needs or circumstances?
3. Were assumptions taken into account in an appropriate way (not necessarily as described above) to avoid failure to successfully move from one level to the next?
4. Were the expectations specified at each level actually achieved, i.e. comparing the outputs, outcomes and impacts expected with those actually achieved?
5. How many levels (out of the total possible) were successfully reached?
6. Were there any unforeseen outputs, outcomes or impacts, and how were these identified and exploited if beneficial or mitigated if not beneficial?
7. Justifying intervention – have the needs of all stakeholders been taken into account through direct consultation? (See also Component 7)
8. Policy rationale – is the achievement of the policy defined in relation to clear and plausible intervention logics?
9. Targets – are there measurable/meaningful targets for performance and impacts?
10. Flexibility – can the policy adapt during the course of programs and actions to meet the changing needs of stakeholders in respect of KSP implementation?
11. Communication – how much information is easily accessible on the policy? (See also Component 7)

5.6.5. Monitoring Policy Utility, Sustainability and Transferability

A final part of the monitoring and evaluation system framework could be the overall utility and sustainability of the policy's impacts in relation to the needs originally identified; see the generic logic framework figure in Component 3. Criteria here could include:

In terms of utility and sustainability:

- What was the effect of the policy on the needs or goals originally identified?
- Has the policy maintained its successful implementation throughout its planned duration, and perhaps beyond?
- How did 'learning' take place during policy implementation about policy efficiency and policy effectiveness, and was this used within the policy implementation period?

In terms of transferability (see also Component 7):

1. Could the policy, whether or not adapted, be transferred to other contexts?
2. Could learning by others be appropriate, for example is it possible to develop an understanding and documentation of:
    - The policy context, i.e. the necessary context for understanding and using the policy, including legal and institutional structures, cultural and national contexts, policy frameworks, technology modalities, organisational and management conditions, human resource conditions, socio-economic and demographic conditions, etc.

- How the policy lessons could be applied elsewhere, i.e. summary advice on how the lessons from the policy can be applied and localised in other contexts: a template for transfer and learning, i.e. basic requirements or assumptions for transfer to other contexts, factors that facilitate or hamper transfer, transfer support (including links to expertise databases and centres), mentoring and partnering, links to other resources which can assist transfer and learning, use of workshops, on-line fora, membership of communities of practice, etc.

5.6.6. Operationalizing the Monitoring Framework

In principle, all levels, logics and external factors could be measured by indicators and related to each other. Which ones are, in fact, measured and how this is done will depend both on the need and the opportunity.

Developing, validating and operationalizing a monitoring framework and indicators needs to take place through interaction with both experts and policymakers, and well as through feedback from trials and pilots. For example, determining and measuring intervention logics can be undertaken through a group building approach which articulates how 'means' and 'ends' (the different policy levels) interrelate, and which indicators are most appropriate to measure each level as well as the externalities.

Once a measurement framework is developed (as above), indicators for each level, for external factors, as well as for policy efficiency, effectiveness, as well as utility, sustainability and transferability can be determined and operationalized in order to obtain high quality data. Indicator development should take account of the following issues (Bianchi et al., 2006) and (Heeks, 2006):

- Likely political and implementation value and acceptability
- Rationality and understanding
- Relevance (for KSP decision-makers)
- Completeness
- Accuracy of data provided
- Timeliness of data provided
- Appropriateness of data presentation
- Ease and cost of data collection or generation
- Ease and cost of data analysis and interpretation of indicator values
- Ease and cost of longer term measurement and monitoring

Each measurement element can include both quantitative and qualitative indicators as measurement criteria, depending on:

- What is being measured
- How in practice it can be done
- The purpose to which the measure is to be put
- How it is proposed to interpret the results

Indicators, or measures, also need to be 'SMART' (European Commission, 2009) i.e.:

- Specific: precise and concrete enough not to be open to varying interpretations.
- Measurable: define a desired future state in measurable terms, so that it is possible to verify whether the objective has been achieved or not. Such objectives are either quantified or based on a combination of description and scoring scales.
- Accepted: accepted, understood and interpreted similarly by all of those who are expected to take responsibility for achieving them.
- Realistic: ambitious – setting an objective that only reflects the current level of achievement is not useful – but they should also be realistic so that those responsible see them as meaningful.
- Time-dependent: related to a fixed date or time period.

5.6.7. Synoptic Evaluation of Knowledge Society Progress

Regardless of which Knowledge Society components are measured for monitoring purposes, it is advisable to deploy some sort of synoptic evaluation of overall Knowledge Societies progress in the territory. This can be important for internal, including political, purposes, as well as for headline messages for external outreach. A useful approach is to agree a small but consistent number of outcome and/or impact indicators (see Section 5.6.2 above) which are relatively reliable, complementary, important but also easy to collect. The indicators could include both quantitative evidence from, for example, official statistics or surveys, and/or qualitative evidence from, for example, sample opinion surveys, questionnaires or focus groups, and then combined in a logical and transparent way to give a composite Knowledge Society index. It is important to take such measurements separately across all of the six Knowledge Societies sub-systems included in the KSP in order to evaluate and compare the progress on each sub-system. Comparison can also take place over a regular timeframe, say every six or twelve months. A notional scale can be constructed from, say, zero to ten, where zero is no evidence of Knowledge Society development and ten is the maximum Knowledge Society development possible according to specific KSP outcomes. All scores will, of course, be relative rather than absolute, but this is not a drawback when measuring development progress, as long as there is consistency in the indicators used and regularity of the measurement period. It is also important that there is full transparency so non-KSP stakeholders can themselves validate and monitor the evidence.

Results could be displayed in a type of radar-graph with six points representing each sub-system and the complete graph representing the knowledge society as a whole, as exemplified in Figure 25.

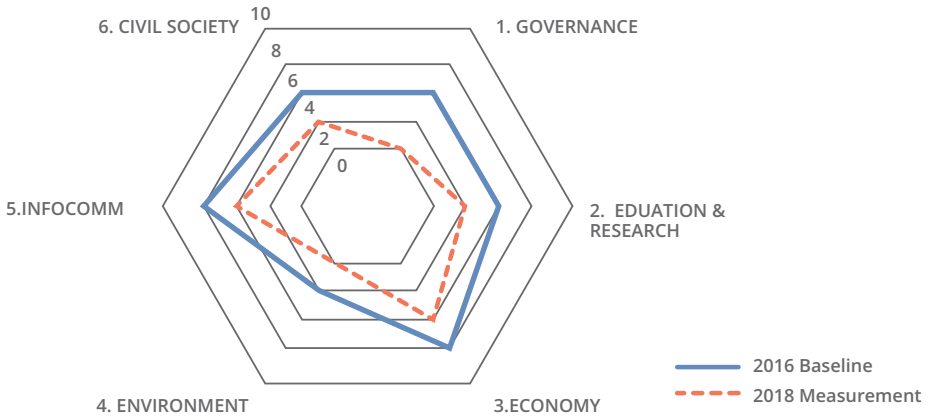

Figure 26: Evaluation of progress towards Knowledge Societies

Figure 25 compares Knowledge Society progress using indices from a baseline measurement, for example, as part of the preparation of the Knowledge Society profile at the beginning of the KSP preparation, as described in Component 1, to the status of Knowledge Society development two years later:

- At the baseline in this hypothetical example, Knowledge Society development was limited and was only readily apparent in the economy and InfoComm sub-systems, with some limited progress in education and research and civil society.
- Two years later some important progress can be seen: the governance sub-system has made good progress (perhaps by digitising government, starting to collect data and make this open, and putting knowledge society legislation on the statute books); the economy and InfoComm sub-systems have developed well, whilst there has only been limited, but nevertheless, real progress in the civil society, education and research as well as the environment sub-systems.

Such a synoptic evaluation approach, if carefully carried out, can be a useful internal measure, as well as a significant tool for outreach and communication (Component 7).

5.6.8. Complementary Approaches for Monitoring and Evaluation

Complementary approaches to monitoring and evaluation can also be used, such as recognised project management tools, Key Performance Indicators (KPIs) and/or balanced scorecard approaches. Specific studies on costs, benefits and other impacts, and comparing these with relevant international studies to learn from good practice, can be useful.

However, comparisons between policies, stakeholders or territories are not always easy given that processes, outputs, outcomes and contexts vary and are often not transparent. It should also be remembered that many policy components rely on outputs and outcomes from other policies, programs or actions, so they can be difficult to measure in isolation, such as when cross-entity initiatives are implemented in multi-stakeholder projects.

If the cost of monitoring and evaluation gets too high in relation to the benefits planned or actually realised, then adjustments should be made, but programs still might be continued if there are sound qualitative and perhaps also anecdotal evidence that they are useful.

It is also important to recognise that KSP typically reflect the political, social and cultural consensus in a territory, and these grounds alone might be sufficient to continue with the policy unless there is good evidence not to do so, such as wasting money which could be better spent elsewhere or providing poor or negative outcomes or impacts.

In terms of assessing actual and long-term outcomes on stakeholders and broader impacts on society, it can also be useful to use other complementary scientifically robust methods where feasible, such as randomised control trials, before-and-after and comparison studies, as well as regular monitoring and data collection.

This can ensure that highly reliable evidence is obtained and assessments made about outcomes and impacts, as well as its costs and benefits, leading to sound judgements about the future of specific KSP components and the design of similar components in order to maximise their impacts and reduce their costs.

There are also other measurement frameworks that are relatively robust, such as:

- Rigorous quality measurement and certification such as ISO 9000 and 14000.
- Some countries deploy so-called SMART frameworks using indicators which are specific, measureable, assignable, relevant and time-related (as above), to track the implementation of policy components.

- So-called 'big data' is also a huge source of potentially valuable evidence, both for assessing outcomes and impacts but also more generally for understanding a large variety of policy characteristics and trends. It is also used for policy modelling exercises as 'what-if' scenarios predicting the likely outcomes of different decisions or policy options.
- However, big data is only really useful if it is statistically representative of the situation being analysed and if the data itself has been robustly collected and analysed. Without detracting from the well documented value of big data and its undoubted on-going potential, it is always useful to run a 'sanity check' on its results and predictions, and this of course applies to all measurements of whatever provenance. Are the results sensible and above all understandable, in the sense that it is clear how and why they have been produced, or do they represent an algorithmic 'black box'?
- It is also important to recognise that any type of evidence, whether statistical or not or however robust, is just an input to a decision-making process. It remains up to the political decision-making process to determine and apply its overall vision of the KS, as long as these, alongside any deviations from the evidence, are transparently and accountably explained and that public discussion is possible (see Component 7).

5.7. Component 7 – Communicating

Communication is the second of two components which are more or less continuous over the whole policy cycle (see Figure 11). They both feed the cycle in terms of informed decision-making (Component 6) and provide mechanisms for stakeholder and public awareness raising and engagement (Component 7). Together they ensure that the KSP retains overall relevance, coherence and effectiveness, by both feeding off and feeding in new knowledge and know-how. This approach also makes it possible to prioritize and scale the main policy cycle components according to need in a timely and flexible manner.

Communication is an ongoing component supporting all others by linking the KSP to stakeholders and wider society and interests, including to the general public as the broader stakeholder base. It consists of two-away communication enabling the KSP to disseminate information and raise awareness, on the one hand, and encourages public consultation and engagement on the other. Seven issues are addressed in this chapter:

- The purpose of communication and the approach adopted – Section 5.7.1,
- Designing the communication strategy – Section 5.7.2,
- Identifying stakeholders and target groups – Section 5.7.3,
- Preparing messages and messengers – Section 5.7.4,
- Selecting channels and approaches – Section 5.7.5,
- Maximizing the impacts of the strategy – Section 5.7.6, and
- Evaluating communication outputs and outcomes – Section 5.7.7.

5.7.1. Purpose and Approach

The overall purpose of the communication component of the KSP is to engage with stakeholders not directly or initially involved in the design and implementation of the KSP. Two main target groups can be envisaged in this context:

- Those who, because of their professional, expert or other situation or interests, need to know about the KSP as they will be, or are, directly and significantly affected.
- People and organizations, largely defined as citizens and the general public, whose support and interest is not absolutely necessary in the short-term but who will be important in the medium- to long-term to build broad societal acceptance.

Moving towards a knowledge society will impact everybody in the longer term, as it changes fundamentally the ways in which all people live, work and are governed. There is always an ingrained resistance to such changes, which is both natural and necessary as change for its own sake or which benefits only a few is rarely beneficial to all.

However, a consensual, inclusive and participative understanding of and involvement in the process of change provides the best opportunity to spread its benefits and lead to optimistic shifts in attitudes, behaviours and values. The challenges should, on the other hand, not be under estimated as one social marketing expert has noted, "changing people's behaviour has always been the most problematic enterprise in human affairs."[19]

This reinforces the need to take communication seriously and to invest some effort in ensuring it is conducted efficiently and effectively. Timely, targeted and appropriate communication, supported by the whole range of media and channels including ICT, needs careful planning and implementation. Two-way communication as a broad strategy is absolutely essential even though the balance will vary between the target group, the issue and the timing, for example: push methods like marketing, awareness raising, publicity and information, and pull methods like opinion gathering, data mining, meetings, hands-on demonstrations, feedback, polling, dialogue and co-creation and co-decision-making.

5.7.2. Designing the Communication Strategy

A successful communication, outreach and engagement strategy should design and then implement the six generic steps summarized in Figure 26. Feedback loops are included, as step 6 on evaluation should itself be continuous and on-going so the adjustment of any part of the strategy can take place in a timely manner.

According to the specific KSP developed and being implemented, it is important to define what the strategy is aiming to communicate, who and how is it intended to reach, with what timetable, and what outcomes it is intended to deliver. In particular:

- Clarify the main goals of the strategy.
- Prepare measurable objectives.
- Set specific milestones and a timetable.
- Be clear about the stakeholders types to be involved, the main types of groups to target and with what type of outcomes.

19 http://www.comminit.com/edutain-africa/content/social-marketing-7-step-approach

In order to make a realistic budget, for example (Christensen, 2007) recommends that about 2% of the total budget should be allocated to the communication and engagement strategy.

Figure 27: Designing the communication strategy for Knowledge Societies policy

5.7.3. Identify Stakeholders and Target Groups

The strategy should specifically identify:

1. The key stakeholders who need to be involved in designing and implementing the strategy, which apart from the relevant government agency could include businesses, academia, InfoComm organizations and civil society partners. In this context, it is important to:
    - Work with and through existing organisations and structures where possible – avoid inventing new arrangements (this is difficult, costly and rarely effective) except where really necessary.
    - Build links between different stakeholders and target groups: coordination and cooperation between organizations have wider benefits than simply increasing the budget. The more people involved in developing and implementing a strategy, the wider the range of ideas, expertise, resources, contacts, established distribution channels and manpower available to draw upon.

- Build consensus, cooperation and coordination at all levels including political.
- Identify and harness the energy, enthusiasm and trust of local and sectoral champions and celebrities who can act as mediators or multipliers of campaign messages, i.e. key individuals who can persuade others, provide leadership, be a shining example, etc.

2. Target groups the communication strategy is aiming at, for example specific social, economic and/or public sector segments (these may include stakeholders, given that they may also be strategy targets in addition to being involved in designing and implementing the strategy). There needs to be a clear understanding of:
   - The target group's needs for specific types of information and engagement.
   - In relation to this, the types of messages and channels to be used to reach the target and the role each message and channel can play.
   - The level of Knowledge Society knowledge, understanding and skills needed by the target groups.
   - How to translate awareness into a behaviour pattern receptive to the KSP.
   - Who precisely in the target group to communicate with and their social, economic, cultural and educational context.
   - How to ensure credibility with the target group – building trust is vital.

5.7.4. Messages and Messengers

It is important to design and deliver information and messages that it is appropriate to the specific target group. For example, an awareness-raising campaign will typically communicate either one common message or one or more specific messages. A common message may be "it's easy, fun and good for your community to participate in the hackathon and develop apps that benefit local causes", or "you can generate new markets, growth and jobs by getting involved, just like company X has done."

Specific issues to be aware of include:

1. Develop a high-level compelling message of a few lines that provides the basic template for all specific communications. This should be clear, compelling, and short, and should do three basic things:
   - Give the target group a reason to care about the issue by appealing to their values and immediate concerns.
   - Briefly describe a problem, challenge or opportunity the target group faces and what is the reason or cause of it.
   - Provide a solution. Describe what action will address the need, problem or opportunity in a way that makes it worthwhile for the target group to listen and engage. Whenever possible, give people something they themselves can do – an action that will allow them to respond to the problem.
2. Communicate a little at a time – aim for quality over quantity.
3. Use language that speaks to the target group. Sometimes what is communicated isn't what the target group hears, because different target groups have different perspectives on issues, e.g. an employer and an employee might have very different attitudes towards automating the workplace, so be sensitive to each target group.

4. Choose appropriate messengers to deliver messages, communicate and engage with the target group. The choice of messenger should depend on both the target group and the message to be conveyed. One of the biggest mistakes is to determine who the messenger should be before knowing the target group or message to be communicated. Messages are normally best received and understood when the messenger is also affected by the challenge or problem.

5. The credibility of the messenger is just as important as the message itself. For example, successful entrepreneurs are the best messengers to communicate about developing new knowledge products and services, and frontline health workers are probably best at delivering messages about remote health monitoring to homebound sclerosis patients.

6. Although for some messages and target groups, communication and engagement activities may need to be on-going, specific timing can often be critical for some groups that are more receptive to particular types of message at specific times.

7. In maximising the impact of a strategy it is important to understand the specific agenda and needs of the target group and to time campaigns and messages accordingly. For example experiences with the implementation of the Irish Revenue Online Service[20] indicated that the time scheduling of publicity is very important. In this example, scheduling was driven more by the internal considerations of the development team than by the external schedules of the targeted audience. The online corporation tax system and publicity was launched during November which is not the optimal time of the year since the annual return had been made by most companies a month before and they would not need to do so again until the following year. The result was that uptake was low until the timing was corrected.

8. It is important to assume that any communication has been unsuccessful until there is evidence to the contrary. It is thus important to engage as much as possible with the target group, both to improve the efficiency and effectiveness of the strategy, but also to co-opt them to the latest extent in designing and delivering messages.

5.7.5. Channels and Materials

For each different type of communication, whether information, messages, dialogue, feedback or opinion mining, a variety of approaches, channels, media, techniques and materials are available so it is important to make matches appropriate to the purpose and target group. Each group can best be reached by a specific set of channels and materials (see below) designed to address their specific needs, awareness levels and multipliers. Many of these materials and products will be common (or have common elements) across different target groups, so it is often the actual mix of materials/products that is important.

Timely delivery of the materials and products/services to the target group in a form that is easy to handle and process, is crucial. As the communication strategy unfolds, a series of different approaches may be necessary, for example characterised by a variable mix between electronic and traditional channels.

A clear media and materials mix is necessary to ensure that everyone in the target group receives and understands the strategy messages through at least one approach. Given target group diversity, any communication strategy that relies too heavily on just one or two approaches is unlikely to achieve its goals.

A broad threefold distinction between different types of communication channels consists of personal communication; traditional mass media; and new media (mass or personal):

20 http://www.revenue.ie/en/online/ros/

1. Personal communication: a personal approach is often the most effective means of selling a good idea, particularly if the approach comes from, or is sponsored by, an individual or organization with recognised credibility: for example, a civil society organization, an individual champion, a celebrity, etc. Personal face-to-face communication can take place through for example:
    - Public briefings and meetings.
    - Presentations and workshops, including hands-on activities.
    - 'Living labs' and 'live labs' providing focused 'real life' experiences normally over a prolonged period or on a regular basis.
    - Briefings by decision makers and stakeholders.
    - Informal social events.
    - Direct advocacy by different interest groups on decision-makers and stakeholders.
    - Specially designed education or training programs prepared to coincide, for example with the launch of the KSP or some major milestone, and the provision of teacher training programs, lesson plans and hands-on activity ideas.
    - Where oral traditions dominate, performances of specially-composed stories, songs, dances, plays and poems might be appropriate.
2. Mass communication materials and channels: whilst personal communication tends to be the most effective means of raising awareness, it is not always the most efficient strategy for communicating a message widely. To achieve this, traditional mass media communication may be necessary, such as:
    - Printed materials – for example, billboards, brochures, cartoons, comics, pamphlets and leaflets, posters and resource books.
    - Static and travelling exhibitions and displays.
    - Science fairs, education shows and public events.
    - Institutional open-days.
    - School and university events.
    - Competitions.
    - Interviews, feature articles and announcements in newspapers and magazines.
    - Media interviews, news items and documentaries on radio and television. This could include interviews with, or endorsement by, celebrities or champions, as individuals known to the target group, whose opinion they respect and trust.
    - Building media awareness through briefings, releases and press packs.
3. New media which can be both personal and mass: ICT and other InfoComm media have the advantage of potentially being both personal and mass simultaneously or by design, although digital divide issues may be a barrier in a population where not everybody has equal access or skills. Examples include:
    - Audio-visual resources, e.g. pre-recorded cassettes, videos, CDs and DVDs.
    - Broadcast SMS messages to mobile telephones.
    - Email discussion lists, email bulletins/newsletters, online newsfeeds and RSS.

- Dedicated outreach websites, with sections aimed at different target groups.
- Webcasts, and telepresence of events, workshops and discussions.
- Blogs and discussion.
- Online surveys, polling and petitions.
- Published open data and other resources, e.g. for use in 'hackathons' or special engagement events by social and commercial entrepreneurs to develop apps, decision support systems, new services, etc.
- Open and citizen science initiatives where members of the public can engage in scientific research, e.g. by observing and recording environmental changes.
- Social media engagement, such as Facebook and Twitter.
- Online opinion and data mining.
- Online crowdsourcing and crowdfunding.

Particular aspects of communication and engagement strategies, which typically require a longer-term perspective, include public relations, advocacy, education and marketing:

1. Public relations deals broadly with activities designed to establish and maintain the reputation or credibility of policy. Public relations is typically defined as the planned and sustained effort to establish and maintain goodwill and mutual understanding between an organization and its external audiences. Examples of useful public relations might include regular briefings for the media on the progress of a campaign, or regular stakeholder meetings with particular target groups. Celebrity spokespeople will often provide very effective public relations opportunities. Ultimately, public relations is about ensuring that the policy is perceived positively and that its message – however this may be communicated – is received by its target group with an open and receptive mind.
2. Advocacy and lobbying for specific interests or points of view are sometimes overlooked when planning a strategy but can be vital for ensuring on-going support from the main stakeholders. Examples of advocacy and lobbying include:
    - Forming strategic alliances and partnerships between government, civil society and commercial organisations
    - Meetings with key decision-makers, such as politicians and industry CEOs, at all levels but focusing on those with the authority and power to open doors, remove barriers and maybe provide resources
3. Education and training: raising awareness about an issue or topic does not necessarily lead to lasting changes in behaviour or belief, especially when people also need specific insights or skills they may not already possess. For a communication campaign to achieve long-term benefits it may be necessary to consider how to provide the target groups with the skills and incentives to change. Thus, changing behaviour may also mean, for some potential stakeholders, the need to upgrade skills, so that the campaign should be linked to educational and training opportunities whoever provides these e.g. the public sector, the private sector, civil society, and however provided. Existing educational offers must therefore be mapped to see whether adequate training is available, and, if not, new offers may need to be provided or encouraged in order to fulfil the needs of the strategy. An otherwise excellent strategy could fail if people want to get involved but do not have the necessary skills. InfoComm technologies are also providing new ways to undertake education and training, so can both support communication efforts as well as directly support Knowledge Society development. Examples include e-learning, online open universities and colleges, and MOOC.

4. Marketing campaigns: part of the communication strategy could include a marketing approach with its own a marketing budget and people with appropriate skills to do the marketing. Branding the strategy or campaign, or certain aspects of it, is highly desirable. This could be outsourced to specialised marketing consultants to develop a strong and recognizable policy image as part of a marketing strategy.

5.7.6. Maximizing Impact

When addressing specific target groups, it is clear that it is impossible to reach everybody at an individual level. However, with a focused strategy that distinguishes the level of knowledge to be transferred and identifies 'multipliers' within the target group, i.e. key persons and organizations as mediators or intermediaries, broad as well as deep awareness-raising is possible. This approach ensures both a focused effect, i.e. engaging key players as 'hubs' or 'nodes' in the target group network, and a mainstreaming effect emanating from these multiplier nodes throughout the network.

The most effective communication includes encouraging input, feedback and reactions from the target group that serve two very important purposes:

- Improving the effectiveness and efficiency of channelling to the specific target group.
- Improving the overall operation of the strategy by reacting to new and changing needs as well as to new understanding of existing needs.

For each specific target group, the following factors need to be identified:

1. Needs: The specific needs of each target group need to be clearly understood and articulated in relation to what the KSP has to offer and how it should involve them. As with the other factors, this may be an on-going, iterative process, and will typically involve dialogue with the target groups that enables the strategy to reach a better understanding of their needs. This will also help the groups, in particular the network 'nodes' or intermediaries, to better understand their own needs.

2. Channels and materials (see above): It is clear that traditional mass media is likely to have greater impact in the delivery of key messages to the less aware than to the experienced target groups, whilst personalized traditional and ICT-mediated messages is better able to meet the requirements of the latter.

3. Multipliers: As stated, it is useful to identify key mediators or intermediaries, both as individuals like champions or celebrities, organizations (such as the small industry association in the case of new digital fabrication techniques), or mechanisms (like the existing newsletters or activities of an organization). This will enable the strategy to target its awareness raising activities accurately. If this is successful, the multipliers will be in a position to act on lessons learnt and information provided for the benefit of the whole target group.

4. Awareness levels: Each target group should be segmented in terms of 'state of awareness' to ensure the content and delivery of the campaign is at the right level. This could be done, for example, as depicted in Figure 27.

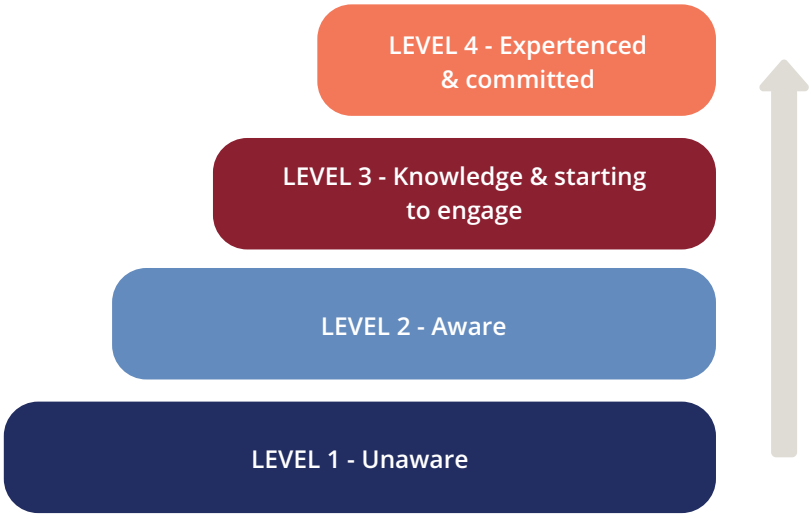

Figure 28: Communication strategy target group awareness levels

The four awareness levels are as follows:

- Level 1 – the unaware: They have little understanding and maybe no interest. Typically, this group has a major learning curve to go through, and is probably already the target of many initiatives which overwhelm them with information. A decision needs to be taken as to whether this group is worth engaging, given the potential challenges and costs involved especially as it is likely it is very large. However, knowledge society policies potentially affect everyone, so there is almost certainly a need to address this group, using the approaches described above, and to attempt to move as many as possible to at least Level 2. A combination of traditional and new mass media is probably most effective, although attractive hands-on activities at popular events like hobby exhibitions, could also be important.
- Level 2 – the aware: They are starting to understand and, more important, become interested. Maintaining the target group at this level requires a continuation of combining traditional and new mass media. In addition, however, there will be opportunities to begin more focused and personalized approaches as the nuanced needs of the group become known and internal distinctions in the group become clearer in term of the messages and support required.
- Level 3 – the knowledgeable: They are starting to participate actively in two-way communication and engagement with stakeholders and each other, although they will still require support and specific resources, encouragement, advice and incentives, perhaps down to the small group or even individual level.
- Level 4 – the experienced: They committed and racing ahead. People here can be champions, advocates, new network 'nodes' and intermediaries. It is likely they will wish to engage directly with the stakeholders and strategy staff, and perhaps take a leading role through co-creation and co-decision making. They can also be sources of good practice for other members of their target group as well as other groups.

It is also important to consider what barriers and drivers might be present in specific target groups, for example:

- Barriers will potentially delay or undermine the campaign but can be overcome with foresight, planning and resources. An important potential barrier often forgotten is the challenge of getting share of voice in an ever more crowded information and media landscape. Many people are showing signs of information overload and the phenomenon of 'attention-turn-off'. It is thus important to remember that the quality of the communication and of the message is more important than its quantity. As a result of information

overload, communication messages are often overlooked or ignored by the target group. To overcome this problem and make the message stand out and become more immediate, many communication strategies are now incorporating case studies, personal stories and testimonials from people; often written or presented in their own words. As mentioned earlier, a personal approach is generally more effective at selling a good idea, especially if it makes people feel smart, clever and good about themselves. This also means that the strategy needs to attempt to think differently and be innovative in its messages, channels and materials.

- Drivers are context specific forces or capabilities that can help achieve the goals of the strategy. Examples could include an influential community leader or champion who publicly endorses the initiative, the widespread availability of do-it-yourself consumer electronics in shops, or new regulation that obliges public authorities to release anonymized data for use by businesses, academic and civil groups.

5.7.7. Evaluating the Outputs and Outcomes of the Communication Strategy

Evaluating the outputs and outcomes of the communication strategy is essential in determining its effects as well as enabling future improvements.

In this context, there can be two types of evaluation:

- Formative evaluation – research and evaluation that takes place when designing the strategy in order to assess the most effective ways to reach the target groups.
- Summative evaluation – comparing the outputs and outcomes of the strategy against its goals and objectives and attempting to assess its success.

Formative evaluation takes place at the strategy stage, whilst summative evaluation takes place during as well as at the end of the strategy process.

In order to determine whether the goals and objectives of the communication strategy are being, or have been met, outputs and outcomes should be measured. Participation and take-up across different channels and media are one way to do this, for example:

- Attendance at meetings, programs and events. Targets for the number of participants could be set as benchmarks for evaluation, including their composition in terms of socio-economic make-up.
- Participation in online events and activities, such as tele-presences, polling, blogs or e-learning activities.
- Surveys of the target audiences, both offline and online, for example to determine their satisfaction with an event or initiative as well as their opinions about the KSP and suggestions for future developments. Are their expectations being met? Do they understand the KSP? Are they incentivized to any kind of action? How did they hear about the event? Basic, one-page survey forms can be very useful in reporting results and planning future activities.
- Content analysis of media coverage and online activity. In addition to counting clips of print and broadcast coverage or numbers of blogs and members of Facebook groups (quantitative), attention should be paid to the content of each activity (qualitative). Are strategic messages getting through and are they prominent? Are the strategy's goals communicated clearly? Are the (social) media outlets in which the coverage or activity occurred appropriate to the target audiences?

See also Component 6 for a comprehensive guide to monitoring and evaluation of the KSP.

6.

Adaptation and Transfer – Localizing Knowledge Society Policy

This chapter considers how a public policy for Knowledge Societies, developing following the process outlined in Chapter 5, could be adapted to different social, economic, cultural, institutional, etc. contexts, how the policy can be transferred from one context to another, and what are the role of different responsible agenda in adaptation and transfer activities.

The remainder of this chapter is structured as follows. Adaptation to roles and responsibilities of responsible agents are examined in Section 6.1, adaptation of a public policy for Knowledge Societies to different contexts is the focus of Section 6.2, and transfer of public policies for Knowledge Societies between contexts is the subject of Section 6.3.

6.1. Adaptation to Roles

The roles of career bureaucracy in public policy-making, particularly in policies and strategies related to Knowledge Societies, are prestigious, but they also constitute an issue of contradictory and differing interpretation, practice, and direction. While higher public servants have always played a major part in shaping public policy, the extent of their involvement has subsided and flowed in response to legal, structural, and political changes at the macro-regional, federal, state, and local government levels.

This Handbook contemplates the governmental officers and civil servants of the national or local state structures (sometimes with the support of an expert team, sometimes with only the assistance of their staff), which face the challenge of initiating, reviewing and/or updating the process of the elaboration of a public policy for Knowledge Societies.

In Knowledge Societies, as well as in its traditional roles as public policy-maker, regulator, and purchaser, governments have increasingly become users, investors, conservators, managing principals, and evaluators of digital goods and services. This makes them, as responsible agents for public policies, play multiple roles.

On the other hand, knowledge economy and the globally influenced policies are generating a globally integrated economy, and they continue to advance. This is building new challenges and opportunities for private and public, for-profit and not-for-profit entities who must deal with the primacy of government. This means that the responsible agents for public policies have to deal with multiple stakeholders which, as mentioned earlier, have often different and sometimes opposing interests and goals.

How can then a responsible agent adapt to the task of generating or updating a public policy, and how can he or she adapt the contents of this handbook to its needs? There are several issues to be taken into consideration by the agents responsible for leading and coordinating the process of Knowledge Society policy development:

- Political will: In order to formulate a Knowledge Societies policy, it is necessary that governments fully acknowledge that ICT are a matter for public policies (Guerra et al., 2008). If such a conviction is not present, there will not be formulation or implementation of such a policy. The jurisdictional scope will have to be clearly defined by the political spheres from which these processes or their (re)formulation will commence. Although in many countries the political and technical civil servants in charge rotate in different positions, the designation of the people in charge of promoting this process, as well as their capacity of management and negotiation with the government and other actors, will have a fundamental impact in the Knowledge Societies future (UNESCO, 2009).

  UNECLAC (2008) expresses an idea to put into practice diverse aspects of the public agenda to present arranged social actions: “Political will does not arise spontaneously and exclusively in the state (...) but it is constructed from the society. However, the main obstacle that interrupts the process constitutes the capacity to represent the social preferences as well as individual preferences”.

- Hierarchy: The process of coordinating the development of Knowledge Societies will be more successful if the responsible agent, be it an individual, team or agency, is located high in the government hierarchy. The higher the level, the stronger the support for the policies proposed, and the higher the possibility of implementing them concretely. If the proponents are not located high enough, it is in their interest to make alliances with the executive power in place. The working procedures and coordination of the participants´ work are also to be considered.

- Interaction Strategy: The scope of information policy is very broad, encompassing a collection of policies and strategies that are designed to promote the development of an information-based society, able to rely on information systems that are accessible, open, diverse and secure. In line with the WSIS approach, it should lead to creating an Information Society that is people-centered and serves to promote human rights and democracy. The scope of an information policy overlaps with four policy fields: technology, industry/economy, telecommunications and media.

- Sectoral interactions: Sectoral policies including but not limited to education, employment, health, welfare, etc. are increasingly having to address issues of new technologies (UNESCO, 2009). It becomes relevant to reflect on the achievement of the agent´s goals regarding the Knowledge Societies considering the presence of government and other stakeholders (including supranational agents and international organizations) in economic and societal affairs, as well as other public policies and plans regarding related issues, such as education, health, urban and regional planning, telecommunications infrastructure, science and technology policies, innovation for development policies, and others.

- Organization building: The governmental agent in charge needs to be sure that he/she maintains the right organizational structure to operate in a truly effective way, given that Knowledge Societies deals with national, regional, and/or local aims as well as with global interests and contexts.

- Leadership development: The government and other stakeholders must be sure that they have the right leadership model for the agent charged with Knowledge Society development. Does the organization include experts in Knowledge Society issues? Has it developed Knowledge Society leaders or is planning to do so?

Table 34: Training Knowledge Society leaders, example from Africa

Several organizations around the world are working on training Knowledge Society leaders. The African Leadership in ICT (ALICT) Programme, for example, aims at developing African experts on ICT in education, science, technology, innovation, and economic development to become Knowledge Society leaders and agents for change in their own countries and be catalysts for regional cooperation in the domain. ALICT will develop new models for capacity building and build the capacity of African leaders on Knowledge Society issues including establishment of a platform for multi-stakeholder contribution and institutional capacity building of the African Union Commission.

ALICT´s objectives are the following:

- Provide direct personal experience of ICT as an enabler for human resource development contributing to development of Knowledge Societies
- Raise awareness and build strategic capacities of leaders and policymakers
- Enable collaboration among African countries for building Knowledge Societies
- Harness the leadership skills of promising ICT leaders and policymakers
- Promote policy dialogue on Knowledge Society issues including dissemination of information and professional development

Source: http://www.saine.co.za/wordpress/wp-content/uploads/2011/09/African-Leadership-in-ICT-ALICT-Programme-.pdf

6.2. Adaptation to Context

How can a public policy for Knowledge Societies adapt to a given context and vice versa? There are many factors to be considered:

1. Political and economic factors: The external factors are exogenous to political decisions on Knowledge Societies strategies, since the strategies´ designers and decision-makers do not have decision power over them.
2. International organizations: International organizations frequently trigger regional and national initiatives to develop Knowledge Societies, as it was shown in the processes leading to, e.g. WSIS 2003, WSIS 2005, WSIS 2015, and E-LAC 2014. They also provide assessments and best practices of Knowledge Society policies.
3. Commercial partnerships: Commercial alliances or partnerships strongly influence national policies and strategies. A given government may wish to protect its alliances with a regional bloc (for example, MERCOSUR or the European Union), adopting measures for a common or coherent Knowledge Society scheme. On the contrary, external commercial alliances may exclude or economically harm countries, which will hence adopt policies that try to compensate for this exclusion.
4. Awareness of political groups: If a government is informed and willing to build Knowledge Societies to integrate them fully in its country, region, or city and with the global Knowledge Society – while respecting its own specificities – it will be likely supportive of and receptive to the transformations proposed by the policy.

5. ICT Infrastructure and services: The most obvious thematic topics of Knowledge Society strategies focus on the building of the digital infrastructure and services. Depending on the characteristics of each country's or city´s infrastructure and ICT services, and the number and location of the underserved population, policies should be aimed at fostering universal access and use of the technology by providing a basic minimum of connectivity for the whole of society, with special emphasis on marginalized groups, such as rural inhabitants, ethnic minorities, women, the disabled and elderly people (UNECLAC, 2004).

6. Regulatory frameworks: National and regional regulatory frameworks are key elements in the formulation of public policies for Knowledge Societies. They need to be established or adjusted to ensure the concrete implementation, assessment and renovation of public policies. The regulation of the telecommunications industry and the strengthening of ICT markets are some key policy areas (UNECLAC, 2004).

An enabling regulatory environment, a favourable investment climate and cooperation and funding of the international community are fundamental elements for the overall development of the knowledge society agenda. It is problematic to define such an "adequate enabling environment", given that each country, region, and city has different needs and a different level of development.

However, some basic requirements for the development of ICT have arisen. These include:

- Appropriate policy adapted to the new demands of the Knowledge society, and transparent and non-discriminatory regulation, to favor investment in telecommunication technology, mobilization of new resources and participation of private enterprises in ICT development.
- Cooperation at international, regional and national levels, coordination of efforts, exchange of information, transfer of technology and knowledge and sharing of experiences and best practices.

All the declarations examined recognized the necessity of policy and regulatory reform, which could imply market liberalization, the introduction of private investment and the creation of independent regulators. A reform may also entail a reorganization of the old regulatory framework in order to better deal with the new issues and problems of the knowledge era (UNESCO, 2009).

Developing Knowledge Societies in a given context, or adapting a successful policy initiative to it, also means assessing the economic, social, human and technological conditions of a country, region, or city regarding its e-readiness and the existing Knowledge Societies in place. Studies and research will have to be conducted and used. In some cases, these studies may be produced by chambers of IT enterprises; the institutions responsible for statistics and censuses can also provide helpful findings.

The role of the civil servants or agencies in charge of the process of developing public policies for Knowledge Societies does not consist of actually carrying out these studies themselves, but to commission them to consultants, professionals or to the scientific sector, using their results and the research already available, having stressed clearly their goals and assessed the coherence and accuracy of their results.

Diagnosing national or local e-readiness may be used by governments as a mechanism to collect the necessary information on which to base the reformulation of the Knowledge Societies goals. This evaluation will help governments to focus their efforts and to identify areas that require the investment of larger resources, external efforts, or extra help.

The tools used in different countries for these evaluations have recourse to diverse definitions of e-readiness, and different methods for the measurements, such as indicators systems. The evaluations differ in their goals, strategies and results. The right tool, in each case, depends on the objective of the user (the evaluator and/or the government). The user may choose a tool that measures the theme studied or sought, guided by a standard adjusted to the users´ own vision on an e-ready society (UNESCO, 2009).

6.3. Transfer from Context to Context

What factors need to be taken into account when evaluating the cross-national or cross-regional transferability of Knowledge Society policy initiatives?

How are Knowledge Societies transferred among diverse national, regional, or local contexts? Cross-national experience is having an increasingly powerful impact upon decision-makers within the private, public and third sectors. In particular, policy transfer and lesson-drawing is a dynamic activity where knowledge about policies, administrative arrangements or institutions is used across time or space in the development of policies, administrative arrangements and institutions elsewhere (Stone, 2001). The literature suggests that policy permeates and diffuses gradually over time, spreading, dispersing and disseminating ideas or practices from a common source or point of origin (Stone, 2001).

Convergence among policies in diverse contexts allows for the possibility of similar developments taking place in different countries, regions or cities with or without any direct link between them. Countries with similar or comparable economic, social, cultural and political developments develop broadly comparable policy arrangements. When social structures, patterns of economic organization and assemblages of political interest change, then policy also changes. These conditions help explain why there are pressures for reform, but not whether or not it will occur or the form it should take (Stone, 2001).

Networking is an important element in policy transfer among contexts. Networks that join policy makers, governments, researchers, practitioners, entrepreneurs, etc. facilitate the circulation of policy cases and models, and may help policy makers to adapt such cases and models into their own contexts.

However, policy transfer should not be taken lightly. Policy makers should be aware of the characteristics of the environments they are going to operate, the demands of the local population, their historical and geographical contexts, their local culture, and their level of e-readiness before transferring external models that may not respond to local needs.

It is also relevant to identify the obstacles and positive factors that can influence policy transfer. The identification of obstacles allows identification of those factors that can inhibit or slow the process of building or updating the country's Knowledge Society Policy.

The most common obstacles could be:

1. Historical and cultural, e.g. resistance to change
2. The countries' diverse development levels
3. Managerial obstacles
4. Political obstacles, e.g. power struggles
5. Institutional factors
6. Infrastructural factors
7. Geographical factors
8. Insufficiency of human resources, etc.

The obstacles identified for each one of the proposed goals can be removed by the impulse of accelerating or facilitating factors. Accelerating factors are measures or actions taken at institutional and political levels; they imply coordinated operations between the diverse actors involved. Accelerating factors require financial investments, specialized human resources, communication strategies and training strategies. Institutional changes

It is also important to consider that the implementation of a public policy for Knowledge Societies may require institutional transformations: changes in the legislation, regulation norms, standards, or even new governmental institutions, such as a Knowledge Society Agency. In some cases, these changes may generate conflicts of interest among the diverse actors taking part. The coordinating team or agency should be alert and organize as necessary a debate about each conflictual issue. It may be necessary to analyze best practices in Knowledge Societies in other local, national, and/or international, experiences, as well as examine the institutional and political sustainability capacity, and the necessary agreements between government and other actors involved in KSP.

7.

Platform and Community – Using the Handbook

The UNKSOC.ORG Platform – the digital face of the Knowledge Societies Policy Handbook – serves two purposes. It provides digital support to the Handbook, thus aiming to enhance its dissemination and usage. It also provides flexible access to the different components that constitute the Knowledge Societies Policy Handbook so the Handbook can become a useful and widely available tool to all those involved in policymaking in the area of Knowledge Societies.

The UNKSOC.ORG Platform has also been thought as an enabler of the emergence of a community of researchers and practitioners around the subject of Knowledge Societies Policy. To fulfil such role, through the content it aggregates and through the functionality it provides, the UNKSOC.ORG Platform must have the ability of becoming a hub within a network that interconnects different players in Knowledge Societies policy-making: government agents and staff, experts, educators, researchers, etc.

This chapter outlines the content and functionality of the platform (Section 7.1), presents how the platform could be used by different categories of users (Section 7.2), describes how the platform could stimulate the development of a community engaged in Knowledge Societies policy-making (Section 7.3), and outlines possible evolution of the platform to address evolving user needs and to support the growth of the community (Section 7.4).

7.1. Content and Functionality of the Platform

To assure its attractiveness, a basic requirement for the UNKSOC.ORG Platform (as it is for the Knowledge Societies Policy Handbook) is to encompass a wide range of content types relevant to the activities of the segment it targets – Knowledge Societies policymakers, experts and researchers. A nuclear component is an authored document that presents a state-of-the-art perspective on policy making for knowledge societies. This document is a renovation of the “National Information Society Policy: A Template” produced by UNESCO/IFAP in 2009. It addresses central concepts in the Knowledge Societies area and provides guidelines for the establishing, the monitoring and the sustained evolution of knowledge societies policies. This document is complemented with a library of diverse resources. Currently, the library contemplates the following resource types:

- Case studies – Descriptions of cases that address the definition and/or implementation of policies related to information or Knowledge Societies; the cases were drawn worldwide.
- Publications – Articles, reports and other documents that address themes relevant to the Knowledge Societies policy area; for each document, besides the title, authors, year and place of publication, it is also provided a summary and the highlights of the document.
- Policies – Documents that described information and Knowledge Societies policies and other related policies in several countries worldwide.
- Indicators – Descriptions of indicators that can be used to measure progress in areas relevant to Knowledge Societies policy.
- Tools – This section encompasses a wide diversity of tools relevant to Knowledge Societies policy, such as portals, libraries and other resources.
- Research opportunities – descriptions of research needs posted by entities seeking for collaboration from universities and research units.
- Glossary – Explanations of key concepts related to Knowledge Societies policy.
- Acronyms – Explanation of acronyms used in the Knowledge Societies Policy Handbook and in the Knowledge Societies policy discourse.

These resources are suitable to be used in different phases of the policy-making process.

In an era of 'prosumers', the UNKSOC.ORG Platform library is expected to be continuously improved, updated and extended by its users. Therefore, the Platform is open to contributions from the community it serves. Such contribution can take multiple forms: suggestions of new entries for the library, in any of the existing library categories; posts and comments on the content or on debates on knowledge societies related themes; sharing of content, especially instances of knowledge societies policies, that are particularly relevant if they have been developed according to the recommendations of the Knowledge Societies Policy Handbook.

7.3. Forms of Use of the Platform

This section addresses the different profiles of the UNKSOC.ORG Platform users and the different ways the platform can be used. User profiles and ways of usage are combined in a table that helps to explain the expected use of the UNKSOC.ORG Platform.

Five main user profiles have been identified:

- Practitioners – this profile includes all individuals involved in the process of Knowledge Societies policy-making; typically they are either elected politicians or civils servants that, at some point in time, participated in one or more steps of the policy-making process; practitioners have personal experience on Knowledge Societies policy making and developed competences relevant to the process; such competences are applied in a specific geographic-economic-social-cultural scope, such a country, a region or a city.
- Educators – educators engage in activities that aim at developing Knowledge Societies policy-making competences; educating activities might be directed towards practitioners that are (or will be) engaged in Knowledge Societies policy-making processes or they can be directed to any individuals interested in getting prepared for getting involved in such process, such as higher education students.

- Researchers – this profile includes all those that engage in research activities relevant to policy-making in the area of Knowledge Societies; as a result of their activities, researchers produce scientific knowledge that will become part of the body of knowledge relevant for Knowledge Societies policy-making; considering the nature of the area, it is envisaged that researchers can be associated to a wide range of science areas such as: political science, sociology, economics, management, public administration, information systems, e-Government, etc.
- Experts – the expert profile aims to cover all those with advanced competences in Knowledge Societies policy-making but do not fit in any of the previous profiles; experts will typically be involved in consultancy activities, advising politicians and public servants in the formulation of Knowledge Societies policies.
- Public – any individuals interested in learning about the Knowledge Societies theme but without further involvement in Knowledge Societies policy-making.

In order to have full access to the Knowledge Societies Policy Handbook and to make use of all the functionality provided by the UNKSOC.ORG Platform users, of any kind, must start by registering themselves. This is viewed as an important step that contributes to the formation of the community that the UNKSOC.ORG Platform is expected to serve. Registration facilitates that contributions are credited and that community members have a way of knowing their fellows.

In what concerns UNKSOC.ORG Platform usage, the following ways can be distinguished:

- Access to content – Navigation in the Platform gaining access to its content.
- Commenting – Participation in debates about the content, about the way the UNKSOC.ORG Platform can be used, or about themes brought up for discussion.
- Contributions – Submission of content to extend the Knowledge Societies Policy Handbook.
- Support to policy-making – Use of the platform during the policy-making process to support some of the activities and to systematize some of the documentation related to the policy-making process.

Table 35 illustrates the ways of usage of the platform that are expected for each profile.

Table 35: **User profiles and ways of using the KSOC.ORG platform**

	Practitioners	Educators	Researchers	Experts	Public
Access to content	√	√	√	√	√
Commenting	√	√	√	√	
Contributions	√	√	√	√	
Support policy-making	√				

Uploading content to the UNKSOC.ORG Platform – either through commenting or contributing – follows a moderation model. Posts and contributions will be filtered by an editorial board before being made public.

7.3. Promoting the Community

The UNKSOC.ORG Platform is viewed as a key element in the establishment of a community that shares interest, experience and learning in Knowledge Societies policy-making. Such community is expected to bring together Knowledge Societies policy-making agents and staff, researchers, experts, educators, and, as well, citizens.

The main purpose of this community is the development and sharing of knowledge about Knowledge Societies policy, thus enabling the different members to learn from each other so the Knowledge Societies paradigm can expand. Such purpose leads to a community whose boundaries are hard to define in the sense that it is the enthusiasm and commitment to the cause of Knowledge Societies that constitute the criteria for inclusion and for deciding to participate.

A community with such characteristics resembles a community of practice (Wenger, 1998)(McDermott, 1999). Although some of the characteristics of an archetypal community of practice might be missing, especially due to the heterogeneity of potential members, to view the UNKSOC.ORG community as a community of practice provides some insights regarding its establishment and evolution. The UNKSOC.ORG community can be considered to be in the Coalesce stage of development (Wenger, 1998): its Potential has already been realized but it isn't yet Active.

The UNKSOC.ORG Platform covers two important elements on the establishment and development of the UNKSOC.ORG community: providing a repository of relevant information and supporting on-line interactions among community members. A third element is constituted by face-to-face interactions among community members. This element is addressed through the participation in workshops, conferences and other types of events where community members can present and debate chief emerging issues in the area. Both academic and practice-oriented conferences are relevant to address the face-to-face interaction dimensions of a community. The ICEGOV conference – a conference that aims at bridging theory and practice in the area of e-Governance – is an example of a conference that fits well the face-to-face interaction needs of the UNKSOC.ORG community.

An Expert Group Meeting (EGM) was carried out on 29 February 2016 in Montevideo, Uruguay immediately prior to the ICEGOV 2016 conference. At this EGM, several ideas have been suggested aimed at promoting the development of the UNKSOC.ORG community and the associated development of the UNKSOC.ORG platform.

Some ideas on the constitution of such community include – the numbers represent references to specific comments in the final report of the EGM (Estevez & Janowski, 2016):

- Develop a kind of epistemic community, a transnational network of knowledge-based experts who help decision-makers define the problems they face, identify various policy solutions and assess policy outcomes (48).
- Involve communities like the Digital Agenda for Latin America and Caribbean (eLAC) in knowledge-sharing and progress tracking (50).
- Get inspiration in other open and participatory such as the Open Government Partnership (30).
- Develop a network of project managers for overseeing implementation of knowledge societies policy-making projects (51).
- The community can also be political, e.g. the National League of Cities, or based on professional networks e.g. Chief Information Officers (CIOs) networks (49).

Other ideas focus on the strategies that can be followed and initiatives that can be launched to promote the Knowledge Societies Policy Handbook and to foster the community around the Handbook, referring again to (Estevez & Janowski, 2016):

- Promote the existence of a pool of experts that act as mentors/advisors during policy-making processes (27).
- The community, supported by the platform, could be a kind of market place for research projects. Governments should create calls and search for collaboration of research units and individual researchers. Based on the unused research capacity, governments need to align the demand and supply of research (53).
- Promote professional workforce development; for example "training people together" by socializing different part of the Handbook with different groups (54).
- Conduct focus/expert groups in regions to regularly update the Handbook (56).
- Promote events in different regions (58).
- Disseminate key ideas through academic programs and think tanks (59).
- Define incentives for governments to participate (60).

7.4. Evolution of the Platform

The success of the UNKSOC.ORG Platform depends its ability to evolve. This evolution contemplates several facets:

1. Content expansion corresponding to extending the UNKSOC.ORG Platform coverage of aspects relevant to knowledge societies policy-making; an example of new content to be covered by the UNKSOC.ORG Platform is courseware – documentation to support education and training addressing the Knowledge Societies Policy Handbook and other aspects relevant to the knowledge societies policy-making.
2. Translation of content in order to make the Knowledge Societies Policy Handbook more easily accessible in countries where English isn't the official language; it is expected that translations are led by community members from such countries.
3. Update of the UNKSOC.ORG Handbook and Platform content in order to accompany the advancements in theory and practices relevant to Knowledge Societies policy-making.
4. Adjustments to the ways the UNKSOC.ORG Platform can be used in order to address the evolving needs of its users and to update forms of providing support to the community it serves.

During the aforementioned EGM, several recommendations were collected that address the evolution of the UNKSOC.ORG Platform (Estevez & Janowski, 2016).

Some of the recommendations suggest new functionalities, e.g. the Platform could offer:

1. A self-diagnosis tool, a kind of engaged independent mechanisms for members to assess their level of Knowledge Societies development (42).
2. Offer of education and training opportunities and documentation (43).
3. Use of rankings to facilitate tracking the progress and to stimulate improvements (47).
4. Develop the Indicators section of the Library in order to provide wide coverage of needs related to measurement through means such as: access to established measurement frameworks, including

frameworks that enable bench-learning; set up partnerships with institutions and agencies that make measurements of diverse facets of society relevant to the knowledge societies area (e.g., ITU, OECD, UNESCO, UN Economic Commissions, etc.) (18, 19, 20, 21).

Other recommendations call the attention to need to take into consideration what can be learnt from several already existing portals and platforms:

5. Learn from the experience of existing platforms, build on their existence and create synergies with them (39).

6. Avoid defining new services based on new requests for data to governments (44).

Part of the evolution of the UNKSOC.ORG Platform can occur by the action of the members of the community, through the regular upload of new content. However, more elaborated forms of evolution might demand the establishment of special mechanisms both for the evaluation of the Platform's success and adequacy and to gather the necessary competences for carrying out major developments in the UNKSOC.ORG Platform.

8.

Conclusions

This report provided conceptual foundations for understanding Knowledge Societies and methodological support for building and implementing locally-appropriated public policies for Knowledge Societies, and for adapting and transferring such policies between contexts.

The current report belongs to the set of four instruments developed by the United Nations University Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV) in collaboration with and co-funded by the UNESCO Information for All Programme (UNESCO/IFAP), to support the UNESCO Member States' policymaking efforts to guide and coordinate the development of nationally- or locally-appropriated Knowledge Societies.

The instruments comprise:

1. Knowledge Societies Policy Handbook, as set of conceptual and methodological frameworks, guidelines and knowhow concerning the development of public policies for Knowledge Societies (UNESCO/IFAP and UNU-EGOV, 2016b);
2. Knowledge Societies Policy Library, a collection of relevant research literature, policies, indicators, case studies and other resources relevant to the development of public policies for Knowledge Societies (UNESCO/IFAP and UNU-EGOV, 2016c);
3. Knowledge Societies Policy Platform, an electronic platform that hosts the content of the Handbook and Library and facilitates the updates and additions to this content by community members through digital devices and channels (UNESCO/IFAP and UNU-EGOV, 2016d); and
4. Knowledge Societies Policy Community, a community of researchers, academics, policymakers, government officials and other stakeholders who, as part of their contribution to planning, developing, implementing and evaluating public policies for Knowledge Societies in the national or local context, are willing to use the Handbook, Library and Platform, and share the outcomes and experience for others to learn (UNESCO/IFAP and UNU-EGOV, 2016a).

The usage and further development and appropriation of such instruments is planned as part of a follow up project (Janowski & Estevez, 2016).

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