International Telecommunication Union

National e-Strategies for Development
Global Status and Perspectives
2010

Prepared in collaboration with:

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on the Information Society
Turning targets into action

National e-Strategies for Development

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Message from the Secretary-General of the International Telecommunication Union

In today's world, information and communication technologies (ICT) have a profound effect on most socio-economic, political and cultural aspects of society; they have become indispensable tools in the implementation of national development plans in many countries, supporting their efforts to secure the welfare and prosperity of their citizens. Yet, the prevalence of digital divisions worldwide hinders the application of ICT capabilities in areas vital for development, such as agriculture, health and education, impeding progress towards the achievement of an inclusive digital society.

With this in mind, nine years ago, the UN General Assembly endorsed the World Summit on the Information Society, held in two phases, in Geneva 2003 and Tunis 2005. In particular, it encouraged governments, as part of the implementation of its *Tunis Agenda for the Information Society*, to establish before 2010, "comprehensive, forward-looking and sustainable national e-strategies, including ICT strategies and sectoral e-strategies, as an integral part of national development plans and poverty reduction strategies" (Para. 85), in order to unleash the full potential of ICT for development.

On the occasion of the fifth anniversary of the WSIS' Tunis phase, and having reached the 2010 deadline proposed in the Tunis Agenda, ITU is especially glad to publish the "*National e-Strategies for Development: Global Status and Perspectives, 2010*" report, in the framework of the WSIS Forum. This publication reports on the excellent work accomplished so far in the development of national e-strategies, while pointing out areas where there is room for improvement. I encourage all WSIS stakeholders to persevere in their endeavours to develop sustainable national e-strategies and improve those already in existence by addressing some of the gaps identified in this report.

ITU remains committed to supporting the efforts of its Member States in this area, facilitating the adoption of ICT strategies and applications that will allow us to move together towards a better, more inclusive, future.

Dr Hamadoun I. Touré
Secretary-General
International Telecommunication Union
Geneva, May 2010

Foreword

For many years, the Telecommunication Development Bureau of the International Telecommunication Union (ITU-D) has undertaken various activities related to the study of the potential benefits of ICT solutions for developing countries, as well as to the implementation of these applications through pilot projects in different countries. ITU-D is also constantly engaged in assisting Member States in the elaboration of national e-strategies.

Many Member States have succeeded in meeting the targets set forward by the World Summit on the Information Society (WSIS), and have incorporated WSIS' recommendations into their own policies. I am pleased to observe that at least 84 percent of all economies have fulfilled the WSIS target of having a national ICT strategy in place by 2010, and at least another 7 percent are in the process of developing such a strategy. Moreover, there is a consensus among stakeholders that areas like health care, agriculture and environmental protection, among others, could benefit from the adoption of ICT. I am reassured by our collective capacity to make real changes in our lives through increased ICT use. This is great news for all of us.

The analysis of national e-strategies included in this report indicates the need to revisit the plans relating to the vision, strategic orientation and ethical dimension of the Information Society. Many countries would benefit also from the formulation of more comprehensive sectoral e-strategies, based on the useful lessons learnt from implementation of scalable pilot projects.

The findings of this report illustrate that a lot has been accomplished already by the 2010 deadline. Yet, we have to continue our work to move forward towards the digital future and the knowledge-based economy. I hope that this report will provide useful insights on how best to strategically use ICT to reach this goal.

Mr. Sami Al Basheer Al Morshid
Director, Telecommunication Development Bureau
International Telecommunication Union
Geneva, May 2010

Abstract

In its Paragraph 85, the *Tunis Agenda for the Information Society* denotes the leading role that governments, in partnership with other stakeholders implementing the outcomes of the World Summit on the Information Society (WSIS), have in the elaboration of "comprehensive, forward-looking and sustainable national e-strategies, including ICT strategies and sectoral e-strategies […], as an integral part of national development plans and poverty reduction strategies, […] before 2010".[1]

The report "National e-Strategies for Development: Global Status and Perspectives, 2010" provides a high-level update and an overview of the progress countries have made in their effort to develop national e-strategies, ICT strategies and sectoral e-strategies, analyzing as well the extent into which ICT have been incorporated into poverty reduction strategies and other national development plans.

In order to provide a broad analysis of ICT strategies, this report describes strategic approaches of national e-strategies and provides three examples of national ICT strategies, detailing their evolution over time.

The report identifies at least 161 economies (84 percent) that have already met the WSIS target of having a national ICT strategy in place by 2010. It also indicates areas where existing national e-strategies could be improved, such as their strategic orientation and their integration into national development plans and poverty reduction strategies. Based on the analysis of sectoral e-strategies, the report also emphasises the need for more comprehensive sectoral e-strategies that take full advantage of the potential ICT have for the economy and society. Finally, the appendix provides the reader a comprehensive list of national ICT strategies developed by ITU Member States.

The information presented in this report comes largely from the WSIS stocktaking,[2] an extensive online research initiative conducted by the International Telecommunication Union (ITU), which brings together national ICT and sectoral e-strategies of ITU's Member States, as well as publications by the five UN Regional Commissions.

[1] ITU. (2005). Paragraph 85.

[2] The WSIS Stocktaking database is available through ITU at http://www.itu.int/wsis/stocktaking/index.html.

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1 Introduction

The report "*National e-Strategies for Development: Global Status and Perspectives, 2010*" is published in the framework of the World Summit on the Information Society (WSIS), on the occasion of the fifth anniversary of its Tunis phase and of the adoption of the *Tunis Agenda for the Information Society*. The report was launched by ITU in May 2010, in Geneva, Switzerland.

The interest of this report on the status of **national e-strategies** stems from their fundamental role as preconditions for bridging the digital divide, that is, the gap between people with access to ICT and those with limited or no access to them. Further, e-strategies are believed to enable socio-economic development. For this reason, as illustrated in Box 1.1 below, the WSIS outcomes encourage countries to incorporate ICT into their national development plans and, in the particular case of lower income economies, to integrate national e-strategies into their poverty reduction plans.

Box 1.1: Call for national e-Strategies in WSIS documents
Call for e-strategies in the Tunis Agenda and the Geneva Plan of Action

Call for e-strategies in the Tunis Agenda and the Geneva Plan of Action
The *Tunis Agenda for the Information Society* encourages governments, in particular, to elaborate national e-strategies.

Tunis Agenda for the Information Society (2005)Paragraph 85
"Taking into consideration the leading role of governments in partnership with other stakeholders in implementing the WSIS outcomes, including the Geneva Plan of Action, at the national level, we encourage those governments that have not yet done so to elaborate, as appropriate, comprehensive, forward-looking and sustainable national e-strategies, including ICT strategies and sectoral e-strategies as appropriate, as an integral part of national development plans and poverty reduction strategies, as soon as possible and before 2010."

Geneva Plan of Action (2003)
Action Line C1. The role of governments and all stakeholders in the promotion of ICTs for development.
8a. "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."

Source: ITU (2003) and (2005).

This report uses three related concepts that need to be distinguished: An **ICT strategy** is a general plan on how to bring a society and its economy forward through the use of ICT; **sectoral e-strategies**, on the other hand, break down the general ICT strategy into policies for specific sectors, such as health, education or administration. Sectoral strategies are called "e" for electronic, followed by the name of the area the strategy applies to, for instance, e-health, e-learning or e-government. Together, ICT strategies and sectoral e-strategies constitute **national e-strategies**,[3] which is the super-ordinate concept.

[3] The Tunis Agenda states in this respect: "Throughout this text, further references to "e-strategies" are interpreted as including also ICT strategies and sectoral e-strategies, as appropriate." ITU. (2005). Footnote 1.

The **purpose of this report** is to address the following questions:

- What is the status of national e-strategies worldwide in 2010?
- What strategic approaches or trends can be identified in current Information and Communication Technologies (ICT) strategies? How can they be explained?
- What is the status of sectoral e-strategies in particular? Which common trends can be observed?
- Have national e-strategies been integrated into poverty reduction strategies?
- How have ICT strategies evolved over time?

To attend to these questions, ITU, in close collaboration with the **five UN Regional Commissions**,[4] collected information on national e-strategies for all its Member States to provide a comprehensive global overview. General findings on the current status of and a regional perspective on national e-strategies are discussed in *Chapter 2*.

The Tunis Agenda calls for the development of "appropriate, comprehensive, forward-looking and sustainable" e-strategies.[5] To obtain evidence on the quality of current **ICT strategies**, *Chapter 3,* in *Section 3.1* of the report, analyses the extent to which the content of a sample of strategies reflect the action lines defined in the *Geneva Plan of Action* of the WSIS.[6] The analysis is based on a random sample of 32 economies from the four income groups defined by the World Bank: low, lower-middle, upper-middle and high.[7] Box 1.2 below lists the economies from each income group that were used in the analysis.

Box 1.2: Sample of ICT strategies analysed
As described in Section 3.1, by income group

Low income group:	Gambia, Ghana, Kenya, Kyrgyzstan, Malawi, Mozambique, Nepal, Tanzania
Lower-middle income group:	Albania, Azerbaijan, Bhutan, Egypt, Jordan, Lesotho, Moldova, Nigeria
Upper-middle income group:	Fiji, Jamaica, Lithuania, Macedonia, Malaysia, Mauritius, Poland, Turkey
High income group:	Finland, Iceland, Ireland, Malta, Oman, Saudi Arabia, Trinidad & Tobago, the State of the United Arab Emirates

Source: ITU.

[4] The UN regional commissions include the United Nations Economic Commission for Europe (ECE), the United Nations Economic Commission for Africa (ECA), the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Economic and Social Commission for Western Asia (ESCWA).

[5] ITU. (2005). Paragraph 85.

[6] See ITU. (2003). Section C. Action Lines.

[7] Regarding its method for allocating economies into income groups, the World Bank states: "Economies are divided according to 2008 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, $975 or less; lower middle income, $976 - $3,855; upper middle income, $3,856 - $11,905; and high income, $11,906 or more." World Bank. (n.d.). *Income Group*.

The analysis of **sectoral e-strategies** included in this report is based on a random selection of strategies for each of the eight fields of ICT applications, as listed in Action Line C7 of the *Geneva Plan of Action*.[8] *Section 3.2* of the report provides some examples of well-elaborated and forward-looking strategies for each e-sector.

Section 3.3 provides an analysis of the **integration of e-strategies into poverty reduction strategies**. The author analysed twenty-four Poverty Reduction Strategy Papers (PRSPs),[9] developed by the World Bank, from which four examples were selected for discussion: Two exemplify cases of forward-looking and comprehensive integration of ICT strategies, while the other two are examples of PRSPs with potential for improvement.

Section 3.4 describes **strategic approaches and trends** identified in national e-strategies, illustrating the findings with concrete examples.

Finally, *section 3.5* examines the **evolution of national e-strategy plans** in three countries, namely Japan, Egypt and Poland, as examples of how strategy development can adapt to a changing environment.

The ITU **WSIS stocktaking database** was used as the primary source for the analysis of Member States' achievements in meeting the Tunis Agenda's target for national e-strategies.[10] Moreover, for the purpose of this paper and to present a comprehensive overview of the status of national e-strategy development, ITU searched for and collected ICT strategies and some sectoral e-strategies for its 191 Member States, using government Internet sites and search engines. The list of identified strategies is presented in *Appendix A1*.

8 *ICT Applications include E-government, E-business, E-learning, E-health, E-employment, E*-environment*, E-agriculture and E-science. See ITU. (2003). Action Line C7, para. 14-22.*

9 World Bank. (n.d.). *Country Papers and JSANs/JSAs*.

10 ITU invited governments and other WSIS stakeholders to provide updated information for the WSIS stocktaking database from 15th January to 30th March 2010. National reports on WSIS implementation are available through ITU at http://www.itu.int/wsis-implementation/national/flash/index.html.

2 General Overview

2.1 Global status of national e-strategies

Most countries have met the WSIS target of developing national e-strategies by 2010. At least 84 percent of all economies have a national e-strategy in place, and at least 14 economies are in the process of developing such a strategy.

As of April 2010, 163 countries and territories, that is, 85.3 percent of all ITU Member States, already had a national e-strategy in place, while another 13 countries and territories (6.8%) are currently formulating and adopting one. Six countries (3.2%) do not have a national e-strategy in place, and the status of ICT strategy formulation in the remaining 9 economies (4.7%) is unknown, due to lack of information. It is possible, however, that some of the economies in the latter group have also formulated an ICT strategy or are in the preparatory process. Some European countries, for instance, follow the regional ICT strategy "iD2010"[11] of the European Union.

Lichtenstein, **Monaco** and the **Vatican**, small economies strongly connected to their neighbouring countries, might have no need for developing their own national e-strategies. Finally, there is no data available on national e-strategies for the **Marshall Islands**, **Nauru**, **Tonga** and **Vanuatu**. Nevertheless, the *Pacific Plan for Strengthening Regional Cooperation and Integration* and its *Pacific Regional Digital Strategy* are encouraging countries in the Pacific region to develop ICT strategies.[12] Therefore, it is possible that these island states are already in the process of formulating such strategies.

2.2 Regional perspectives

There are similarities among ICT strategies from the same world region.

The ICT strategies of the **Asia-Pacific** economies share a focus on policies relating to the regulatory regime, as well as an interest in promoting ICT infrastructure, cybersecurity and the creation and control of local content. Following the recommendations of the *Regional Action Plan towards the Information Society in Asia and the Pacific*,[13] many Asian-Pacific countries have formulated ICT policies to establish enabling regulatory environments. In doing so, many countries dissolved their telecommunication monopolies and established independent regulatory authorities, [14] facilitating the introduction of liberalisation, privatisation and competitive practices in the region's ICT sector.[15] The new strategies covered not only traditional regulatory topics, such as universal service, unbundling of the local loop, frequency allocation and number portability, but also set regulations for cyberspace, such as digital rights management and spam controls.[16]

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11 European Commission. (n.d.). *The European Broadband Portal*.

12 Pacific Island Forum Secretariat. (2009). p. 6.

13 ESCAP. (2009b). p. 17.

14 Ibid.

15 ESCAP. (2008). p. 4.

16 Ibid.

In **Latin America and the Caribbean**, several countries, including **Brazil** and **Mexico**, had developed ICT policies during the 1960 and 1970s.[17] Although different stages of development, most countries in this region had developed a national e- strategy. The process has been fostered by the Regional Action Plan for the Information Society in Latin America and the Caribbean (eLAC), that has started in 2005 under ECLAC's coordination. The Action Plan has been supported by regional governments, private sector, non- Governmental Organisations (NGO's) and members of civil society. By the time of the first WSIS phase, most economies in the region had already an overall ICT vision in place and were working on the formulation of their strategies. ICT were high up on the agenda of the heads of state of countries like **Chile**, **Colombia**, **Mexico** and **Trinidad and Tobago**, resulting in the development of ICT strategies that address issues of infrastructure, e-government and education.[18]

The **Caribbean region,** in particular, is considered to have potential "for becoming an international hub of Information and Communications Technologies (ICT) services hosting, outsourcing and delivery"[19] for North, Central and South America. Some of the regional characteristics, such as its native languages (Spanish and English) and its time zone, are considered advantageous "for 'near-shore' business".[20]

In general, **Africa** is the continent with the lowest penetration of ICT, as well as the region where the formulation of ICT strategies has taken place at the slowest pace. By the first phase of WSIS in 2003, only 17 African countries had developed ICT strategies.[21] The existing ICT policies are characterized by their emphasis on addressing the lack of infrastructure, as well as the poor regulatory environment and financing mechanisms. In terms of infrastructure and the regulatory environment, many African countries have favoured privatisation. Some countries have also addressed in their policies issues of access for all and poverty reduction through employment opportunities. Non-governmental organisations (NGO's) and members of civil society were very active in Africa, influencing the development of ICT policies in the region.[22] According to a recent ECA survey, 90 percent of the African countries consider ICT as their national priority.[23]

The **Arab** economies show different stages of development in their evolution towards the Information Society. While some countries have already taken measures to facilitate the transformation of their societies, others are just taking their first steps or are still facing basic challenges posed by insufficient ICT infrastructure. Nevertheless, almost all Arab countries or territories are fulfilling the WSIS recommendations concerning the formulation of ICT strategies, having either developed such a strategy or being ready to adopt existing drafts. According to ESCWA, almost half of the 13 countries[24] in its region had elaborated their first ICT strategies between 1999 and 2003, and an additional four economies did so between the two phases of WSIS.[25] In fact, understanding the great impact that furthering ICT development could have for the region, many of the Arab economies were very engaged in the period of preparation for WSIS, as well as during the Summit's two phases.[26]

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17 ITU Regulators Knowledge Centre, http://www.itu.int/ITU-D/ICTEYE/Regulators/Regulators.aspx; T. Unwin. (2009). pp. 153.

18 Ibid.

19 ECLAC (2010). p. 1.

20 Ibid.

21 T. Unwin. (2009). p. 158.

22 Ibid.; ESCWA. (2009). p. 5.

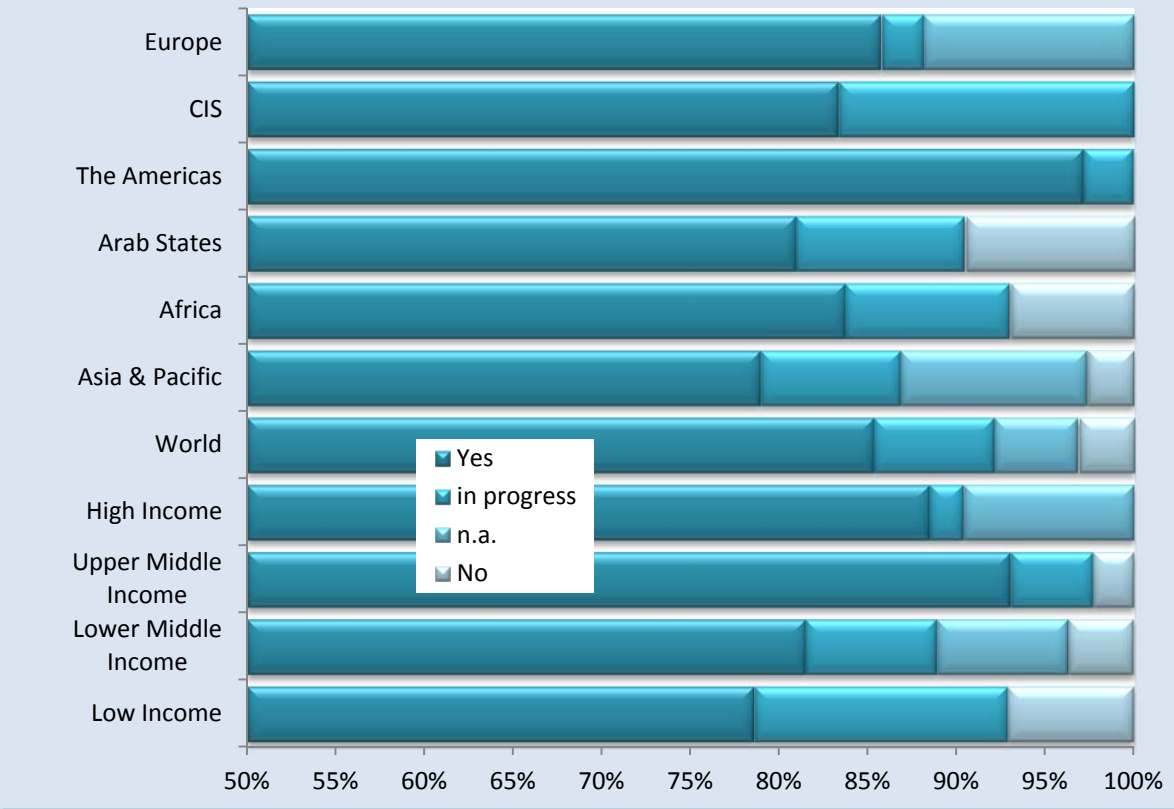
23 ECA. (2009). p. 3.

24 ESCWA's countries or territories include Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syrian Arab. Republic, United Arab Emirates and Yemen.

25 ESCWA. (2009). p. 6.

26 ITU. (2009a). p. 18.

Figure 2.1: Global status of ICT Strategies
Percentage of regions and income groups with national e-strategies in place or in progress in 2010.



Source: ITU WSIS Stocktaking.

Finally, in the **European** and **CIS** countries, ICT strategies share a common focus on the knowledge-based economy,[27] with many of them including legislations that enable e-business, such as e-payment or authentication.[28] While the digital divide that existed between the countries in transition and Western Europe is decreasing, the broadband gap seems to be widening. Some of the strategies proposed to bridge this divide include providing broadband Internet to a larger number of users and deploying mobile broadband infrastructure.[29] Many countries in the region also face the challenge of promoting digital literacy to close internal digital divides.

The UN Regional Commissions have supported the elaboration of national e-strategies in their respective regions. To name a few examples, the *UN Economic Commission for Latin America and the Caribbean (ECLAC)* assists countries in its region with coordination and sharing of good practices and acting as the Technical Secretariat for the implementation of the Regional Action Plan monitoring the progress in fulfilling their goals. Further, in Africa, the *United Nations Economic Commission for Africa* (*ECA)* is running the *African Information Society Initiative (AISI)* since 1996. ECA also collected information on the priorities of its Member States through a questionnaire sent to the regional economic communities and to all the national information and communication infrastructure and

[27] ECE. (2009a). p.2.
[28] ECE. (2009b). p. 1.
[29] ECE. (2009c). p. 3.

WSIS focal points within its region, to assess their commitment to the implementation of the WSIS Plan of Action.[30]

Similarly, the *UN Economic and Social Commission for Western Asia (ESCWA)* has supported several of its Member States with the development of ICT strategies. In the Asia Pacific region, the *United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)* has promoted the development of "comprehensive and articulated policy […] at the national level in order to enhance national capacity in building national and regional information societies and to achieve the MDGs."[31] Finally, the *United Nations Economic Commission for Europe (ECE)*, jointly with ESCAP, is supporting ICT policy development in the economies of Central Asia through the UN *Special Programme on the Economies of Central Asia (SPECA)*.[32]

[30] ECA. (2009). p. 1.

[31] ESCAP. (2009a). p. 7.

[32] ECE. (2009c). p. 4.

3 Analysis

3.1 ICT Strategies

The national ICT strategies analysed in this section address diverse aspects of the WSIS action lines proposed in the *Geneva Plan of Action*. Several of these strategies follow a future-oriented and comprehensive approach, as recommended in the Tunis Agenda. Nevertheless, some would benefit from improving their approach to the vision, strategic orientation and the ethical dimension of the Information Society.

Paragraph 85 of the Tunis Agenda for the Information Society encourages governments to elaborate and adopt "appropriate, comprehensive, forward-looking and sustainable" national e-strategies. This section provides examples of innovative ICT strategies along the WSIS Action Lines.

WSIS Action Line C2: Information and communication infrastructure

WSIS Action Line C2 considers information and communication infrastructure "an essential foundation for the information society". Following WSIS' lead, many countries have included the improvement of ICT infrastructure among the objectives of their ICT strategies. The *ICT Policy for* **Lesotho**, for instance, proposes a forward-looking approach that targets universal access, encourages infrastructure sharing, endorses competition and technology neutrality and promotes public-private partnerships.[33] The policy aims at achieving universal access for all. To this end, Lesotho intended to create a Universal Service Fund to promote the expansion of ICT infrastructure in rural areas.[34]

In Latin America and the Caribbean, the information and communication infrastructure is the most common line in the ICT agenda of the Information Society. The Digital Strategy 2007-2012 for **Chile** provides ICT infrastructure expansion in the territories which do not have such, in order to explore how to have a better-quality Internet connectivity at the reasonable prices.[35]

In **Costa Rica**, the Plan of the Telecommunication Development 2009-2014 includes actions for services and universal access. This Plan seeks to ensure that telecommunication is essential enabling factor enhancing the society of information and knowledge.[36]

Similarly, in **Mexico,** the digital agenda *eMexico* intends, among other goals, to provide all the population universal access to telecommunication means.[37] Market forces are expected to drive broadband deployment,[38] and, in remote areas, community telecentres are being used to give the rural population access to broadband services.[39]

Bhutan*'s Information and Communications Technology Policy and Strategy* also follows a forward-looking approach regarding infrastructure. It explicitly demands the adoption of "the most up to date open standards that are compatible with foreseeable future technologies".[40]

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33 Lesotho. (2005). p. 27.

34 Ibid. p. 28.

35 Digital Strategy Chile 2007- 2012.

36 Costa Rica, Plan of Telecommunication Development 2009- 2014.

37 Mexico, Dirección General de Comercio Interior y Economía Digital. (2010). p. 3.

38 Ibid. p. 1.

39 Ibid, p. 2.

40 Bhutan, Royal Government of. (2004). p. 22.

Finland, a country with advanced and far-reaching fixed broadband infrastructure, continues moving forward its infrastructure by promoting the deployment of wireless broadband and mobile 3G networks.[41]

WSIS Action Line C3: Access to information and knowledge

Other factors, beside the availability of infrastructure, can hinder access to and use of ICT. For this reason, WSIS Action Line C3 aims at increasing access to information and knowledge from a non-infrastructural perspective. Countries are giving priority to different issues under this action line in order to respond to their local circumstances.

In Agenda of the Digital Solidarity, which is a part of the Telecommunications Development Plan, **Costa Rica** seeks to ensure telecommunication services through the installation of telecentres specific communities (disabled, youth at risk, elderly, indigenous, digital illiterate). It focuses on the inhabitants of these countries, who are in vulnerable economic, social and geographical conditions.[42]

The government of **Gambia**, for instance, aims at improving access to information and knowledge in the country, especially for "non-literate, persons with disabilities, disadvantaged and vulnerable groups".[43] To this end, the government is promoting the development of software and content in local languages and setting up community-based multipurpose community telecentres.[44]

ICT education[45] and the establishment of public access points at the National Library, as well as at its branches and post offices[46] are also part of **Lesotho**'s strategy to make ICT accessible to all.

WSIS Action Line C4: Capacity building

The success of ICT policies depends largely on the human factor. Therefore, most countries are promoting ICT-related capacity building as part of their ICT strategies.

In the case of **Jamaica,** ICT literacy is not limited to advancing the use of ICT at schools, supporting teaching and education, but also includes integrating ICT into the curriculum, making it a subject in itself.[47] By the same token, different private and public organisations — among them the Jamaica Sustainable Development Network Programme (JSDNP) — are taking advantage of existing telecentres to provide training on the use of ICT.

Through the CEIBAL Plan, **Uruguay** aims to provide by 2010 personal computer to all students and teachers of the Primary Education Council, as well as training for all teachers in use of such computers for educational purposes. Currently, this project is implementing as the pilot project in El Salvador.

Albania considers the integration of ICT into the high school curriculum a matter of high strategic importance. In 2005, the country approved a Master plan for e-schools that aims at installing computers in all Albanian schools and connecting them through broadband.[48]

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41 Finland, Government of. (2008). p. 11.

42 Costa Rica, Plan of Telecommunication Development 2009- 2014.

43 Gambia, Government of, Department of State for Communication, Information and Information Technology (DOSCIIT). (2008). p. 80.

44 Ibid., p. 63.

45 Lesotho. (2005). p. 30.

46 Ibid., p. 36.

47 Jamaica, Central Information Technology Office (CITO). (n.d.). p. 17.

48 Albania, Republic of, Council of Ministers, Minister of State for Reforms and Relations with the Assembly. (2010), pp. 22-23; UNDP, Albania. (2010).

Responding to the demand of the labour market for well-trained and educated multilevel ICT professionals,[49] the government of **Kyrgyzstan** has made capacity building one of the priorities of its national ICT strategy.[50] This strategy promotes the use of distance learning not only for educational purposes but also to improve public administration, enhancing staff capabilities at different levels of government. [51] Kyrgyzstan's distance learning programme takes advantage of regional and international experiences, following a multi-stakeholder approach that brings together representatives from the private sector, civil society and international organisations, such as the UN Development Programme (UNDP).[52]

Estonia also intends to increase human capacity in the ICT sector. To advance digital literacy among its citizens, the government is improving the quality of higher education on technology-oriented subjects and educating high level IT specialists, in cooperation with the private sector. Among its goals, the government strategy aims at: Educating IT support staff systematically in a new Vocational Education and Training (VET) framework; training teachers on ICT to make use of these technologies in classrooms; improving the use of e-learning, and making scientific documents available online. Estonia also participates in EU programmes to support research and development (R&D) activities in ICT-related areas.[53]

Similarly, **Gambia** intends "to develop the human capital base",[54] while **Oman** wants to transform the country "by empowering its people, through the eOman initiative, besides opening up thousands of job opportunities for nationals in the IT sector, within the digital society".[55] Similarly, **Mexico** plans to develop its human capacity for software and service production, both in quality and quantity terms.[56]

WSIS Action Line C5: Building confidence and security in the use of ICTs

Governments are constantly balancing conflicting goals: They promote local cultures, protect privacy and secure critical information infrastructure, while, at the same time, trying to ensure freedom of expression, enable international trade laws and further the global information age.

To build confidence in the use of ICT and "not become a haven of cybercrime",[57] the government of **Tanzania,** for instance, is planning to develop cybersecurity rules and regulations to protect electronic transactions "susceptible to electronic criminality",[58] and shield minors from inappropriate content or from "those that promote behaviour that might endanger minors and society".[59]

The governments of Lithuania and Mauritius follow a similar trend. **Lithuania** "fosters the trust of customers and enhances social cohesion",[60] while **Mauritius** plans on "fostering a culture of security

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49 Ibid., p. 5.

50 Kyrgyz, Republic of. Ministry of Transport and Communication. (2002). p. 3.

51 Ibid., p. 5.

52 Ibid., p. 2.

53 Estonia, Government of. (n.d.). p. 8.

54 Gambia, Government of, Department of State for Communication, Information and Information Technology (DOSCIIT). (2008). p. 10.

55 Oman, Sultanate of, Information Technology Authority (ITA). (2007). p. 18.

56 Mexico, Dirección General de Comercio Interior y Economía Digital.p. 1.

57 Tanzania, the United Republic of. Ministry of Communications and Transport. (2003). p. 15.

58 Ibid., p. 16.

59 Ibid.

60 Lithuania, Government of the Republic of. (2001). p. 3.

and trust in ICT"[61] and "promoting uptake of ICT in economy and society through high levels of trust and confidence".[62]

Malawi also targets "issues related to aspects of the Internet that can potentially damage or corrupt Malawi's cultural heritage, national image and national identity".[63] Further, it plans to fend off all attacks against the "availability, authenticity, integrity and confidentiality"[64] of its government IT network. At the same time, Malawi's strategy aims at the promotion of e-commerce and the country's "participation in the information age and economy".[65]

Ireland is an experienced country in the area of cybersecurity. In 2000, the country established an *Internet Advisory Board* to monitor a system of self-regulation in relation to illegal and harmful content by the Internet Service Provider Industry.[66] Ireland's ICT strategy is also exemplary in terms of the promotion of regional cooperation on the issue of cybercrime.

Regional and international cooperation on cybersecurity is particularly crucial since cybercrime and the Internet are transboundary by nature. Not surprisingly, cybersecurity is one of the priority domains for ITU's Programme 3 of the Doha Action Plan.[67] Under this Programme, ITU facilitates study groups, as well as regional and inter-regional cooperation initiatives on cybersecurity issues, in which many of its Member States are actively involved.

WSIS Action Line C6: Enabling environment

"Enabling environment", the focus of WSIS Action Line C6, refers to the "rules of the game" governments set for the participation of different actors in the field of ICT. Under this action line, **Saudi Arabia** seeks, for example, to "encourage domestic companies to build local ICT industries"[68] by establishing Free Zones, which are expected to function as incubators for Small and Medium Sized Enterprises (SMEs) in the ICT sector.[69] Further, Saudi Arabia intends to set regulations on e-transactions for both the public and private sectors[70] in order to enhance the use of ICT for business transactions and government services.

In contrast, **Iceland**'s strategy in this area is focused on eliminating barriers to electronic transactions. As a result, the country is expected to streamline existing legislation, facilitating the introduction of "eIDs",[71] allowing online payment for e-government transactions and enhancing electronic procurement.[72] In Iceland, SMEs should also receive support from the *Innovation Centre Iceland*.[73]

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61 Mauritius, Republic of. (n.d.). p. 6.

62 Ibid.

63 Malawi, Republic of. (2003). p. 40.

64 Ibid.

65 Ibid., p. 41.

66 Ireland, Government of. (2002). p. 11.

67 For more information on ITU's cybersecurity activities see http://www.itu.int/ITU-D/cyb/cybersecurity/index.html.

68 Saudi Arabia, Kingdom of, Ministry of Communications and Information Technology. (n.d,). p. 42.

69 Ibid., p. 72.

70 Ibid., p. 65.

71 Iceland, Government of, Prime Minister's Office. (2008). p. 10.

72 Ibid., pp. 10-11.

73 Ibid., p. 13.

In **Chile**, the Technology Policy for the Digital Development mentioned in the Digital Strategy 2007-2012, recognizes the need for an appropriate legal framework in the areas such as net neutrality, intellectual property, data protection, computer crime, and consumer rights on the Internet.

Similarly, **Ghana**'s *ICT for Accelerated Development (ICT4AD) Policy* seeks to streamline regulation, while protecting basic rights. The Policy has as a goal to *"*as far as possible create a flexible and dynamic legal and regulatory framework and system that restricts regulation to the necessary minimum, reinforce competition within the industry and sector, while ensuring that the basic rights, choices and preferences of consumers continue to be protected*"*.[74]

The **Peruvian** Digital Agenda focuses on the promotion and strengthening the regulatory system for free and fair competition. That kind of competition encourages investment in the telecommunication market and permits users to benefit access to better quality of services and the lower fares.[75]

Finally, it should be clarified that this action line covers all aspects of telecommunication regulation, which is at the heart of most ICT strategies. For instance, **Saudi Arabia**'s *National Communication and Information Technology Plan*[76] addresses licensing issues, including granting additional licences for the provision of fixed-line and mobile cellular services.

WSIS Action Line C7: ICT applications — benefits in all aspects of life

WSIS Action Line C7 refers to eight different areas of electronic applications: e-Government, e-business, e-learning, e-health, e-employment, e-environment, e-agriculture and e-science.

Many ICT strategies include approaches for the adoption of *e-government*. **Mauritius**, for instance, formulated its intention to accelerate e-government in its *National ICT Strategic Plan 2007-2011*. The plan focuses on enhancing "citizen convenience"[77] and increasing "internal effectiveness and efficiency".[78] So far, the government has developed an online portal, and it is seeking to expand its reach by adopting "multi-channel delivery" in the upcoming years.[79] Mauritius' multi-channel and transactional approach is a smart plan for the future, in line with up-to-date practices of advanced government electronic services. Additionally, Mauritius recognises the need to create an "eGovernment Cell", a monitoring and advising body in charge of overseeing and ensuring the transparency of different e-government initiatives.[80]

Hong Kong is among the most advanced economies in terms of the provision of e-government services. Holders of a smart Identity Card in Hong Kong are able to perform "self-service immigration clearance at control points installed with e-channels, where the fingerprint verification technology is deployed for authentification of a person's identity."[81] In its *Digital 21 Strategy*, Hong Kong has laid down its strategy for e-government services, which is based on further integration across departments.[82] In a mid-term perspective, Hong Kong seeks to encourage "increasing interface with citizens and businesses".[83]

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74 Ghana, Republic of. (2003). p. 69.

75 The Peruvian Digital Agenda.

76 Saudi Arabia, Kingdom of, Ministry of Communications and Information Technology. (n.d.). p. 67.

77 Mauritius, Republic of. (n.d.). p. 34.

78 Ibid.

79 Ibid., p. 35.

80 Ibid.

81 Hong Kong, Government of. (2007). p. 14.

82 Ibid., p. 8.

83 Ibid., p. 21.

Albania pays great attention to e-government in its approach towards the Information Society. Since 2007, for instance, businesses are able to register online, reducing registration time from 42 days to one.[84] Further, the government has set up an electronic procurement system, introduced citizen ID cards with biometric data and facilitated electronic tax filing.[85]

In **Argentina**, the National Plan on Electronic Government (2005) seeks to provide the measures for the simplification of procedures, particularly those ones involving multiple jurisdictions in order to facilitate transactions with the inhabitants, citizens and users.

Colombia launched its first e-government strategy in 2000, as part of the Colombian *Connectivity Agenda*. The Agenda was revised in 2006, focusing it particularly on e-government, and was re-launched in 2008. Colombia's current e-government strategy aims to "contribute on building a more efficient, transparent and participative Government, which provides better services to citizens and companies by means of taking advantage of the ICT."[86]

The National ICT Strategy 2008-2018 in **Panama** aims to develop the ICT sector and intends to make Panama an international center with the worldwide ICT entrepreneurships.

The ICT strategies of many countries have given particular attention to the introduction of e-business applications. *E*-**Moldova**, for instance, addresses the need to establish a national electronic payment system, seeking to fulfil international requirements and widen export opportunities for Moldovan goods.[87] Moldova, **Mozambique** and many other countries are enabling e-business through two complementary approaches: First, by establishing e-payment systems and secondly, by supporting SMEs' adoption of e-business.[88]

Furthermore, the adoption of ICT by the health sector is a prominent strategy in many countries. **Mozambique**, for example, intends to create an ICT infrastructure "capable of interconnecting the country's main health units, the electronic management of patients' profiles and the management of pharmaceutical stocks".[89]

In **Hong Kong**, for instance, one company is in charge of the majority of hospitals and has a large share on the whole health care system. This company keeps track of patients' data through a Clinical Management System.[90]

WSIS Action Line C8: Cultural diversity and identity, linguistic diversity and local content

Several countries have included this action line into their ICT strategies. As mentioned above, **Gambia** is supporting the development of software and content in local language.[91]

Similarly, **Kenya** considers the "underdevelopment of local content"[92] as a challenge. Kenya aims to "develop local content in ICTs for greater access and relevance to the citizen. To this end, the country's strategy on local content will: "Support locally based development on IT applications and multimedia content for productivity; [e]ncourage the use of local language in developing content;

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84 Albania, Republic of, Council of Ministers, Minister of State for Reforms and Relations with Assembly. (2010), p. 20.

85 Ibid; Albania, Republic of, Council of Ministers, National Agency for the Information Society. (n.d.), pp. 13-15.

86 Colombia, Government of. (2010).

87 Moldova, Republic of. (2005). p. 28.

88 Ibid; Mozambique, Republic of, The Council of Ministers. (2002). p. 55.

89 Ibid., p. 47.

90 Hong Kong, Government of. (2007). p. 60.

91 Gambia, Government of, Department of State for Communication, Information and Information Technology (DOSCIIT). (2008). p. 80.

92 Kenya, Republic of, Ministry of Information and Communications. (2006). p. 7.

[e]ncourage the development of content that captures and preserves knowledge and culture of local communities; [p]romote electronic publishing, collection and preservation of local materials; and [e]ncourage the development and management of information and knowledge resources as a national heritage."[93]

WSIS Action Line C9: Media

Due to digital convergence, media are nowadays considered an integral part of ICT. Many countries no longer address media explicitly in their ICT strategies. The countries that do, tend to limit the issue to addressing the responsibilities broadcasters have regarding the provision of local content and space for advertisement, as well as the support of national/local identity. **Kenya**,[94] for instance, follows such an approach.

Finland, in contrast, considers media, such as broadcasting services, even more relevant in the Information Society age. In its ICT strategy, Finland emphasises the availability of radio and television through new compression techniques. As a result, the country's government is expected to revise its media legislation in the coming years to address on-demand services.[95] Moreover, as illustrated in Box 3.1 below, Finland follows a future-oriented approach, empowering consumers through media education.

Box 3.1: Finland – Educating children and young people as informed consumers
Approach

"Today's children and young people are the information society's new generation. […] For this, they need media education, i.e. guidance in perceiving the information environment and responding to the endless flow of information, means to protect themselves from harmful, illegal and unwanted content, the preparedness to report disquieting or frightening content and actions, as well as the capacity to take advantage of the channels of influence and information sharing offered by technology. The objective is to promote the development of media literacy in children and young people so that they have the ability and skills to process media content critically and from various perspectives."

Source: Finland. (2008). *Ubiquitous Information Society*, p. 15. Available at http://www.arjentietoyhteiskunta.fi/files/73/Esite_englanniksi.pdf.

WSIS Action Line C10: Ethical dimension of the Information Society

The ethical dimension of the Information Society, covered by the WSIS Action Line C10, has been at the heart of the WSIS discussions on bridging the digital divide. According to the *Geneva Plan of Action*, the "Information Society should be subject to universally held values and […] [t]ake steps to promote respect for peace and to uphold the fundamental values of freedom, equality, solidarity, tolerance, shared responsibility, and respect for nature."[96] Some of the ICT strategies analysed for this report are attuned to this approach. As mentioned above, **Moldova** grants its citizens the right "to communicate and to be informed by guaranteeing him/her universal access to information and communication resources".[97]

93 Ibid., p. 13.

94 Ibid., pp. 16-18.

95 Finland (2008). *Ubiquitous Information Society*. p. 13.

96 ITU. (2003). Para. 25 & 25a.

97 Moldova. (2005). p. 8.

Macedonia's *National Strategy* considers legislation a balancing act between information security and "fundamental human rights, free access to information, [and] protection of personal data".[98] Similarly, **Nigeria** mentions "freedom of expression"[99] and "access and rights to information" in its *National Policy for Information Technology*.[100] Finally, **Lesotho**'s *ICT Policy* reflects "the right to information, freedom of expression and media pluralism and independence"[101] in the context of media.

WSIS Action Line C11: International and regional cooperation

ITU Member States acknowledge the advantages of international and regional cooperation. Almost all of the ICT strategies analyzed in this section refer to prospective and existing partnerships and activities. The ICT strategy of **Macedonia**, for instance, recommends the country's "participation in the European institutions for the development of ICT and [the] Information Society".[102] Similarly, **Mozambique** considers cooperation with many stakeholders essential for policy implementation, as discussed in Box 3.2 below.

Box 3.2: Mozambique – Multi-stakeholder approach

Mozambique's strategy states that "the ICT Policy Implementation Strategy will only be possible with the involvement of all interested participants: the public and private sectors, academic and research institutions, civil society, and international development organisations. Partnerships will be promoted not only at the national level but also within provinces […]. The international development agencies and international business will be called upon to coordinate and reinforce their involvement in the implementation of this Strategy. Partnerships with the international private sector" will also be needed in order to implement Mozambique's strategy.

Source: Mozambique, Republic of, The Council of Ministers. (2002). *Information and Communication Technology Policy Implementation Strategy*: Toward the Global Information Society. p.19.

In Latin America and the Caribbean, the Regional Action Plan (eLAC) is a kind of "metaplatform" for public-private actions in order to coordinate the efforts of various sectors, to generate synergies, to avoid the duplication of efforts and to strengthen regional projects, by means of cooperation and the exchange of best practices at a regional level. Moreover, this Plan is a toll for intermediation between the needs of the regions and the rhythm of the global development, considering regional particularities within the context of the goals of the global community.

Recommendations

Several ICT strategies are still lacking a real *strategic* approach. Despite the existence of numerous good practices and innovative and forward-looking strategies, some plans are merely a collection of initiatives and projects. Governments, societies and economies would benefit from an overarching strategic direction and from the formulation of a long-term vision. Further, sectoral e-strategies should be rooted in these overarching national e-strategies in order to unleash the full potential of ICT in each sector, making best use of existing synergies.

Many strategies focus on the provision of government services. e-Government is very relevant for governments, administrations and citizens, but also for businesses, which benefit from increased

98 Macedonia, Republic of, Ministry of Transport and Communications. (n.d.). p. 33.

99 Nigeria. (n.d.). p. 33.

100 Ibid.

101 Lesotho. (2005). p. 37.

102 Macedonia, Republic of, Ministry of Transport and Communications. (n.d.). p. 13.

transparency in administrative processes. As the example of Finland's broadband strategy shows, the Information Society keeps developing further and so should the vision and aims of governments and other stakeholders. Accordingly, governments should continuously think about their next goals.

Finally, ICT can be considered crosscutting tools that impact many sectors of the economy and society. Consequently, it would be recommendable for governments to evaluate the possibility of creating an overarching institution, able to oversee the implementation of the overall national ICT strategy across sectors, in a sustainable manner.

3.2 Sectoral e-Strategies

Many e-government, e-business, e-learning and e-health strategies are in place. Other sectors are still lacking e-strategies. Governments need to ensure more coherence between their ICT and sectoral e-strategies. Even though there are not always sectoral e-strategies in place, countries are implementing ICT projects and initiatives in all the eight areas of e-applications.

Sectoral e-strategies are national plans for the strategic application of ICT in specific sectors of the economy and society. The *Tunis Agenda for the Information Society* encourages "those governments that have not yet done so to elaborate, as appropriate, comprehensive, forward-looking and sustainable national e-strategies, […] and sectoral e-strategies".[103] In its Action Line C7, the Tunis Agenda mentions eight areas of e-applications: e-Government, e-business, e-learning, e-health, e-employment, e-environment, e-agriculture and e-science. These policy fields are sectors where a systematic use of ICT could have great impact. This section describes developments in each of the eight areas of sectoral e-strategies, providing examples of good practices.

e-Government

e-Government strategies are the most common type of sectoral e-strategies. Many of these sectoral strategies focus on improving the effectiveness and transparency of public administration activities by making use of ICT in government-to-government, government-to-citizen and government-to-business relations.

India provides an example of good practice for the development of a comprehensive e-government strategy. India's *National e-Governance Plan (NeGP)*, approved in 2006, aims to interconnect "islands of e-Governance initiatives in the country at National, State, district and even block level."[104] The Indian strategy recognises the need for establishing a "common vision, strategy and approach to objectives"[105] to guide activities at all levels of the Indian administration. This common vision seeks to "make all Government services accessible to the common man in his locality, through common service delivery outlets and ensure efficiency, transparency & reliability of such services at affordable costs to realise the basic needs of the common man".[106] This holistic approach and the coordination of actions are expected to bring about "huge savings in cost, in terms of sharing the core and support infrastructure, enable interoperability through standards etc, which would result in citizen having a seamless view of Government".[107] The e-Governance Plan also includes a project for the development of the e-government portal www.india.gov.in, to provide citizens a single point of entry for all government services.

Similarly, **Denmark**'s e-government strategy 2007-2010 "entails better and more binding co-operation and emphasises the implementation of specific digitalisation measures to enable efficiency gains within the public administration. […] The idea embedded in the strategy is therefore that the public sector should deliver better, more cohesive and efficient digital services to citizens and businesses. The strategy aims therefore at providing the individual authorities with a new framework for their digitalization efforts up to 2010."[108]

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103 ITU. (2005).

104 India, Government of, Department of Information Technology, Ministry of Communications & Information Technology. (n.d.). *The National e- Governance Plan (NeGP): e-Governance initiatives across the country*.

105 Ibid.

106 India, Government of, Department of Information Technology, Ministry of Communications & Information Technology. (n.d.). *The National e- Governance Plan (NeGP*), NeGP vision.

107 Ibid.

108 OECD. (2010). p. 31.

Also **Abu Dhabi** has developed an ICT strategy. The aim of this strategy is to "to develop a world-class customer experience for users of government services"[109] and to "drive government modernization through positioning the government as a customer focused service provider"[110].

e-Algérie 2010, the ICT strategy of **Algeria**, also emphasises e-government. According to this strategy, the implementation of e-government has two aims: to modernise the administration through the use of ICT and to bring the administration closer to its citizens.[111]

e-Business

Several countries have formulated sectoral strategies for e-business activities, also called e-commerce. The prominence of this policy area is influenced in part by the increased use of the Internet for business transactions. To provide an enabling environment for these commercial interactions, national e-business strategies are addressing paying modalities and authentication techniques for these transactions to enhance security and trust in electronic commerce. Further, governments are encouraging the adoption of ICT applications in the world of business to diversify their economies by offering e-services that attract foreign direct investment (FDI) and foreign companies interested in relocating businesses to lower income economies. Finally, economies in low and middle-income groups can benefit from the application of ICT in the private sector, which may help generate new export and trade links. Box 3.3 below provides an example of the potential benefits of e-business identified in **Guyana**'s *National Development Strategy*.

Box 3.3: Guyana – e-Business in the National Development Strategy
Activities

"[I]nformation technology could extend the scope of our tradeables in the service sector. Through the adoption of electronic commerce we could be in a position to provide or receive, for example, a range of legal, accounting, medical, educational, financial, data processing, retailing and tourism services. Indeed, new types of jobs and new fields of endeavour could become available through access to the information economies of the world: software development, translation services, data entry and data housing services, and data conversion, to mention only a few of the already available opportunities."

Source: Guyana. (2006). *National Development Strategy*, Chapter 6, para. 6.II.2.7. Downloaded 02.04.2010 from http://www.ndsguyana.org/Frames/chapter6.htm.

Moreover, to encourage the development of e-commerce, as established in the broader national development strategy, the Ministry of Tourism, Industry and Commerce of **Guyana** published and opened for discussion a *Draft E-Commerce Bill*[112] in 2005. The bill addresses topics common to many e-business strategies, such as legal aspects of electronic transactions. The case of Guyana provides examples of two good practices in sectoral strategies: Linking the sectoral e-strategy to the national development strategy and submitting the draft bill to a public consultation process.

109 Abu Dhabi Systems and Information Centre.

110 Ibid.

111 République Algérienne Démocratique et Populaire. (2008). p. 13.

112 Guyana, Ministry of Tourism, Industry and Commerce. (2005).

e-Learning

In many countries around the world, e-learning is seen as an enabler for learning and teaching, offering access to multi-media teaching methods and recent material at lower costs. Perhaps the "frog green" 100-Dollar-Laptop of the *One Laptop per Child (OLPC) Initiative*[113] is the best-known example of this approach. Moreover, ICT are increasingly being incorporated into the curricula. This is true not only for high-income countries, but in particular for developing economies. Teaching ICT literacy is not only a precondition for participation in the Information Society, but it is also very relevant for the training and education of skilled and advanced IT-professionals.

Jordan is a good example of a country supporting its educational reform though e-learning. In 2003, the government formulated the *Jordan Education Initiative* as a framework to improve teaching and learning through the adoption of ICT.[114] The initiative "was created as pioneer model for developing education, based on fostering ingenuity, utilizing the power of technology and coupling it with proven modern teaching tools to transform the school environment into a cradle of discovery and creativity, allowing Jordan students to imagine and realize the reality they can grow up into."[115]

Different activities have been undertaken within this initiative: Teachers and school administrators were trained in basic IT skills; schools were connected with broadband networks, and thousands of computers were distributed to schools.[116] A centrepiece of the initiative is the e-learning platform EduWave,[117] which is composed of content on different subjects specifically created for the platform. One factor that contributes to the success of this initiative is Jordan's emphasis on using a multi-stakeholder approach. The Initiative was launched in close cooperation with the World Economic Forum and engaged "more than 17 global corporations, 17 Jordanian entities, and 11 governmental and non-governmental organizations".[118]

e-Health

Several governments have also developed e-health strategies. e-Health, also called telemedicine, describes the use of ICT in the health sector. The variety of uses of ICT in medicine is enormous. It ranges from IT and telecommunication equipment for hospitals, including Management Information Systems (MIS), to distance diagnosis and monitoring tools; and from medical information available to lay persons via the internet to services provided by health insurance companies, such as the patient smart card, containing personal and medical data. Some of the benefits of e-health include faster and easier access to medical data; improved delivery of healthcare services, in particular in rural and remote areas, and the reduction of costs for healthcare services.[119]

Countries with scarce population in large geographic areas can benefit tremendously from e-health. **Australia**, for instance, has consulted an external adviser regarding the adoption of ICT in its health sector.[120] Australia envisions that "E-Health will enable a safer, higher quality, more equitable and sustainable health system for all Australians by transforming the way information is used to plan, manage and deliver health care services."[121]

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113 One Laptop Per Child (OLPC). (n.d.).

114 Jordan Education Initiative. (n.d.).; Economic and Social Commission for Western Asia. (2009). p. 92.

115 Jordan Education Initiative. (n.d.).

116 The Jordan Times. (2003).

117 Embassy of Jordan. (n.d.).

118 ESCWA. (2009). p. 92.

119 ITU. *e*-Health (n.d.).; ITU. (2008b).

120 Deloitte. (2008).

121 Australian Health Ministries' Conference. (2008), p. 5.

Lithuania also aims at improving the efficiency of its health sector through ICT. With the assistance of the World Bank, the country developed and adopted an *eHealth Strategy for 2005-2010*.[122] The e-Health Strategy follows a modern, patient-centred and comprehensive approach that involves many stakeholders from the health sector, including patients, health care professionals and government representatives as illustrated in Box 3.4 below.[123]

Box 3.4: Lithuania's e-Health strategy
Activities

- "development of the model for resource management system
- definition of the e-Health priorities and development plan covering issues of telemedicine, clinical decision support, telecare, monitoring, patient health record, distance learning and patient awareness
- proposed model for computerisation and networking of institutions […]
- definition of the public health monitoring information system according to the main EU activity areas
- integration of the health care registers and databases within the integral health information system
- formation of the infrastructure of the e-Health system: safety, technical resources, data transmission infrastructure and data interchange standards."

Source: Era Org. (2007). E-Health Priorities and Strategies in European Countries, Fact sheet: Lithuania. pp. 2-3.

e-Employment

e-Employment strategies are less prominent than the sectoral e-strategies described above. e-Employment initiatives usually cover e-recruitment procedures for the public service, so called Public Employment Systems (PES). These applications are very helpful for governments because they allow a timely selection of candidates. Another area e-employment deals with is the reporting of staff information to social insurance institutions.

During the data collection for this report, there was no e-employment sector strategy accessible. Nevertheless, many institutions are running e-employment initiatives and projects. For instance **Bangladesh** reports the following activity in the WSIS stocktaking:

> The *"Bureau of Manpower, Employment and Training (BMET) has automated much of the registration process for Bangladeshi overseas job-seekers. It has also developed a rich interactive website, which offers various services for job-seekers and also for employers. BMET has established a Data bank of Prospective Overseas Job Seekers. This Data Bank is web based which offers the facility to search prospective overseas job seekers of Bangladesh through the Internet."*[124]

[122] EraOrg. (2007). p.1.

[123] Ibid.

[124] ITU. WSIS Stocktaking Database.

e-Environment

In the last few years, governments have paid increasing attention to the potential of ICT for dealing with environmental matters. Consequently, by 2010, several countries had launched initiatives focusing on e-Environment. ITU played a crucial role in facilitating this process by providing practical input[125] and a forum for international exchange of ideas among government representatives, scientists and activists in this area. ITU has identified four major application areas for different ICT applications in the environmental field: Environmental observation, analysis, planning and environmental management and protection.[126] Remote sensing, the collection of primary data on environmental changes and IT based environmental modelling are some examples of e-environment implementations. Other areas where ICT can have direct positive impact on the environment are, for instance, the production of more energy-efficient devices or of products made from renewable resources.

Germany, for instance, is implementing an action plan called *Germany: Green IT Pioneers*.[127] The focus of the initiative is on energy efficient ICT and its "contribution to climate protection through the development of specialised ICT products and services, through awareness campaigns targeted toward users, and through the dissemination of best-practice solutions."[128] Some of the measures under this action plan include targeting the energy consumption of the German government; promoting energy-efficient solutions for households; encouraging the adoption of energy labelling of products; launching awareness raising campaigns, and establishing research clusters on energy efficient software and hardware, among others.[129] The German government, industry and the research community are implementing the initiative.[130]

e-Agriculture

Self-supporting countries relying on their agricultural products, as well as countries with an industrialised farming sector can benefit from the application of ICT in agriculture, that is, from e-agriculture. One well-known example of this application is the use of cell phones and Short Messaging (SMS) by farmers to obtain information on the latest prices for their produce. On the basis of the latest market information, the farmer can take an informed decision and head for the market offering the best price. Large-scale agricultural industries can also reduce transaction costs and maximise their profit by applying smart ICT systems, like Global Positioning Systems (GPS), to find the optimal track to till a field or to find the largest swarm.

While no national e-agriculture strategies were found at the time of this report, several smaller projects are currently being implemented. **Kyrgyzstan**, for instance, cooperated with ITU in an e-agriculture project that enables "rural farmers […] to have access to information on the price of their products and facilitate the establishment of direct relationships with potential buyers in order to get a better return for their products".[131] The project required installing "Information technology solutions to facilitate the collection of agricultural information (e.g., types of produce, volumes of production and location produced)"[132] and establishing a "Multi-media Multi Purpose Community

125 ITU. ICTs and e-environment. (n.d.).

126 ITU. (2008a).

127 Germany, Federal Ministry of Economics and Technology (2008).

128 Ibid., p.1.

129 Ibid., pp. 1-3.

130 Ibid., p. 1.

131 ITU. (2004).

132 Ibid.

Telecentre (MCT) in the village to enhance access to educational, weather and health information […] and also facilitate communication between the village community and the rest of the world."[133]

e-Science

e-Science is another ICT area of great relevance to several countries; yet no e-science strategy had been reported during the data collection period for this publication. e-Science refers to science that requires grid computing for the analysis and storage of an immense amount of data sets. The subjects covered by e-science are diverse, including research projects for the analysis of global warming, human behaviour, genetics, and particle acceleration. e-Science also includes activities that attract research institutes and companies' R&D departments to certain localities. For instance, using the American Silicon Valley as a model, **Saudi Arabia**, **Singapore** and **Turkey** have established privileged zones or parks[134] in order to turn them into IT-hubs and research clusters.

Recommendations

Similar to the case of ICT strategies, many sectoral e-strategies consist of a list of projects and initiatives that lack a comprehensive strategy. This shortfall hinders the unfolding of ICT's full potential in the specific sectors. On the other hand, the large number of projects and initiatives identified in the WSIS Stocktaking database indicates that governments are actively adopting ICT applications in different economic sectors. Accordingly, countries would benefit from compiling experiences and analysing the performance of past and ongoing projects from which coherent, comprehensive and future-oriented sectoral e-strategies could be formulated.

Further, not enough sectoral e-strategies are rooted in their respective national ICT strategy. Good practices in this regard, like the example of Guyana's e-business strategy, are rare. While integrating ICT and sectoral e-strategies is not an easy task, due to the different responsibilities of an administration and the involvement of diverse stakeholders groups, countries would benefit from ensuring policy coherence.

Several policy fields still remain to be considered in ICT and sectoral e-strategies. The potential of ICT use in environmental protection, employment, agriculture and science has not yet been recognized to its full extent. Further research on these topics would help obtain a better understanding of and documentation on the potential of ICT in the different sectors. Governments, academia, civil society, the private sector, as well as regional and international organisations could jointly engage in this mission. It might also be necessary to review the sectors listed in the 2005 *Tunis Agenda for the Information Society* to determine whether they are still the ones with the most potential to benefit from ICT adoption or whether new sectors should be considered.

Stakeholders should be encouraged also to keep heading for more ambitious targets and not rest once the targets stated in their current ICT strategies and, particularly, in their more narrow sectoral e-strategies have been met. The ICT sector, ICT applications and the Information Society are in continuous evolution and so should the strategies that address them.

Strategic choices have to be made when public and private resources for ICT are very limited. Governments are well advised to focus first on the sectors where demand for ICT usage exists and where the potential of ICT use is particularly great.

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133 Ibid.

134 Ameinfo.com (2006); ida Singapore (n.d.); UNIDO (n.d.).

3.3 Integration of national e-strategies into poverty reduction strategies and national development plans

Several e-strategies have been integrated into national development plans. Many countries have realised the potential of ICT to enable economic development and poverty reduction through employment creation and improvements in government services, education and healthcare. Some national development plans mention ICT, but the strategic integration of both types of strategies needs to be improved.

The *Tunis Agenda for the Information Society* encourages governments, in particular, to make national e-strategies an "integral part of national development plans and poverty reduction strategies, as soon as possible and before 2010".[135] At the time of the WSIS Summit in Tunis, in 2005, most high-income countries had already incorporated the ICT sector and the use of ICT in other sectors into their national development plans.[136] Therefore, this section focuses on the progress made by some developing countries in this respect.

In June 2006, 80 of the 181 developing countries and countries in transition (around 44%) were in the process of designing a national e-strategy.[137] Today, 84 percent of ITU's 191 Member States have formulated an ICT strategy. e-Strategies have being integrated into many development plans and poverty reduction strategies during the past decade[138] to fight poverty and foster economic growth and social development.

This report uses the *Poverty Reduction Strategy Papers (PRSPs)*, developed by the World Bank and the International Monetary Fund (IMF), as a key resource for the analysis of e-strategy integration into development strategies and plans.[139] The PRSPs are centrepieces in the relation of the World Bank and the IMF with developing countries and countries in transition. A PRSP describes the macroeconomic and social situation of a country, as well as policies targeting economic growth and poverty reduction. PRSPs also identify areas where assistance is required and set priorities for the spending of government and external sources' funds.[140]

e-Strategies have being integrated into many development plans and poverty reduction strategies during the past decade to fight poverty and foster economic growth and social development.

This section discusses two examples of e-strategies closely integrated into PRSPs: **Rwanda**'s 2007 *Economic and Development Poverty Reduction Strategy 2008-2012*, and **Bosnia and Herzegovina**'s *Poverty Reduction Strategy Paper – Mid Term Development Strategy* of April 2004.

Rwanda was among the first African economies to make ICT an integral part of its development agenda. In particular, Rwanda's president, Paul Kagame, made the promotion of ICT in Rwanda a major issue. Key objectives of the promotion of ICT in the current PRSP of Rwanda are the creation of wealth through employment, capacity development and education for productive employment, and

135 ITU. (2005). para. 85.

136 R. Labelle. (2005). pp. 11-12.

137 UNCTAD (2006), p. 168.

138 Ibid. p. 165; ESCAP. (2009b). p. 31.

139 International Monetary Fund. (n.d.). Poverty Reduction Strategy Papers (PRSP).

140 The process intends for governments and Breton Wood Institutions to develop strategies in a participatory manner. The implementation of the PRSP is evaluated and adjusted after some years.

the improvement of government service provision.[141] Like other infrastructural sectors, ICT are treated in the PRSP as cross-sectoral and are therefore considered shared responsibility of the public and private sectors.[142]

Rwanda's PRSP reflects Rwanda's *National Information and Communication Infrastructure (NICI)* Plan and explicitly interconnects, year by year, the PRSP with the implementation of NICI priorities. The ICT objectives integrated into the PRSP are congruent with those in the NICI. Other objectives of the NICI plan that have been adopted in the PRSP include rural community development, private sector development, legal, regulatory and institutional provisions and standards, as well as national security, and law and order.

Rwanda's PRSP is ideal not only because it indicates the degree of systematic integration of the country's national e-strategy, but also due to the paper's analysis of the country's current situation and earlier measures. Further, as illustrated in Box 3.5 below, the paper lists precise activities that should be undertaken within the time frame of the poverty reduction strategy. The PRSP even sets measurable numerical targets for those activities.

Box 3.5: Rwanda sets precise and measurable targets for activities promoting the cross-sectoral use of ICT in its PRSP
Targets

- The use of ICT in media enterprises is planned to increase from 30% to 80% and the number of media clubs in secondary schools will increase from 120 to 360.
- Monitoring and evaluation user manuals and ICT equipment will be supplied to local governments and geographic information systems (GIS) will provide baseline data. Capacity for data collection (e.g. Citizens Report Cards and Community Score Cards), data analysis, and database management will be developed.
- Expanding access to Technical and Vocational Education and Training (TVET) and ensuring existing centres are adequately equipped are of strategic importance if Rwanda is to become the ICT hub of the region.
- High-level vocational skills for continuing professional education will be developed, such as high level certification courses in ICT.
- Specific interventions include the establishment of a Science and Technology capacity-building fund […] to be reinforced in all priority sectors of the economy to foster dissemination of the knowledge that exists outside Rwanda, the adoption of knowledge developed within Rwanda and to ensure that workers have the requisite skills to use new technology.
- In keeping with the need to develop Science and Technology programmes, expenditure for science laboratories and equipment is being prioritised in the budget.
- It is expected that the number of additional jobs created each year in the ICT Sector will rise from 7,000 in 2008 to 20,000 in 2012. This ambitious programme will be overseen by the regulatory authority, whose institutional capacity will need strengthening over the period of the EDPRS.
- The number of telecentres will be increased substantially and the cost of connecting to a telecommunications network will halve by 2011.

Source: Rwanda, Republic of. (2007), pp. 45, 57, 59, 62-64, 88.

141 Rwanda, Republic of. (2007). p. 78.

142 Ibid., p. 76.

The macroeconomic and social situation of **Bosnia and Herzegovina** and Rwanda presented in their respective PRSPs were quite different, except for the fact that both countries had faced unrest and civil war quite recently. Yet, there were some interesting parallels between the two PRSPs. Bosnia and Herzegovina's employs ICT to develop its rural areas, enhance inexpensive access to government information and lower the costs of administrative services, improve education in support of ongoing reform in this sector,[143] and to enable e-commerce.[144] Regarding planed activities, the country's major concern in 2004 was telecommunication regulation, as illustrated in Box 3.6 below. The PRSP of Bosnia and Herzegovina lists the ICT sector as one of twelve priority areas for the government and sets up a precise road map for the implementation of activities.

Box 3.6: Bosnia and Herzegovina to develop its rural areas through ICT
Sound telecommunication regulation as a precondition

Bosnia and Herzegovina's *Mid-Term Development Strategy* for poverty reduction includes the acceleration of ICT infrastructure as one of its priorities for national economic development and poverty reduction. To strengthen its ICT infrastructure and the government's capacity to use ICT, the Development Strategy proposes, among others, the following measures:

- Introduce 2.5G GPRS and EDGE network services in mobile communications, along with WAP and Bluetooth interfaces and protocols in mobile telephony, and prepare for introduction of a 3G network.
- Expand mobile signal coverage […] to ensure full competition.
- Liberalise the global Internet link.
- Efficiently enforce the rules of behaviour for large operators, with the special attention to penalties.
- Create non-profit organizations, tasked to secure the global Internet link, and ensure equal market conditions for all participants.
- Establish an integrated network infrastructure: provide Internet ("government online").
- For a successful development of the telecom sector, an IT bus needs to be built and linked with the neighbouring countries
- Penetration in the fixed and mobile telephony needs to be increased, as well as of the Internet; the third generation (3G/UMTS) systems should be introduced in the mobile telephony. The activities of liberalizing the market of telecom will be continued with in this sector.
- Initiate a national, all-inclusive drive for teachers to achieve IT literacy; […] provide additional training for IT and non-IT teachers alike.
- Training public administrators in the use of ICT […], including training for managers of IT-enabled institutions.
- Legal changes to permit modern electronic commerce (ecommerce) will be made.
- All levels of government in BiH [Bosnia and Herzegovina] will introduce the system of electronic services to citizens (e-government).
- The system of ICT agencies will be established, and the Academic and Research Network of BiH (Arnet) and the Education Network of Elementary and Secondary Schools (EduNet) will be reactivated.

Source: International Monetary Fund (2004). pp. 18, 263-265.

[143] International Monetary Fund. (2004). p. 254.

[144] Ibid., p. 262.

Some national development strategies analysed in this report would benefit from better integration of ICT applications into socio-economic development plans. For instance, **Gabon**'s *Country Assistance Strategy (CAS)* of May 2005 mentions ICT as a research tool for parliament,[145] but it only includes the following general statement on the potential of ICT to promote economic development:

> *"In order to compensate for declining oil production, other economic activity will need to be promoted. In medium and longer term, economic diversification will be needed in order to address the future gaps in revenue due to oil shortfalls. Promising areas of diversification in Gabon are mining, forestry, fisheries, construction, and tourism, and new sectors such as information, communication and technology services."*[146]

The *Interim Poverty Reduction and Growth Strategy Paper* of the government of **Comoros**,[147] submitted to the Breton Woods Institutions in October 2005, provides another example of a national development plan that could benefit from the integration of ICT's potential for socio-economic development. The paper discusses the telecommunication sector, describing the need for major investments into this particular infrastructure, among others. It recommends upgrading of telecommunication infrastructure to reduce transaction costs and stimulate national and foreign investment. Tourism is the only other sector highlighted in the paper as an area where ICT adoption would be useful. Otherwise, communication with the rest of the world, with Comorians living abroad, or communication between the islands is seen as an end in itself. Unfortunately, the paper does not address the potential impact that technologies like VSAT could have on education through distance learning, even tough education is a priority for the government of Comoros.

145 World Bank. (2005). p. 41.

146 Ibid., p. 8.

147 Comoros, Government of. (2005).

Recommendations

ICT strategies are essential to developing countries. The resources available to the private sector alone might be insufficient to bridge the digital divide and it is indispensable to develop mechanisms to provide ICT access to unserved and underserved areas. A sound ICT strategy can give private investors confidence on the soundness of investing in the sector and on the potential to obtain profits over time. Finally, ICT strategies can provide a forum where civil society can interact with government representatives to contribute to the implementation of activities.[148]

In order to unleash the full potential of ICT for development, it is necessary for national e-strategies to be integrated into national development strategies. As the examples of Bosnia and Herzegovina as well as Rwanda illustrate, a sound integration of e-strategies requires resource planning and measurable targets in order to implement the strategy successfully.

The ICT sector is an area of rapid technological change. Comparatively, the processes of policy formulation, implementation and adjustment are often long and time-consuming. This contrast makes it difficult for technologies like broadband, which can drive economic and social development, to be reflected in PRSPs.[149][150] Therefore, it would be recommendable to formulate development plans that integrate ICT in a technology-neutral manner, focusing on targeted objectives (e.g. increasing bandwidth), rather than on a particular technology.

[148] T. Unwin. (2005). p. 150.

[149] UNCTAD. (2009). pp. 35-38.

[150] Two exceptions are the PRSPs of Ghana and Sri Lanka. Ibid., p. 61.

3.4 Strategic approaches and trends

The analysis of national e-strategies made evident the existence of trends and common approaches around the globe for achieving digital inclusion. Many countries use ICT as drivers for economic growth, innovation and employment, while telecommunication regulation has become a means to protect consumers and improve infrastructure. National e-strategies are also giving priority to building ICT capacity. Other common trends include establishing transactional e-government and e-democracy solutions, enhancing the competitiveness of the national ICT industry, and following the WSIS multi-stakeholder approach.

Strategic Approaches

The digital divide is closing slowly. According to the ITU Information Telecommunication Index (ITI),[151] ICT access and use has increased in the 159 countries for which relevant data is available[152] and the costs of ICT services are decreasing, particularly those for fixed broadband connectivity.[153] The developing world has the most dynamic economies in terms of their improvement in ITI rankings between 2002 and 2008;[154] yet, many populations around the world still lack access to ICT. Most of these developments have been driven in part by national ICT plans, formulated or enhanced in response to the WSIS. Today, most countries have an ICT strategy in place.

The national e-strategies analysed for this report are following several strategies to accelerate ICT deployment, improve access and promote capacity building. While many strategies share similar objectives, the particular approach used to tackle a challenge might differ among countries.

The digital divide that exists between and within countries still poses a great challenge. It is not surprising then that the goal of connecting the unconnected remains an objective of most national e-strategies. To deal with this challenge, **Poland** has established distance-learning centres that provide access to education opportunities to people in rural areas.[155] **Egypt** created a network of IT clubs across the country, so that rural and underprivileged areas could have access to computers.[156] **Azerbaijan**'s national e-strategy includes the elimination of the digital divide as an explicit target[157] and **Moldova** even grants its citizens the right "to communicate and to be informed by guaranteeing him/her universal access to information and communication resources".[158]

National ICT plans address both the integration of underserved areas and of other disadvantaged groups into the Information Society. **Azerbaijan**'s strategy, for instance, intends to help "invalids and [the] disabled in their socio-cultural needs through ICT means".[159] **Jordan**'s strategy, on the other hand, considers the internal digital divide to be mainly an issue of tariffs, in particular, for broadband access.[160]

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151 The ITI captures the level of advancement of ICT in more than 150 countries worldwide and compares progress made within 5 years; see http://www.itu.int/ITU-D/ict/publications/idi/2009/index.html.

152 ITU. (2010). p. 39.

153 Ibid., p. 53.

154 Ibid., p. 12.

155 Poland, Ministry of Interior and Administration. (2008). p. 17.

156 Egypt, Arab Republic of, Ministry of Communications and Information Technology. (2005). p. 6.

157 Azerbaijan.(n.d.). p.9.

158 Moldova. (2005). p.8.

159 Azerbaijan. (n.d.). p.17.

160 Jordan. (n.d.). p. 9.

Some governments are using **telecommunication regulation and policies** as means to stimulate network deployment and infrastructural upgrades or to control service rates. In **Bahrain**, the liberalization of the telecom sector remains a priority. Accordingly, the *Second National Telecommunications Plan* of Bahrain, adopted in 2008, aims at improving the institutional framework of telecommunication regulation in order to make telecommunications services "increasingly available and internationally more competitive in terms of the range of services offered as well as prices."[161] For many years, regulation strategies were usually occupied with privatisation and market liberalisation. Nowadays, as a result of the increasing complexity of the ICT market and technologies, several countries are shifting the focus of their national e-strategies to customer protection for both consumers and businesses, as the example of Bahrain illustrates in Box 3.7 below.

Box 3.7: Bahrain — Regulatory approach of the Telecommunication Authority

- "Involve consumers and businesses in the development of the regulatory framework and policies for the sector, in particular with regard to consumer protection;
- Develop competition in telecommunications, including both infrastructure and access services, and enable it by ensuring that barriers to entry for all forms of competitors are minimised and by taking steps to maximise economic efficiency in using scarce resources, in particular the electromagnetic spectrum and access to land;
- Promote active investment by the private sector in telecommunications infrastructure;
- Enhance the use of the Internet and broadband amongst all users at internationally competitive prices;
- Develop the legislative, policy and regulatory environment to take account of convergence in technology and services."

Source: Bahrain, the Kingdom of, The Prime Minister. (2008). *The Second National Telecommunication Plan*. Decision No (8) of 2008, Regarding the Second National Telecommunications Plan Approval. p.3.

Bahrain's national e-strategy states that consumers and businesses should reap the benefits of the development of telecommunications technologies, both in terms of the services they consume and the capabilities they need, to realize their personal and business potential.[162] **Ireland**, for its part, has facilitated a legal and regulatory environment that includes a secure and predictable legal framework for electronic transactions, providing business and consumers the necessary confidence to use e-services.[163] **Fiji** is promoting the development of a pro-business and pro-consumer regulatory framework that is clear and transparent and supports sustainable market competition.[164] This framework should also secure consumer interests, welfare and rights.[165] Similarly, **Nigeria** intends to incorporate social and consumer concerns in the deployment of new products and services.[166]

Infrastructure deployment is another strategic approach used in many national e-strategies. The type of technology being used depends on national characteristics and needs. Several Asian economies, for instance, have benefited from mobile connectivity and WiMAX; in contrast, in the Pacific and in other regions with island states, satellite connectivity is considered highly relevant. In high-income countries, the rush for fixed broadband deployment has continued for several years. Regional strategies for equal access, such as the European Union's *Broadband Portal*,[167] are

161 Bahrain, the Kingdom of, The Prime Minister. (2008). p. 3.

162 Ibid.

163 Ireland, Department of the Taoiseach. (2002). p. 4.

164 Fiji, Government of. (n.d.). p. 4.

165 Ibid. p. 15.

166 Nigeria. (n.d.). p. 29.

167 European Commission. (n.d.).

successfully encouraging the provision of fixed broadband services at competitive prices, even in sparsely populated areas. The **Czech Republic**, for instance, is currently working on the Czech national strategy for the development of electronic communications in the next decade. This *Digital Czech Republic* strategy will define the steps for facilitating access to broadband Internet in the country.[168]

The approach of many governments is to focus on creating an enabling regulatory environment, relying on the private sector for infrastructure deployment. **Lesotho**, for instance, encourages infrastructure sharing, competition, technology neutrality and public-private partnerships.[169] Governments and regulatory authorities set the environment for competition, trying to ensure access at affordable prices. **Bahrain**'s ICT strategy, for example, encourages competition in both infrastructure and access services. The strategy intends to promote competition by minimizing market entry barriers and maximizing economic efficiency in the use of scarce resources, in particular the electromagnetic spectrum and the access to land.[170]

In the context of the current economic turmoil worldwide, ICT are seen as a way out of the crises

Ireland's national e-strategy considers the provision of competitive broadband crucial to the success of its industrial promotion efforts. The strategy aims to foster real competition amongst service providers on the basis of price and service, accelerating the availability of advanced broadband infrastructure and services in a short-term period.[171] **Ghana** also considers "Rapid ICT and Enabling Physical Infrastructure Development"[172] as a major objective.

Further, national e-strategies are considered an **instrument to boost the economy**. In the context of the current economic turmoil worldwide, ICT are seen as a way out of the crises.[173] Many countries have integrated ICT strategies in their economic stimulus package. e-Business is considered to have great potential, particularly for economies with a large informal sector, like many developing countries, or with a significant number of small and medium enterprises, where the adoption of ICT by the business sector could have positive economic impact.

Jamaica follows such an approach and plans to "[e]ncourage the increased use of online business to business and business to consumer operations";[174] "[b]uild an effective indigenous ICT industry";[175] "[s]upport Small and Medium Enterprises and NGOs in taking greater advantage of ICTs for strategic and operational effectiveness";[176] and "[m]easure the contribution of the use of ICTs and the ICT industry to the national economy".[177]

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168 Contribution received directly from the Czech Republic.

169 Lesotho. (2005). p. 27.

170 Bahrain, the Kingdom of, The Prime Minister. (2008). p. 3.

171 Ireland, Department of the Taoiseach. (2002). p. 9.

172 Ghana, Republic of. (2003). pp. 63-65.

173 ITU. (2009b). p. 103.

174 Jamaica, Government of. (n.d.). p. 9. Jamaica, Central Information Technology Office (CITO). p. 9

175 Ibid.

176 Ibid.

177 Ibid.

Additionally, **making local ICT industries globally competitive** is crucial for many governments. A strong ICT industry in the country is seen as an enabler for other sectors. For instance, as part of its national e-strategy, **Nepal** has established an IT park in Banepa, District of Kavrepalanchok, and is encouraging companies to develop industries within the park, by charging them "only one percent customs duty for the import of equipment related to the industry for up to five years."[178]

A strong ICT industry in the country is seen as an enabler for other sectors

Similarly, **Nigeria** has established a high profile National Electronic Commerce Council (NECC) to facilitate international trade through an e-commerce infrastructure. Moreover, the government encourages "Made in Nigeria IT products and services", such as software and professional services.[179] The government of **Ghana**[180] is committed also to creating a highly competitive ICT-lead value-added and export oriented ICT services sector.

Another approach used in national e-strategies is to **encourage innovation through ICT**. The areas targeted for innovation vary. Some ICT strategies focus on innovation in education; others intend to introduce innovation in environmental aspects, government service delivery, transportation, health care and so on. **Turkey** clearly expresses its view on the correlation between ICT innovation and development:

> *"Innovations in Information and Communication Technologies (ICT) have an important effect on the development of globalization and influence all areas of economic and social life, all segments of the society and deeply affect how public services are delivered, businesses function, and citizens lead their daily lives. In other words, these innovations cause a social transformation. These technologies already put their mark on the twenty-first century and laid the foundation for a new social transformation towards "information society".*[181]

Trinidad and Tobago has formulated a future-oriented approach focused on innovation, called *FastForward* (see Box 3.8 below). This strategy intends to "kick-start the e-Economy. New skills, ideas and access to new sources of information and global markets will be generated. This will result in local employment opportunities that will require new skills and ideas. The cycle will have been completed – and a knowledge-based society created".[182]

The Government of **Gambia** aims at transforming the country into the "Silicon Valley" of Africa, not only technologically, but also in terms of serving as a hub within the sub-region for the development and production of high-income earning knowledge products, and the provision of ICT-enabled value-added services.[183]

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178 Nepal. (2000). p.3.

179 Nigeria. (n.d.). p. 34.

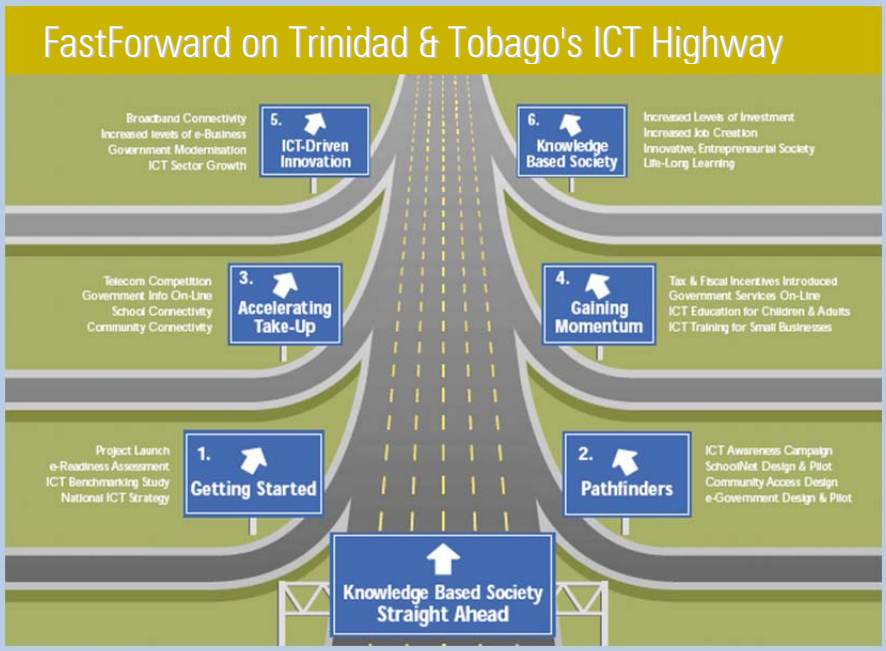
180 Ghana, Republic of. (2003). p. 22.

181 Turkey, State Planning Organization. (2006). p. 1.

182 Trinidad and Tobago. (n.d.). p. 14.

183 Gambia, Government of, Department of State for Communication, Information and Information Technology (DOSCIIT). (2008).

Box 3.8: Trinidad & Tobago — ICT driven innovations



Source: Trinidad and Tobago. (n.d.). *Accelerating into the digital future, Fast Forward, National Information & Communication Technology Strategy.* p.7. Downloaded 03.04.2010 from http://www.fastforward.tt/files/cms/Fastforward_Summary_Brochure.pdf

There is a global competition for attracting and retaining ICT experts. The fast growing and changing ICT industry requires a constant influx of well-skilled and qualified specialists. Education and training of national human resources are means for meeting this demand. But, in the case of aging societies, such as countries in the global North, attracting foreign ICT experts has also been a successful approach. For developing countries, where some of these experts come from, the main concern is establishing policies and creating incentives to avoid "brain drain". Realising that its highly educated ICT specialists were prone to leave the country, attracted by higher salaries abroad, **Albania** plans to open up its ICT sector to the international market, hoping to create attractive working conditions in the country, a market for ICT products, and increase salary levels in the ICT sector.[184]

Nigeria intends to build and secure its own human resources by prescribing that IT solution providers in areas such as training, software development and "service" houses must ensure that not less than 30 percent of the values of all ICT contract awards are undertaken using local value-added products, services or personnel.[185] **Mozambique** intends to "[r]aise the number and quality of ICT professionals in order to make them competitive in the world market".[186] Governments also hope that ICT will create more employment and assist in income generation, economic growth and poverty eradication.

[184] Albania, Republic of. (n.d.). p.11.

[185] Nigeria. (n.d.). p. 8.

[186] Mozambique, Republic of, The Council of Ministers. (2002). p. 3.

One of the most common objectives of national e-strategies is the **improvement of government service delivery (e-government)**. While interaction between citizens and the public administration via ICT already exists in many countries, governments are intending to establish transaction channels via ICT. For instance, the Internet Payment Gateway in **Oman** will enable citizens to engage in e-commerce transactions with both government departments and other business communities through a range of electronic channels, primarily the Internet.[187] Several government organisations of Oman are enhancing their Internet presence, improving their web pages and integrating mechanisms for interaction with citizens.[188] Additionally, "the Multi-Party Smart Cards are the latest technology in chip-based cards being used in various applications in Oman. Currently they hold driving license information. E-visa and passport details and e-purse capabilities are being considered to be included with the same chip-based, biometrically secure, smart card."[189]

In **Malta**, more than 60 public services, 90 percent of those between government and citizens or government and businesses, are now provided online. This has been made possible by "a central electronic identity framework, which offers a secure, single sign-on authentication mechanism to every person".[190]

ICT not only have the potential to improve government services but also to strengthen democracy. Several countries formulate their national e-strategies to make **ICT an enabler for democracy**. Online participation is one way to employ ICT to enable participation in democratic processes. **Malta**, for instance, will consult its citizens to shape legislation, policy and governance through the Internet.[191] The same is true for **Lithuania**,[192] **Finland**,[193] and **Iceland**.[194] **Estonia** will even introduce an e-voting system.[195]

The WSIS process has emphasised **the importance of following a multi-stakeholder** approach in the formulation and implementation of ICT strategies. Some governments have adopted this approach, involving many stakeholders in their national e-strategies. The government of **Malawi** believes that other stakeholders need to be part of the process to build consensus and encourage national mobilization and participation. Apart from the private sector, other key national groupings and stakeholders, including the media, NGOs, labour unions, academia and other sections within the civil society, are encouraged to contribute to the Malawian ICT-led socio-economic development process. [196] Similarly, **Egypt** intends to leverage public-private partnerships (PPP) as an implementation mechanism wherever possible,[197] and **Kenya** addresses explicitly multi-stakeholder participation in its national e-strategy.[198]

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187 Oman, Sultanate of, Information Technology Authority (ITA). (2007). p. 26.

188 ESCWA. (2009). p. 38.

189 Oman, Information Technology Authority (ITA). (2007). p. 64.

190 Malta. (n.d.). p. 8.

191 Ibid., p. 42.

192 Lithuania, Government of the Republic of. (2001). p. 4.

193 Finland. (2008). p. 5.

194 Iceland, Prime Minister's Office. (2008). p. 5.

195 Estonia, Ministry of Economic Affairs and Communications. (n.d.). p. 3.

196 Malawi, the Republic of. (2003). p. 43.

197 Egypt, Arab Republic of, Ministry of Communications and Information Technology. (2005). p. 7.

198 Kenya, Ministry of Information and Communications. (2006). p. 2, p. 43.

3.5 Evolution of national e-strategy plans

National e-strategies and master plans need to be revised and updated over time. The examples of Japan, Egypt and Poland show how strategies are being adjusted to changing circumstances.

Japan

An important landmark in the development of Japan's national e-strategies and their implementation was the foundation of a central agency, named *IT Strategy Headquarters*, by the former Prime Minister, Junichiro Koizumi, in 2001. Since then, the IT Strategy Headquarters has been in charge of the development and implementation of Japan's e-strategies. The first *e-Japan Strategy*, launched in 2001, gave high priority to infrastructure development and the effective use of IT resources.[199] After the development of the *IT Policy Package* in 2005, the *IT New Reform Strategy* was launched in 2006, aiming at the creation of the "ubiquitous network society by 2010".[200] Two driving forces behind the latest strategy were the increased global competition on ICT products and services, and Japan's intention to remain among the group of countries with leading ICT industries.[201]

In contrast to the initial *e-Japan Strategy,* the main focus of the *IT New Reform Strategy*, the latest overarching e-strategy, is no longer on infrastructure, but on safety issues, as illustrated in Box 3.9 below.[202] The focal change among the e-strategies mirrors a transition in the concerns of the Japanese government and the ICT industry from infrastructure to the protection of intellectual property rights (IPR).

The Ministry of Internal Affairs and Communication (MIC) and the Ministry of Economy Trade and Industry (METI) are responsible for implementing the national e-strategy. In 2004, MIC launched, in accordance with the *e-Japan Strategy*, the *u-Japan Policy*, where ""u" stands […] for ubiquitous, "but also "universal," "user oriented," and "unique.""[203] The *u-Japan Policy* initiated research activities on new-generation networks (NGN)[204] "to realise a ubiquitous network society that enables ICT infrastructure to be used anytime, anywhere, and by anyone".[205] The Policy has another four additional objectives, including the "advanced usage of ICT";[206] enhancing the "enabling environment";[207] developing an "international strategy"[208] on tied relations with Asian countries and through the participation in international organisations;[209], as well as the implementation of a "technology strategy (to strategically promote R&D and standardisation in priority areas, and to strengthen international competitiveness through innovations)".[210]

199 Y. Myoken. (2008), p. 6.

200 Ibid.

201 Ibid., p. 2, pp. 13-14.

202 Y. Myoken. (2008). p. 6, based on MIC's official report, p. 9.

203 Japan, Ministry of Internal Affairs and Communication (MIC). (n.d.). *The u-Japan Concept*.

204 Ibid., p. 2.

205 Ibid., pp. 2-3.

206 Y. Myoken. (2008). p. 6, based on MIC's official report, p. 9.

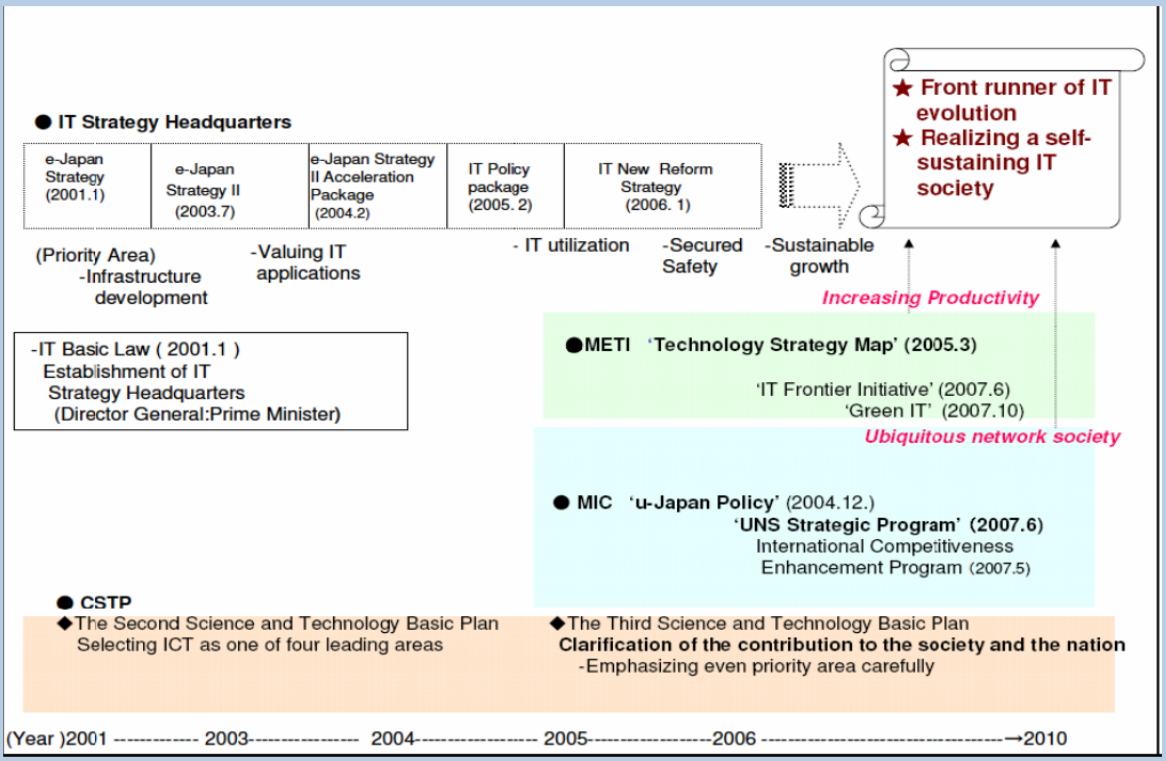
207 Ibid.

208 Ibid.

209 Japan, MIC. (n.d.). *The Potential of ICT to Resolve Social Problems.*

210 Y. Myoken. (2008). p. 6, based on MIC's official report, p. 9.

Box 3.9: The development of national e-strategies in Japan



Source: Y. Myoken. (2008). p. 6, based on MIC's official webpage http://www.soumu.go.jp/menu_seisaku/ict/u-japan_en/new_outline01.html.

Following the *IT New Reform Strategy* in 2006, MIC launched the UNS Strategic Programme (see Box 3.9). UNS stands for "**U**niversal communications, **N**ew generation networks, and **S**ecurity and safety technology strategies"[211] and consists of research projects aiming at ensuring the benefit of the Information Society anytime, anywhere and for everybody.[212]

Further, to promote Japan's international competitiveness in ICT, the MIC implemented a programme for the years 2006-2007 and established a related Panel in 2007, chaired by the Prime Minister, called the I*CT Committee for International Competitiveness*. [213]

Meanwhile, METI implemented the *Technology Strategy Roadmap,* a ten-year strategy "designed to strengthen international competitiveness in Japan's ICT industry with increasing safeties and reliabilities."[214] This roadmap takes into consideration "the opinions of a 'task force' composed of 500 researchers and experts from New Energy and Industrial Technology Development Organisation (NEDO) and National Institute of Advanced Industrial Science and Technology (AIST)".[215] METI is implementing research on "new energy-saving products, including server storage/non-volatile memory, as well as organic electric luminescence."[216]

211 Ibid.

212 Ibid; M. Fujino. (2009). p. 9.

213 M. Fujino. (2009). p. 11.

214 Ibid.

215 Ibid.

216 Ibid., p. 3.

Egypt

In the last decade, Egypt has experienced enormous development in its ICT sector and society: Its telecommunication infrastructure has increased dramatically; the ICT sector has become an important source of employment and one of the fastest growing sectors, with continued double-digit growth; the digital divide within society keeps closing down and the use of ICT in companies is quickly increasing,[217] prompted by "continuing research and development in the application of ICT in industries to allow Egypt to become and remain a world-class competitor".[218]

The government of Egypt established its *Cabinet Information and Decision Support Center (IDSC)* in 1985. The aim of this centre was to build up Egypt's IT Industry and to provide the government with additional ICT know-how. The Cabinet has not only provided advice but also implemented many projects "in legislation reform, public sector reform, human resources development and job creation, cultural heritage preservation, urban planning, and sectoral development projects at the ministerial and governorates level (…)".[219] In 1999, President Mubarak founded a new Ministry of ICT matters, called the *Ministry of Communications and Information Technology* (MCIT).

Box 3.10 below, provides an overview of the vision presented in three key policy papers of Egypt's ICT strategy: *Building Digital Bridges - Egypt's Vision of the Information Society*, developed in 2003 and updated in 2004; *Egypt's Information Society* of 2005, and *Egypt's ICT Strategy 2007-2010*, published by the MCIT.

Box 3.10: Egyptian's ICT strategy – Key documents

Based on a clear vision, Egypt has developed a sound ICT strategy, adjusting measures to changing circumstances

Building Digital Bridges - Egypt's Vision of the Information Society (2003)

"Egypt remains firmly committed to its goal of bridging the digital divide – to ensure that Egypt, its citizens, and its business derive the maximum benefit from information and communication technology. This commitment to fostering a transition to an Information Society is made not as an end in itself but rather as a means to the more fundamental goals of the Egyptian government: improved public services, a stronger economy, increased productivity and greater opportunities".

Egypt's Information Society (2005)

"The Egyptian government has set three main pillars where policy and development are currently concentrated, that are interwoven to allow Egypt to present itself as a world class provider of services and industry, and at the same time **address development issues internally**."

Egypt's ICT Strategy 2007-2010

"Egypt's 2010 ICT Strategy consolidates and builds on the progress made to date by the government in partnership with the private sector and civil society. For Egypt, […] **ICT is one of the key drivers of economic development and growth.** In the coming pages we share with you our vision for restructuring Egypt's ICT sector, maximizing the benefits of ICT for development, and nurturing innovation to support industry development, while creating partnerships locally, regionally and globally."

Source: Egypt, Ministry of Communications and Information Technology (MCIT). (2003). p.5; Egypt, MCIT. (2005). p.3 ; Egypt, MCIT. (n.d.). *Egypt's ICT 2007-2010*. pp. 6-7. [Bold added].

[217] Egypt, Ministry of Communications and Information Technology (MCIT). (n.d.). *Egypt's ICT 2007-2010*, pp. 4-5.

[218] Ibid.

[219] Egypt, MCIT. (2003). p. 9.

In 2003, Egypt's government described its vision of building an Information Society and bridging the digital divide (see Box 3.10). The *Building Digital Bridges* document provided the base line for further decisions, describing the situation in the country regarding ICT access and use, and introducing seven areas of activity or "bridges", which would be part of the Egyptian Information Society Initiative (EISI). These bridges addressed the areas of e-readiness, e-learning, e-government, e-business, e-health, e-culture and an ICT export initiative.[220]

The government of Egypt has held on to its vision while developing its two following ICT strategies. Nevertheless, there have been strategic changes between the two ICT strategies to take into consideration changes that occurred after 2005.

In general, the 2005 strategy is holistic, dealing with all aspects of the Information Society and focusing on bridging many gaps. The strategy includes many projects dedicated to advancing progress in the ICT industry and building capacity within the country through the promotion of ICT literacy, e-learning and access to information. Yet, it also gives priority to other social aspects, such as employment creation and gender equality.[221]

To strengthen the competitiveness of its ICT industry on the global market, the government of Egypt gave precedence to the promotion of economic development and growth in its current ICT strategy (see Box 3.10). Accordingly, the priorities set up in the 2007-2010 ICT strategy are more industry oriented, even when referring to capacity building objectives:

- "To continue development of state-of-the-art ICT infrastructure that provides an enabling environment for government and businesses throughout Egypt and links it globally.
- To create a vibrant and export-oriented ICT industry.
- To leverage public-private partnerships as an implementation mechanism whenever possible.
- To enable society to absorb and benefit from expanding sources of information.
- To create a learning community whose members have access to all the resources and information they require regardless of gender and location, thus allowing all to achieve their full potential and play a part in the country's socioeconomic development.
- To support the development of the skills required by the ICT industry.
- To support research and innovation in the field of ICT."[222]

So far, Egypt has followed a very comprehensive and future-oriented ICT approach, enabling the development of a global competitive ICT industry that would benefit society and stimulate national development towards the Information Society.

[220] Egypt, MCIT. (2003). pp. 10-11.

[221] Egypt, MCIT. (2005).

[222] Egypt, MCIT. (n.d.). pp. 6-7.

Poland

Over the last decade, Poland's strategy for the ICT sector has evolved through a series of key documents, discussed in Box 3.11 below, that guide its path towards the Information Society. In 2000, Poland communicated its vision for the Information Society in its first national e-strategy, called *Aims and Directions of the Information Society Development in Poland*. This strategy was based on seven reports conducted in the framework of Poland's preparation to join the European Union in 2004. Among its objectives, the strategy included strengthening the Polish economy,[223] enabling universal access and facilitating the use of ICT by the public sector to ensure greater efficiency and assist in the establishment of open, transparent and citizen-friendly structures of public administration.[224]

Box 3.11: Poland's ICT strategy – Key documents
Ten years of national e-strategies.

Aims and Directions of the Information Society Development in Poland (2000)
"[T]he strategy for implementing the idea of the information society in Poland should be viewed as a set of activities aimed at ensuring the access of all citizens to information on the regulations, procedures, government actions, initiatives of private enterprises, possibilities of investment and development, financial mechanisms, available technologies and products, possibilities of applying ICT in the workplace and at home, as well as statistical information in the field of economy, demographics, living standards, environmental protection, etc., and at increasing the competitiveness of the Polish economy on the European and world market."[225]

Action Plan for the Information Society Development in Poland for the years 2001-2006, "ePolska"
Objectives:

- "to prepare the Polish society for fast technological, social and economic transformations resulting from the creation of the information society",
- "to adapt the legal framework to requirements of fast technological progress",
- "to prepare the Polish society for challenges of a new labour market and new methods of work",
- "to adapt the national economy to global e-commerce requirements",
- "to create transparent and citizen-friendly public administration",
- "to create conditions for sustainable and balanced regional development",
- "to enhance their innovativeness in order to improve the Polish economy's competitiveness",
- "to secure support for e-commerce",
- "to promote widely Poland's culture and its economic achievements."[226]

223 Poland, State Committee for Scientific Research. (2000).
224 epractice.eu. (2010).
225 Poland, State Committee for Scientific Research. (2000).
226 Poland, Government of, Ministry of Economy. (n.d.).

ePolska – Strategy for the Development of the Information Society for the years 2004-2006, adopted by the Council of Ministers in 2004

Strategic goals:

- Contribute to the development of the knowledge-based economy;
- Improve the citizens' quality of life.

Main objectives:

- Provide affordable, fast and secure Internet access to all citizens and businesses;
- Develop useful on-line content and services;
- Achieve widespread ICT literacy.[227]

Strategy for the development of the Information Society in Poland until 2013 (2008)

Vision: "A Pro-active Society that achieves a high quality of life at the personal and social level."[228]

Mission: "To ensure the universal and effective use of information and knowledge for harmonious social, economic and personal development."[229]

Within the *People* area, the Strategy adopted the following objectives:

- Improving the level of motivation, awareness, knowledge and skills in the use of ICT solutions;
- Improving the level and accessibility of education (pre-school to university) and promote life-long learning by using ICT solutions;
- Adjusting the educational offer to the requirements of the labour market, with ICT as one of its vital components;
- Increasing the feeling of safety in the society by using ICT solutions;
- Increasing Polish citizens' social, cultural and political activity by using ICT solutions;
- Ensuring that the infrastructure for ICT is cost-effective, secure and oriented to the future needs of the citizens, which is required to develop the Polish information society.

Within the *Economy* area, the objectives include:

- Improving the ability of R&D centres to create innovative solutions to be used by enterprises;
- Creating favourable conditions for the development of the ICT sector and e-services in Poland;
- Increasing the competitiveness and innovation potential of Polish enterprises by creating conditions that will allow better use of ICT.

Within the *State* area, the strategy seeks to:

- Provide a broad range of public administration services via electronic channels;
- Increase the effectiveness of the public administration by the extensive use of standardized and interoperable IT solutions;
- Provide citizens and enterprises access to data from reference registers and other public information sources to ensure its further use for the enhancement of the contents and services of the administrations' offer;
- Support the creation of pan-European services and the mutual recognition of ICT solutions and tools.

Source: Poland, State Committee for Scientific Research. (2000); Poland, Gov. of. Ministry of Economy. (n.d.); Poland, Government of. Ministry of Science and Information Society Technologies. (2004); Poland, Government of. Ministry of Interior and Administration. (2008).

227 Poland, Government of, Ministry of Science and Information Society Technologies (2004).

228 Poland, Government of, Ministry of Interior and Administration. (2008). p. 8.

229 Ibid.

To guide the implementation of its e-strategy, Poland developed the *Action Plan for the Information Society Development in Poland for the years 2001-2006, "ePolska",* published by the Ministry of Economy (see Box 3.11). This action plan focused on six areas, namely: The development of further telecommunication infrastructure; universal, fast, safe and affordable access to the Internet; enabling people to participate in the knowledge economy; online services by government and businesses; the special situation of rural areas, and the development of digital television.[230] The implementation of the Action Plan, coordinated by the Ministry of Communication, took into consideration the e-strategy of 2000 and sectoral strategies developed by different Ministries.

In 2003, the government established the *Ministry of Science and Information Society Technologies*, which became responsible for the Information Society and e-government.[231] During this period, the Action Plan was updated with *ePolska - Strategy on the Development of the Information Society for the years 2004-2006* (see Box 3.11).

Both plans were followed-up with the *Plan for the Informatization of the State 2007-2010*, which built upon the previous plans, and sought to face the challenge of dealing with the large inflow of structural funds that the European Union allocated for the Information Society.

The current Polish e-strategy, called *Strategy for the Development of the Information Society in Poland until 2013*, was approved by the Council of Ministers and signed by the Prime Minister in 2008.[232] This document was greatly influenced by the European Union's e-strategy *i2010* and the *Lisbon Strategy*, which is the EU's economic development plan. The aim of the strategy is to ensure the universal and effective use of information and knowledge for harmonious social, economic and personal development. It provides an analysis of the existing situation and identifies geographical, educational and economic barriers for participation in the knowledge-based economy.[233]

The strategy, structured along the areas of "People", "Economy" and the "State" (See Box 3.11), proposes the following strategic directions:

- "Accelerate the growth of the intellectual and social capital of Polish citizens with the use of ICT solutions";[234]
- "Increase the productivity, innovation potential and competitiveness of Polish companies, and thus Poland, in the global market, and facilitate B2B communications and cooperation with the use of ICT solutions";[235]
- "Increase the accessibility and effectiveness of public administration services with the use of ICT solutions to reconstruct internal processes in the administration and the delivery of services."[236]

230 Poland, Government of, Ministry of Economy. (n.d.).

231 epractice.eu. (2010).

232 Ibid.

233 Ibid., p. 5.

234 Ibid., p. 11.

235 Ibid.

236 Ibid.

Moving ahead on this strategy, the Council of Ministers established a special inter-ministerial group in December 2008 to prepare a set of actions, called *Digital Poland*, and coordinate and monitor their implementation.[237] The programme aims to extend the provision of broadband services in Poland by 2012 by removing obstacles for and promoting ICT investment, among other activities. As part of *Digital Poland*, the government will conduct legal, financial and technical analyses to optimise the implementation of the programme; it will also prepare the necessary legislative amendments to accomplish these objectives, and promote cooperation with the local authorities.[238]

More recently, in 8 April 2010, the Sejm, Poland's lower chamber of the Parliament, passed an act to support the development of telecommunications services and networks. The act establishes a legal framework for universal access to telecommunications services, especially broadband. It includes comprehensive solutions to facilitate telecommunication investments and develop market competition; it also enables local authorities to stimulate investment. The act is expected to come into force in mid-2010.

[237] European Commission. (2010).

4 Conclusion

By 2010, **at least 84 percent of economies worldwide already** had an ICT strategy in place. Many other countries are currently in the process of formulating or adopting such a strategy. Accordingly, the majority of countries have met the target set in Paragraph 85 of the *Tunis Agenda for the Information Society*.

Some of the approaches and trends identified in the analysis of ICT strategies were foreseeable. **Infrastructure** continues being a key concern, even among countries with high ICT penetration. **Broadband and mobility** are the two major technological trends addressed by governments. In most strategies, the private sector plays a crucial role in deploying ICT infrastructure. Therefore, almost all countries continue their path towards liberalisation in order to stimulate the market through competition. Increased competition is expected also to result in reduced rates.

Capacity building is another area of interest shared by most national e-strategies. Governments are aiming at increasing ICT use in education and developing ICT skills at all educational levels, from primary school to academic research, in response to their local circumstances. The goal is to produce and retain larger numbers of IT graduates and skilled IT professionals.

The development of national ICT strategies is being driven in part by **growing international competition** in the ICT sector. Many governments are working towards expanding their ICT exports, attracting outsourcing activities to their countries or protecting their current positions. Not surprisingly, issues of intellectual property rights, international standards and economic regional integration are increasingly included in national e-strategies.

Similarly, **confidence and security** are two topics frequently mentioned in national e-strategies. As the number of **e-government** and **e-business** transactions rises worldwide, governments and other stakeholders alike are realising the need to take measures for improving the level of trust in those ICT applications. Both e-sectors are characterised by the conduction of sensitive transactions, and an uptake in the level of usage by citizens and customers depends largely on their trust in these technologies.

Many national e-strategies include concrete measures aimed at promoting economic development through the improvement of national competitiveness in the regional or global ICT market. Consequently, many countries have **integrated ICT into their national development plans** and **poverty reduction strategies**.

Many initiatives and projects are currently being implemented based on the consensus that policy areas like health care, agriculture, and environmental protection could benefit from the adoption of ICT. Nevertheless, many countries still lack a sectoral e-strategy based on these experiences. One area recommended for further improvement would be, therefore, the **strategic integration of ICT into different sectors.**

All the UN Regional Commissions have contributed to the success in the development of national e-strategies. They have actively supported many countries in the elaboration of e-strategies, as well as collected and reported on the e-strategies already formulated in their respective regions. The Commissions also provide a great platform for the regional and interregional exchange of good practices. The similarities among national e-strategies highlighted in this report emphasise the usefulness of sharing national experiences and good practices among countries and regions.

A unique feature of the WSIS process has been its **multi-stakeholder approach**. Most governments have mirrored this successful approach at the national level, involving civil society, NGOs, the private sector, academia, and regional and international organizations in their ICT strategies. The pervasiveness of ICT in all aspects of the economy and society makes multi-stakeholder participation an indispensable approach.

ITU will continue tracking the development of national e-strategies worldwide, and remains committed to supporting its Member States in their efforts to elaborate and improve their national e-strategies, so as to enable the achievement of a truly digital society.

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Appendix: National e-Strategies

Country	Strategy status	Name of strategy
Low-income group		
Islamic Republic of Afghanistan	Yes	Information and Communication Technologies (ICT) Policy, November 2003
Bangladesh	Yes	National ICT Policy
Benin	Yes	The Communication and Information Infrastructure Development Plan of Benin: 2000-2004
Burkina Faso	Yes	An Information and Communication Infrastructure Development Plan of Burkina Faso: 2000-2004
Burundi	Yes	Stratégie Nationale de Développement des TIC (SNDTIC)
Cambodia	In Progress	Draft ICT Policy
Central Africa Rep.	In Progress	National ICT Strategy, Policy
Chad	Yes	Plan de Développement des Technologies de l'Information et de la Communication au Tchad - PLAN NICI
Comoros	Yes	Lettre de Politique de développement des Nouvelles Technologies de l'Information et de la Communication 2004-2008
D. R. Congo	In Progress	
Eritrea	No	
Ethiopia	Yes	The Draft National ICT Policy; Five-year National Action Plan and National ICT Strategy
Gambia	Yes	The Gambian ICT4D-2012 Plan; Developing The Gambian Information Economy and Society and Accelerating the Process of Transforming The Gambia into the Silicon Valley of Africa
Ghana	Yes	Ghana ICT for Accelerated Development (ICT4AD) Policy
Guinea	Yes	Plan de Développement de l'Infrastructure Nationale d'Ínformation et de Communication de la République de Guinée 2001-2004
Guinea- Bissau	No	
Haiti	Yes	Plan d'Action pour le Développement des Technologies de l'Information en Haïti
Kenya	Yes	The National Information & Communications Technology (ICT) Policy
Kyrgyzstan	Yes	National Strategy Information and Communication Technologies for Development in the Kyrgyz Republic; National ICT Action Plan
LAO P.D.R.	Yes	
Liberia	Yes	National Telecommunications Policy for Liberia
Madagascar	Yes	Lettre de Politique Nationale du Secteur des Télécommunications et TIC pour la période 2007-2012 ; Stratégie Nationale des TIC pour le Développement
Malawi	Yes	An Integrated Socio-Economic and ICT Policy and Plan Development Framework for Malawi
Mali	Yes	Politique Nationale et Plan Stratégique National des Technologies de l'Information et de la Communication (2005-2006-2007) ; NICI Policy and Plan Documents
Mauritania	Yes	National Information and Communication Infrastructure Development Plan: 1999-2002
Mozambique	Yes	Information and Communication Technology Policy Implementation Strategy, toward the Global Information Society
Myanmar	Yes	ICT Master Plan of Myanmar
Nepal	Yes	Information Technology Policy, 2057; Nepal's Information Technology Policy
Niger	Yes	Le Plan de Développement des Technologies de l'Information et de la Communication au Niger- Plan NICI du Niger pour la période 2005-2010
Rwanda	Yes	National Information and Communications Infrastructure plan, NICI, 2001-2005; The NICI- 2010 Plan
Senegal	Yes	Senegal National Strategy
Sierra Leone	In Progress	A national policy on ICT
Somalia	No	
Tajikistan	Yes	State Strategy ICT for Development of the Republic of Tajikistan1 (e-Strategy)
Tanzania	Yes	National Information and Communications Technologies Policy
Togo	Yes	Plan NICI

Country	Strategy status	Name of strategy
Uganda	Yes	National ICT Policy
Uzbekistan	In Progress	In Progress
Viet Nam	Yes	Master Plan for Information Technology use and development in Vietnam by 2005; Strategy for Development of Vietnam's Information and Communication Technology toward 2010 and orientations toward 2020
Yemen	In Progress	Information Technology Master Plan for Yemen
Zambia	Yes	Zambia's First Draft National Information and Communication Technology Policy; ICT Policy, Fifth National Development Plan2006-2010 - a third and final draft
Zimbabwe	Yes	National ICT Strategy Document; The Zimbabwe ICT Strategic Plan (2010-2014)
Lower-Middle Income Group		
Albania	Yes	National Information and Communication Technologies Strategy
Angola	Yes	Strategy for The Development of Information technology 2000-2010
Armenia	Yes	ICT Master Strategy for Republic of Armenia
Azerbaijan	Yes	The National Information and Communication Technologies Strategy for the Development of the Republic of Azerbaijan for the years 2003-2012; The State Program (E-Azerbaijan) on the Development of the Communication and Information Technologies in the Republic of Azerbaijan covering the years of 2005-2008
Belize	Yes	The National ICT Policy
Bhutan	Yes	Bhutan Information Technology Strategy (BITS); ICT Master Plan for Bhutan; Bhutan ICT Policy & Strategies (BIPS)
Bolivia	Yes	Estrategia Nacional Para la Transición Hacia una Sociedad de la Información Boliviana; National Plan for Digital Inclusion 2007-2010
Cameroon	Yes	The draft NICI plan
Cape Verde	Yes	Plan National de Développement d'Infrastructures des Technologies d'Information et Communication
China	Yes	Golden Projects' Strategic Plan for National Information Infrastructure; State Informatization Strategy (2006-2020)
Congo Rep.	Yes	Stratégie Nationale pour le Développement des Technologies de l'Information et de la Communication en République du Congo
Cote d'Ivoire	Yes	Plan de Développement de l'Infrastructure Nationale de l'Information et de la Communication 2000 – 2005
Djibouti	Yes	ICT Strategy and Action plan with a 20-year horizon; Djibouti National ICT Strategy and Accompanying Action Plan
Ecuador	Yes	National Connectivity Agenda 2002 (Plan of Action 2005-2010); Agenda Nacional de Conectividad Plan de Acción 2005-2010
Egypt	Yes	National Plan for Communications and Information Technology; Egypt's Information Society; ICT Strategy 2007-2010
El Salvador	Yes	E-Country Programme 2007-2021; Política Nacional de Informática
Georgia	Yes	ICT Development Framework for Georgia
Guatemala	Yes	National Agenda for the Information and Knowledge Society 2007-2015
Guyana	Yes	ICT4D Guyana, National Strategy, Final Draft, National Strategy 2001-2010
Honduras	Yes	WSIS Declaration and Plan of Action within the "Marco Law"
India	Yes	IT Action Plan I: Software; IT Action Plan II: Hardware; and IT Action Plan III: Term National IT Policy; National Informatics Policy
Indonesia	Yes	Five Year Action Plan for the Development and Implementation of Information and Communication Technologies (ICT); E-Indonesia Action Plan; ICT Policy Framework
Iran	Yes	TAKFA- Extension of Application of ICTs in Iran
Iraq	In Progress	ICT strategies 2007-2010
Jordan	Yes	National ICT Strategy of Jordan 2007-2011
Kiribati	No	
Lesotho	Yes	ICT Policy for Lesotho; Lesotho ICT Implementation Plan
Maldives	Yes	Science and Technology Master Plan
Marshall Islands	N/A	
Micronesia	In Progress	
Moldova	Yes	National Strategy on Building Information Society- "e- Moldova"

Country	Strategy status	Name of strategy
Mongolia	Yes	E-Mongolia; National Vision for ICT Development of Mongolia up to 2010 ("ICT Vision 2010")
Morocco	Yes	Stratégie Maroc 2005; Stratégie e-Maroc 2010
Nauru	N/A	
Nicaragua	Yes	National Development Strategy ICT
Nigeria	Yes	National Policy on Telecommunications; Nigerian National Policy for Information Technology, "Use It"
Pakistan	Yes	IT Policy and Action Plan
Papua New Guinea	Yes	National Policy on Information and Communication
Paraguay	Yes	National Development Plan of the Information Society 2002-2005
Philippines	Yes	National Information Technology Plan 2000;IT21; E-Philippines: ITECC Strategic Roadmap; IT 21 Philippines Asia's Knowledge Center. IT Action Agenda for the 21st Century; Philippines ICT Roadmap (2006-2010)
Samoa	Yes	ICT Policy and Strategic Plan; National e-Strategy; National ICT Policy; Digital Strategy (for the Countries in Pacific)
S. Tome & Principe	No	
Solomon Islands	Yes	Digital Strategy (The Pacific Plan's Digital Strategy)
Sri Lanka	Yes	E-Sri Lanka
Sudan	Yes	National Strategy for Building the Information Industry in Sudan; The Sudan National Strategy for ICT Industry
Swaziland	Yes	ICT Strategy for the Period 2006 – 2011
Syria	Yes	ICT Strategy for economic and social development
Thailand	Yes	IT 2000 Policy (1996-2000); IT2010 Policy (2001-2010); National IT Policy Framework, IT 2010; National Information and Communication Technology (ICT) Master Plan (2002-2006)
Tonga	N/A	
Tunisia	Yes	National Policy and a strategy of implementation
Turkmenistan	In Progress	In Progress
Tuvalu	In Progress	Tuvalu National ICT policy, "Information and Communication Technologies for every Tuvaluan Citizen"
Ukraine	Yes	National Strategy for Information Society Development in Ukraine; General Measures of Information Society Development in Ukraine – 2007-2015
Vanuatu	N/A	
Upper-Middle Income Group		
Algeria	Yes	e-Algérie 2013; Law N. 2000-03
Argentina	Yes	National Programme for the Information Society; Estrategia Nacional Para la Sociedad de la Información
Belarus	Yes	Strategy of Information Society Development in Belarus during the period 2010-2015
Bosnia	Yes	Policy, Strategy and Action Plan for the Development of an Information Society; Information Society Strategy and Action Plan, 2004-2010
Botswana	Yes	The National ICT Policy
Brazil	Yes	Information Society in Brazil, Green Book; Green Book of the Information Society
Bulgaria	Yes	National Program for the Information Society: Strategy Paper; National Strategy and Action Plan for Bulgarian ICT Industry's Competitiveness; National Strategy on ICT policy in Bulgaria
Chile	Yes	Agenda Digital 2004-2006; Strategic Digital Development Plan 2007-2012
Colombia	Yes	Connectivity Agenda; Agenda de Conectividad Conpes 3072
Costa Rica	Yes	National Science and Technology Plan 2002-2006; Agenda Digital
Cuba	Yes	Lineamientos Estratégicos de Informatización de la Sociedad; Governing Programme for the Computerization of the Cuban Society
Dominica	In Progress	Estrategia Nacional para la Sociedad de la Información
Dominican Rep.	Yes	National Strategy for the Information Society: Strategic Plan 2007-2010; Estrategia Nacional para la Sociedad de la Información Dominicana: e-Dominicana

Country	Strategy status	Name of strategy
Fiji	Yes	Policy Directions and Strategies for the Development and Growth of Information and Communication Technology, Fiji Information Technology Development Policy, e-Fiji the future online, Creating Information Economy for Fiji
Gabon	In Progress	In Progress
Grenada	Yes	ICT Strategy and Action Plan 2001-2005; ICT Strategy and Action Plan 2006-2010
Jamaica	Yes	NICT Strategy 2002-2006; A Five Years Strategic Information Technology Plan for Jamaica; E-Powering Jamaica 2007-2012; National ICT Strategy, Context and Background, Supporting Document to the e-Powering Jamaica 2012 NICT Strategy
Kazakhstan	Yes	State Program of Formation and Development of the National Information Infrastructure of the Republic of Kazakhstan, 2001
Latvia	Yes	Information Society Development Guidelines for 2006 –2013
Lebanon	Yes	National ICT Strategy and Action Plan; National e-strategy for Lebanon
Libya	No	
Lithuania	Yes	Resolution No.229 on the Approval of the Conceptual Framework of the National Information Society Development of Lithuania; Information Society Development Strategy
TFYR Macedonia	Yes	The Government Programme (2006-2010); National Information Society Policy document and the National Strategy and Action Plan for Information Society Development; National Strategy for Information Society Development in FYROM; National Strategy for the Development of Electronic Communication with Information Technologies
Malaysia	Yes	The National IT Agenda (NITA); The Malaysian Public Sector ICT Strategic Plan
Mauritius	Yes	National IT Strategy Plan (NITSP); National Telecommunications Policy (NTP - 2004); National ICT Strategic Plan 2007-2011
Mexico	Yes	Sistema Nacional e-México; National Development Plan 2001-2006; National Development Plan 2007-2012
Montenegro	Yes	National Strategy for Information Society
Namibia	Yes	Telecommunications Policy and Regulatory Framework for Namibia; Information and Communication Technology Policy For the Republic of Namibia (2001, 2002)
Panama	Yes	Programa E-Panamá; National Agenda for the Innovation and the Connectivity
Peru	Yes	Lineamientos de Políticas Generales Para Promover la Masificación de Internet en el Perú; e-Perú: Propuestas para un Plan de Acción para el Acceso Democrático a la Sociedad de la Información y el Conocimiento; Peruvian Digital Agenda 2005-2014
Poland	Yes	The Strategy for Development of the Information Society in Poland until 2013
Romania	Yes	National ICT Policy, the "Digital Romania"; National Strategy for the New Economy and the Implementation of the Information Society
Russia	Yes	Electronic Russia. Government Program 2002-2010
Serbia	Yes	National Strategy for an Information Society
Seychelles	Yes	National Strategy on ICT
South Africa	Yes	The South Africa IT Strategy Project (SAITIS); Strategic Plan 2005-2008; Strategic Plan 2009-2012
St. Kitts and Nevis	Yes	National Information and Communications Technology (ICT) Strategic Plan
St. Lucia	Yes	Pan Caribbean SME ICT Competitiveness; Development Programme 2005-06; ICT Development Strategy
St. Vincent and the Grenadines	Yes	ICT Strategy and Action Plan 2002 to 2006
Suriname	Yes	Road Map to ICT Policy of Suriname
Turkey	Yes	The Turkish Information Society Strategy and the related Action Plan for the period 2006-2010
Uruguay	Yes	
Venezuela	Yes	National Information Technology Plan 2001; National Plan for Telecommunications, Information Technologies and Postal Services 2007-2013
High Income Group		
Andorra	In Progress	
Antigua & Barbuda	Yes	Information and Communication Technologies (ICTs) Draft Policy
Australia	Yes	

Country	Strategy status	Name of strategy
Austria	Yes	
Bahamas	Yes	Policy Statement on Electronic Commerce and the Bahamian Digital Agenda
Bahrain	Yes	The Second National Telecommunications Plan, Decision No. (8) of 2008 Regarding the Second National Telecommunications Plan Approval
Barbados	Yes	Mobile Barbados: Building the Networked Nation. Draft Report of the Barbados' National ICT Strategic Plan
Belgium	N/A	
Brunei Darussalam	Yes	National IT Strategic Plan- IT 2000 and Beyond; Brunei Darussalam Information Society: Strategy Paper
Canada	Yes	Canada's eStrategy
Croatia	Yes	e-Croatia Programme; Information and Communication Technology- Croatia in the 21st Century
Cyprus	Yes	
Czech Republic	Yes	Information Policy 2000; eStrategy 2003
Denmark	Yes	
Estonia	Yes	IT Policy 2004-2006; Estonian Information Society Strategy 2013
Equatorial Guinea	Yes	The Equator Guinean Plan of action for the decade (2001 – 2010)
Finland	Yes	Ubiquitous Information Society Action Programme 2008-2011
France	Yes	
Germany	Yes	Innovation Policy, Information Society, TelecommunicActions. The Federal Government's Broadband Strategy
Greece	Yes	National Digital Strategy 2006-2013
Hong Kong	Yes	Digital 21 IT Strategy (1998); Digital 21 IT Strategy (2001); Digital 21 IT Strategy (2004); Digital 21 Strategy, Continuing to Build our Strengths through Technology across the Community
Hungary	Yes	The Hungarian Information Society Strategy
Iceland	Yes	Policy of the Government of Iceland on the Information Society; Iceland the e-Nation. Icelandic Government Policy on the Information Society 2008-2012
Ireland	Yes	New Connections, A Strategy to Realize the Potential of the Information Society, Government Action Plan
Israel	Yes	
Italy	Yes	The "Digital Italy Plan"
Japan	Yes	E-Japan Strategy; IT New Reform Strategy' and 'U-Japan'; New IT Reform Strategy - Realizing Ubiquitous and Universal Network Society Where Everyone Can Enjoy the Benefits of IT
Korea (Rep.)	Yes	First Master Plan for Informatization Promotion; Cyber Korea 21 (Second Master Plan for Informatization); E-Korea Vision 2006 (The Third Master Plan for Informatization); T 2003: Broadband IT Korea Vision (revision of the third Master Plan for Informatization); - IT 839 Strategy
Kuwait	Yes	National Strategy for Building an Information Society
Liechtenstein	N/A	
Luxembourg	Yes	Stratégie nationale d'anticipation des compétences TIC (Innosertion)
Macau, China	Yes	
Malta	Yes	The National ICT Strategy for Malta 2008-2010, "The Smart Island"
Monaco	N/A	
Netherlands	Yes	National ICT Agenda 2008-2011
New Zealand	Yes	The Digital Strategy: Creating our Digital Future
Norway	Yes	An Information Society for All in 2006
Oman	Yes	Digital Oman Government Strategy; Oman Digital Report
Portugal	Yes	The Portuguese National Strategy for the Information Society, Ligar Portugal (LP); Connecting Portugal (Ligar Portugal)
Qatar	Yes	Qatar National ICT Strategy
San Marino	N/A	

Country	Strategy status	Name of strategy
Saudi Arabia	Yes	The National Communications and Information Technology Plan, The Vision Towards the Information Society; National ICT Plan
Singapore	Yes	Infocomm 21.Where the Digital Future is; National Computerisation Plan; National IT Plan; IT2000; INFOCOMM 21;Connected Singapore; iN2010; National Infocomm Strategy and Policy
Slovak Republic	Yes	The National Strategy for the Broadband Access to Services of the Information Society (until the year 2008); Information Society Strategy for 2009-2013
Slovenia	Yes	Strategy for the Development of the Information Society in the Republic of Slovenia until year 2010 (SI2010)
Spain	Yes	Plan Avanza: An Information Society Strategy for Spain
Sweden	Yes	Innovation Strategy; Broadband Strategy for Sweden
Trinidad & Tobago	Yes	Fastforward: Trinidad and Tobago-Accelerating into the digital future. 2003-2008
United Arab Emirates	Yes	General Policy for the Telecommunications Sector in the State of the United Arab Emirates (2006-2010); Information Society Development Plan
United Kingdom	Yes	Digital Strategy 2005
United States	Yes	Connecting America: The National Broadband Plan
Vatican	N/A	

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