International Telecommunication Union
World Summit on the Information Society
WSIS Stocktaking Process

working together towards 2015

World Summit Geneva 2003 Tunis 2005
on the Information Society
Turning targets into action

REPORT ON THE WORLD SUMMIT ON THE INFORMATION SOCIETY STOCKTAKING

2015
2014
2013
2012
2010
2008
2005

REPORTING ON THE IMPLEMENTATION OF WSIS OUTCOMES

www.wsis.org/stocktaking

world summit
on the information society
Geneva 2003 - Tunis 2005

ITU

Report on the WSIS Stocktaking 2014

www.wsis.org/stocktaking

Acknowledgements

The WSIS team would like to acknowledge the tremendous contributions of governments, international organizations, private sector, civil society and other stakeholders in providing information on ongoing projects and initiatives to the WSIS Stocktaking Platform. WSIS Stocktaking Report is based on the contributions provided by stakeholders in response to the ITU official call for update and new entries. The full descriptions of the activities are available at accessible online database www.wsis.org/stocktaking.

The report benefited from the contributions and insights of Jaroslaw Ponder (ITU), Regina Valiullina (ITU), Anthony Pitt (ITU), Marco Obiso (ITU), Gitanjali Sah (ITU), Carla Licciardello (ITU), Preetam Maloor (ITU), Simon De Nicola (ITU), Hala Al-Yammouni (ITU), Makhtar Fall (ITU), Riccardo, Passerini (ITU), Takayuki Sugimoto (ITU), Hani Eskandar (ITU), Susan Teltscher (ITU), Vanessa Gray (ITU), Desire Karyabwite (ITU), Vladimir Daigele (ITU), Susan Schorr (ITU), Onder Cetinkaya (ITU), Mahmoud Al-Wreikat (ITU), Andrea Maia-Reboucas (ITU), Ramita Sharma (ITU), Istvan Bozsoki (ITU), Hwanjung Yang (ITU), Lucas Guillermin (ITU), Torbjorn Fredriksson (UNCTAD), Michael Riggs (FAO), Sophie Treinen (FAO), Kristin Kolshus (FAO), Alice Vander Elstraeten (FAO)

In case of any suggestions or recommendations, please, do not hesitate to contact us at wsis-stocktaking@ itu.int

Foreword by the ITU Secretary-General, Dr Hamadoun I. Touré

It is my honour to release the sixth (2014) edition of the *WSIS Stocktaking Report.*

Since the World Summit on the Information Society (WSIS), held in two phases in 2003 and 2005, we have witnessed an extraordinary evolution in the development of the information society. Information and communication technologies (ICTs) are increasingly becoming an everyday tool, rather than a luxury. By the end of 2014, there will be almost as many mobile-cellular subscriptions worldwide as there are people, and there will be close to 3 billion people online.

For many years, the Geneva Plan of Action and the Tunis Agenda for the Information Society have been serving as a reference point for governments and all stakeholders striving to achieve the WSIS goals and bridge the digital divide. Enormous progress has been made in the information society, leveraging the use of ICTs to improve quality of life. Nowadays, almost every country in the world has a vision and plan to develop the information society. Thanks to ICTs and their applications, a link between government and other stakeholders has been created whereby everybody has an opportunity to make their voice heard.

The International Telecommunication Union (ITU) has been committed to the WSIS process since the latter was established in order to implement WSIS follow-up actions - whether by coordinating annual WSIS Forums, managing the WSIS Stocktaking process, chairing or vice-chairing the United Nations Group on the Information Society (UNGIS), coordinating actions of the Partnership on Measuring ICTs for Development or fulfilling its role as sole facilitator for the WSIS action lines on ICT infrastructure, cybersecurity and enabling environment. The WSIS Stocktaking process is one of the outcomes of the WSIS Summit. For ten years, the WSIS Stocktaking process has been serving as a global repository for collecting and reporting on ICT-related projects fostering implementation of the WSIS outcomes. I am pleased to note that, today, the WSIS Stocktaking community comprises more than 30 000 stakeholders who are eager to contribute regularly and work on the WSIS process year after year.

I am proud to say that, thanks to inputs from our stakeholders, we have been able to maintain a unique collection of best practices and update our readers with reports each year. The multistakeholder approach continues to be the core element in the WSIS process. This report gives an overview of more than 1 000 activities from all over the world implemented by international organizations, governments, the private sector, civil society and other stakeholders.

Many projects and initiatives reflected in the report highlight developments made towards achieving the WSIS goals as well as the Millennium Development Goals. I believe that stakeholders should continue to work on those activities in the framework of the post-2015 development agenda and the forthcoming Sustainable Development Goals.

On the occasion of the WSIS+10 High-Level Event, it is my pleasure to release the WSIS Stocktaking Report 2014, and in so doing to extend my sincere gratitude to all stakeholders who have been engaged in this process since 2004 by sharing with others their national advances on implementation of the WSIS outcomes.

Dr Hamadoun I. Touré
ITU Secretary-General

Table of Contents

Table of Contents

Page

Table of Contents

Introduction

Introduction to WSIS

United Nations General Assembly (UNGA) Resolution 56/183 (21 December 2001) endorsed the holding of the *World Summit on the Information Society* (WSIS) in two phases. The first phase took place in Geneva, from 10 to 12 December 2003, and the second phase took place in Tunis, from 16 to 18 November 2005. The objective of the first phase was to develop and foster a clear statement of political will and take concrete steps to establish the foundations for an information society for all, reflecting all the different interests at stake. The objective of the second phase was to put the Geneva Plan of Action into motion, as well as to find solutions and reach agreements in the fields of Internet governance, financing mechanisms and follow-up and implementation of the Geneva and Tunis documents.

The information society has witnessed dramatic development since 2005. Studies directed by the International Telecommunication Union (ITU) have measured that, for instance, the number of mobile-cellular subscriptions has risen from about 35 to close to 100 per 100 inhabitants between 2005 and 2014, representing a 96 per cent penetration worldwide.[1] Internet penetration has increased from around 15 per cent in 2005 to 40 per cent globally in the same time-frame.[2] The ICT Facts and Figures Report for 2014 also indicates that, globally, 44 per cent of households have access to Internet at home,[3] thus giving the population an opportunity to benefit from information and knowledge available online.

Beyond 2015, information and communication technologies (ICTs) will continue to be fully and effectively integrated in the global wave of socio-economic development. The vision pursued by plans at the regional level is in line with the United Nations Millennium Development Goals (MDGs) and WSIS, and enshrines the principle that ICTs are instruments for economic development and social inclusion. International organizations remain committed to working on ICTs beyond 2015: issues related to technology and ICTs were included, for instance, in the First Geneva Dialogue on the Post-2015 Sustainable Development Agenda, organized by Secretary General of the United Nations Conference on Trade and Development (UNCTAD).

WSIS Forum

Pursuant to §§ 108 and 109 of the Tunis Agenda for the Information Society, the *WSIS Forum* serves as a unique global platform to coordinate implementation of the WSIS outcomes in a multistakeholder format. The cluster of WSIS-related events was rebranded as the "WSIS Forum" in 2009, since which time the forum has provided an international platform through which WSIS stakeholders can network, learn and share, resulting in concrete actions and outcomes. Each year, the WSIS Forum is hosted and organized by ITU, and co-organized by the United Nations Educational, Scientific and Cultural Organization (UNESCO), UNCTAD and the United Nations Development Programme (UNDP). The forum provides a perfect vehicle

---

1 ICT Facts and Figures 2014: http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf

2 Ibid

3 Ibid

for world leaders to shape strategies that will harness the power of ICTs more effectively in order to accelerate progress towards achievement of the MDGs and the WSIS connectivity targets for 2015 and beyond. It also provides a platform for networking, learning and sharing experiences and outcomes in regard to projects implemented by stakeholders.

WSIS+10 High-Level Event [4]

The WSIS outcome documents and UNGA Resolution 60/252 resolved to conduct an overall review of the implementation of the Summit outcomes in 2015. In this context, building upon the outcomes of the United Nations Group on the Information Society (UNGIS) open consultations on WSIS+10, including the UNGIS Plan of Action for WSIS+10, as well as the multistakeholder guidance provided at the WSIS Forum 2012 and 2013, ITU's membership, through Resolution 172 (Guadalajara, 2010) of the ITU Plenipotentiary Conference and ITU Council Resolution 1334 (Mod. 2013), resolved to hold an ITU-coordinated *WSIS+10 High-Level Event* in 2014 and to establish a preparatory process based on the open and inclusive WSIS+10 Multistakeholder Preparatory Platform (WSIS+10 MPP).

WSIS+10 MPP is a preparatory process for the WSIS+10 High-Level Event involving open and inclusive consultation among WSIS stakeholders (governments, private sector, civil society, international organizations and relevant regional organizations). The preparation is geared to developing multistakeholder consensus on two draft outcome documents (a *WSIS+10 Statement on the Implementation of WSIS Outcomes* and a *WSIS+10 Vision for WSIS Beyond 2015 under mandates of participating agencies*) to be submitted for consideration and endorsement by acclamation during the WSIS+10 High-Level Event. The open consultation process for the WSIS+10 High-Level Event started in July 2013, and is structured in six phases.

The WSIS+10 High-Level Event is an extended version of the WSIS Forum, and is expected to endorse the two outcome documents. The event is built upon two tracks, the High-Level Track, consisting of formal statements, prize awards and endorsement of the outcome documents; and the Forum Track.

Each year, the forum is enriched by case studies and projects submitted for inclusion in the WSIS Stocktaking Database. Real stories about project implementation by stakeholders complement the forum programme, thereby linking the policy and planning processes with practical implementation and grassroots action on the ground. During the opening segment of the WSIS+10 High-Level Event, winners of the WSIS Project Prizes 2014 contest will be publicly announced and awarded with the prize for excellence in recognition of their implementation of WSIS outcomes. The WSIS Project Prizes 2014 ceremony will celebrate achievements of stakeholders committed not only to working towards achieving the WSIS goals, but also to sharing their experiences and knowledge at the global level.

Welcoming an expected 2 000+ delegates from governments, the private sector, civil society and international organizations, the WSIS+10 High-Level Event will focus on a multistakeholder vision for WSIS beyond 2015. The comprehensive event and pre-events programme[5] features high-level dialogues, a ministerial round table, WSIS action line

[4] www.wsis.org/forum

[5] http://www.itu.int/wsis/implementation/2014/forum/agenda/

facilitation meetings, interactive sessions, thematic and country workshops, knowledge exchanges and an exhibition. A ministerial round table will explore the vision of world leaders in the WSIS process beyond 2015, ensuring that ICTs remain a priority in the development agenda going forward. The programme of the WSIS+10 High-Level Event is shaped by a bottom-up approach, through an extensive open consultation process with a wide range of stakeholders. Over the years, the WSIS process has evolved into an outcome-oriented forum founded on multistakeholder consensus and recommendations. Building on the success of the outcome documents from last year, this year's forum will generate crucial outputs, in the form of a Forum 2014 Outcome Document - a compilation of recommendations from all sessions. In order to facilitate participation and inclusion of all WSIS stakeholders, remote participation has been foreseen as an integral feature of the WSIS+10 High-Level Event. Building on the success of e-participation facilities rolled out at WSIS Forum 2011, the organizers have worked towards integrating the most user-friendly and widely employed tools to encourage remote participation at the WSIS+10 High-Level Event. These easy-to-use tools enable two-way communication, allowing WSIS stakeholders to participate in the WSIS+10 High-Level Event at their own convenience and, at the same time, disseminate information about the different sessions and happenings at the forum.[6]

United Nations Group on the Information Society [7]

Since 2006, the *United Nations Group on the Information Society* (UNGIS) – comprising 30 UN agencies – has been serving as an inter-agency mechanism to coordinate substantive policy issues to be addressed in the United Nations system's implementation of the Geneva Plan of Action and Tunis Agenda adopted by WSIS, thereby contributing to improving policy coherence in the UN system, as requested by the Summit in 2005. Now, pursuant to § 46 of UNGA Resolution 62/208, UNGIS also ensures coordination within the United Nations development system, in order to respond to the international attention being given to science and technology transfer in line with the WSIS outcomes. During the WSIS Forum 2013, UNGIS members issued a joint declaration highlighting how the potential of ICTs as key enablers of development and as critical components of innovative development solutions is fully recognized in the Post-2015 Development Agenda, which reflects lessons learned during the past decade in the implementation of the WSIS outcomes. In 2014, ITU is chairing UNGIS and will host the annual UNGIS high-level and working meetings during the WSIS+10 High Level Event.

Partnership on Measuring ICT for Development [8]

The *Partnership on Measuring ICT for Development* is an international, multistakeholder initiative to improve the availability and quality of ICT data and indicators, particularly in developing countries. One of the Partnership's key achievements has been the identification of a core list of indicators. This list of over 50 indicators, which was agreed upon through a consultation process involving governments and international organizations, covers basic infrastructure and access indicators as well as ICTs in households, business and education.

6 http://www.itu.int/wsis/implementation/2014/forum/info/rp.html

7 www.ungis.org/forum

8 www.itu.int/ITU-D/ict/partnership/

The list, which is revised regularly and which was again endorsed by the United Nations Statistical Commission (UNSC) in March 2014, was drawn up to help guide countries in measuring the information society. The Partnership's work is closely related to WSIS, which called upon countries and international organizations to develop appropriate indicators and produce official statistics to monitor the information society. The Tunis Agenda makes reference to the Partnership,[9] and invites the international community to strengthen the ICT-related statistical capacity of developing countries,[10] which is also one of the Partnership's key objectives.

Through its Task Group on Measuring the WSIS Targets, the Partnership is actively involved in the WSIS+10 review process and has taken the lead role in monitoring progress towards achievement of the WSIS Targets. Led by ITU, the Partnership has prepared the *Final WSIS Targets Review: Achievements, Challenges and the Way Forward* report, which analyses and discusses the achievements made on each of the ten WSIS targets. The report is based on available data for the 52 indicators identified in the Partnership's 2011 document *Measuring the WSIS Targets: A statistical framework*. It will be launched at the opening of the WSIS+10 High-Level Event on the overall review of WSIS, on 10 June 2014.

WSIS Project Prizes 2014

WSIS Project Prizes is an international contest developed in response to requests from the WSIS stakeholders to create an effective mechanism to evaluate and recognize individuals, governments, civil society, local, regional and international agencies, research institutions and private-sector companies for outstanding success in implementing development-oriented strategies that leverage the power of ICTs. The WSIS Project Prizes contest is an integral part of the WSIS stocktaking process (www.wsis.org/stocktaking). The contest was held for the first time in 2012, and fast gained attention and popularity within the ICT for Development (ICT4D) community. It was highly appreciated, and earned recognition in United Nations Economic and Social Council (ECOSOC) Resolution 2012/5, on assessment of the progress made in the implementation of and follow-up to the outcomes of WSIS, which reiterates the importance of sharing best practices at the global level, and, while recognizing excellence in the implementation of the projects and initiatives which further the WSIS goals, encourages all stakeholders to nominate their projects for the annual WSIS Project Prizes as an integral part of the WSIS stocktaking process, while noting the report on the WSIS success stories.

WSIS stocktaking

The *WSIS Stocktaking Database* continues to be a global repository of projects and initiatives relating to the use of ICTs for development purposes. This repository constitutes a register of ICT activities carried out by governments, civil society, international organizations, the private sector and other entities. In accordance with § 120 of the Tunis Agenda, ITU maintains the WSIS Stocktaking Database as a publicly accessible electronic resource (www.wsis.org/stocktaking) with more than 6 000 updated entries. The database is a means of monitoring progress towards achieving the objectives and targets of the information

[9] Tunis Agenda, § 114

[10] Tunis Agenda, § 118

society set in 2003 and 2005 under each of the 11 action lines that seek to harness the potential of ICTs for advancing internationally-agreed development goals by 2015.

In 2010, the Web 2.0 WSIS stocktaking platform was launched to provide a mechanism for sharing experiences among its 30 000 participants representing governments, the private sector, international organizations, civil society and other stakeholders, and has become the biggest ICT4D platform.

The *WSIS Stocktaking Report* continues to ensure regular reporting on WSIS-related activities, following the multistakeholder approach and capturing input from stakeholders from all over the world as well as from facilitators and co-facilitators. The first WSIS stocktaking report was published in 2005, as a follow-up to the Tunis phase of the Summit.

In 2013, for the first time, *regional* WSIS stocktaking reports were prepared as information documents for the ITU-D regional development forums (RDFs) and the regional preparatory meetings (RPMs) for the World Telecommunication Development Conference (WTDC), in order to provide examples of activities related to the implementation of WSIS outcomes in each region and to enrich discussions related to the overall review of implementation of the WSIS outcomes and the upcoming WSIS+10 High-Level Event. The regional stocktaking reports were based on the contributions to the WSIS stocktaking exercise collected since the previous WTDC in 2010.

The *WSIS Stocktaking Report 2014*, describing projects and initiatives aimed at implementation of the WSIS outcomes for the period May 2013-May 2014, details of which were provided in response to ITU's official call for updates and new entries, is being released on the occasion of the WSIS+10 High-Level Event. The report describes work contributing to the WSIS goals and MDGs accomplished by stakeholders worldwide. It emphasizes achievements, highlights trends and draws conclusions consistent with the action lines referenced in the Geneva Plan of Action. Its publication will provide readers with key findings on emerging trends in the development of the information society, and a guide to major activities being implemented by facilitators, co-facilitators and other stakeholders in the 18 areas covered by the 11 action lines.

Box 1: ITU contribution to implementation of the WSIS outcomes

ITU has initiated a series of annual publications that provide information on the key WSIS-related initiatives and activities carried out by the three Sectors of the Union (Telecommunication Standardization – ITU-T, Radiocommunication – ITU-R, and Telecommunication Development – ITU-D) and the General Secretariat. The annual reports provide yearly updates on the tasks carried out by ITU at the operational and policy level, covering all the mandates assigned to the Union in connection with the WSIS process, in particular in its capacity as:

- Lead facilitator for coordinating multistakeholder implementation of the Geneva Plan of Action (§ 109 of the Tunis Agenda) and primary organizer and host of the annual WSIS Forum event in May
- Facilitator for Action Lines C2 (Information and communication infrastructure) and C5 (Building confidence and security in the use of ICTs), as well as C6 (Enabling environment)
- Co-facilitator for Action Lines C1, C3, C4, C7, and C11
- Partner in Action Lines C8 and C9
- Rotating chair and vice-chair of the United Nations Group on the Information Society (UNGIS) (§ 103 of the Tunis Agenda)
- Lead for the Partnership on the Measuring the ICT for Development (§ 114 of the Tunis Agenda)
- Facilitator for the WSIS stocktaking process (§ 120 of the Tunis Agenda)
- Organizer of World Telecommunication and Information Society Day (§ 121 of the Tunis Agenda)
- Lead for the Connect the World initiative (§ 98 of the Tunis Agenda).

These annual reports will also be considered as the official submissions by ITU to various internal and external meetings related to the WSIS process, such as the ITU Council Working Group on WSIS (WG-WSIS), the ITU Council and the United Nations Commission on Science and Technology for Development (CSTD).

Action Line C1. The role of governments and all stakeholders in the promotion of ICTs for development

In the framework of World Summit on the Information Society (WSIS), the United Nations Department of Economic and Social Affairs (UNDESA) continues to act as the lead facilitator for Action Line C1: The role of governments and all stakeholders in the promotion of ICTs for development.

C1.1 National e-strategies

The importance of the elaboration of ICT for Development (ICT4D) plans and national e-strategies was reiterated in 2003, in line with the first phase of the WSIS held in Geneva, **Switzerland**. According to Geneva Plan of Action, 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.[11] The overall goal of national e-strategies is to improve the quality of life of the country's residents. In many countries, the strategies are built on the same pillars, including connectivity, access to information and knowledge, capacity building focused on improving digital skills and competencies in society, inclusiveness, public services and e-government programmes, ICTs for the environment and entrepreneurship driven by youth. Some national strategies highlighted that all citizens, societies, civilians and the private sector should have an opportunity to access public services and to be equal members of the information society. E-inclusion is an important element to be integrated in the development of a country's national strategy and vision. Solidarity among all members of society is crucial to building the information society. ICT national strategies contribute dramatically to the achievement of sustainable socio-economic development at the state level. Examples of the development and implementation of national e-strategies are set out below.

In **Austria,** various strategic elements are being addressed in the national effort to build the *information society for everyone*, whereby digital technologies and their application are regarded as instruments capable of contributing to greater equality of opportunity, personal freedom and solidarity between all members of society. Examples of these strategic elements include:

- Broadband strategy 2020
- E-government strategy
- Austrian ICT security strategy
- Digital Agenda for education, arts and culture
- E-inclusion in Austria
- E-accessibility in Austria
- E-health in Austria
- Austrian energy strategy
- Strategy for research, technology and innovation.

[11] Geneva Plan of Action, § 8a)

There are many actors involved in building the information society, such as the Federal Ministry of Transport, Innovation and Technology, the Federal Ministry of Labour, Social Affairs and Consumer Protection, the Federal Ministry for Education, the Arts and Culture, the Federal Ministry of Economy, Family and Youth, the Federal Ministry for Science and Research, the Federal Ministry of Agriculture, Forestry, Environment and Water Management, the Federal Office for the positive assessment of computer and console games, the Austrian Regulatory Authority for Broadcasting and Telecommunications, Statistics Austria, Internet Offensive Austria, the Internet Society Competence Centre, the Austrian Chamber of Labour, the Austrian Federal Economic Chamber, Internet Service Provider Austria, Saferinternet.at and others.

In **Cyprus**, the Ministry of Communications and Works has further developed the *National Digital Strategy for Cyprus*, which covers six objectives, as follows:

- Objective 1: Connect Cyprus
- Objective 2: Modernize public administration and provide public electronic services
- Objective 3: Inclusion of all (including vulnerable groups) into digital Cyprus
- Objective 4: Education and learning
- Objective 5: Digital entrepreneurship
- Objective 6: ICT for the environment

In **Malta**, the *Networked Society Strategy 2012-2015* is one of the drivers for maximizing the opportunities offered by ICT and reducing the digital divide through e-inclusion initiatives. This strategy is based on five activity thrusts, each with its own specific set of targets and initiatives:

- Thrust 1: Inspiring everyone to get online
- Thrust 2: Facilitating access and opportunity
- Thrust 3: Building digital skills and competencies
- Thrust 4: Promoting ICT as a social equalizer
- Thrust 5: Contributing to a better policy.[12]

In **Morocco**, the Ministry of Industry, Trade and New Technologies introduced the national strategy for the development of the information society and digital economy: *Digital Morocco 2013***.** The Digital Morocco 2013 strategic plan is designed to make information technology a cornerstone of the economy, a source of added value for other economic sectors and public administration, and an engine for human development, with a view to positioning Morocco as a regional technology hub.

The following four strategic priorities are identified in the plan:

- Provide individual citizens with access to broadband Internet and promote interaction and access to knowledge
- Sensitize the public administration about users' needs with regard to efficiency, quality and transparency, through an ambitious e-government programme

[12] http://meib.gov.mt/en/ministry/Documents/Malta%20Digital%20Economy%20Vision.pdf

- Promote computerization in small and medium enterprises to improve productivity
- Develop local IT business potential by providing support for the creation and growth of local actors, as well as by promoting the emergence of areas of excellence with strong export potential.

The plan foresees two implementation imperatives:

- Ensure the availability of human resources, in terms of both quality and quantity, to meet the sector's needs
- Put in place the right conditions for cyberconfidence,

and two accompanying measures:

- Put in place overall governance
- Ensure the allocation of adequate financial resources.

In **Azerbaijan**, the Ministry of Communications and Information Technologies has developed the *National Strategy on Development of the Information Society in the Republic of Azerbaijan for 2013-2020***.** The main objectives of the national strategy are:

- To establish the information society
- To provide an opportunity for citizens, societies, civilians and the private sector to access ICT services and take their place as equal members of the information society
- To apply ICT development in the fields of governance and public-private partnerships (PPP) as well as in all spheres of socio-economic and cultural development, in order to establish a sustainable, stable and transparent information society
- To utilize ICT as a catalyst and driver for overall development of the country.

In **Oman**, the Information Technology Authority (ITA) has implemented the *e.oman* digital strategy, which sets long-term direction under six pillars: Society and human capital development; Enhanced e-government and e-services; ICT industry development; Governance, standards and regulations; National infrastructure development; and Promotion and awareness. No fewer than 2 020 performance indicators (KPIs) have been defined and translated into annual milestones achievable through an integrated portfolio of national programmes and projects with annual measurement and improvement. Currently, more than 95 per cent of government entities are applying e.oman.[13]

In **Hungary**, the *National Infocommunication Strategy* approved at the latest government session outlines the primary objectives for the period 2014-2020, focusing on the fields of digital infrastructure, competence, economy and state. A major governmental goal on the basis of the strategy is to establish the necessary digital infrastructure.[14]

In **Kazakhstan**, the joint-stock company National Information Technologies JSC has implemented the government programme *Informational Kazakhstan – 2020*, aimed at leading the informatization and automation of all spheres of Kazakhstan's economy and

[13] *Project nominated for a WSIS Project Prize 2014*

[14] http://www.kormany.hu/en/ministry-of-national-development/news/national-info-communication-strategy-fully-electronic-services-in-public-administration-within-four-years

governance. It is based on the use and development of existing ICT infrastructure together with the building and integration of new elements. The programme provides for progress in all sectors of state and citizens' life – healthcare, education, entrepreneurship, agriculture, mass media, tourism and sports, ecology and environmental protection, as well as the development of human capital. The main aim of the programme is to create the conditions for transition to the information society in Kazakhstan.

In **Colombia,** the Ministry of ICT set up *Redvolución* to empower youth through use of the Internet. *Redvolución* seeks to reduce the digital divide by expanding knowledge of new technologies and the Internet, for members of communities which for various reasons have not yet entered the digital age. In practice, the strategy is implemented under the compulsory social service (CSO) scheme for all schoolchildren aged 10 and 11.

In **Uruguay,** the Agency for E-Government and Information Society (AGESIC) implemented the *Digital Agenda Uruguay* (Uruguay's digital policy). Thanks to sustained and continuous efforts through several versions (2007-2008, 2008-2010, 2011-2015), this multistakeholder commitment has attained its objectives. Uruguay is the regional leader in ICT access. Outstanding plans are offered by government such as 1 GB broadband with no monthly fee. All students in public schools have their own PC. The PC access gap between lower-income and upper-income households has been cut to 10 per cent. Moreover, no child need walk more than 300 metres from home to access the Internet.[15]

The Lithuanian *Information Society Development Programme 2011–2019* was approved by the government of **Lithuania** in March 2011. It was developed as the horizontal planning document, linking objectives with institutions implementing various tasks. The strategic objective of the programme is to improve quality of life for Lithuanian residents and the business environment for companies, by exploiting the opportunities created by ICTs, and to increase the proportion of Internet users in Lithuania to at least 85 per cent by the year 2019. The information society must be developed on the basis of the following priorities:

- Enhancing Lithuanian residents' ability to use ICTs
- Developing, and promoting the use of, electronic content and services
- Developing the ICT infrastructure.

In **Nigeria**, the *Nigerian ICT4D* plan was developed by National Information Technology Development Agency (NITDA) in collaboration with the United Nations Economic Commission for Africa (ECA). The development of the Nigerian ICT4D Strategic Action Plan, which began in 2003, is in line with the WSIS outcome documents as well as the African Information Society Initiative (AISI) initiated by ECA. It was developed within the context of achieving various Federal Government socio-economic development programmes and initiatives aimed at positioning Nigeria among the 20 leading economies in the world by 2020. The plan covers ICT in agriculture, education, health, e-government, infrastructure, human resource development, national security and law enforcement, legal and regulatory framework, research and development, private-sector participation, and ICT awareness and popularization. It is already serving as a roadmap on how the national information technology system will be upgraded and used in addressing several development issues.

[15] *Project nominated for a WSIS Project Prize 2014*

Coordination of the implementation process is ongoing, through the printing of abridged versions and the hosting of stakeholder workshops to create ownership and ensure inclusion in the annual budgetary estimate for all sectors.

In addition, NITDA is continuously evolving *relevant ICT policies* to guide the development and deployment of ICT in order to achieve sustainable socio-economic development at the state level in **Nigeria**. States covered under this phase are the states of Niger, Osun and Enugu. NITDA produced a *National Software Policy Document (NSPD)* comprising eight critical components, as follows:

1. Software human capital
2. Software infrastructure
3. Software products, services and markets
4. Software industry economy
5. Software legislation, regulatory and institutional frameworks
6. Software fiscal policy
7. Software strategic policy
8. Software research, development and innovation

C1.2 ICT for development in international and regional organizations

The United Nations Economic Commission for Latin America (ECLAC) presented the *Plan of Action for the Information and Knowledge Society in Latin America and the Caribbean* (eLAC2015), a long-term vision plan for 2015, in line with the Millennium Development Goals (MDGs) and WSIS, and enshrining the principle that ICTs are instruments for economic development and social inclusion. The eLAC2015 plan was approved at the third Ministerial Conference on the Information Society in Latin America and the Caribbean, in November of 2010, in Lima, **Peru**. During the fourth Ministerial Conference, held in April 2013, in Montevideo, **Uruguay**, governments of the region adopted the Montevideo Declaration and the 2013-2015 Work Plan for eLAC2015 implementation.

ECLAC is also the technical secretariat of the *Regional Dialogue on Broadband*, which expanded in 2013 to 11 members. During 2013, ECLAC stepped up its work on measurement of the digital economy and its benefits for equality, and on the promotion of ICT use to overcome the gender divide.[16]

The United Nations Economic Commission for Africa (ECA) continues to support its Member States in the implementation of the Tunis Agenda for the Information Society, working closely with the African Union Commission and Africa's regional economic communities on the development of an *African convention on cybersecurity*, *harmonization of cyberlegislation* and *e-government indicators*. The Africa ICT Alliance, a private sector-led

[16] Report of the Secretary General. Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels: http://unctad.org/en/PublicationsLibrary/a69d65_en.pdf

cooperation among African ICT organizations, launched operations in 2013, conducting activities in support of implementing the WSIS action lines.[17]

The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) carried out a *regional review of the WSIS outcomes* in Asia and the Pacific in 2013, identifying areas of progress and continuing challenges. In 2013, ESCAP and the International Telecommunication Union (ITU) produced a set of *terrestrial transmission infrastructure maps* to allow the identification of missing links and bottlenecks in cross-border optical fibre networks.[18]

In 2013, the United Nations Economic and Social Commission for Western Asia (ESCWA) produced the latest edition of the *Regional Profile of the information society in the Arab region*.[19]

The Council of Europe works with its 47 Member States, the private sector, civil society and other actors to shape *ICT policies* for the region, through conventions in fields such as cybercrime, data protection and the protection of children and through the *European Dialogue on Internet Governance*.[20]

In November 2013, the Secretary General of the United Nations Conference on Trade and Development (UNCTAD) organized the *First Geneva Dialogue on the Post-2015 Sustainable Development Agenda*, including on issues related to technology and ICT.[21]

UNCTAD has developed a *model framework and methodology for conducting ICT policy* reviews (ICTPR Framework), aimed at enabling governments systematically to identify and take into account ICT constraints and circumstances and to leverage their national strengths. The ICTPR Framework builds on UNCTAD's longstanding work on ICT policies and on ICT measurement for economic development. It was initially proposed in the Information Economy Report and first tested in the ICT Policy Review of **Egypt** undertaken at the request of Egypt's Ministry of Communications and Information Technology. The ICTPR Framework seeks to show how other governments could benefit by undertaking a similar ICT policy review. Several governments of developing countries have expressed their interest in benefiting from UNCTAD assistance in this area.[22]

ITU continues to monitor developments in the global ICT sector through its collection of statistics and indicators. In 2012–2013, more than 150 statistical indicators from over 200 economies worldwide were collected. ITU published its brochure entitled *The World in 2013: ICT Facts and Figures*, featuring estimates for key ICT indicators. In 2013, ITU launched the *Measuring the Information Society Report 2013* which presents the first comprehensive mobile-broadband price data set, for almost 130 economies. It features a new model and

17 Ibid

18 Ibid

19 Ibid

20 Ibid

21 UNCTAD contribution: http://unctad.org/ier

22 UNCTAD contribution

data to measure the world's digital native population - those young people who were born into the digital age - as well as a quantitative overview of digital TV broadcasting trends.[23]

C 1.3 Other examples

Outreach promotional campaigns and awards serve as tools to raise awareness about the value of ICTs that engage the population to be more active and use government e-services. Another important element in multistakeholder collaboration is online platforms/portals that can provide information about government services and create a link between government and other stakeholders to contribute to the development of the information society. These kinds of tools give stakeholders the opportunity to make their voices heard.

In the **United Arab Emirates**, the Telecommunication Regulatory Authority (TRA) initiated *Ana Electroni.* Ana Electroni (Arabic for "I am electronic") is a broad promotional campaign aimed at educating the public about, and encouraging them to adopt, government e-services in UAE. The campaign aims to demonstrate how the e-services save the public time, effort and money compared to traditional over-the-counter services.

In **Turkey**, the Turkish Industry and Business Association (TÜSIAD) and the Turkish Informatics Foundation (TBV) regularly organize the *e-Turkey Awards*, which are designed to encourage developments in the implementation of e-government. The aim of this project is to contribute to improving productivity and competitiveness by creating a transparent and effective public administration moving towards transformation into an information society. The ETR Awards aim to draw attention to government practices, enhancing public opinion of innovative initiatives.

In **Mexico**, the Sinaloa State Government introduced the *Sistema de Evaluacion y Seguimiento a las Metas del Plan Estatal de Desarrollo* (SISEPSIN), a tool by which society and the media can follow the commitments made by the governor in the State Development Plan, thereby serving as an incentive to openness and transparency. The webpage itemizes all the targets, categorized under three main headings:

- Political
- Human
- Material

Each and every goal is supported by documents, images, videos, graphics, geo-references and statistics signed by the top officials in the department concerned. This is a key element in order to build confidence on the part of society and instil responsibility on the part of government employees with respect to the information they publish. Furthermore, SISEPSIN is enabled with social media so as to promote discussion and engagement with each goal, resulting in the creation of an open innovation space in which citizens can add value to proposals and generate new ways of solving challenges. Open government is a global trend to reduce corruption and maximize citizen participation.

[23] http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2013.aspx

In **Spain**, the Cybervolunteers Foundation serves as an atypical non-profit organization made up of social entrepreneurs whose vision is to use new technologies as a means for social innovation and citizen empowerment, thereby alleviating social gaps. Its purpose is to increase the rights, opportunities and capabilities of each person in their own environment, through the social use of technological tools and applications within their reach. The organization's *Empodera.org* platform provides the following information:

1. Experiences: Videos, articles and interviews
2. Symposium on Technologies for Social Action (eSTAS)
3. The Empodera awards
4. Publications: Books/e-books
5. EmporeArte: Collaborative photo exhibition.

In the **United Arab Emirates**, TRA introduced the *Mobile Government* initiative. The aim of the initiative is to incite government entities to work out creative solutions for providing services efficiently through simple and transparent procedures that meet customers' expectations round-the-clock. It also stresses communication with customers, in order to provide a high quality of life for UAE nationals and expatriate residents, in line with the UAE Vision 2021. The new initiative will exploit mobile phones, mobile devices and other advanced technological tools to deliver services and information to the public. It supports the establishment of a mobile innovation centre, national trusted service manager (NTSM), government mobile app market, mobile payment, mobile identity and many more creative and innovative applications.[24]

The *reporting and measurement mechanism on countries' progress* acts as a strong incentive and motivation for government agencies and other stakeholders to contribute more to the information society. It is worth highlighting such activities in order to share best practices and demonstrate achievements at the national and international levels. The latest country reports provided to the multistakeholder preparatory process (MPP) for the WSIS+10 High-Level event include reports on **Oman**, **Argentina**, **Belarus**, **Bulgaria**, **Japan**, **Lithuania**, **Rwanda**, **Uruguay** and **Poland.**

In the **Islamic Republic of Iran**, the Information Technology Organization (ITO) launched the *Design and Implementation of ICT Measurement* system. Policy-makers have recognized the importance of measuring and monitoring ICTs, and have foreseen a specific article in the fifth Socio-Economic and Cultural Development Plan of Iran (2011-2015) that instructs the ICT ministry to complete the development of a system for ICT measurement in the country by the end of second year of the plan. According to the plan, the ICT ministry is responsible for measuring, monitoring and providing analytical reports and feedback for the decision-makers. The ICT ministry charged one of its subsidiaries, the Iran Information Technology Organization (ITO), with developing the country's ICT measurement system. ITO performed this assignment during the fourth development plan and, based on its previous experience, acts as national coordinator for ICT measurement in Iran, a task it has taken up with the help of Information Technology Research Centre of Tarbiat Moddares University, the Iran University of Science and Technology and the Parvaresh Dadeha data-processing company.

[24] *Project nominated for a WSIS Project Prize 2014*

This initiative is a working example of cooperation among government, academic and research bodies and the private sector in Iran for achieving the country's goals and objectives. ITO is ready to pass on this experience and related best practices to the member countries in the region.

The *Cuban System for information and management of the electoral processes* computerizes management of the data generated at by-elections and general elections in **Cuba**. While other versions have been in use for over 20 years, the new system is the first secure and robust solution covering the whole spectrum of election activities, from the grassroots (electoral district in each borough) up to those for electing delegates to the provincial assemblies. Successfully used during the 2012-13 by-elections and general elections, the system streamlines data flow between the various levels, displays geo-referenced statistics and other information, generates reports, makes comparisons with previous elections and supports information management between elections.

Action Line C2. Information and communication infrastructure: an essential foundation for the information society

As stated in the Geneva Plan of Action, ICT infrastructure plays an important role in achieving the World Summit on the Information Society (WSIS) objectives. The construction and development of essential infrastructure within countries continue to contribute to progress towards WSIS targets such as digital inclusion, and encourage the creation of universal, sustainable and affordable access to ICTs for all. This chapter illustrates some of the initiatives relevant to this field.

The International Telecommunication Union (ITU), as the sole facilitator for WSIS Action Line C2, organized the eighth *WSIS Action Line C2 Facilitation Meeting* in Geneva on 13 May 2013, as an integral part of the WSIS Forum 2013. On the basis of proposals received during the WSIS multistakeholder open consultation process, the theme for the Action Line facilitation meeting was *Broadband backbone connectivity: Economic, regulatory policy and technical aspects*.

ITU has been organizing a series of *Connect Summits* aimed at mobilizing additional funds and new partnerships to attain the WSIS goals, including the development of infrastructure. The *Connect Asia-Pacific* summit, the last in the series, was jointly organized by ITU and the Royal Thai Government and took place on 18 November 2013 in Bangkok. The theme was *Asia-Pacific 2020: Smartly DIGITAL (Digital Inclusive Green Innovative Transformative Affordable Living),* and the summit was attended by 625 participants, including seven heads of State or government and 30 ministers, deputy ministers and ambassadors.

ITU's *Connect a School, Connect a Community* initiative, launched within the framework of the Connect the World initiative, aims to improve access to broadband in schools and enable schools to serve as community ICT centres. ITU is connecting schools in **Comoros, Lesotho, Sri Lanka, Sierra Leone** and **Tanzania,** in cooperation with **Switzerland**, and is equipping and connecting schools in **Tanzania, Gambia** and **Niger,** in cooperation with **France**. A similar project is being implemented in **Palestine** with funds from ITU. In addition, ITU is currently providing assistance for the establishment of *community centres* in **Dominica, Grenada** and **Saint Lucia**, to help extend ICT access and services to rural communities by providing basic sets of accessible ICT equipment to rural areas.

ITU has been helping countries develop their own *wireless broadband master plans*, which will eventually provide access to broadband-supported services and applications at rates that are affordable and comparable to those in developed countries. With support from the Government of the **Republic of Korea**, ITU has provided technical assistance for the formulation of *broadband policies/plans* in **Brunei Darussalam**, **Lao PDR**, **Marshall Islands**, **Philippines** and **Saint Lucia**.

In cooperation with the Craig and Susan McCaw Foundation and Nexpedience, ITU is implementing broadband wireless networks and developing ICT applications to provide *free or low-cost digital access* for schools and hospitals and underserved populations in rural and remote areas in selected countries. Broadband wireless networks are operational and will be extended in **Djibouti**, and are being deployed in **Burkina Faso** and **Lesotho**.

In order to provide a global overview of broadband connectivity that will allow all stakeholders to identify broadband investment opportunities, ITU has launched a project to build the first *interactive online transmission maps*. In the framework of this project, BDT will develop and release in the public domain an authoritative, cutting-edge ICT data-mapping platform to take stock of national backbone connectivity (fibre and microwave) and other key metrics in the ICT sector. Currently, data collection has been completed for the **Africa**, **Americas**, **Arab States**, **Asia-Pacific** and **CIS** regions, and data collected from more than 150 operators worldwide are available online.

In cooperation with the **Republic of Korea**, **Japan** and **Australia**, ITU has provided assistance to countries such as **Gabon**, **Fiji**, **Indonesia**, **Lao PDR**, **Myanmar**, **Papua New Guinea**, **Philippines**, **Thailand** and **Timor-Leste**, and is extending assistance to **Viet Nam**, **Vanuatu** and **Guyana**, for the *roadmap on the transition from analogue to digital terrestrial television broadcasting* and for the introduction of *mobile television*. It has also extended assistance to the **Democratic Republic of the Congo**, **Bangladesh**, **Pakistan**, **Micronesia**, **Afghanistan**, **Kiribati**, **Nauru**, **Samoa** and **Solomon Islands** for the production of updated *guidelines on digital broadcasting* that take into account new developments in the area of digital terrestrial television broadcasting (DTTB) and mobile television (MTV) implementation and convergence, while adding sections on Internet Protocol television (IPTV), satellite television, etc. The updated version of the guidelines, which can be used worldwide, is now available on the ITU website.

ITU has been conducting *conformance and interoperability* (C&I) activities on a regional basis in partnership with regional stakeholders. Experts from the **Americas, Africa, Arab States, Asia-Pacific** and **CIS** regions have participated in capacity-building events organized on the premises of laboratories with which ITU has signed collaboration agreements. ITU has organized training on conformity assessment procedures and testing for different domains, such as electromagnetic compatibility (EMC) and mobile terminals. It has produced guidelines on mutual recognition agreements (MRA), C&I regimes and feasibility studies for conformance test centres, and provided assistance on that basis to requesting countries. It is also conducting assessment studies in the regions to determine areas of commonality and differences in the countries concerned in relation to C&I. A study involving 15 countries from the Southern African Development Community (SADC) has been completed, and a study for the Arab States region is ongoing.

C2.1 Infrastructure and broadband

In **Bhutan,** the *National Broadband Master Plan* project was initiated to create the nationwide broadband infrastructure needed to promote ICT access within the country and for international connectivity. The project aims to establish a high-speed fibre-optic network covering 20 districts and 201 *geogs*[25] (four are off-grid and will be served through appropriate radio technology), using the Bhutan Power Corporation transmission network. As a result, all 20 district headquarters and some 170 geogs are now connected by optical fibre. Moreover, infrastructure has been set up for the second international gateway, to create the required redundancy and ensure an uninterrupted communication link.

[25] A *geog* is a Bhutanese administrative unit comprising a group of villages, equivalent to a subdistrict.

Also in **Bhutan,** as part of the government's *common minimum programme* aimed at social and economic empowerment of the people, the Ministry of Information and Communications has worked diligently with the two service providers to ensure universal connectivity through mobile services. Funding has been provided as a government subsidy to the two operators through the Universal Service Obligation fund. As a result, mobile services are now available in all 20 districts and in 205 *geogs*. By December 2013, they will be accessible in all villages throughout the country, except in a few shadow areas.

In **Ethiopia**, under the *National Broadband Expansion* project, telecommunication service access and coverage have been provided across the country and the existing network has been upgraded. The project aims to increase mobile telephone density to 40 per cent in 2015, to provide 3G Internet access throughout the country and to introduce 4G broadband Internet in Addis Ababa.

In **Malta**, over 190 *WiFi hotspots* have been set up in public places, such as town and village squares, public gardens and libraries across Malta and Gozo, for free use by the general public. The objective of this initiative is to facilitate and promote Internet use outside homes, schools and offices. The WiFi hotspots having proved very popular among minors, a filter limiting access to content and services considered harmful to a younger audience has been installed.

In **Nigeria,** the Federal Road Safety Corps (FRSC) has installed 371 *very small aperture terminals* (VSATs) connecting all FRSC command posts nationwide, allowing FRSC headquarters and the field command posts to exchange reports and upload data to update the FRSC database. The number of VSATs makes this the largest public-sector wide area network.

Also in **Nigeria**, *wide area Internet access* has been provided in four tertiary institutions (Ladoke Akintola University, Ogbomoso; the Federal Polytechnic, Kebbi; the Federal College of Education, Gusua; and the University of Nigeria, Enugu Campus) for the teaching and learning of 20 000 concurrent users in Nigerian tertiary institutions.

In **Azerbaijan**, the Ministry of Communications and Information Technologies has initiated the development of *national broadband Internet*. The project has the following main aims: (a) establish a fibre-optic cable network with high data-transmission opportunities; (b) avoid the existing digital bridge in the broadband Internet infrastructure between urban and rural areas; (c) foster the widespread application of e-services and accelerate the building of the information society; and (d) create a regulatory environment supporting fair competition in the service market. A range of arrangements and indicators have been defined for monitoring these objectives. Simultaneously, the project aims to create conditions for the country's population to use e-services, to expand the implementation of e-education, e-health, e-commerce and other e-services all over the country, and to enable all residents to have access to e-government services by 2015.

In **Japan**, the Ministry of Internal Affairs and Communications (MIC) has launched the *Far Remote Island MCT* project**.** The project is intended to provide connectivity to Mejit Island (300 to 400 inhabitants), a far remote component of the **Marshall Islands**, consisting of five islands and 29 atolls. Before the project, the island was only connected by HF radio. A VSAT antenna installed on Mejit is to be linked with the capital, Majuro, via the NSS-9 C-band

satellite with a demand assigned multiple access (DAMA) system to provide the islanders with voice/data services, including GSM mobile, e-administration, e-healthcare, e-education and e-business. The project is supported by an Asia-Pacific Telecommunity grant, the Government of the Marshall Islands, the Mejit local government and the Marshall Islands National Telecommunication Authority (MINTA).

In **Colombia**, the Ministry of Information Technologies and Communications is implementing the *National High-Speed Connectivity* project, an initiative that seeks to deploy alternative infrastructure in 47 municipalities where it is not possible to lay optical fibre. This will facilitate national coverage of the information highway.

In **Turkey**, the Istanbul Metropolitan Municipality has launched the *Broadband Wireless Communication Infrastructure* project. Its aims are to provide a broadband communication system for public services, to ensure safe and fast communication between public institutes and to sustain this system for emergency and disaster management.

Also in **Turkey**, the Ministry of Interior IT Department has introduced the *Central and Provincial Hardware and Network Infrastructure Renewal and Reinforcement* project. This project involves renewing and reinforcing hardware and network infrastructure for the processes and procedures of the Ministry of Interior central units, governorates and district governorates that are performed via electronic platforms, so that they can be carried out more rapidly and effectively. Studies on the development of business intelligence and decision support systems are still in progress, the ultimate aim being to provide secure voice and video communication between central and provincial units with the *Data-based Communication Infrastructure* project, to eliminate the slow speed and performance problems in governorates and district governorates with Internet connection standardization, and to draw up capacity and performance plans more rapidly and easily and create the required analysis and reports on the basis of these data from a single point.

Again in **Turkey,** the Istanbul Development Agency (ISTKA) has elaborated the *Internet-based Earthquake Damage and Loss Estimation Routine (ELER),* a computer program developed as part of the Network of Research Infrastructures for European Seismology (NERIES) project under the European Union's sixth Framework Programme. In the new project, supported by ISTKA, the ELER program will be re-designed so as to be Internet-based, and with a Turkish interface.

In **Algeria**, the Ministry of Vocational Education and Training has introduced *high-speed Internet access* for all training institutions and administration departments.

In **Uruguay**, the National Telecommunication Administration (ANTEL) is implementing the *Fibre-to-the-Home (FTTH)* project. ANTEL's objective is to provide comprehensive telecommunication services via optical fibre, by connecting all households through FTTH. This means that the entire span, from ANTEL's switch to the customer's premises, is connected via optical fibre.[26]

[26] *Project nominated for a WSIS Project Prize 2014*

C2.2 ICT for all and connectivity for public access institutions

In **Benin**, *Cotonou-Wireless* has been established to serve as a community non-profit group whose mission is to provide wireless access to users across the city of Cotonou. It uses free software and affordable wireless equipment.

In **Nigeria,** the *IT Services and Connectivity* project is aimed at deploying infrastructure to support the Conditional Grants Scheme (CGS) for the Millennium Development Goals (MDGs) in local government areas in Nigeria, and thereby achieve the MDGs. The project provides for:

- a wide area network across locations in the 36 states and the Federal Capital Territory, for end-to-end information processing and automation of operations (currently deployed to 120 operational sites);
- access to a secure virtual private network (VPN) and the Internet for personnel;
- delivery of managed messaging and collaboration services and other application platforms with high availability, security and service support;
- an extensible infrastructure to accommodate the future needs of the scheme.

In **Jordan**, the Ministry of Information and Communications Technology has launched the *National Broadband Network* (NBN) programme, a fibre-optic, open-access data network being developed in the Kingdom. The network is based on IP/Ethernet technologies and currently connects up to 680 public schools, eight universities, 174 government entities and 88 healthcare centres with a bandwidth capacity of 100 Mbit/s per site, with a view to providing high-speed broadband access to increase universal access and universal coverage and contributing to the efficient and effective development of e-service delivery, quality and performance in Jordan, particularly in relation to the country's education and healthcare systems. Future plans are being studied to utilize the network to support the business sector in Jordan and increase access in underserved areas in response to greater demand brought about by the accelerated spread of technology.

In **Algeria**, the *Data Centre and Cloud Computing Infrastructure* (IT ecosystem) is at the core of the digital economy. The data centre provides a secure environment and high-availability network access for IT and telecommunication equipment. The advent of cloud computing gave birth to the "cloud centre" concept for extreme flexibility and scalability. The project is aimed at meeting the current needs of the Sales Intelligence business and anticipates future growth in a fully innovative way by:

- providing hosting services that ensure very high availability
- ensuring fast, reliable and secure access to the data stream
- reorganizing offers of an information system.

C2.3 Adequate and affordable ICT equipment and services

In **Turkey**, the Ministry of Justice IT Department has implemented the *Mobile Search Informatic System (MABS)* in order to provide instant access to all apprehension and arrest decisions for law-enforcement units executing such decisions on behalf of judicial units, and to ensure mobility. The MABS project allows the system to be interrogated via mobile phones, the cheapest and most common technology used today, and all mobile law-

enforcement units were included in the system without the need for additional hand terminals. The MABS project allows law-enforcement forces providing mobile services (at sea, at the country's borders or in mobile patrol cars) to make online inquiries about apprehension and arrest decisions taken by judicial units and contained in the National Judiciary Informatics System (UYAP) via mobile phones, without further investment.

Also in **Turkey**, the Ministry of National Education has implemented the *FATIH (Movement to Increase Opportunities and Technology)* project, whereby classes will receive smartboards, students and teachers will receive tablet computers and classes will be enriched with the use of e-books. The project has been completely designed by Turkish teachers and engineers. All State schools, from preschools to high schools, will receive a total of 620 000 smartboards, while tablet computers will be distributed to 17 million students and approximately one million teachers and administrators. This project, which is being conducted by the Ministry of National Education and supported by the Ministry of Transportation, is expected to be completed in 2015. The tablet computers distributed to students are loaded with e-books, class lessons, sounds, animations and graphics. Both teachers and students are restricted from entering all websites. Only websites that have been selected by educators and specialists, passed through the Ministry of National Education's filtering system and deemed harmless are accessible. Teachers are able to check on their own tablets whether or not a student is following the course. If a student is found to be straying from the lesson, the teacher can lock the student's computer.

In **Oman**, the Information Technology Authority (ITA) is enhancing the national knowledge society by providing digital devices en masse and empowering citizens. A Royal Grant of USD 51 million was issued by His Majesty the Sultan in support of the *eOman strategy*, bestowing free PCs on specific segments of Omani society and making PC ownership affordable by subsidizing the cost and providing added-value training courses. Since the strategy's launch, more than 115 000 PCs and 75 000 free Internet modems have been provided to families, students and teachers. As a result, the national PC penetration rate increased to over 66 per cent in 2013 from less than 20 per cent in 2003. Internet penetration has also increased, to more than 70 per cent.

In the current context of education in **Cuba**, ICT use is seen as a vital means of developing - aside from general intellectual skills - a culture that puts pupils in the context of their time and is consistent with their individual characteristics and needs. The *creation of digital material for Cuba's schools* is a government programme that aims essentially to raise the quality of the learning process. This has involved equipping schools with over 92 000 computers and training all the necessary teaching staff. Pupils and teachers have produced scholastic software platforms for all teaching levels, covering the entire range of subjects in the curriculum. The content has been generated for use in all the country's schools, regardless of their degree of connectivity or the availability of independent workstations or virtual laboratories, in the context of the national education portal. It is generated in cooperative environments applying the principles of cloud learning and using game-based learning, with open content and on a variety of media, and involving significant development of learning analytics. The whole undertaking is supported by ongoing teacher training via open online courses delivered on various platforms.

In **Ghana,** the Ghana Investment Fund for Electronic Communications has launched the *Rural Telephony* project. This is a turnkey, green-energy telecommunication solution enabling voice and data communication services in unserved and sparsely populated rural communities in Ghana. It provides a zero capital expenditure investment opportunity for mobile network operators to expand their services to the remote rural poor.[27]

In **Lebanon,** the government is seeking to democratize *access to educational and entertainment content* and allow young people greater access to new information technology. The Ministry of Education aims to replace books with tablets in the long run, and to bring about a radical change in teaching methods by taking advantage of new technologies. The first stage of the project will provide the Ministry of Education with the 1 500 tablets needed to complete the pilot phase.

In **Nigeria,** the National Information Technology Development Agency (NITDA) has initiated the deployment of IT infrastructure in about 150 tertiary institutions across the country. The equipment includes computers, servers and Internet access. Thirty-six tertiary institutions, or one per state, benefited from the programme in 2010, another 46 units of IT infrastructure were provided in 2011, 72 more were added in 2012 and another 111 were being introduced in 2013, for a total of 265 units of IT infrastructure deployed in tertiary institutions. The idea is to *equip tertiary institutions with basic IT tools and facilities* so as to enhance the global competitiveness of graduates.

In the **United Arab Emirates,** the Abu Dhabi Education Council (ADEC) has introduced *wide area application services (WAAS).* Three years ago, ADEC began an ambitious project to raise the standard of education throughout the Emirates by encouraging the design and production of ICT equipment and services so that everyone could have easy and affordable access to them. To that end, it invested in next-generation education IP infrastructure. It worked closely with Cisco Advanced Services and Cisco partners to plan the research and development phase of creating a scalable wireless access network (WAN) foundation that connected all schools and would support future planned voice, data and video needs. At the same time, by optimizing connectivity between major information networks, ADEC began furnishing computing devices to teachers and administrative staff at every school, and supplying every classroom with a computer, digital smartboard and projector. It finally decided to install a Cisco WAAS solution to deliver an optimal experience for administrators and teachers accessing human resources (HR) and enterprise resource planning (ERP) business applications from anywhere on the WAN, thereby streamlining processes and enhancing productivity.[28]

In **Kuwait**, the Central Agency for Information Technology implemented the *Kuwait Information Network (KIN),* one of the early projects for the communication infrastructure needed to support the implementation of efficient and integrated nationwide e-services. KIN was intended to integrate the networks of all government entities in order to enable future integration of isolated information systems and develop electronic services.[29]

---

27 *Project nominated for a WSIS Project Prize 2014*

28 *Project nominated for a WSIS Project Prize 2014*

29 *Project nominated for a WSIS Project Prize 2014*

In **Poland,** the Office of Electronic Communications, in partnership with the National Institute of Telecommunications, has launched the *Inventory of Telecommunication Infrastructure and Broadband Services*. The broadband infrastructure information system (SIIS) gathers, processes, presents and shares information about telecommunication infrastructure, public telecommunication networks and buildings, so as to facilitate co-location/site-sharing. The main reason for launching the project was to identify areas of low penetration of broadband services in order to focus investment in the telecommunication sector and identify areas for public intervention in national broadband development plans. The project has resulted in increased investment in the telecommunication sector, boosted investment in the construction of next-generation networks co-financed by EU funds, and lowered barriers to investment in telecommunication infrastructure. The SIIS data can be used by regulators/governments to provide the information about the country's telecommunication infrastructure that is needed for effective decision-making.[30]

The *Nigerian Universities Electronic Teaching and Learning Platform* (NUTALP) project in **Nigeria** is an ICT-enabled interactive teaching and learning concept, whose main focus is on developing 'smart' classrooms that use technology to overcome the challenges of large classes, supporting modern methods of teaching and learning and developing content using interactive tools. The project was funded by the Tertiary Education Trust Fund (TETFund) and, under the pilot phase, 12 universities were selected as beneficiaries, each receiving 20 units of interactive whiteboards with accompanying projectors and accessories. The project is aimed at addressing the inherent challenge of large classes, as students can participate adequately in their lectures from a distance.

In **Serbia**, the Ministry of Foreign and Internal Trade and Telecommunications launched the *Digital School* project. Digital School is the largest national project to comprehensively support education by equipping all elementary schools in Serbia with computer labs and strengthening the overall digital literacy of students and teachers through education and competition, enabling them to use ICTs safely and effectively in work/studies/extracurricular activities. The programme covers 95 per cent of all elementary schools in Serbia, equipping them with computer labs, representing a total of more than 30 000 computers. The value of the project comes to over EUR 12 million.[31]

30 *Project nominated for a WSIS Project Prize 2014*

31 *Project nominated for a WSIS Project Prize 2014*

Action Line C3. Access to information and knowledge

In the framework of World Summit on the Information Society (WSIS), the United Nations Educational, Scientific and Cultural Organization (UNESCO) is acting as lead facilitator for WSIS Action Line C3: Access to information and knowledge. Referring to the *10-Year WSIS Action Line Facilitators' Reports on the Implementation of WSIS Outcomes*, UNESCO, in partnership with other stakeholders, has been working to:

- Shift global discussions from information to inclusive knowledge societies
- Enhance access to public information and resources
- Promote access to both proprietary and open-source software
- Provide access to scientific journals and other data sources which are valuable for research
- Promote community development
- Advocate access to ICTs, information and knowledge for vulnerable social groups, including persons with disabilities.[32]

The ten years since WSIS have seen a shift in emphasis from *access to infrastructure* towards *access to skills and content*.[33]

Referring to the Report of the United Nations Secretary-General on Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels, UNESCO continued to promote the use of free and open-source software in its fields of competence, and discussed recommendations in this area in the framework of the WSIS+10 review, in collaboration with the International Federation for Information Processing.

In addition, UNESCO launched five national initiatives in 2013, under the project *World Map of UNESCO's Points of Interest*, with the aim of strengthening local communities' ability to deal with post-disaster and post-conflict situations with the aid of an openly licensed geographic information system and data infrastructure. UNESCO and the Global Initiative for Inclusive ICTs produced the global report *Opening New Avenues for Empowerment*, which offers a model policy for accessible ICTs in support of implementation of the United Nations Convention on the Rights of Persons with Disabilities.[34]

The International Telecommunication Union (ITU) is co-facilitator for Action Line C3. In 2013, ITU released the report *The ICT Opportunity for a Disability-Inclusive Development Framework,* which contributes to a better understanding of the extent to which ICTs can enable and accelerate the social and economic inclusion of persons with disabilities. It lists challenges that are still to be addressed and outlines a number of specific measures to be

32 https://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C3.Summary.pdf

33 https://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C3.Summary.pdf

34 http://unctad.org/en/PublicationsLibrary/a69d65_en.pdf

taken by each group of stakeholders, as well as a set of indicators to help measure progress towards a disability-inclusive development agenda.[35]

In order to provide access to information and knowledge and build an inclusive information society, stakeholders continue to work on a range of activities. These include:

- Enabling everyone, including people with disabilities, to benefit from ICTs by developing *policies on e-accessibility*. Different projects and initiatives were put in place to improve citizens' quality of life, develop skills and foster digital inclusion of people with disabilities. Some 15 per cent of the world's population lives with a disability, representing about 1 billion people globally.[36]
- Bringing ICTs to rural and underserved areas by establishing *community centres, digital public libraries, free Wi-Fi spots* and other *public access points* that provide affordable or free-of-charge access and remove barriers to bridging the digital divide. General public services are provided in rural areas to improve the living conditions of the poor and promote greater integration of isolated communities.
- Strengthening and promoting *research and development*, including research on the information society that facilitates accessibility of ICTs for all, and for disadvantaged groups. In particular, there is a special focus on youth and older people to enable those groups to benefit fully from ICTs and information.
- Raising *public awareness* and encouraging the use of different *software models*, including proprietary, open-source and free software.

C3.1 Access to information

In **Lebanon,** the Ministry of Telecommunications launched the *Free Internet in Public Gardens* initiative, which is intended to equip all public gardens in Lebanon with a free Wi-Fi service. The ministry will install the infrastructure, while the Société de Développement des Télécommunications du Liban s.a.l (Sodetel) will provide the service, and the Association of Banks will bear the costs arising in some gardens. So far, three public gardens have been equipped with the service: Sioufi and Sanayeh in Beirut, and Menchiyeh in Tripoli. In order to extend the project to other gardens, the Ministry of Telecommunications is currently conducting negotiations with several sponsors to provide the necessary funding and services.

The importance of *mainstreaming accessibility* has been confirmed by a recent study launched by ITU, to which 150 experts contributed, on a global assessment of communication technology, disability, and development.[37]

In June 2013, the World Intellectual Property Organization (WIPO) administered the Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled.

---

35 http://www.itu.int/en/action/accessibility/Pages/default.aspx

36 http://www.itu.int/en/action/accessibility/Pages/default.aspx

37 http://itu4u.wordpress.com/2014/05/08/mainstreaming-accessibility-deafblindness-assistive-technology-and-advocacy/

WIPO's *Access to Research for Development and Innovation* programme facilitates access to scientific and technical journals. It is also part of the Research4Life partnership, together with specialized programmes from the World Health Organization (WHO), the Food and Agriculture Organization (FAO) of the United Nations and the United Nations Environment Programme (UNEP). Similarly, WIPO's *Access to Specialized Patent Information* (ASPI) programme allows access to commercial patent databases.[38]

In **Colombia**, *CONVERTIC* is the national strategy that envisages measures to promote the social, economic and employment inclusion of people with visual impairment. By facilitating the purchase of an unlimited four-year licence for screen-reader and screen-magnifier software that can be downloaded anywhere in the country, the ICT ministry plans to improve quality of life, empower the population, develop skills and foster the digital inclusion of people with disabilities, specifically those with visual impairment. The digital divide will be diminished only through the creation of strategies that allow the entire population to make full use of technology and make it part of their daily lives.

In **Sweden**, Post och Telestyrelsen (PTS), the country's postal and telecommunications agency, created the *Facebook Interface for people with deafblindness*. The aim is to develop a service that makes Facebook accessible to deafblind people. The service will be flexible and can be used on smartphones, tablets and "normal" browsers on different platforms. The service will also work with the various tools used by people with deafblindness, such as magnifiers, screen readers and Braille displays. For the development of the service to be successful, deep knowledge of user-centered design is required, so deafblind persons are involved in developing the service throughout the development process, from user testing to product launch.

In **Cuba,** the *Integrated and progressive teaching aids* system was launched. This is a programme in which every academic subject has an associated set of teaching aids that, in addition to printed matter and audiovisual facilities, also include a multimedia application and a slot on the education platform. It provides students with aids on various media within a coherent, rational and constantly updated environment. Each of the aids included in the system has a number of cognitive benefits for the user, fostering the development of specific cognitive abilities and exploiting the potential of each aid.

In **Turkey**, the Istanbul Metropolitan Municipality implemented the *Information System for the Disabled* project, with the following main objectives:

- Improve the quality of public transport services
- Provide access to public transport services for everyone
- Support the participation of the visually impaired in social life
- Ensure equal opportunities to benefit from public services
- Increase demand for public transportation by improving the quality of wheeled public transport services.

[38] http://unctad.org/en/PublicationsLibrary/a69d65_en.pdf

Also in **Turkey**, in 2011 the Information and Communication Technologies Authority (ICTA) launched the *Ensuring Equivalence in Access for Disabled End-Users* (EEADE) project, in collaboration with various NGOs, academic institutions, mobile, fixed and cable operators, the Ministry of Family and Social Policies and the Ministry of Transport, Maritime Affairs and Communications. The purpose of this project is to eliminate barriers to ICT access for people with disabilities. The project addresses the specific needs of persons with disabilities by requiring the provision of more affordable and specially designed ICT services for these vulnerable groups.[39]

In **Italy**, Informatici Senza Frontiere (ISF) has implemented the *Strillone* ("paper boy") application, a free application that works on smartphones, tablets and PCs, offering visually impaired people easy and rapid access to daily newspapers using a free embedded "text-to-speech" (TTS) system. Visually impaired people can use the voice synthesis system to listen to news "on demand".

In **Egypt**, the Ministry of Communications and Information Technology introduced the *Innovation Competition for Developing Software and Mobile Applications for People with Disabilities* (Tamkeen). Tamkeen ("Empowerment") is an annual innovation competition aimed at encouraging individuals and companies to develop software and mobile applications which help people with disabilities carry out their daily activities and provide them with better education and employment opportunities. Persons with disabilities themselves were involved in identifying the themes of the competition. Prototypes that were submitted and passed the technical assessment were then evaluated for usability by people with disabilities, before being accepted for funding. Tamkeen also provides technical and financial support for developing the prototypes selected. The goal of the competition is to empower persons with disabilities in Egypt and the Arab world by providing them with affordable and customized assistive technologies.

In **Italy**, the Department of Women's and Children's Health of the University of Padua introduced the *Vocal Output Communication Aids for Temporarily Impaired Owners,* involving a study of "augmentative serious games", in a paediatric intensive care unit. The spread of video games over the past decade means that games are now as widespread as films. Games are intended mainly, but not exclusively, for entertainment; but they are also used in other, more serious contexts that include the defence industry, education, scientific exploration, healthcare and emergency management. The aim of this project is to take a step forward in the growing field of development, verification and validation of ASG in a paediatric intensive care unit. It focuses on a less-explored domain, namely access to ASGs for children suffering from "locked-in" syndrome.

C3.2 Software and open access

Cuba has for some years been applying a set of strategies aimed at the *adoption of open source* at national level within the shortest possible time-frame. These strategies involve searching for possible alternatives for each of the systems currently in operation and, given the risks associated with radical change, seek a gradual transition to open-source alternatives. The University of Computing Sciences is the primary technical support for the

[39] *Project nominated for a WSIS Project Prize 2014*

migration process, and has developed Cuban distribution for the Nova operating system, which is being disseminated nationwide. Cedrux, another system developed by the university, is a candidate for the Cuban ERP (enterprise resource planning) system, which is designed initially to cover the accounting domain, moving on in the short- to medium-term to modules for other areas of management in government departments and agencies as well as Cuban business organizations. *Nova* is an operating system that uses the Linux kernel and includes certain software application packages to satisfy the needs of migration to open-source platform that Cuba is undergoing as part of the process of applying ICTs to build the information society.[40]

In **Turke**y, the Land Registry and Cadastral General Directorate introduced the *Spatial Property System* (MEGSIS), which it developed as an open-source application. Cadastral data are collected by the central system from local users in the cadastral offices in digital ".cad" format and harmonized with land registry data for submission to stakeholder institutions, organizations, municipalities and citizens by e-government link. Studies held under MEGSIS are collected under four main headings: i) web-based application software; ii) international standard map services; iii) e-government services; and iv) orthophoto services.

C3.3 Community centres

In **Sudan**, the Gedaref Digital City Organization (GDCO Sudan) has set up *telecentres*, as a means of connecting the unconnected, providing ICT support, and empowering the establishment of strong communities through skills development in order to facilitate lives in marginalized, underserved and disadvantaged areas. Telecentres serve as a tool for bridging the digital divide and reaching everyone, based on a "win-win" public-private partnership. GDCO has shared its knowledge, experience and best practices with others, and telecentre networks can bring best practices from other parts of the world to Sudan. GDCO Sudan has developed many initiatives with its partners to help the government speed up the provision of e-services to the community. This project includes e-agriculture, e-education, telemedicine, children not attending school, and people with disabilities.

In the **Syrian Arab Republic**, the government launched the *Salamieh Telecentre* initiative. By providing access to *telecentres for people with disabilities,* the initiative leverages ICTs to offer e-learning opportunities for students with disabilities, an objective that is very high on the political agenda. The aim of the project is to develop an effective strategy to enhance ICT and IT skills among students with disabilities, use technology to improve education and digital literacy and expand the social support and information opportunities available to them. In this context, the Syrian Arab Republic has deployed significant efforts to develop conceptual knowledge and manage the content of learning activities in pedagogical settings. [41]

In **Portugal**, the *Programa Escolhas* ("Choices programme") was launched in order to promote equal opportunities and social cohesion. It is aimed specifically at the digital and social inclusion of children and young people in lower socio-economic segments. Some 126 *digital inclusion centres* were set up across the country and in autonomous regions between January 2010 and December 2012. About 1 400 certifications were issued, including 6 302

[40] *Project nominated for a WSIS Project Prize 2014*

[41] *Project nominated for a WSIS Project Prize 2014*

for basic skills diplomas, 2 284 relating to the digital literacy curriculum and 55 to "NetAcad", among other courses. [42]

In **Bhutan,** the *Community Centres* (CCs) project was implemented in order to ensure the accessibility of information and electronic services anytime, anywhere. The community centres in the "*geogs*" (administrative units) have been identified as potential hubs where the community can have access to information and government services. The Ministry of Information and Communications has been mandated to establish one CC in every *geog*, making a total of 205 CCs in the country, with the objectives of improving the living conditions of the poor and promoting greater integration of isolated communities through easy access to government and business services, including postal and other general public services. The project was started in mid-2009. Currently, 182 CCs have been established and the remaining 23 CCs will be completed within one or two years. Of the 183 CCs that have been established, 130 are connected with broadband Internet. [43]

In **Nigeria,** the *Rural Information Technology Centres* (RITCs) are reliable vehicles for providing public access to ICTs and services in rural and underserved communities. They are a major means of fulfilling the Nigerian National Information Technology Development Agency's (NITDA) mandate of enhancing Internet penetration and general deployment of ICTs, especially in Nigeria's rural areas. Particular attention is paid to the rural areas in order to bridge the digital divide that exists between urban and rural areas. The centres house IT equipment (computers, scanners, photocopiers, printers, application/e-learning software and other IT support tools); power backup (inverters, batteries, solar modules and other auxiliary power equipment); and Internet access (VSAT dish, modem, bandwidth). It is envisaged that the project will be implemented in the country's 774 local government areas. A total of 10 RITCs were established in 2007, 17 in 2008, 58 in 2009, 111 in 2010, 60 in 2011, 93 in 2012 and 50 in 2013. About 399 have thus been established, and more are currently in progress.

In the **Republic of the Congo**, the African Forum for the Promotion of New Information and Communication Technologies launched the project *ICT space for each rural area*. Its objective is a community network for each rural area, adding TCM-TF (tunnelling compressed multiplexed traffic flow) in order to provide VoIP and other real-time services, thereby fostering ownership and expansion of ICTs in local communities, and awareness-raising and training in ICT for the development of an autonomous network together with local populations, leading to sustainable development and society-inclusive information. TMC-FT technology is suitable for regions of sub-Saharan Africa where bandwidth is low, and offers a way of engaging people in rural areas for the years beyond 2015.[44]

In the **Republic of Korea**, the National Information Society Agency (NIA) has formulated the *Information Access Centre* (IAC) concept. The agency is eager to provide greater opportunities for access to information and knowledge in developing countries. Since 2002, a total of 34 IACs have been set up. From children to older people, anyone wishing to access

[42] *Project nominated for a WSIS Project Prize 2014*

[43] *Project nominated for a WSIS Project Prize 2014*

[44] *Project nominated for a WSIS Project Prize 2014*

and use ICTs can visit an IAC and obtain training without charge or at an affordable cost. NIA plans to create 60 more IACs in developing countries.

In **South Africa**, the *Siyafunda Community Technology Centre* (CTC) project was implemented to empower, educate and connect communities. Siyafunda CTC supports information and community knowledge centres, where people can access computers, the Internet and other digital technologies that enable them to obtain information, create, learn, and communicate with others, and develop essential digital skills. The focus is on the use of digital technologies to support community, economic, educational and social development, thereby reducing isolation, bridging the digital divide, promoting health issues, creating economic opportunities and reaching out to youth.

In **Kenya,** the *Kenya Telecentres Network* is a telecentre-support network with the ultimate goal of sustainability. The network works with various partners to deliver capacity support in the areas of telecentre management, service development and technical support for telecentres and their managers.

In **Algeria**, the Ministry of Vocational Education and Training has launched a project to development *telecentres*. In total, eight telecentres were established under the terms of a partnership between the ministry and Germany's Gesellschaft für Internationale Zusammenarbeit (GIZ).

C3.4 Digital libraries and archives

In the **United Arab Emirates**, the *National Index* (Emirates Catalogue of Libraries) was established to link all libraries across UAE. This is part of an initiative to support the library sector and encourage the culture of reading and research among the national population. A national index will help researchers and students to access the resources at hand and easily track down other sources of information they require. The search process will be simplified by the introduction of an e-search function that will enable those interested to trace the various books and documents they require, through an online database linking all libraries. It will save valuable time that would otherwise have been spent in searching for a publication in different libraries.

In **Cuba**, the *National University Network* links universities and research centres attached to the Ministry of Higher Education. It provides the following services: repositories and digitized scientific journals; digital library; videoconferencing; corporate chat system; free Ubuntu, openSUSE and Debian software repository; media library of cultural and educational resources (videos, classical music, films); and an art gallery (painting, sculpture and historical photographs).

The National University Network provides:

- Hosting of portals of interest to the institution
- Downloading of materials of various kinds
- Hosting of virtual machines for end users (software as a service)
- Databases of scientific references on the Internet
- Resource-search system

- Access to the open courses platform
- Access to the university observatories network
- Access to the EcuRed mirror and Wikipedia
- Hosting of a private corporate social network.

More than 90 per cent of university libraries in Cuba have a webpage on the local intranet. A substantial digitization exercise produced over 89 000 electronic documents. All the libraries operate the ABCD library-management software, and around 50 per cent of catalogue entries have been digitized to date. Over the last ten years, the libraries have accessed 12 EBSCO databases.

In **Turkey**, the Atatürk Supreme Council for Culture, Language and History implemented the *Integrated Information System* (IIS). This project is aimed at creating a digital library by gathering together rare scientific resources and providing access to them via an online system.

In **Malaysia**, the Malaysian Communications and Multimedia Commission (MCMC) introduced the *u-Pustaka* library system. Ubiquitous availability of knowledge is crucial to a nation's development, and the role of the *ubiquitous library* in the context of development, national unity and global competitiveness is vital for any nation. The u-Pustaka project is a major advance for research and scholarship and will allow unparalleled access to vast collections for anyone, anytime, anywhere. The programme is an innovation that reflects a collaborative synergy between government agencies and private-sector organizations to provide u-Pustaka infrastructure and services.

In **Nigeria**, NITDA's *Virtual Library* Project, also known as *Information Resource Centre* (IRC), is a reference/research library providing comprehensive and authoritative information for researchers, students, lecturers etc. The NITDA Virtual Library/IRC uses the e-granary digital information resource also known as "Internet in a Box" that provides an open-source digital resource comprising more than 30 million documents and educational resources, including websites/pages, books and journals, thereby providing a media-rich digital resource. These digital educational and multimedia resources, with appropriate copyright, are fully indexed and searchable and are hosted on a new-generation Intel Dual Core 4TB data drive eGranary Digital Library Appliance Server. The eGranary Digital Library Catalogue covers a wide range of subjects including computer science, ICT, mathematics, engineering, social sciences and humanities, to mention but a few.

Also in **Nigeria**, the establishment of the *Virtual Libraries in Tertiary Institutions* is intended to provide a wide variety of resources through searchable databases and databanks, audio cassettes, videos, CD-ROM and images. It is a rich repository of information (over 30 million materials in different disciplines) for students and researchers. In addition to the one at NITDA headquarters, two more have been provided at two federal universities while moves are under way to establish another four during the current financial year.

Action Line C4. Capacity building

Capacity building and ICT literacy are essential for building an inclusive information society. As stated in the Geneva Plan of Action, ICTs can contribute to achieving universal education worldwide, through delivery of education and training of teachers, and offering improved conditions for lifelong learning, encompassing people that are outside the formal education process, and improving professional skills.[45]

Governments continue to develop national policies to ensure that ICTs are fully integrated into education and training at all levels. Literacy programmes in schools familiarize children with ICT tools. Capacity-building programmes provide an excellent basis for educating and preparing the national workforce for the future.

Governments stress the fact that it is important to create a critical mass of qualified and experienced ICT professionals by establishing public access points and local ICT training centres. Knowledge and information are exchanged via webcasts and other portals.

In some countries, adult illiteracy is still an enormous challenge, particularly in rural and underserved areas. Numerous efforts have been made to narrow the digital divide between rural and urban areas. New opportunities have been created to provide ICT education for citizens in rural areas through specially equipped vehicles, such as trucks and buses, designed to travel across the country and target rural areas.

More and more, training is becoming available for women and girls, with the aim of engaging them with ICTs and increasing the number of women in ICT careers. Projects are increasingly focused on facilitating access to new information technology by young people and children. Investment in ICT literacy for older persons is crucial in many countries. Worldwide, 2 billion people will be aged 60 or over by 2050.[46]

The United Nations and its specialized agencies continue to promote international and regional cooperation in the field of capacity building.

C4.1 ICT literacy

In **Turkey**, TTNET, working in collaboration with the Turkish Ministry of Transport, Maritime Affairs and Communications, has implemented the project *Life's Simpler with Internet*. Although there are 35 million Internet users in Turkey, a wide range of individuals are deprived of Internet access owing to economic and regional inequalities. As part of its social responsibility initiative, TTNET promotes technology to enhance the life of local communities via Internet access. Engaging with communities, TTNET aims to bring Internet literacy to every corner of the country. In order to allow individuals to experience the digital world, a specially equipped truck has been designed to travel across Turkey, to cities that do not have opportunities to provide computer and Internet education for all citizens. To date, the project has touched the lives of more than 3 000 people, including students, elderly people, underprivileged men and women, and convicts in a State prison.

---

45 Geneva Plan of Action, § 11

46 WHO data available at: http://www.who.int/ageing/en/

In **Cuba**, the *Computing and Electronics Youth Club* provides ICT-related services to foster the population's computer culture, the priority being children and young people. The club consists of a network of 600 facilities present all over the country, including in rural zones (138) and mountainous areas (38). It is supported by a team of over 5 000 employees, 48 per cent of whom are college graduates, 691 have a master's degree in science and one has a doctorate in science. More than 4 million people have taken the different types of courses run by the Youth Club: face-to-face, blended learning and distance learning. Among the graduates are children, young people, seniors and people with disabilities.[47]

In **Nigeria**, *capacity-building programmes* are being mainstreamed for all citizens in the country on an inclusive basis. They provide training to students, young people, unemployed graduates, experts, government officials, etc., in order to improve their ICT knowledge and skills, as follows.

a) *Training of government officials*: Various training programmes have been organized for government officials in the three branches of government (directorate officials from federal government ministries, departments and agencies, National Assembly members and the judiciary).

b) *Training of unemployed graduates*: In all, 6 100 unemployed graduates have been trained in ICT-related jobs.

c) *Training of university lecturers*: This programme was initiated by the National Information Technology Development Agency (NITDA) to provide IT training for lecturers at tertiary institutions, especially university lecturers. Over 900 lecturers have been trained in 36 universities under the “train-the-trainer” programme.

d) *Training of graduates*: In all, 1 200 engineers and IT graduates in all 36 states and the Federal Capital Territory have received training.

e) *Scholarship scheme*: Scholarships are awarded for higher degrees in core IT disciplines. Scholarships were granted to 36 master’s level and six doctorate level students in 2010, to 72 master’s and six doctorate level students in 2011 and to 74 master’s and six doctorate level students in 2012; the 2013 scholarships are in the process of being awarded. This is NITDA’s initiative for students to obtain higher degrees in different universities around the world.

f) *NITDA ICT Youth Empowerment Scheme (YES) 2012*: The scheme is aimed at alerting Nigerian young people to ICT career opportunities and developing ICT human capital and entrepreneurship skills among young people. In 2012, about 230 young people were trained in web technology (design, management and marketing), and the best 30 were equipped with basic start-up tools to launch a business.

g) *Establishment of IT parks*: NITDA has established two information technology parks, one in Calabar, Cross Rivers State, the other in Lagos, Lagos State. These parks are intended to provide a free trade zone and outsourcing opportunities, and to promote rapid growth of start-ups – small and medium-sized enterprises (SMEs) – as well as job creation, skilled manpower development and improved foreign exchange earnings.

[47] *Project nominated for a WSIS Project Prize 2014*

In **Ukraine**, the A.S. Popov Odessa National Academy of Telecommunications has introduced a group of projects to develop IT education in schools in the Odessa region. The projects include *creating educational online districts* in the regional centres of the Odessa region, *ordering ICT infrastructure* for Odessa schools, and the *IT education* project.

- The first project aims to provide distance education for pupils living in the countryside by enabling them to connect to the online district in the district centre.
- The second project involves the participation of students in assembling and maintaining local computer networks in schools.
- The *IT education* project is implemented through a system of specialized IT classes.

In **Sierra Leone**, the B-Gifted Foundation of Sierra Leone is implementing the *Second Chance* project, which provides an effective system of second chances through B-Gifted's ICT-related programmes, giving young people the hope that they can make up for bad luck or bad choices and empowering them through skills training in multimedia technology. The aim is to build the young people's life skills and self-esteem, as well as making them productive citizens. The project will further ensure that young people have access to ICTs for socio-economic development and can influence policy development, and will facilitate the mainstreaming and integration of young people and gender into development and promote empowerment.

In **Mexico,** private assistance institutions have launched a project to establish an *innovation and education centre* (CIE) project under an innovative model created to promote training for children, young people and anyone wishing to learn or innovate through ICTs. The centre is a non-profit organization that develops art, education and innovation programmes involving civil-society stakeholders such as volunteers and entrepreneurs. For the past five years, the centre has been growing and promoting the role of technology in enhancing the learning experience for society, especially rural communities.[48]

In **Bolivia**, the non-governmental organization Ayni Bolivia is implementing the *ch@ski* programme in order to integrate the country into the digital age. This programme has several aims: it provides training at all levels to both teachers and students, especially in areas underserved in terms of basic and advanced education; it provides capacity building by generating contextualized educational software for primary and secondary schools and for both computers and phones; and it implements an online learning platform where teachers share materials generated so they can be widely used both nationally and internationally.[49]

C4.2 National policies

In **Cuba,** the Ministry of Higher Education has launched the *education technology training strategy*, which is aimed primarily at ensuring the efficient use of ICTs in education. Initiatives launched under the strategy range from technological support to teacher training. The strategy includes one programme for producing and distributing high-quality teaching materials for the undergraduate and postgraduate national curricula, and another for

[48] *Project nominated for a WSIS Project Prize 2014*

[49] *Project nominated for a WSIS Project Prize 2014*

devising methodological guidelines for assessing and certifying quality in the employment of educational technology.

In **Bangladesh**, the Ministry of Education, in partnership with private and global actors, has launched the *ICT for Education at Secondary and Higher-Secondary Level* project. The objectives of the project are: (a) to familiarize all secondary and higher-secondary students with ICT tools; (b) to provide them with modern education in order to increase their employment prospects; (c) to make classrooms more interactive; and, most importantly, (d) to narrow the digital divide between rural and urban students.

In the **Russian Federation**, the Ministry of Telecom and Mass Communications is implementing the *Educational ecosystem at the municipal level for intergenerational population adaptation to modern ICTs* (EMAMICT). The project takes the form of public-private partnerships, and has operated since 2006. The project customers are the municipality, which is designated as a target group made up of different generations of people and as a user of State e-services; and secondary school teachers, as advanced providers of ICT skills. Project partners are the district prefecture; the Cisco Systems Training Centre; and Moscow Technical University of Communications and Informatics. The project builds the – primarily educational – potential of trainers in a programme of adaptation to modern ICTs; in turn, those trainers already teach classes to trainees. Competitions on modern ICTs show that the project is highly effective.[50]

In **Turkey**, the General Directorate of Foundations has established the *Charity Services System*, which is aimed at reducing all bureaucratic barriers by providing different types of support for Internet use. In this case, it provides education grants (from primary school up to and including university), food support, and monthly salaries for disabled and poor people. All types of applications will be filed via the Internet, and all the information needed will be obtained from related State associations via the Internet.

In **Saudi Arabia**, the Human Resources Development Fund (HRDF) has funded the *National e-Training Programme*. HRDF is the Ministry of Labour branch that focuses on upskilling and preparing the Kingdom's national workforce for public- and private-sector employment purposes. In order to achieve its goals, the fund continues to invest in state-of-the-art ICT infrastructure and projects. The National e-Training Programme is an easy-to-use learning and content-management platform provided on a pre-scheduled basis. The platform currently provides 46 training modules to an average of 100 000 candidates per week.

In **Egypt,** the Information Technology Institute (ITI) has introduced *Industry-based IT Human Capital Development*. Human capacity building is a central part of ITI's mission, and a number of initiatives and programmes have been set up to develop professional capabilities, support new technologies and forge partnerships for innovation. These programmes are aimed at bridging the gap between the academic world and industry so as to enable young people to break into ICT markets and to create more employment opportunities, thereby contributing to Egypt's economic development and enhancing capabilities to leverage Egypt's ICT global competitiveness.

[50] *Project nominated for a WSIS Project Prize 2014*

In **Colombia**, the Ministry of Information Technologies and Communications has launched the *Soy TIC* project to create basic face-to-face and virtual learning spaces. The target population comprises low-income people, victims of violence, persons with disabilities, community leaders and ethnic communities. Soy TIC is an integrated web-based platform that allows all the adoption processes taking place in Colombia to be followed up. It comprises a statistical database, a complete virtual learning environment and a training material library open to all, with a view to the transfer of knowledge in a digital community within a new network-based society.[51]

In the **United Arab Emirates**, the *Mohammed Bin Rashid smart learning project* (MBRSLP) aims to transform the educational system in the Emirates and keep pace with the latest global developments in education by creating a new advanced unified electronic learning environment in all public schools. The environment will take the form of "smart classes" in which every student will have an electronic device and access to learning resources via high-speed networks. In addition, the project will enable teachers, students, parents and administrators to collaborate on a student-oriented educational system that identifies students' individual learning styles, intelligence, strengths and weaknesses, and enhances their skills according to their abilities based on interactive teaching and learning.[52]

C4.3 ICT for professionals and experts

In **Cuba,** the University of Computer Sciences (UCI), a higher-education institution providing free training for highly skilled professionals and developing computer products and services, has an *innovative training regime* encompassing teaching, research and software development, and involving intensive application of ICTs to the teaching/learning process. Founded in 2002, UCI's role includes supporting the Cuban software industry. It is one of the Cuban State's most far-reaching initiatives in the development of the knowledge economy and information society. In 10 years, it has trained over 11 000 professionals (of which over half of Cuba's engineers in this field) and developed and conducted over 200 computerization and ICT application projects – local and national – based on sustainable development principles. It also exports products and services to various countries, making a sustained contribution to the national economy. It boasts three Capability Maturity Model Integration (CMMI) Level 2 certified development centres and an international postgraduate centre. It maintains academic and commercial relations with institutions in over 10 countries.[53]

Another *ICT personnel training and development* programme has been initiated in **Cuba** for undergraduates, master's level and doctorate level students. There are now 282 students studying for a PhD and 3 990 studying for an MSc in 65 centre programmes.

In **Nigeria,** the *Network Administration and Management Training* project for IS/IT support staff in ministries, departments and agencies and public-sector agencies was put in place to build public-sector capacity and enhance a maintenance culture with reference to IT-related investments. The project has provided:

---

51 *Project nominated for a WSIS Project Prize 2014*

52 *Project nominated for a WSIS Project Prize 2014*

53 *Project nominated for a WSIS Project Prize 2014*

- Training for personnel from more than 50 separate agencies, equipping them to manage their internal networks and make better use of shared IT services provided through Galaxy
- An extensible infrastructure to accommodate the future needs of the scheme.

In **Argentina**, the *South School on Internet Governance* (SSIG) was set up to increase the participation of Latin American and Caribbean representatives in debates, forums and participation spaces where Internet governance is discussed and where Internet policy processes take place. SSIG:

- creates capacity-building programmes for new opinion leaders and encourages them to participate actively in meetings and debates about the Internet and Internet governance;
- trains professionals from Latin America and the Caribbean in Internet governance-related issues from a global, regional and local perspective;
- motivates young students and professionals from Latin America and the Caribbean to participate actively in policy development processes related to the Internet and Internet governance.

In **Turkey**, Fatih Sultan Mehmet University has launched the *Manager, Auditor and End-user Informatics Academy*. Manager, auditor and end-user staff of institutions will be trained in deciding how to prepare technical needs and analysis of IT tools. The aim is to produce high added value by increasing the efficiency and effectiveness of IT investments.

In **Mexico,** the *Training Digital Leaders* programme seeks to strengthen and professionalize digital community centre staff and promote social and economic development through ICTs. In 2013, more than 850 digital leaders were trained based on a standard that is recognized by the Ministry of Public Education. The training certification includes social promotion, digital skills and digital centre management. Digital leaders around the country will become community activists who promote ICT literacy in digital community centres. The online training of over 6 000 digital leaders will be consolidated via the website www.promotoresdigitales.mx, where they will be able to share knowledge and experiences and build identity.[54]

In **Malta,** *EPITOME* is the acronym for *Empowerment Programme for IT Use: Outreach for Micro Entrepreneurship*. The primary deliverables of this project were the identification of ICT skills shortages and the development and delivery of training aimed at addressing them. The objective was to offer the employees of micro-enterprises an opportunity to acquire basic skills in ICT technologies and applications that could be applied in business and entrepreneurship. All training has been completed and the last phase (tracer study) will be finalized in November 2013. Feedback received from the first phase of the tracer study demonstrated that the majority of certified employees were actively using some of the new skills acquired in their respective businesses.

At the request of the National Bureau of Statistics (NBS) of **China**, the United Nations Conference on Trade and Development (UNCTAD) organized a *training workshop on ICT and e-commerce statistics* from 25 to 27 June 2013 in Beijing. The workshop was based on the

[54] *Project nominated for a WSIS Project Prize 2014*

UNCTAD course on information economy statistics, and included a session on the global context for measuring the information economy and links to policy-making. A total of 13 South-east Asian and 58 Chinese statisticians benefited from the training.[55]

The UNCTAD *Training Course on Information Economy Statistics* organized in **Mozambique** from 4 to 8 November 2013 aimed to help developing countries improve their statistics on the use of ICTs by businesses and on the ICT production sector. Since it piloted the course in 2007, UNCTAD has trained 152 producers of ICT statistics from 98 countries, but so far none had been Portuguese-speaking. The training course is based on the UNCTAD *Manual for the Production of Statistics on the Information Economy* (2009 revised edition), which was recently translated into Portuguese. It was delivered to 17 staff of national statistical offices and other institutions in charge of producing official statistics on the information society from six Portuguese-speaking countries, including five least developed countries. The project is funded by the Government of **Sweden** (through the Swedish International Development Cooperation Agency).[56]

C4.4 International and regional cooperation

The *RAFT (Réseau en Afrique Francophone pour la Télémédecine)* network was established to provide continuing education for healthcare professionals and access to specialized advice for improving the quality, efficiency and accessibility of health systems. The network offers services in the following countries: **Algeria, Benin, Burkina Faso, Burundi, Cameroon**, **Republic of the Congo**, **Democratic Republic of the Congo**, **Côte d'Ivoire, Madagascar, Mali, Mauritania, Morocco, Senegal** and **Tunisia**. In developing countries, this type of healthcare education and advice is usually limited to capitals, and remote professionals do not have access to such opportunities, or even to didactic material adapted to their needs. This can limit their ability to remain active in the periphery, where they are most needed. The core activity of RAFT is webcasting interactive courses targeting physicians and other care professionals on topics proposed by the network's partners. Courses are webcast every week, freely available, and followed by hundreds of professionals who can interact directly with the teacher. No fewer than 70 per cent of the courses are now produced and webcast by experts in Africa. A bandwidth of 30 kbit/s, the speed of an analogue modem, is sufficient and enables participation from remote hospitals or even cybercafés. Other activities of the RAFT network include medical tele-expertise, tele-ultrasonography, and collaborative development of educational online material.

Japanese Funds-in-Trust for the Capacity-building of Human Resources was created in order to contribute, through the United Nations Educational, Scientific and Cultural Organization (UNESCO), to capacity building of human resources in developing countries as a part of the Government of **Japan**'s official development assistance (ODA). The scope of the project includes capacity building in the use of ICTs in education, information literacy, open access to scientific information, etc.

---

55 UNCTAD contribution

56 UNCTAD contribution

The *ict@innovation* project is a capacity-development programme started in 2008 by the Free and Open Source Software Foundation for Africa (FOSSFA) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), which is funded by the German Federal Ministry for Economic Cooperation and Development (BMZ). The support of GIZ on behalf of BMZ ended in 2012. The project was active in 18 countries of **sub-Saharan Africa**. It helped to create a community of more than 1 200 African and international experts who are exchanging knowledge on FOSS as a key technology to drive innovation, add local value and create sustainable and affordable ICT solutions in African economies.[57]

[57] *Project nominated for a WSIS Project Prize 2014*

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

Confidence and security play an essential role in the information society. Governments, in cooperation with the private sector, are working to prevent, detect and respond to cyberthreats and misuse of ICTs by: developing guidelines that take into account ongoing efforts in these areas; considering legislation that allows for effective investigation and prosecution of misuse; promoting effective mutual assistance efforts; strengthening institutional support at the international level for preventing, detecting and recovering from incidents; and encouraging education and raising awareness. Thus, the projects reported on in this chapter showcase how stakeholders are contributing on an ongoing basis to building confidence and security in the use of ICTs.[58]

Being the lead facilitator for Action line C5: Building confidence and security in the use of ICTs, the International Telecommunication Union (ITU) has made available to the international community a global platform for dialogue, coordination and cooperation. During the 2013 WSIS Forum, ITU organized a *Facilitation Meeting on Action line C5* and a *High-Level Panel on Cybersecurity*.

The ITU *Global Cybersecurity Agenda* (GCA) provides the framework within which the international response to the growing challenges of cybersecurity can be coordinated and addressed. Within this framework, the Union has continued play a key role in the global community, through partnerships and initiatives. The ITU *International Multilateral Partnership against Cyberthreats* (ITU-IMPACT) has provided cybersecurity services and capabilities to 149 countries and, together with the United Nations Office on Drugs and Crime (UNODC), ITU is assisting Member States in properly addressing cybercrime.

Within the framework of the GCA, the *Child Online Protection* (COP) initiative brings together partners from all sectors of the global community to ensure a safe and secure online experience for children everywhere.

For instance, together with the United Nations Children's Fund (UNICEF) and other partners, ITU has recently updated the *Child Online Protection Guidelines for Industry*. These new guidelines aim to provide a framework for the increasingly broad range of companies that develop, provide or make use of ICTs in the delivery of their products and services.

In addition, ITU is working with different partners to facilitate the establishment of *COP national frameworks* all over the world. This high-level process will consist of five phases: assessment, definition of country plans, finalization of country plans, implementation, and monitoring and evaluation.

ITU is organizing the *Child Online Protection Challenge* to address the issue of educating children by presenting an interactive platform where children, parents and educators can engage in fun activities to learn more about the risks that children face on the Internet and how these risks can be averted.

[58] Geneva Plan of Action, § 12 b)

Furthermore, the fight against *online child sexual abuse content* is increasingly a global effort. The Internet Watch Foundation (IWF) has been invited by ITU to develop a template that will enable countries which currently have no provisions in this regard to access IWF's expertise and resources with a view to establishing efficient and cost-effective methods of tacking this owing problem.

Legal measures

As part of ITU-D Programme 2, on cybersecurity, ICT applications and IP-based network-related issues, ITU is assisting Member States in understanding the *legal aspects of cybersecurity* in order to harmonize their legal frameworks.

A persistent concern is the lack of *harmonization of cybersecurity-related legislation*, which makes it difficult to investigate and prosecute offenders if the categorization of cybercrimes and other misuses of cyberspace differ from country to country. In response, ITU has assisted selected countries, upon request, with legal aspects of cybersecurity and helped with harmonizing their legal frameworks so as to make them applicable and interoperable across the world. An example of ITU's cybercrime legislation resources is its publication (in six languages) entitled *Understanding Cybercrime: A Guide for Developing Countries* and the *Toolkit for Cybercrime Legislation*.

Technical and procedural measures

In order to identify cyberthreats and countermeasures to mitigate risks, ITU-T Study Group 17 has approved seven *Recommendations on cybersecurity*, including on a cybersecurity indicator of risk to enhance confidence and security in the use of telecommunications/ICTs, and language for the open definition of vulnerabilities and the assessment of a system state. This also includes work by ITU-R on topics such as security principles for international mobile telecommunications – IMT (3G and 4G) – networks and Recommendations on security issues in network management architecture for digital satellite systems.

Organizational structure

The absence of *institutional structures* to deal with cyberincidents and attacks which result in fraud, the destruction of information and/or the dissemination of inappropriate content is a genuine problem in responding to cyberthreats.

In partnership with IMPACT, ITU continues to deploy capabilities to build capacity at the regional and international levels. ITU-IMPACT has undertaken technical assessments to evaluate preparedness for the establishment of *national computer incident response teams* (CIRTs) in 47 countries and is continuing with the necessary follow-up actions. Future assessments are planned in **Bolivia**, among others. National CIRTs have been set up in seven countries, namely **Burkina Faso**, **Côte d'Ivoire**, **Kenya**, **Montenegro**, **Tanzania**, **Uganda** and **Zambia** and are in the process of being established in **Jamaica**, **Ghana**, **Burundi**, **Trinidad and Tobago**, **Barbados** and **Cyprus**.

In collaboration with IMPACT, ITU conducts *cyberdrills* for its partner countries designed to enhance the communication and incident response capabilities of participating teams, and to strengthen national and international cooperation against cyberthreats. So far, ITU-IMPACT has conducted cyberdrills for more than 50 countries. In the current reporting

period, a cyberdrill was held for the Latin America region in Montevideo, **Uruguay**, from 26 to 29 August 2013, and for the Arab region in Muscat, **Oman**, from 27 to 28 October 2013. Cyberdrills for Europe and the Americas region are planned for the first semester of 2014, in **Turkey** and **Peru**, respectively.

In July 2013, ITU signed a memorandum of understanding (MoU) with the Nigerian Communications Commission to set up a *Regional Cybersecurity Centre* in **Nigeria** to facilitate collaboration on combating cyberthreats at the regional and national levels. This centre will also provide support for child online protection.

Capacity building

The important role that ICT plays today in providing services in sectors as varied as health, education, finance and commerce highlights the paramount need to be aware of both the opportunities offered by a secure cyberenvironment and the threats inherent to cyberspace. At present, however, there is a shortage of qualified cybersecurity professionals in all countries – including the most technologically advanced among them.

To help bridge this gap, ITU has organized *cybersecurity training workshops* for more than 2 700 government officials, regulators and public- and private-sector ICT professionals around the world. The workshops cover various technical and policy aspects of ICT security, including malware analysis and investigation, securing networks and forensics. Some of these workshops feature mock trials to test participants' knowledge of national legal frameworks applicable to cyber-related offences. In addition, several national CIRTs around the world have taken part in ITU-IMPACT cyberdrills involving simulated cyberattack scenarios to test their communication and response capabilities in emergencies.

Least developed countries (LDCs), on account of their limited human, institutional and financial resources, face particular challenges in elaborating and implementing national policies and frameworks for cybersecurity, protection of critical information infrastructure and human capacity building. *Enhancing cybersecurity in LDCs* is a project that focuses on assisting LDCs in building their capabilities, capacity, readiness, skills and knowledge in the area of cybersecurity. Apart from human capacity building, the project is also geared towards providing the appropriate enabling technologies and related tools to assist LDCs in carrying out activities for securing their cyberspace. To date, assistance has been provided to eight LDCs.

The *Global Cybersecurity Index* (GCI) project aims to effectively measure each nation's level of cybersecurity development. The ultimate goal is to help foster a global culture of cybersecurity and integrate cybersecurity at the core of ICTs. The long-term aim of the GCI is to drive further efforts in the global adoption and integration of cybersecurity. By measuring the level of cybersecurity preparedness in various areas, the index will encourage states to assess where they are on a scale of development, where they need to make further improvements and how far they are from implementing an acceptable level of cybersecurity. The project is the result of an MoU signed between ITU and ABI Research, a United States based company and ITU-D Sector Member. The data-gathering exercise is being performed through a questionnaire to be completed by Member States. The GCI was first unveiled during the WSIS Forum in May 2013.

International cooperation

The battle to eradicate misuse of ICTs for criminal or other purposes has yet to be won, as challenges to cybersecurity such as denial-of-service attacks, identity and data theft and destructive malware proliferate and become more sophisticated.

In line with its Global Cybersecurity Agenda, ITU has consolidated its global alliance with governments, academia and industry experts to promote a *culture of cybersecurity awareness* and a *holistic approach to counter misuses of online networks*. In collaboration with United Nations agencies, other international organizations and the European Commission, and in association with IMPACT, the Union is helping countries around the world to address cybersecurity challenges.

At the request of the United Nations system Chief Executives Board for Coordination (CEB), ITU, in collaboration with the United Nations Office on Drugs and Crime (UNODC) and some 35 United Nations agencies has developed a UN-wide *Framework on Cybersecurity and Cybercrime*, which was endorsed by CEB at its 2013 second regular session in November 2013. CEB has requested ITU, the United Nations Educational, Scientific and Cultural Organization (UNESCO), UNODC, the United Nations Development Programme (UNDP) and the United Nations Conference on Trade and Development (UNCTAD), in close coordination with the High-Level Committee on Programmes (HLCP), the High-Level Committee on Management (HLCM) and the United Nations Development Group (UNDG), to develop a *system-wide comprehensive and coherent strategy* for addressing the issue, for discussion at CEB's 2014 second regular session.

Member States have access to ITU's comprehensive *cybersecurity-related research, analysis and training materials*. The Union has also established formal cooperation with cybersecurity companies such as Symantec and Trend Micro, which have agreed to share information on current and emerging global cyberthreat trends, as well as with UNODC to build mechanisms to counter cybercrime. In addition, ITU is working with the Forum for Incident Response Team (FIRST) – the world's biggest computer incident response team association – to share best practice on how to develop *national incident response capabilities* and, through IMPACT, with INTERPOL to foster and benefit from *synergies with the law-enforcement community*.

Regional actions:

Africa

Within the framework of a joint ITU-European Commission project to create *harmonized ICT policies* and an *efficient regulatory environment* in **African**, **Caribbean** and **Pacific** countries, model policies on cybercrimes, electronic transactions and data protection have been developed and are now being transposed into domestic legislations.

Under the project known as HIPSSA (*Support for the Harmonization of ICT Policies in Sub-Saharan Africa*), input was provided to the African Union to develop a continent-wide Convention on Cybersecurity.

Twenty-five African countries have benefited from ITU-IMPACT assessments of their cyberthreat preparedness and response capabilities (**Botswana, Burkina Faso, Burundi, Cameroon, Chad, Cote d'Ivoire, Democratic Republic of the Congo, Ethiopia, Gabon, Gambia, Ghana, Lesotho, Mali, Niger, Nigeria, Kenya, Senegal, Sierra Leone, Swaziland, Tanzania, Togo, Uganda, Zambia** and **Zimbabwe**). Since 2010, four of them (**Burkina Faso, Kenya, Uganda** and **Zambia**) have set up CIRTs and four others (**Burundi, Côte d'Ivoire, Ghana** and **Tanzania**) are in the process of doing so, with ITU-IMPACT support.

Various other cybersecurity initiatives are foreseen in Africa, including the *Regional Cybersecurity Centre* referred to above, to be set up in Nigeria under the MoU concluded between with ITU and the Nigerian Communications Commission in July 2013. . This regional centre will facilitate collaboration on combating cyberthreats at the regional and national levels, with an emphasis on activities related to protecting children online.

An ITU-led Africa *Child Online Protection* summit is also planned, in order to identify risks and vulnerabilities for children in cyberspace, to develop practical tools to help minimize risks and to share knowledge and experience. In 2013, the First Lady of **Nigeria**, Dame Patience Goodluck Jonathan, graciously agreed to be ITU's Champion for Child Online Protection.

A *CIRT assessment workshop*, organized by the ITU Telecommunication Development Bureau (BDT), in collaboration with IMPACT, was held in **Addis Ababa**, Ethiopia, from 10 to 14 March 2014, with the participation of **Zimbabwe**, **Swaziland** and **Liberia**. ITU-IMPACT pledged its support to the countries attending that workshop, as well as to **Democratic Republic of the Congo** and **Ethiopia**, in setting up their national CIRTs and more broadly in defining national cybersecurity strategies for the countries that do not have one. The attendees received the surprise visit of ITU Secretary-General, Dr Hamadoun Touré, who in his brief speech recalled the importance ITU attaches to assisting its Member States in assessing their national cybersecurity preparedness and cyberthreat response capabilities.

Asia and the Pacific

Joint action by ITU and the Association of Southeast Asian Nations (ASEAN) has increased *regional cooperation to address cybersecurity challenges*. It has also been instrumental in strengthening the capacities of several least developed or developing countries to counter cybersecurity threats and manage related emergencies.

Cambodia, **Lao P.D.R.**, **Myanmar** and **Viet Nam** are among the countries to have received direct assistance in this regard in recent years. Cooperation on cybersecurity issues between these countries was enhanced following their participation in an ITU/ASEAN *subregional workshop* held in **Myanmar** in 2011. The workshop focused on national CIRT policies, procedures, best practices, challenges and opportunities.

Cooperation between Asia-Pacific countries on combating cybercrime was further consolidated at a *regional workshop* organized by ITU and UNODC in Seoul, **Republic of Korea**, in 2011. A *regional seminar on cybercrime* was held in February 2014, in partnership with INTERPOL and IMPACT.

In partnership with IMPACT, ITU has continued to assess the capacity of existing national CIRTs of several Asia-Pacific countries to manage cybersecurity emergencies, help set up teams in countries where they do not exist, and provide training and material assistance. **Afghanistan**, **Bangladesh**, **Brunei Darussalam**, **Bhutan**, **Cambodia**, **Lao P.D.R.**, **Maldives**, **Myanmar**, **Nepal**, **Sri Lanka** and **Viet Nam** have all received various forms of assistance to bolster their cybersecurity in recent years.

Americas

Several countries in the Americas region are benefiting from ITU expertise on cyberthreats. Since 2012, ITU-IMPACT *cyberthreat preparedness assessments* have been conducted in 15 countries in the Americas: **Anguilla**, **Antigua and Barbuda**, **Barbados**, **Costa Rica**, **Dominica**, **Dominican Republic**, **Grenada**, **Ecuador**, **Haiti**, **Honduras**, **Panama**, **Saint Kitts and Nevis**, **Saint Lucia**, **Suriname** and **Trinidad and Tobago**).

MoUs have been signed with **Barbados** and **Jamaica** to establish *national CIRTs*, and discussions are under way to do likewise in **Trinidad and Tobago**. Furthermore, plans have been agreed to create a *subregional CIRT* overseen by the Organization of Eastern Caribbean States. ITU-IMPACT will provide the necessary technical inputs and training to establish and manage these teams, which aim to strengthen national cybersecurity capacity and to enhance regional and international collaboration in this domain.

In collaboration with the Latin American and Caribbean Internet Registry (LACNIC), the first round of ITU-IMPACT *cyberdrill exercises* for the Americas region took place in Montevideo, **Uruguay**, in August 2013, with the participation of ICT and security experts from **Barbados**, **Bolivia**, **Chile**, **Colombia**, **Ecuador**, **Paraguay**, **Peru**, **Trinidad and Tobago** and **Uruguay**.

As part of the joint ITU-European Commission project to create *harmonized ICT policies* and an *efficient regulatory environment* in African, Caribbean and Pacific countries, the cybercrime legislative frameworks in eight of the 15 beneficiary Caribbean countries were reviewed in 2011 and 2012, and final recommendations for updated legislation - developed through stakeholder consultations - were submitted to **Barbados**, **Grenada**, **Saint Kitts and Nevis** and **Trinidad and Tobago**. Proposed national legislation or amendments to existing laws were also transmitted to **Haiti**, **Jamaica**, **Saint Lucia** and **Saint Vincent and the Grenadines**.

Commonwealth of Independent States

More than 90 ICT and security experts from Europe, the Commonwealth of Independent States (CIS) and Asia and the Pacific discussed strategic aspects of cybersecurity and cybercrime during an ITU-IMPACT *cross-regional seminar* organized in partnership with the Odessa National Academy of Telecommunications, **Ukraine**, in March 2012. Legal frameworks and international cooperation to combat cybercrime, child online protection and the role of public-private partnerships were among the topics on the agenda. Participants proposed the creation of a *public reference repository* of recommended and prohibited Internet resources for children.

A year earlier, in April 2011, cross-regional cooperation on child online protection was boosted at a workshop attended by some 55 cybersecurity experts from CIS and European countries organized by ITU, also in partnership with the Odessa National Academy of Telecommunications, **Ukraine**. **Armenia** and **Kyrgyzstan** benefited from targeted assistance to develop national cybersecurity strategies, and **Ukraine** received guidance in setting up a national body for the registration of object identifiers.

ITU also supported the government of **Azerbaijan** in organizing an *international conference on cybersecurity* in 2013, in partnership with the World Bank, the World Economic Forum (WEF) and INTERPOL.

Europe

In partnership with the Bulgarian Ministry of Transport, Information Technology and Communications, an *ITU Regional Forum on Cybersecurity for Europe and CIS* took place in Sofia, **Bulgaria**, in October 2012. The forum brought together more than 90 participants from 19 countries. During the forum, ITU and IMPACT organized a *cross-border cybersecurity drill* for Europe and CIS countries, designed to test national cyber-response capabilities and improve readiness and reaction in the event of a cyberattack. The *Applied Learning for Emergency Response Team* (ALERT) cyberdrill featured eight actively participating countries: **Armenia**, **Bulgaria**, **Moldova**, **Montenegro**, **Romania**, **Slovakia**, **Turkey** and **Ukraine**, with 11 other nations taking part as official observers: **Albania, Austria, Azerbaijan, Croatia, Italy, Kyrgyzstan, Luxembourg, Malta, Poland, Portugal** and **Tajikistan**.

A series of scenarios totalling 250 minutes were triggered during the exercise to put participants to the test and observe their responses. These scenarios included phishing, web defacement and wireless security breach. The simulation, which was sponsored by ABI Research, also benefited from the participation of ITU-IMPACT's key industry partners including Codenomicon, Internet Society Bulgaria, Kaspersky Lab, Lirex.com, Microsoft, Symantec and the Cyber Guardian.

Cyberemergency preparedness assessments were conducted in **Albania**, **Bosnia and Herzegovina**, **Montenegro**, **Serbia** and **The Former Yugoslav Republic of Macedonia** with a view to establishing CIRTs in these countries.

In September 2013, **Montenegro** hosted the eleventh *ITU conference on regulatory frameworks to protect the interests of electronic communication users in Europe*. Participants sought to identify the main user-protection challenges, reviewed current regulatory frameworks and exchanged views on regulatory best practices.

ITU collaborated with the Greek Government and the European Commission in organizing a regional conference in March 2014 in Athens, **Greece**, on the theme *Safety and Security in Cyberspace: Building up trust in the EU*. The event provided an opportunity for high-level dialogue between the stakeholders on strategies and policies directed towards a more protected and reliable cyberspace, laying emphasis on potential cyberthreats and areas where there is scope for improvement, while building confidence and security in the use of ICTs.

Projects reported below highlight how various stakeholders are contributing on an ongoing basis to building confidence and security in the use of ICTs:

In **Malta,** the *BeSmartOnline!* safer Internet programme focuses the efforts of national stakeholders working towards safer use of the Internet by children and young people. The initiative aims to raise awareness and educate minors and educators on safe use of the Internet; establish, operate and promote a hotline for reporting illegal activities committed via the Internet; and support the public with any difficulties they may have through a helpline. A *Maltese Safer Internet Centre* has been set up to coordinate the awareness-raising initiatives. The project is co-funded by the European Commission's Safer Internet Programme.

In **Japan,** the Ministry of Internal Affairs and Communications (MIC), as the ministry in charge of infocommunications, which is one of the critical infrastructures, is actively promoting measures for information security in order to establish an environment for people to use infocommunication networks with ease. These include implementing projects such as *Proactive Response Against Cyberattacks Through International Collaborative Exchange* (PRACTICE), *Cyberdefence Exercise with Recurrence* (CYDER) and *Advanced Cyberthreats Response Initiative* (ACTIVE), promoting information sharing among telecommunication operators and enhancing educational and awareness-rising activities for the public.

Also i**n Japan**, the police tackle threats in cyberspace through *mutual cooperation* between the units responsible for community safety, security and infocommunications. The Community Safety Division is in charge of cybercrime countermeasures, the Security Division is in charge of cyberattack countermeasures, and the Infocommunications Division is in charge of providing technical support to the other two areas. In July 2012, the National Police Agency (NPA) established a new post, *Director-General for Cybersecurity*, within the Commissioner General's secretariat, in charge of cybersecurity strategies, in order to enhance the unified strategic efforts of NPA to address various difficult challenges in tackling threats in cyberspace. Under the Director-General, a cross-departmental structure is being promoted, as well as measures focusing on ensuring an analysis /enforceability system, based on enhancing abilities to counter cyberthreats and cyberattacks, strengthening public-private cooperation/international cooperation, and advancing infocommunication technology.

In **Lebanon,** the *Responsible Citizen in Cyberspace* project is being implemented in order to build a sustainable platform to help increase awareness of the risks of interacting in cyberspace and provide suggested tools, methodologies and best practices to address these risks. In order to help the Lebanese become responsible cyberspace citizens, a three-pronged project has been implemented that is aimed at reaching the full community, including:

1) Building a national awareness website (www.e-aman.com):

Internet safety has been a major concern for parents, teachers, NGOs, ministries and other stakeholders in Lebanon for many years. Various roundtables, projects and activities were initiated, all revolving around finding solutions that best suit the Lebanese community. The Telecommunications Regulatory Authority (TRA) is a main partner with

many stakeholders working to protect children in cyberspace, notably Himaya, which has put in place a dedicated e-helpline (www.himaya.org), and World Vision, in celebrating Safe Internet Day and creating dedicated Facebook page (https://www.facebook.com/SaferInternetDayLebanon) and a dedicated Twitter and Hash account (@SIDLebanon Hashtag: #SIDLB13), and helping with the production of a dedicated book on online safety to be used from grade 5 to 9 in all public and private schools, which was officially launched by the Centre of Educational Research and Development (CERD) at the Ministry of Education and Higher Education.

One of TRA's main objectives relates to increasing awareness of the risks that the community faces when surfing online. It has thus established a *dedicated national website* offering comprehensive tips and exhaustive information to help the community avoid Internet risks, and reflecting all the measures undertaken with all Lebanese stakeholders to date in this regard. The website targets the Lebanese community as a whole, including parents, youth and teachers. It aims to help Lebanese citizens become more responsible in cyberspace. Adults need to be aware of the many options they have to secure their Internet access. They also need to understand the potential risk areas, so as to act responsibly online. The website provides general tips and principles for the community to act conscientiously online, while providing tools for specific audiences, for example on child online safety. The website was launched in February 2013, and publicized through a mass SMS campaign.

2) Drafting a request for proposal (RFP) for the Young Safe Internet Ambassadors (E-Ambassadors) project:

The RFP for the *E-Ambassadors* project relates to a new regional initiative for empowering young people to promote safe Internet awareness among peers and in the community as a whole. Many different approaches have been adopted by various countries around the world for promoting awareness as a critical tool to protect children online. Some have chosen the option of empowering parents and teachers and encouraging them to take an approach involving filtering and restrictive access, while others are focusing on educating minors for responsible use and providing them with toolkits of resources. There is now plenty of information - and many excellent tools - made available online by ITU-D and the industry. E-Ambassadors proposes an alternative approach to influence parents, teachers and minors directly through relevant NGOs, ministries, service providers, vendors, media and schools, offering awareness training on online safety dispensed by young people. A dedicated training model encourages users, both young and old, to join a positive online environment, to share both knowledge and wisdom, and to support each other when things might be risky or go wrong.

The RFP contains three distinct requirements:

- evaluating the level of knowledge on online safety, and developing a training curriculum tailored to the need of the community;
- piloting this exercise in order to select a training model;
- selecting, training and supporting E-Ambassadors to quickly raise awareness for implementation, while evaluating and reporting progress in public and private schools.

3) Drafting a Code of Practice for Internet service providers:

Within its mandate as a member of the Arab Regulator Network (AREGNET), TRA conducted a study among all Arab countries on their national child online protection efforts. Following the survey, a draft *Code of Practice for Internet Service Providers* was prepared by TRA and shared among all AREGNET members for their feedback. The code of practice was then finalized, after incorporating all AREGNET members' comments, the document was approved and adopted, and it is now under final review before becoming binding on all ISPs in Lebanon, who will thus be required to install parental control features in their systems and make all their existing and future clients aware of the risks faced in cyberspace.

In **Uruguay**, Federico Monteverde introduced the campaign *Tus datos valen. Cuidalos!* (Your data are valuable. Take care of them!). It makes a fundamental contribution to ensuring that children, their families and educators know and learn how to take proper care of both their own personal data and that of other people. The project aims to alert and train children in the 6th year of school, their teachers and their families regarding the importance of taking care of and protecting personal data.[59]

Also in **Uruguay**, the Agency for e-Government and Information Society (AGESIC) has set up *CERTuy*. CERTuy is the Uruguayan computer emergency response team. It is responsible for receiving, analysing and responding to information security incidents. It acts as focal point in the country coordinating actions, organizations and other incident response teams.[60]

In **the Democratic Republic of the Congo**, the *Cellule Anti–Cybercrminalité* has implemented *NET PLUS SUR ("A safer Net")*, a project aiming to teach people how to manage their electronic reputation on social network sites in DR of the Congo, where the use of social media networks is increasing.

In **Turkey**, ISKI has introduced the *System Security Structure,* which handles a vast data-processing infrastructure and various intra- and inter-corporal applications. The objective is to make all existing software and hardware in end-user computers secure, as well as preventing all internal and external threats to ensure secure and continuous system operation.

In **Oman**, the Omani National Computer Emergency Readiness Team (OCERT) has established the *Regional centre for cybersecurity for the Arab region***.** In December 2012, OCERT was designated to serve as the regional centre for cybersecurity for the Arab region. Recognizing the leading role played by the Information Technology Authority (ITA), represented by OCERT, an MoU was signed with OCERT, in cooperation with both ITU and IMPACT. One of the main objectives for establishing the regional centre in the Sultanate is to localize ITU-IMPACT's cybersecurity services in the Arab region. Through localization, services will be able to be delivered based on the regional language, culture and other features. It is also expected that the creation of such a regional centre will encourage information sharing. Furthermore, by situating the regional centre in Oman, cybersecurity capacity and capabilities will be enhanced through regional collaboration and cooperation. Other aims of the centre include assisting the developing countries in their cybersecurity

[59] *Project nominated for a WSIS Project Prize 2014*

[60] *Project nominated for a WSIS Project Prize 2014*

initiatives and encouraging research and development in the field of cybersecurity in the Arab region.

In **United Arab Emirates**, the Child Protection Centre (CPC) built a mobile app designed to help families and to provide instant communication with family members, along with their locations. It even supports family safety alerts for emergencies. The *CPC Mobile App* enables parents to know where their child is at all times. The application is available on iPhone, Blackberry, Windows and Android. [61]

In order to provide citizens with reliable means of authentication and digital signature, **Kazakhstan** introduced the ability to issue an *electronic digital signature for ID cards*, which is a major achievement in the field of information security. The National Certification Authority of the Republic of Kazakhstan (NCA RK) was put into commercial operation on 29 October, 2008. Today, NCA RK registration certificates are used by more than 1.9 million people in the information system in 30 states. The advantages of placing electronic digital signature keys on ID cards are secure storage, precluding the possibility of third parties copying the private key, and permanent possession of a digital signature.[62]

In **Malaysia,** Arash Habibi Lashkari, a Malaysian Senior Lecturer and Research Adviser in computer and information security devised a *graphical password for mobiles and tablets*. This new graphical password specifically designed and developed for mobiles and tablets is suitable for all websites, online shopping and e-businesses. It is resistant to five common types of authentication process attack and boasts more than 90 per cent usability features for users.[63]

61 *Project nominated for a WSIS Project Prize 2014*

62 *Project nominated for a WSIS Project Prize 2014*

63 *Project nominated for a WSIS Project Prize 2014*

Action Line C6. Enabling environment

Integration in the information society can yield many social, economic and environmental benefits. In order to facilitate this process, governments and other agencies recognize the importance of creating an enabling environment with transparent and non-discriminatory policies and regulation. By the November 2013, independent regulators had been established in 161 countries throughout the world.

Acknowledging the strong commitment of the International Telecommunication Union (ITU) to bridging the digital divide in the area of the enabling environment, the United Nations Development Programme (UNDP), in May 2008, officially handed over the lead facilitation role on World Summit on the Information Society (WSIS) Action Line C6 to ITU. Since then, ITU has been acting as the sole facilitator for this action line, building upon its regular work carried out within the framework of ITU-D Programme 3: Enabling environment, in close collaboration with ITU-D Programme 2: Cybersecurity, ICT applications and IP-based network-related issues. The Union organized the sixth facilitation meeting on WSIS Action Line C6 on 14 May 2013, during the WSIS Forum.

As stated in the *10-Year WSIS Action Line Facilitators' Reports on the Implementation of WSIS Outcomes*, since 2003 the following achievements have been made:

- Sector reform, including creation of regulatory agencies and more open and competitive markets to attract investment
- Progression of e-government, although levels of online presence vary tremendously
- Emergence of open data as a promising tool for greater transparency
- Internet governance issues debated through multiple forums at the national, regional and international level
- Consumer protection and privacy in cyberspace continue to face challenges from computer threats and government surveillance.[64]

For the period 2013-2014, ITU has undertaken numerous activities that foster the *development of an enabling environment worldwide*, including information-sharing; the creation of tools for effective regulation; national and regional assistance; and the elaboration of training materials and opportunities. Examples of these ongoing activities include:

- The Global symposium for Regulators (GSR-13) was held in Warsaw, **Poland**, from 3 to 5 July 2013 under the overarching theme of: *4th Generation regulation: Driving digital communications ahead*. The event concluded with the adoption by the regulators of a set of *best-practice guidelines* on the evolving roles of regulation and regulators in a digital environment.The 14th Forum on Telecommunication/ICT Regulation and Partnership in Africa (FTRA-13) was held in Victoria Falls, **Zimbabwe**, from 3 to 6 September 2013 under the theme of: *Development of broadband and Investments required to support sustained growth*.

64 http://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C6.Summary.pdf

- ITU-D also continued to collect and analyse *regulatory trends and practices*, and *tariff policies*.
- Various regulatory publications were released, including the annual *Trends in Telecommunication Reform* report, and a new series of *thematic reports and country case studies on broadband* (developed jointly with the secretariat of the Broadband Commission for Digital Development).
- The *ITU Broadband Atlas*, an interactive online 3D data visualization tool, allows simple and user-friendly visualization of broadband penetration.
- The joint *ITU-InfoDev ICT Regulation Toolkit*, which features insightful and up-to-date analysis and information on key regulatory issues, as well as best practices, assists regulators in the design of effective and enabling regulatory frameworks.
- The *ICT Regulation Toolkit*, developed by ITU in partnership with the World Bank/InfoDev, assists regulators in developing effective regulatory frameworks by sharing information on key regulatory issues and best practices. In 2013, the Toolkit's content management system and design were modernized, enhancing the navigation and interactivity of the web platform.
- The ITU/BDT Regional Forums on Economic and Financial aspects of Telecommunications/ICTs were organized in collaboration with ITU-T.
- The ITU High-Level Workshop on Regulatory and Economic Aspects of Roaming was held in Geneva, **Switzerland**, from 23 to 24 September 2013. The meeting identified some *policy and regulatory actions* to be taken by all stakeholders as well as actions needed to respond to *international mobile roaming prices*.
- The *Global Regulators' Exchange* (G-REX) continued to offer regulators the opportunity to share experiences, as did the TREG *Regulatory Knowledge Centre* and the *Regulatory Blog*.

The Geneva Plan of Action states that to maximize the social, economic and environmental benefits of the information society, governments need to create a trustworthy, transparent and non-discriminatory legal, regulatory and policy environment.[65]

The United Nations Conference on Trade and Development (UNCTAD) published a report entitled *Review of E-commerce Legislation Harmonization in the Association of Southeast Asian Nations***.** The report documents the significant advances made by ASEAN countries in the area of e-commerce laws, and makes concrete proposals for accelerating the process of regional integration and harmonization in **South-East Asia**, as outlined in the ASEAN ICT Masterplan 2015. Electronic commerce is seen as a key component for ASEAN to realize its vision of a regionally integrated economy. Having a single market will enable ASEAN Member States to take advantage of rapid economic development within the region and in neighbouring countries. ASEAN was the first region in the developing world to adopt a harmonized legal framework for e-commerce. Ten years later, it is the most advanced developing region in terms of implementing harmonized e-commerce laws.[66]

[65] Geneva Plan of Action, § 13

[66] UNCTAD contribution

A total of 23 legislators from eight French-speaking countries in **West Africa** attended the *UNCTAD-ECOWAS seminar* in Dakar, **Senegal**, from 11 to 14 February 2014, to discuss how to harmonize legislation on electronic transactions, computer security and personal data protection. The seminar follows a distance-learning course on the *legal aspects of electronic commerce* given by UNCTAD for 221 representatives from the public and private sectors in October 2013. The objective of the UNCTAD/ECOWAS project is to strengthen regional harmonization of e-commerce laws, to ensure implementation at the national level of regional cybersecurity frameworks for electronic transactions, data protection and cybercrime, and to strengthen cyberlegislation and criminal justice capacities. A similar seminar for English-speaking countries was organized in Accra, **Ghana**, from 18 to 21 March 2014, for 21 participants from seven English-speaking West African countries, in cooperation with the Council of Europe.[67]

In April 2013**,** UNCTAD, the Commonwealth Parliamentary Association and the Commonwealth Telecommunications Organization jointly organized a *special briefing session of Commonwealth Parliamentarians* highlighting international and regional best practices on key legal aspects of e-commerce and cybersecurity. Parliamentarians play a central role in reforming legislation to handle the transformation of commerce through ICTs. The meeting concluded that, at the national level, lawmakers should take into account all relevant stakeholders, and adopt peer-review mechanisms when preparing to draft cyberlegislation. The involvement of ICT experts, for example, enabled lawmakers to better understand the evolving ICT landscape and to legislate appropriately. Different actors could be brought on board by raising awareness about ICT opportunities and threats, including in rural areas and among marginalized communities, and also by building trust among users and providers of e-commerce, for example by creating consumer-protection agencies.

In **Nigeria,** the *Legal Framework for the establishment of ICT systems* was put into place. The Nigeria Computer Society (NCS) identified and examined the various legal instruments to establish the required legal framework, with recommendations for achieving the desired legal environment for e-trade.

In **Poland,** the Office of Electronic Communications (UKE) introduced a memorandum on cooperation for improving the quality of services in the telecommunication market provided to users, which stipulates that:

- Contracts for services should be structured in a clear, understandable, easily accessible form
- Published information on the quality of services provided by telecommunication undertakings should be comparable, relevant and up to date
- Measurable indicators of quality of service shall be identified, as well as the content, form and method of providing information to be published.[68]

In **Japan**, in order to comprehensively verify the degree of attainment of indices on the spread of broadband and the status of compliance with fair competition requirements, the *Fair Competition Review System for Promoting Broadband Dissemination* has been in

[67] UNCTAD contribution

[68] *Project nominated for a WSIS Project Prize 2014*

operation since the 2012 fiscal year. In addition, on the basis of the Japan Revitalization Strategy (June 2012 Cabinet decision), as from July 2013 the government has initiated verification processes concerning competition policies in the telecommunication area, with a view to developing the world's top-level telecommunication infrastructure.

In **Turkey**, the Istanbul metropolitan municipality is establishing the *Information-Based Governance System* (IVAS) project. The overall objective of the project is to contribute to increasing competitiveness through the implementation of information technologies at the institutional level. The specific objectives of the project are to control stakeholders from the standpoint of financial and legal requirements and enable them to function in a more coordinated way. The expected outcomes of the project are to establish an information-based governance system, by researching the governance systems of the EU member countries, establishing a network and creating a dialogue between the stakeholders.

In **Nigeria,** the *Business process engineering and data harmonization for the trade supply chain* project yields multiple benefits:

i) Development of information standards for the documents and processes associated with import/export/transit goods, equipment and conveyance management for stakeholders

ii) Harmonization of the process requirements for import/export/transit/goods, equipment and conveyance

iii) Gap analysis to identify where Nigeria's current best practices are similar to and/or different from international best practices, highlighting areas where standard, international, harmonized data sets that meet governments' requirements for international cross-border trade could be adapted for an automated environment

iv) Provision of a detailed description of data elements and sets needed for international trade transactions, including justifications for why different data sets are needed and in what format.

The Geneva plan of Action states that governments, in collaboration with stakeholders, are encouraged to formulate conducive ICT policies that foster entrepreneurship, innovation and investment, and with particular reference to the promotion of participation by women.[69]

In **Kuwait**, the *Kuwait Direct Investment Promotion Authority* (*KDIPA.gov.kw*) cooperates and coordinates with various governmental institutions nationwide to offer the best possible services and whatever facilities are required by foreign direct investors. Such efforts will serve to attract reputed foreign investors and overcome any obstacles to their business activities in Kuwait, as well as creating attractive job opportunities for Kuwaiti national workers, ensuring full diversification of economic structures, achieving better management of scarce economic resources and applying both modern technologies and expertise locally.[70]

[69] Geneva Plan of Action, § 13 l)

[70] *Project nominated for a WSIS Project Prize 2014*

In **Nigeria**, in recognition of the dynamism of ICT and the multifaceted effects of its applications, the National Information and Technology Development Agency (NITDA) has embarked on laudable projects/programmes aimed at creating an *enabling environment for both local and foreign investment* in the sector, and hence for the information society, including, *inter alia*:

i) Collaboration with the Nigerian Internet Registration Authority (NIRA) for effective and efficient management and supervision of the Nigerian country code *top-level domain name* (ccTLD), in order to enhance Nigerian identity in cyberspace

ii) Launch, on 24 May 2012, of *Consumers Contact Centres*, of a platform through which complaints about sub-standard or inferior products or services can be made

iii) Continuous collaboration with stakeholders in critical sectors of the economy and awareness-raising on the *effectiveness of ICT deployment* in these sectors.

The first *IT Park* in **Bhutan** was established in Babesa, Thimphu (the capital). The overall objective of the IT Park project was to increase productive employment in Bhutan by fostering enterprise development in the IT/ITES sector, enhanced IT skills and improved access to finance. The project is aimed at promoting innovation and entrepreneurship in the country, providing gainful employment to the growing youth population and promoting inclusive growth, which is critical for laying a strong foundation for the Bhutanese information society. The Thimphu Tech Park houses the *Bhutan Innovation and Technology Centre*, which includes the business incubation centre, a shared technology Centre, and a Tier II data centre. Out of 13 fledglings hosted in the IT Park's incubation centre, three have already graduated and are fully running their own business. *Data Centre Services* is a joint venture between a local IT company and Burland Technology. The **United Kingdom** has set up a data centre and hosted three local clients. So far, a total of 1 372 young Bhutanese have been trained and 1 009 are employed within and outside Bhutan.

In the **United Arab Emirates**, the Khalifa Fund for Enterprise Development launched the *Khalifa Fund E-Space* project - a change-management project with the objective of securing an e-presence in the small and medium-sized enterprise (SME) community that offers four platforms for four audience segments. Each platform plays a role in offering platform spaces, hence none of the platforms' strategies can be created in isolation, and every platform has to be aligned with overall Khalifa Fund strategy. The first platform is the *SME Toolkit UAE*, targeting all entrepreneurs nationwide, and providing information, guides and tools for starting up and operating an SME in UAE. The second platform is the *Khalifa Fund Website*, targeting Emirati entrepreneurs, and offering information about programmes, funding benefits and services offered by the Khalifa Fund. The third platform is the *Knowledge Management System*, targeting Khalifa Fund applicants and members; it is a research engine for an online library with reports and statistics relevant to SMEs in UAE. The fourth platform is the *Khalifa Fund Gateway*, targeting Khalifa Fund members, and providing online support, business linkage and access to government tenders.

The Polish Agency for Enterprise Development created the *We support e-business – web.gov.pl* platform to respond to all the needs of small and medium-sized enterprises (SMEs) in **Poland** searching for information about running a business on the Internet. One of the key tasks of the platform is to encourage all entrepreneurs – including those who have just started up their own business – to begin or expand their activity on the web. The

platform consolidates in one place top-quality economic knowledge, information about innovative ideas for e-services and B2B technologies, and information about European funds for business.[71]

In **New Zealand**, the *Digital High Impact Programme* (HIP) was officially launched in December 2013 and has received project funding of NZD 3 million from the Ministry of Business, Innovation, and Employment (MBIE). The main objective is to create initiatives that support high export growth companies in New Zealand, so as to leverage further growth. The programme is delivered by New Zealand Trade and Enterprise (NZTE) and Callaghan Innovation, working in partnership with the New Zealand Technology Industry Association (NZTech). It targets support to firms working in the areas of software as a service (SaaS), web services, software development, gaming development, post production, animation and mobile technology.[72]

In **Lebanon**, the *Digital Zones* project was implemented to support and facilitate the creation of digital zones to be developed throughout the country. The concept is simple: a real-estate developer joins forces with an incubator or accelerator and submits their project to the ministry, which makes sure that it meets the eligibility criteria. Then, the ministry will act as a facilitator and support the development of the zone by laying leading-edge infrastructure and intervening with the other administrations such as Investment Development Authority of Lebanon (IDAL), municipalities and other ministries. An example of the pilot project is the *Beirut Digital District*. It was inaugurated on 3 September 2012, with 5 000 m^2 initially, eventually rising to cover 40 000 m^2. The objective is to support startups, as well as companies wishing to use Lebanon as a regional platform to export their services.

In **Turkey**, the Istanbul Metropolitan Municipality has set up the *High security business continuity centre*, with the overall objective of generalizing information technology services to public bodies, especially in case of natural disasters, and improving quality of service.

Governments can support the involvement of small and medium-sized enterprises (SMEs) in ICT projects through the establishment of incubators and by encouraging youth and women in entrepreneurship.

A project on *ICTs and Women's Entrepreneurship* has been carried out by UNCTAD, the International Labour Organization (ILO) and the Swedish International Development Cooperation Agency (SIDA). The ILO and UNCTAD teamed up to ensure that the role of ICTs is fully reflected when assessing the environment for women's entrepreneurship. The project is funded by the Government of Sweden (through SIDA). The purpose is to leverage ICTs to support women entrepreneurs. The project was included as a best-practice case in a report from the Broadband Commission on *broadband and gender*. UNCTAD organized a number of workshops and seminars discussing the ICT dimension in relation to the promotion of women entrepreneurship, including in **Tanzania** (April, 2013), in Stockholm, **Sweden** (November, 2013), and at a meeting of the Donor Committee on Enterprise Development (DCED). In April 2014, UNCTAD published a practical guide aimed at helping

71 *Project nominated for a WSIS Project Prize 2014*

72 http://www.ict.org.nz/Category?Action=View&Category_id=311

policy-makers and development practitioners formulate more effective policies in the area of ICTs and women's entrepreneurship.[73]

In **Oman**, the Information Technology Authority (ITA) launched *"Sas"* - an Arabic concept that refers to any solid foundation. Hence, the *Sas* programme is designed to provide the foundation for creating a new and vibrant ICT industry, thereby fostering an entrepreneurial spirit in the ICT sector in Oman. Targeting small and medium ICT businesses, students and jobseekers of any age interested in starting a business, the *Sas* programme seeks to develop an internationally competitive ICT industry in Oman, attract more foreign and local investment in the ICT sector, encourage and support innovation by contributing to the introduction of new technologies to create innovative products, solutions and services, and encourage young graduates to create their own businesses.[74]

In **Malta**, the *Networked Enterprise Strategy (2012-2015)* is aimed at assisting Maltese entrepreneurs to integrate Web technologies into business processes so as to maximize profits, and is underpinned by five main activity thrusts, namely:

- Thrust 1: Awareness and motivation
- Thrust 2: Capacity building.
- Thrust 3: E-commerce for local and global reach
- Thrust 4: Exploiting opportunities
- Thrust 5: A robust business environment for growth.[75]

An integral part of ITU-TELECOM World events since 2011, the *Young Innovators* programme works with innovative young people from all over the world who are using technology to transform their communities and their social reality. Each year, the Young Innovators competition invites talented, technologically-minded young people to compete for one of the prestigious places in the programme.[76]

In order to inspire girls to consider a future in technology, ITU instituted *Girls in ICT Day* in 2010 and continues to support the global organization of activities every year on the fourth Thursday in April.[77]

Telecentre Academy (TCA), the capacity-building arm of the Telecentre.org foundation, is planning to launch a new course entitled: *Women, Entrepreneurship and ICTs.* The course seeks to equip participants with the necessary knowledge and skills in entrepreneurship and encourage them to pursue entrepreneurial activities.[78]

---

73 UNCTAD contribution

74 *Project nominated for a WSIS Project Prize 2014*

75 http://meib.gov.mt/en/ministry/Documents/Malta%20Digital%20Economy%20Vision.pdf

76 http://www.itu.int/en/ITU-D/Digital-Inclusion/Youth-and-Children/Pages/Young-Innovators-Competition.aspx

77 http://www.itu.int/en/action/women/girls-ict-day/Pages/2014.aspx

78 http://www.itu.int/ITU-D/sis/newslog/CategoryView,category,Gender.aspx

In **Turkey**, the Istanbul Metropolitan Municipality has launched the *traffic control centre for universities* project. The aim of the project is to support R&D and innovative business technology innovation (BTI) work, and the creation of partnerships between the public and universities.

Also in **Turkey**, the Turkish Industry and Business Association (TÜSIAD) has implemented the *Software and Services Sector and Information Ecosystem Development* project. TÜSIAD's Information Society, Information and Communication Technologies and Innovation Committee concentrates on issues such as R&D, technology production, the use and transfer of technology, IT, entrepreneurship, innovation and e-government. The committee manages two working groups: on Technology and innovation, and on Information technology and telecommunications. The Information Technology and Telecommunications Working Group contributes to the project, which addresses the strengths and weakness of Turkey's current market structure by comparing it with the models of countries around the world. In addition, the project aims to formulate the ideal ecosystem and legal arrangements which could bring foreign firms' R&D centres to Turkey.

The Geneva Plan of Action invites governments to:

i) facilitate the establishment of national and regional Internet exchange centres;

ii) manage or supervise, as appropriate, their respective country code top-level domain name (ccTLD);

iii) promote awareness of the Internet.[79]

In the **United Arab Emirates**, *UAE-IX* is a neutral Internet traffic exchange platform that interconnects global networks and, above all, network operators and content providers in the Gulf Cooperation Council (GCC) region. The UAE-IX is built on a fully redundant switching platform located in a top-class secure data centre in Dubai. Initiated by UAE's Telecommunication Regulatory Authority (TRA) and managed by DE-CIX, the world´s largest Internet exchange, based in Frankfurt, **Germany**, UAE-IX delivers a highly available local alternative for regional traffic exchange, localizing Internet content. UAE-IX will reduce latency times by up to 80 per cent and costs by up to 70 per cent for GCC providers. Moreover, UAE-IX will improve IP-network resilience and robustness, and will also help to provide reliable connectivity within the GCC.

In **Nigeria**, *Internet exchange points* (IXPs) were established to keep local Internet traffic local and reduce bandwidth usage. This will foster greater accessibility at reduced price, and will enable additional applications with a considerable multiplier effect on the economy. Centres already established include Lagos, Abuja, Kano and Enugu.

The eighth *Internet Governance Forum* (IGF) was held in October 2013 in Bali, **Indonesia**, on the overarching theme of *Building bridges: Enhancing multistakeholder cooperation for growth and sustainable development*. The eighth IGF introduced new formats and refocused some of the forum's traditional issues, in line with the evolving landscape of Internet governance discussions.

[79] Geneva Plan of Action, § 13 c)

Action Line C7. ICT applications: Benefits in all aspects of life

C7.1 E-government

In the framework of the World Summit on the Information Society (WSIS), the United Nations Department of Economic and Social Affairs (UNDESA) continues to act as the lead facilitator for Action Line C7: ICT applications (E-government).

As stated in the *10-Year WSIS Action Line Facilitators' Reports on the Implementation of WSIS Outcomes*, e-government is recognized by governments and stakeholders as an enabler of good governance.[80]

The 2013 Report of the United Nations Secretary-General: Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international level[81] shows that UNDESA was involved in several activities in 2013:

- It co-organized *Leading the Way in E-Government Development: Conference for Government Chief Information Officers and Key Officials*, in Helsinki, with the Government of **Finland** and in cooperation with the European Commission. It also organized the *Global e-Government Forum on Smart Government and Smart Society* through its affiliate, the United Nations Project Office on Governance (UNPOG), in cooperation with the Government of the **Republic of Korea**, and was a partner in the organization of the *Government Summit* held in the **United Arab Emirates**.
- It organized *regional workshops to build e-leadership capacity* in cooperation with UNPOG, and sponsored an expert group meeting on *The Transformative Power of e-Government*, in **Bahrain**. Together with the Government of **Colombia** and the United Nations Development Programme (UNDP), it established the *Centre for Innovation on e-Government Development for Latin America and the Caribbean*. It also undertook more than 15 *advisory and technical assistance missions*.
- It developed two *tools for measuring e-government*, prepared *guidelines on open government data for citizen engagement* as an online reference and delivered *interactive courses* to more than 5 000 participants via the United Nations Public Administration Network Online Training Centre.

Governments across the world have made effective and efficient efforts to enhance dialogue with a view to promoting positive socio-economic growth.[82] They remain committed to building strategies, programmes and plans on e-government at the national scale, in order to provide the most appropriate responses to citizen and government needs. E-government strategies are a means of enhancing effective and transparent political and administrative

---

80 https://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C7_E-Government.Summary.pdf

81 http://unctad.org/en/PublicationsLibrary/a69d65_en.pdf

82 https://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C7_E-Government.Summary.pdf

government processes. Many governments aim to create a one-stop service hub where everyone can use public services anywhere and anytime.

In **Azerbaijan**, the Ministry of Communications and Information Technologies has implemented the State programme to *expand e-services in government bodies* and *develop "e-government" for 2013-2015*. The main purposes of the State programme are to formulate e-government policy and to enhance e-services as the extension of current government action, in order to meet the needs and requirements of the modern information society.

In **Bangladesh**, *Access to Information* (A2I) is a programme being implemented by the Prime Minister's Office with technical assistance from UNDP and the United States Agency for International Development (USAID). It focuses primarily on:

a) making government services responsive to citizens' needs; and

b) bringing public and private services "to citizens' doorsteps".

Recognizing that non-transparent service delivery increases the scope for rent-seeking behaviour and has an adverse impact on the ability of the poor to access the information and services they need in order to earn a livelihood, the project *Services@Citizens' Doorsteps,* which is being implemented under the A2I programme, is leveraging the flexibility and ubiquity of indigenous ICTs to quickly upscale various small prototypes, instilling a culture of innovation in the Bangladeshi civil service.[83]

Ethiopia has launched the *e-government strategy* to facilitate effective delivery of government services to different customers. The strategy focuses on establishing 219 e-services (77 informational and 134 transactional services) over a period of five years, from 2011 to 2015. It includes core projects, namely: national payment gateway, enterprise architecture framework, public key infrastructure, national data set, national enterprise service bus and national integrated authentication framework.

In **Bhutan**, the Ministry of Information and Communication, as the lead ministry for the promotion of ICT in Bhutan, has taken numerous initiatives to prepare Bhutan for the knowledge society, including building ICT backbone infrastructure and improving access thereto, developing and promoting the use of application systems, creating the right environment by putting in place appropriate policy and legislative instruments and providing ICT education. In order to further advance the government's ICT agenda, the ministry, in consultation with other ministries and agencies, has developed the *e-governance master plan*. Consolidating the gains made in recent years, the e-governance master plan provides a further set of holistic ICT programmes and strategies to further the government's vision of an information society. The overall objective of the master plan is to enhance effective and transparent political and administrative processes within the government, to enable and facilitate the growth of the Bhutanese information society and to act as the key enabler for socio-economic development. The plan provides a coherent and holistic view of the ICT strategies, initiatives and projects that the government will implement over the next five years.

[83] *Project nominated for a WSIS Project Prize 2014*

In **Japan**, e-government is promoted on the basis of the *Declaration to Be the World's Most Advanced IT Nation* (June 2013 Cabinet decision and IT Strategic Headquarters decision). In order to enable everyone to use one-stop public services anywhere and anytime, the Government of Japan plans to provide administrative e-services, to reform administrative information systems through the government and local government, and to strengthen its own IT governance. For this purpose, it is promoting the open government and the consolidation or integration of government information systems by constructing the *Government Shared Platform*, which began operations in March 2013, and utilizes cloud computing technologies.

In the **Russian Federation**, the Ministry of Telecom and Mass Communications has launched the *State Data Interchange System,* which aims to ensure the availability of the data needed for one-stop public and municipal services, to provide safe and guaranteed data delivery, and to create a data-exchange ecosystem, including the rules of connection and interaction. The system was made to simplify and optimize government-to-government and government-to-citizen/public institution interaction, completely changing the process from both the organizational and technological standpoints, making it possible to pay taxes and fines or file applications for documents online, etc. The project is part of the government's *Information Society (2011–2020)* programme.[84]

Governments continue to work on projects and initiatives to facilitate the exchange of information between government agencies. *Government-to-government* (G2G) is a type of electronic interaction in e-government.[85] Governments have carried out numerous activities in order to build centralized and customized systems that could provide services connecting their agencies and the employees of those agencies. The introduction of technical facilities, such as videoconferencing, automated management systems and communication platforms, transforms government services into effective and efficient mechanisms. E-applications are used to transmit information and data between government agencies, including all government actors. Many governments address security issues as an important factor once they have developed and launched e-government services.

In **Turkey**, Türksat has introduced the *Public Application Centre*. The platform is an online non-commercial communication system between Turkish government organizations, departments, authorities and legal entities (companies, etc.). It optimizes information management by different government systems and provides rapid access to various levels of data resources available over the network. G2G has many advantages for sharing the huge volume of information required to implement Turkey's various public policies for development.

Also in **Turkey**, the Ministry of Development has launched the *Development Agencies Management System* project. This project is aimed at developing a modular, integrated and central information system that will underpin the development agencies' institutional operations and increase the efficiency of their main service processes.

---

84 *Project nominated for a WSIS Project Prize 2014*

85 http://unpan3.un.org/egovkb/egovernment_overview/ereadiness.htm

In **Algeria,** the Ministry of Commerce has started work on *intranet infrastructure* and an *interconnected network* for the administration and its external departments. The intranet network of the commerce sector aims mainly to establish secure computer infrastructure to upgrade the administration of commerce, improve communication and inter-structure exchanges, and convey all information in real time for better decision-making. The main activities revolved around the following:

- implementation of a data centre at the Ministry of Commerce;
- installation of 60 local computer networks at the commerce directorates in the *wilayas* (provinces), at regional directorates and in port/border inspection units;
- establishment of secure interconnection infrastructure via intranet for all the above-mentioned data centre structures.

In **Uzbekistan**, the State Unitary Enterprise UNICON.UZ has launched the electronic document-handling system *E-Hujjat,* which is to be used to exchange legitimate electronic documents that have legal value, to improve and automate the existing document-handling and case-management system in different organizations and entities, to save time and money, to advance the transition to a paperless electronic document-handling system and to increase the level of executive discipline. E-Hujjat uses a centralized database, installed on the organization's server, to store all electronic documents in one place. It increases the level of data security against possible losses, for example should one of the system user's computers fail. Data security is provided by built-in multi-user identification and authentication. Access to the system is obtained using the username + password pair and the user's two-part electronic digital signature key.

Nigeria is implementing the *Government-wide Messaging and Collaboration* (GWMC) project. The purpose of this project is to provide government employees with a platform for e-mail and collaboration that is official and tied to their respective ministries, so as to discourage the use of free, web-based e-mail systems for official communications. Once completed, the system will cater for 40 000 users and more.

Also in **Nigeria**, the *Electronic Documents Management System/Council Chambers Automation System* (EDMS/CCAS) has been created for the following purposes:

a) Deployment and operation of a robust and secure electronic document management workflow solution, and automation of Federal Executive Council memo submission and distribution

b) Establishment of an integrated solution with an enhanced audiovisual conferencing system for seamless and increased collaboration between government officials

c) Digitization and back-scanning of archives (Federal Executive Council memos, notes, conclusions, etc.).

Still in **Nigeria,** IP phones and videoconferencing facilities have been deployed, with the following results:

a) The Galaxy backbone supports a multivendor/protocol unified communication system working seamlessly to deliver audio and video calls, videoconferencing, a conferencing bridge, directory services and other value-added services

b) Deployment of seamless intra- and inter-agency communication, improved accessibility to government offices and data, telephone cost savings for the government, and improved responsiveness by government agencies

c) Secure sharing of documents and opinions, regardless of location or platform

d) Enhanced security of government information and data

e) Improved efficiency and effectiveness of archival systems across government ministries and agencies.

In the **United Arab Emirates**, the Ministry of Cabinet Affairs has set up the *e-Briefcase and Knowledge Centre*. The e-briefcase assigns each minister a portal through which to access data related to his or her portfolio. This integrated platform, which has unified electronic components and advanced applications, works as a provider and an information exchange for Cabinet sessions. It also facilitates electronic communication between ministers and accelerates decision-making in the federal government. The knowledge centre allows a minister to access his or her ministry's fiscal reports submitted by the State Audit Bureau and reports on best international practices and experiences in similar ministries in other countries. It will also have sections on media reports and analyses, and provide the breaking news that ministers need to know.

The National Statistics Centre in the **United Arab Emirates** has launched the *UAE Statistical Atlas* for all government, local and federal authorities concerned and for scientific and research institutions, to enable them to conduct studies and issue recommendations with a view to drawing up economic, population, social, environmental and agricultural policies. The statistical atlas is composed of a number of practical maps linked in a structured manner and supported with statistical tables and diagrams. The map presentation, which displays the digital statistical facts geographically, aims to meet the different needs of data users. In addition, it provides an updated comprehensive picture of the economic, demographic, social, agricultural and environmental situation in the UAE and a geographical description of the State.

Also in the **United Arab Emirates**, the *Government Service Bus* is considered one of the next-generation technological advances in Dubai e-government. It integrates systems, data and services, allowing all government departments and entities to exchange information and complete public transactions. It also spares customers the inconvenience of moving from one government department to another for stamps, approvals and information and procedures. This platform facilitates fully integrated electronic transactions, ultimately helping further enhance quality of life in the Emirate, in line with its main purpose.

In **Turkey,** the Ministry of Justice IT department has implemented the *Audiovisual IT Communication System*. The purpose of the system is to record court hearings on audio and video recording systems and ensure simultaneous and live visual communication between courts located in different regions of Turkey.

In **Poland**, the Ministry of Finance has started to *consolidate and centralize customs and tax systems*. The project includes a modern data-processing centre equipped with platform-as-a-service (PaaS) and infrastructure-as-a-service (IaaS) cloud applications, with the following objectives:

- build a Ministry of Finance data-processing centre;
- provide IT equipment for the data-processing centre;
- consolidate and centralize IT systems.

In **India**, *Project Arrow* is an initiative to transform India Post by improving the look and feel of post offices and using IT-based key performance indicators (KPI) to monitor and improve their core operations (mail delivery, remittances, postal savings schemes and office services). To complement these efforts, the *Mail Network Optimization Project* was launched in 2010 to consolidate mail offices, redesign processes and introduce a KPI-based online monitoring system. Another step towards improvement of service delivery was the introduction of a citizen-centric web-based grievance mechanism to redress, monitor and prevent public complaints.[86]

Another type of electronic interaction in e-government is *government-to-business* (G2B) and vice versa, and *government-to-consumer/citizen* (G2C) and vice versa.[87] Governments continue to reinforce efforts to offer citizens and businesses the most beneficial services in the information environment. Communication and information-sharing platforms, management systems, and consolidated or integrated government information systems are tools for moving towards a transparent information society and promoting open governance. Citizen- and business-oriented projects and initiatives provide one-stop services, by creating government contacts and call centres, setting up national emergency numbers and modernizing notarial systems. Customer service has been improved thanks to the development of online platforms and portals through which citizens can access public services round the clock. Advanced social security, e- insurance, e-pension systems and e-funds are applications that help improve the social climate in the country. Data sharing and access to statistical data play a facilitating role, building trust among different categories of stakeholders. More and more projects are being implemented with a view to providing services oriented towards enabling people with special needs to perform government transactions.

Egypt has launched a *national three-digit emergency number,* 122, for easy and instant communication from members of the public on road conditions and situations such as road traffic collisions and traffic gridlock.

In **Uzbekistan**, the UZINFOCOM Computerization and IT Development Centre has introduced the *single portal for interactive public services*. The portal - my.gov.uz - is a key component of Uzbekistan e-government and the single point of access to government information and services. It was created pursuant to the government's decision to strengthen interaction between government agencies, the public and business entities, to use information technology to improve the efficiency of public agencies, and to meet the information needs of the population. Today, the single portal allows users not only to access public services, but also to file applications with public agencies in electronic form.

In **Kazakhstan,** the Government has introduced the Kazakhstan *eGov web portal,* which serves as a tool for the fundamentally new format of dialogue between the government and

---

86 *Project nominated for a WSIS Project Prize 2014*

87 http://unpan3.un.org/egovkb/egovernment_overview/ereadiness.htm

citizens. Thanks to the www.egov.kz portal, citizens can not only obtain and submit different documents and pay fines and taxes, they can also directly address State agencies and post suggestions or comments on draft legislation and public service projects, even from thousands of miles away. Kazakhstan's eGov portal accompanies the country's citizens in a whole range of life situations – starting a family, childbirth, opening a business, retirement, and many others. It is an opportunity to replace thousands of doors with one window.[88]

In **Mexico,** the *Lazos* project aims to strengthen socialization within communities in the Sinaloa region. Sinaloan families have access to innovative communication channels for technology, where they can see, call, send messages to and share with others, wherever they are, regardless of location or distance between them.[89]

In **Turkey,** the Ministry of Transport, Maritime Affairs and Communications has implemented the *National Transport Portal*. Providing travel information to people is a very important component of intelligent transportation. This web-based portal offers many different services, such as travel planner (public, own car, door-to-door), weather and road conditions, flight information, public announcements about the sector, cargo tracking, traffic and kids, 3D road images, points of interest (POI). The portal can be visited at www.ulasim.gov.tr. The mobile application, developed for Apple IOS, Android and Windows8, is being put in service as *Ulastirma Portali*.[90]

In **Colombia,** *MiMedellin* is an open innovation platform developed by government programmes. Its main goal is to encourage citizen participation in government issues and in current city problems through co-creation, feedback mechanisms and a dialogue of ideas. The platform is an open venue where the public sector learns about citizen proposals, evaluates each proposal's potential applicability and determines whether the sum of the various ideas would make a bigger applicable project.[91]

Also in **Colombia**, the Ministry of Information and Communication Technologies has co-created the *Vive Gobierno Móvil* event, which promotes the development of mobile applications that automate public transactions and services for anyone interested in using the open data submitted by the country's public institutions.[92]

In **Kuwait**, the government has launched *Kuwait Government Online* (KGO), a government portal that provides a web-based, easy-to-use, mobile-enabled, one-stop, multilanguage single entry point to user-centric Kuwaiti government information and e-services. The portal is available round the clock. It is the gateway and first point of visit for citizens (G2C), businesses (G2B) and visitors wishing to find information and e-services provided by the Government of Kuwait. Multiple access channels have been established through the web, mobile and other tools of communication to ensure KGO portal users can benefit from

88 *Project nominated for a WSIS Project Prize 2014*

89 *Project nominated for a WSIS Project Prize 2014*

90 *Project nominated for a WSIS Project Prize 2014*

91 *Project nominated for a WSIS Project Prize 2014*

92 *Project nominated for a WSIS Project Prize 2014*

information and services. To maintain top usability, performance and security rates, the developers designed KGO according to international technical standards.[93]

In **Oman**, the *Injaz Hall – One-Stop-Shop Services* initiative perfectly attests to the government's efforts to enhance its customer services in rural areas. The challenge of serving remote villages and communities in vast undulating terrain, coupled with the lack of connectivity, did not deter the Ministry of Regional Municipality and Water Resources from providing quality customer services to those living in the interior. Powered by a pervasive IT system, Injaz Hall has standardized, streamlined and united municipal services in the interior. With standardized information from all 44 municipalities in the country's nine governorates, data collection and knowledge sharing are simplified and provide accurate input for the ministry's further planning and strategic development. The increased number of licences and permits processed and issued are evidence of the initiative's success. The most remarkable achievement is the multifold increase in government revenue collected from such services. By strengthening Oman's efforts to provide quality services to rural communities, this initiative has successfully bridged the digital divide between the country's cosmopolitan townships and its rural communities. It has also met the overall objectives of the national digital strategy and fulfilled the vision and mission defined by the ministry's management.

In **Turkey,** the *Online Appointment System* provides the best level of service to citizens. Appointments can be made using the appointment request form available at http://onlinerandevu.tkgm.gov.tr. The system has been put into operation in 343 Land Registry Offices.

In **Saudi Arabia**, the National Information Centre (NIC) has set up the *NIC Hub*. Run by the Ministry of the Interior, NIC is not a mere data centre; it is the port of call for all e-government programmes in the Kingdom. All the Kingdom's e-government programmes operate using NIC's interface and data-exchange services. The centre stores the demographic information relating to all citizens and expatriates, against which other programmes can crosscheck their e-transactions. It is also developing and operating e-services that provide significant benefits to both nationals and expatriates, enabling millions of users to perform transactions at any time and from anywhere. This comfortable mode of interaction has specifically made it possible for women and people with special needs to perform government transactions as never before.

In **Poland**, the Social Insurance Institution, the main social security administration and the country's biggest public administration, has implemented the *Electronic Services Platform* (PUE), providing services for:

- 15.9 million insured persons
- 7.3 million pensioners (old-age, disability, survivors)
- 2.1 million social insurance contributors.

[93] *Project nominated for a WSIS Project Prize 2014*

PUE is a comfortable, efficient and safe customer service. It consists of a new Internet portal, a call centre, a customer queuing system and self-service information devices (indoor kiosks). Since June 2012, it has registered the following results: 300 000 individual customer profiles established, 1 800 000 documents received from customers, and 1 500 000 call centre connections set up, with each conversation lasting an average of 3:59 minutes.

In the **United Arab Emirates**, the Ministry of Justice has introduced *E-Notary*. This system enables members of the public to submit notarial requests online, around the clock and anywhere, by logging onto the system on the Ministry of Justice website. Each notarized document has several security features, including a watermark (in the form of a thick solid ring that detects and guards against photocopied and scanned documents), a microprint reference number that is only visible with a magnifying glass, a two-dimensional barcode that contains encrypted data and the electronic signature by the notary officer.

In **Turkey**, the Central Bank of Turkey has developed the *Electronic Data Dissemination System* (EDDS), a dynamic and interactive data dissemination system providing access via the Internet to the statistical data produced and/or compiled by the Central Bank. No additional hardware or software is needed to access and use the system, which presents the data, in either Turkish or English, in the form of reports, diagrams and e-mail data.

Also in **Turkey**, *mobile e-government* will provide mobile applications for interaction with all citizens, building a mobile e-government platform that will serve as the catalyst for expanded electronic government.

Still in **Turkey**, Türksat has implemented the *e-Government Gateway of Turkey* (www.turkiye.gov.tr), a platform offering electronic government services to citizens. By registering with the e-Government Gateway, citizens can sign up for any of the Turkish government's services that are available over the Internet and integrated into the e-Government Gateway. The e-Government Gateway simplifies processes and makes government information services more accessible for citizens.

Again in **Turkey**, the *National Judiciary Informatics System* (UYAP) is an institutional portal that is part of the *e-devlet* (e-State) system. It enables authorized persons from institutions or the private sector to access, using an e-signature and the Internet, the content of court cases and proceedings (enforcement/bankruptcy) to which the institution/company is a party. It allows institutions/companies easily to follow the cases to which they are party and thus they do not feel the need to obtain information from their lawyers. It enables authorized persons from large institutions or companies to access thousands of cases and proceedings filed in dozens of cities, courthouses and courthouse units from their offices, houses or any place with an Internet connection, without limit of time or space. Thanks to this system, lawyers and the representatives of institutions/companies can save on labour, time, transportation and accommodation, which become unnecessary as they do not need to go to the courthouses to follow their cases, and do not need to spend on the personnel, finance and supplies to maintain the software they use for this purpose and to access data.

Lastly, the *Online Vehicle Restriction System* in **Turkey** enables users to add or remove any restriction (capture, confiscation, precautionary attachment, interlocutory injunction, etc.) on the electronic records of motor vehicles simultaneously, thanks to the integration established with POLNET (police automation system) between the judiciary and its auxiliary

units for the active and efficient operation of the *e-adalet* (e-justice) system, which is part of the *e-devlet* system.

In **Saudi Arabia**, the Ministry of Higher Education has implemented the *Higher Education Degree Verification eService* (Moahhal). The ministry has realized the importance of acting fast to facilitate a nationwide process of qualification and credential verification that is fully automated and electronic. Thanks to the implementation of Moahhal, the verification process is now instantaneous, accurate and free. Moahhal is available to public and private employers, who can verify online the accuracy of the academic information presented by a graduate. It also aims to compile an accurate and updated, complete national database of all graduates and conduct important business intelligence analyses on performance indicators.[94]

In **Kazakhstan**, the *National Certification Authority* was created in order to provide citizens with reliable means of authentication and digital signature. Thanks to the authority, an electronic digital signature can be issued for each ID card, which is a major achievement in the use of information technology for information security. The National Certification Authority of the Republic of Kazakhstan (NCA RK) was put into commercial operation on 29 October 2008. Today, NCA RK registration certificates are used by more than 1.9 million people in 30 state information systems in the country. The advantage of placing electronic digital signature keys on ID cards are secure storage - the key cannot be copied by third parties - and permanent possession of a digital signature.

In **Oman**, the State Audit Institution (SAI) has initiated programmes to bolster government transparency and citizen participation through enhanced information exchanges using an *e-complaint window*. SAI is the key government agency combating corruption and ensuring greater accountability, transparency and fairness in government performance. Since it launched the e-complaint window, there has been a dramatic (100 per cent) increase in the number of complaints. The e-complaint window logs and categorizes feedback and complaints before channelling them to the department/party concerned. It has activated online channels to enhance the process, and partnered with the public to ensure transparency and efficiency in government. In 2010 and 2011, around USD 2.6 billion of public funds were recovered and saved using the e-complaint window.

In **Kuwait**, the Ministry of State for the National Assembly has launched *www.mona.gov.kw* . Through this site, the ministry seeks to put parliamentary life in Kuwait on view. The general public and relevant professionals can follow all the sessions of the National Assembly, accessing documents such as minutes of meetings, minutes of agenda items, proposals made by the House of Representatives, laws and regulations, interviews, discussions of interest to citizens, and interesting documents of entities in other governments. They can use this information to make appropriate decisions and retrieve past information precisely and transparently, whereas in the past access was restricted to certain destinations.[95]

In **Morocco**, the State pension fund, the *Régime Collectif d'Allocation de Retraite* (RCAR), has implemented *Agylis plus*. About 10 years ago, the fund's top management decided to

[94] *Project nominated for a WSIS Project Prize 2014*

[95] *Project nominated for a WSIS Project Prize 2014*

modernize its management system. One of its strategic orientations was the enhancement of customer capital. In concrete terms, a programme to create value projects using ICTs was launched in order to provide citizens with greater access to information. The portfolio of projects was customer-oriented and should facilitate the RCAR e-community's relations with its business partners and diversify client channels for all e-government retirement services on offer.

In **Kazakhstan**, the National Information Technologies JSC has introduced *blogs* by government agency executives that provide a unique means of fostering interactive communication between citizens and government officials. The blogs allow citizens to ask questions, file complaints or make suggestions. They are a perfect tool for information sharing and are maintained in three languages: Kazakh, Russian and English. The blog platform has been functioning for more than four years, and its popularity is growing rapidly. The most popular subjects are healthcare, education, social support and private enterprises.

In **Turkey**, the Ministry of Family and Social Policy General Directorate of Social Assistance has introduced the *Integrated Social Assistance Services Information System,* which is an electronic platform for receiving applications from poor and needy citizens, creating household files, searching for personal information, compiling information on the socio-economic conditions and wealth of citizens from central databases, reporting on on-site social observations on household socio-economic conditions, determining citizen neediness, giving bank orders for assistance payments and preparing automatic accounts for all assistance.

Also in **Turkey**, the Ministry of Interior Department of Information Technologies has launched the *e-Interior* project (*e-Icisleri* in Turkish), an e-transformation project that was initiated so that the processes and procedures of Ministry of Interior central units, governorates, district governorates and special provincial administrations can be performed via an electronic platform. The services have become more transparent and accountable, with ICTs being used to provide a citizen-oriented service approach. The e-Interior project is divided into three main groups: common modules, central modules and provincial modules (governorate, district governorate and special provincial administration). Of the project's 165 modules, 154 have been completed. The application developed with the project has 3 200 interfaces, 3.7 million code lines and 10 terabytes of data.

In **Saudi Arabia**, the General Organization for Social Insurance (GOSI) has introduced *Proactive Services,* a revolutionary delivery channel through which customers are offered a service before they even apply for it. For example, a female beneficiary will receive a marriage grant as soon as the marriage has been registered by the government body concerned. This represents a shift from the “ask-receive” to the “have the right to receive” approach.

In **Nigeria,** the *Government Contact Centre* and *Single-Window Portal* projects were implemented, involving:

a) deployment and operation of a central government contact centre (including technology, processes and operation);

b) deployment of a national e-government single-window portal to provide citizens and other stakeholders with access to the information and services being provided by various ministries, departments and agencies through websites.

The Ministry of Justice in **Oman** has launched the *fingerprint reader* service at public notary offices in a step towards digital transformation. As many as 54 devices were put into operation in the first stage, which will be completed later by providing more than one device in each of the Sultanate's 60 public notary offices. The system, which is linked to the Civil Status Office at the Royal Oman Police (ROP), aims to provide maximum security for the official records issued by the public notary offices and to save time and effort when visitor data is codified, also enabling women not to be required to reveal their faces. The system is part of a package of electronic services that will link with 17 government entities, including the Administrative Affairs Council for the Judiciary, the ROP, the Ministries of Finance, Housing, Manpower, Commerce and Industry and Civil Service. It will involve computerization of the ministry's administrative and financial affairs, including tenders, procurement, recruitment, warehouses, and special services related to archiving official records issued by the Notary Public, some of which date back to the first half of the last century.

C7.2 E-business

Within the framework of the World Summit on the Information Society (WSIS), the United Nations Conference on Trade and Development (UNCTAD) is the lead facilitator for Action Line C7: ICT applications (E-business).

Several activities were implemented by UNCTAD and its partners for the period 2013-2014:

- UNCTAD published the *Information Economy Report 2013: The Cloud Economy and Developing Countries* in December 2013. Cloud computing is deemed by some to be one of the most significant disruptive technologies for the next two decades. Significant improvements in the capability to process, transmit and store data are generating considerable potential for economic and social development. Although cloud use is still limited in most developing countries, the report takes a forward-looking stance and outlines the potential benefits and costs associated with the uptake of cloud services in those countries. The report is especially timely since most developing-country policy-makers need to start reflecting on what cloud computing entails, how to reap benefits from it and how to respond in terms of policy.[96]
- A joint UNCTAD–International Labour Organization (ILO) project to revise ILO's framework for assessing *women's entrepreneurship development policies* and better reflect the ICT dimension was completed in 2013.[97]
- The United Nations Economic Commission for Europe (ECE) continues to develop *electronic business standards* through the United Nations Centre for Trade Facilitation and Electronic Business. These include the *United Nations Rules for Electronic Data*

[96] UNCTAD contribution http://unctad.org/ier

[97] The 2013 Report of the United Nations Secretary-General: Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels http://unctad.org/en/PublicationsLibrary/a69d65_en.pdf

Interchange for Administration, Commerce and Transport, which facilitate the exchange of information on transport, customs, government and business procurement, just-in-time manufacturing and finance. During the course of 2013, the electronic data interchange directories were continually improved and updated.

- The United Nations Economic Commission for Africa (ECA) implemented a project on *e-commerce facilitation* for SMEs to enhance the implementation of ICT policies and plans in **Ethiopia** and **Gambia**.[98]
- The International Trade Centre (ITC) presented the results of a *consultation on e-business* at two WSIS review meetings in 2013. It also undertook projects to support businesses in **Côte d'Ivoire**, **Fiji**, **Kenya** and **Kuwait**, applying web- and mobile-based tools and providing training to improve supply chains and market linkages.[99]
- In October 2013, the World Trade Organization (WTO) Public Forum discussed trade and innovation, under the theme *Expanding trade through innovation and the digital economy*.[100]

As is stated in *the 10-Year WSIS Action Line Facilitators' Reports on the Implementation of WSIS Outcomes*, since 2003 numerous advances have been achieved in the e-business sphere, such as the adoption of e-business practices, an increase in Internet use by enterprises, the adoption of mobile phones as a commonly-used ICT tool among micro and small enterprises in low-income countries, computerization of business administration, and the development of payment system, e-banking and e-procurement portals. Many new innovations – from mobile apps to cloud computing – have entered the market. Social networks are facilitating the development of e-business and e-commerce. New business opportunities have emerged, including in the mobile sector, in social outsourcing and with regard to freelance work.[101]

Governments and other stakeholders are committed to pursuing their efforts to provide benefits to citizens and businesses through ICT applications. The projects and initiatives presented below provide an overview of how ICT applications can enhance the business environment by reducing expenses, facilitating payment methods, optimizing supply chains, securing document and data exchanges, strengthening logistics and procurement management and promoting local production. Numerous systems have been created to provide guidance and protection to consumers venturing into the world of online tools. Environmental issues are now addressed more regularly in business agendas. Businesses are pursuing initiatives aimed at reducing the paper flow between institutions through the use of efficient electronic methods.

In **Turkey**, many business players are involved in the development of a *favourable business environment* and are fostering *business-to-business* (B2B) interaction:

- The Capital Markets Board (CMB) of Turkey has launched the *Remote Data Gathering* project for independent auditing firms. Remote Data Gathering is a software project that

98 Ibid

99 Ibid

100 http://www.wto.org/english/forums_e/public_forum_e/public_forum_e.htm

101 http://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C7_E-Business.Summary.pdf

makes data communication between CMB and independent auditing firms more productive in order to reduce the operational workload on CMB staff and increase the effectiveness of operations.

- CMB has established the *Capital Adequacy System*, designed to strengthen the financial structure of intermediary institutions, portfolio-management companies and banks. The system basically represents the financial situation of institutions. The aim is to obtain the required data via electronic signatures, thereby enhancing the security of the system and doing away with the paper traffic which places a heavy burden on CMB's archiving facilities.
- In July 2013, the Ministry of Economy introduced the *National Market Surveillance Information System* (PGDBIS), which serves mainly as a data pool for the exchange of information among market-surveillance authorities concerning unsafe and non-compliant products they have found in the market, as well as the results of import controls. The system also enables market-surveillance authorities to post data concerning their activities (number of inspections, number of compliant, unsafe and non-compliant products, number of products tested, etc.) and generate statistical reports from those data.
- In 2010, the Public Procurement Authority (PPA) launched the *Electronic Public Procurement Platform* (EKAP), administered by PPA, where contracting entities and economic operators can conduct procurement procedures, such as the preparation of tender documents, notices and bids, and the awarding of contracts, via the Internet. E-tender preparation, submission and evaluation functionality was added to EKAP in June 2013 for the call-off stages of framework agreements. The full digitization of procurement expenditures in all tenders is expected to result in annual savings of around TRY 5 billion.
- The Ministry of Development has introduced the *Provincial Coordination and Monitoring System* (IKIS project), which enables the posting of data relating to projects, project monitoring, inventories and performance, and provides information necessary for evaluating project proposals. The system also offers a substructure for monitoring investments, problems and progress in the related sectors; taking timely and appropriate measures; and determining and elaborating productive and solution-oriented processes for long-term investment projects, programmes and strategies.
- In addition, the Central Bank of Turkey (CBT) has introduced several projects:
  - The *Internet Banking System* (IBS) has been developed to enable banks to track their accounts interactively and generate bank statements in real time. IBS includes all accounts of the banks that are located in branches of CBT as well as CBT headquarters. With the ability to query account positions in real time, banks are now able to take more accurate decisions involving their payment systems.
  - The *Electronic Data Transfer System* (EVAS) is a platform for the secure uploading/downloading of files to/from Türkiye Cumhuriyet Merkez Bankas (TCMB) via the Internet. It is used between TCMB and banks and a number of government and private financial institutions.
  - The *Public Electronic Payment System* (PEPS-KEOS) has been developed for handling the cash transmission requirements of general budget institutions, meeting their

needs in that regard and electronically processing their payment orders. PEPS enables the processing of all such transactions automatically without the need for any external intervention, and can therefore be considered a global example of an automation system operating on the basis of the "end-to-end" principle. With this system, every step of public payment transactions can be monitored by the Treasury Undersecretariat and the Ministry of Finance simultaneously through the infrastructure put in place by the Central Bank using secure IT architecture.

- The Banking Regulation and Supervision Agency has introduced the *Financial Turkey Map* (FINTURK) application, which provides quarterly information about the geographical distribution of Turkey's credit and deposits and about the usage of financial services in different cities.
- CMB Turkey has launched the *Investor Portal*, which is designed to inform investors about investment instruments, things to consider when making an investment, their rights, unauthorized public offerings and capital market activities. The website also features the *Capital Market Glossary*, prepared for the use of investors and other relevant sectors.
- In 2010, the Ministry of Economy launched the *Risk-Based Trade Control System* (TAREKS) to perform safety and quality checks on export and import goods electronically. The new system seeks primarily to make the country's trade policy more efficient, ensure the supply of safe, high-quality products to consumers and firms, rationalize the allocation of resources, control "risky" products and traders, and reduce waiting times for customs clearance.
- The Istanbul Metropolitan Municipality has launched *Instant Mobility* (multimodality for people and goods in urban areas), with the overall aim of contributing to the implementation of personalized travel (transport) options and scenarios according to personal preference by pursuing real-time solutions for the effective handling of urban logistics and loads, passengers, road traffic and various forms of travel optimization under the *Fast Transport Idea 2020* concept; in short, by creating scenarios which address every aspect of urban transportation simultaneously (public and private transportation, commercial and private vehicles).
- The Banking Regulation and Supervision Agency has set up the *Information Acquisition System*, which enables people to request and obtain information from the agency and provides for statistical reporting on requests.

In the **United Arab Emirates**, various e-business activities have been undertaken to improve trade and encourage the flow of investment into the country:

- Dubai Trade introduced *Online Supply Chain Management*. As part of a new initiative by Dubai Trade to move services online, customers will be able to download software that will enable them to upload contracts and engage with business partners remotely. Starting with 80 services in 2006, Dubai Trade was launched as an independent department to accommodate 800 services accessed by over 57 000 registered companies, one of its main objectives being to persuade more customers to use online services. Dubai Trade has achieved substantial growth in the number of registered users and online transactions as more companies have joined its electronic platform. The new service will make trading easier, faster and cheaper for all stakeholders, enabling

businesses to check the schedules and space availability of all the cargo companies in Dubai, obtain quotes, make bookings and track containers or shipments by reference number.

- The Dubai Statistics Centre (DSC) founded *the e-Statistics System*, seen as a pioneering electronic system in the global statistical field, its primary objective being to support planning and decision-making processes. The system will provide its users with specific databases on economic, demographic and social surveys and censuses conducted by DSC, with substantial added value in terms of the "smart tools" that users can employ to construct statistical reports according to their preferences; mechanisms for consulting the most current data and statistical registry reports issued by various government departments and institutions; and updated and accurate statistical reports directly accessible to users through DSC's webpage.
- The Ministry of Cabinet Affairs introduced *Adaa 2.0,* a system which provides an effective mechanism for managing institutional performance. It serves all the different levels of an organization, making it highly integrated and comprehensive. It can also be accessed everywhere and on the go, for example on mobile and laptop devices. The system is designed as an electronic platform to support strategic decision-making within the federal entities, in addition to providing briefing reports to the leadership on the progress made towards achieving *UAE Vision 2021*. The new system promotes and supports internal management, while following up processes under the strategic and operational plans and reporting on their status.
- Dubai Customs has launched the *Virtual Account Project* as a new and innovative option designed to facilitate the payment processes used by the department's various categories of client who use the Customs Duty Credit (CDR) account. The new system allows clients to execute their payment processes using a new banking system. The new electronic facility, which takes the form of a bank account number linked to the CDR account, has been developed as an alternative channel for the payment of instalments in an easy and comfortable manner. The project – an extension of Dubai Customs' broad range of customer services – can serve as an important tool for improving the customs collection service. In addition, Virtual Account enables clients to complete their payment processes using 24-hour Internet banking services, as well as to make payments through bank branches or ATMs scattered throughout the country, thereby eliminating the effort involved in visiting the department's counters to settle their financial obligations through the CDR account facility.

In **Bangladesh**, several projects have been implemented for the purpose of developing rural areas and promoting the exchange of market and local product information through the creation of centres and online platforms, such as:

- Future Solution for Business (FSB) Ltd implemented the *Amar Desh Amar Gram (My Country My Village*) project, focusing on e-commerce for poverty alleviation. The project aims to minimize the digital gap between rural and city life, by creating market linkages for rural communities. The *Amar Desh e-shop* is the virtual market for emerging rural communities in Bangladesh. The e-centres, established in rural areas as hubs, are run by trained members of the local youth community. They collect products from poor producers in all the villages, and then open up national and international markets for them.

- *Online Micro Small and Medium Enterprise* (MSME) secures access to timely information and helps to boost the competencies required to ensure business growth. The main objective is to introduce the *MSME Support Service* as an online platform to assist MSMEs and their stakeholders through the following services: 1) Advisory and information services (Online SME Doctor); 2) Online marketplace; 3) Members' Forum; and 4) Directory services. The Members' Forum is designed to categorize users according to their common interests. This has helped SMEs to unite under those common interests and will benefit them through the exchange of information. The primary target beneficiaries are MSMEs in rural, semi-urban and urban areas of Bangladesh. Groups benefiting from the service include: entrepreneurs at the individual, group and regional levels; associations and institutions; corporate customers; and rural artisans, whose products will be promoted in local and international markets.[102]

In the **United States**, Dimagi, Inc. has established *CommTrack*, which serves as an open-source, turnkey product designed to strengthen logistics management through the use of mobile technology. Through a partnership with John Snow International (JSI), CommTrack is currently being used in **Tanzania** (ILSgateway), **Ghana** (early warning system), **Malawi** (cStock) and **Uganda** (mTrac). In Tanzania, the Ministry of Health and JSI are in the process of deploying this technology nationwide, with over 2 300 facilities currently reporting. In **Ghana**, CommTrack is being deployed to all antiretroviral therapy facilities and other health facilities in 18 districts. In **Malawi**, 1 500 community health workers are using CommTrack across more than half of the country's districts.

In the **Islamic Republic of Iran**, the Data Processing Company launched *Hubco*, an *e-procurement system***.** This e-commerce network operates within the supply chain of any industry as a matchmaking system between vendors and suppliers. In this web-based system, suppliers and vendors can register themselves, their capabilities and their products. Also, organizations (e.g. companies, factories) requiring certain products and/or services can use the system to submit enquiries. The system automatically recognizes the required items and distributes the requests to the registered suppliers/vendors. Suppliers can then, via the system, send their quotes in response to the requests. The system uses algorithms and processes to rank the quotes for the requester, which can then order from the supplier of their choice. Revenue is generated for the system through membership packages, advertising, information sharing, and so on. The system, acting as a hub in the supply-chain management of any industry, can link many suppliers among the existing industries within a country or even abroad.[103]

In **Cuba**, the *Comprehensive Customs Management System* (GINA) is designed to ensure that customs formalities comply with the requirements laid down by the World Customs Organization (WCO) in the revised Kyoto Convention, with the regulatory framework, and with WCO's electronic data model. The system operates on the basis of advance information on cargos, international passengers and means of transport, in standard UNEDIFAC and XML formats, supporting customs facilitation and control operations at the borders based on a powerful risk-analysis system for selecting items to be checked. It also supports the provision of customs services to foreign trade operators at their offices. The system is

102 *Project nominated for a WSIS Project Prize 2014*

103 *Project nominated for a WSIS Project Prize 2014*

endorsed by WCO and exchanges electronic information automatically with shipping companies, airlines, foreign trade operators, banks, couriers, central government agencies and customs authorities in other countries. It automates all the customs processes (clearance of merchandise, non-commercial goods, mailed packages, international travellers and means of transport). It is linked automatically with the personnel, finance, planning, document management, training administration and other non-customs processes, and to the x-ray scanners, radioactivity scanners, scales and other detection aids relating to the safety of international trade and passenger transport. The system is based on an open-source platform and a network of 1 700 PCs. The core of the system has been operating since 1 January 2001 and is under constant development by a team of specialists from the customs authority, the University of Computing Sciences and the José Antonio Echevarría Technical Institute.

In **Nigeria**, governments and other agencies have contributed to the development of business and trade data centralization and to the establishment of efficient mechanisms for reducing expenses:

- The *single-source for foreign trade information* (VUCE) project is the offshoot of a strategy for progressing to a single system for foreign trade information. It includes a feasibility study and analysis of the requirements for determining the potential scope of the future single source for foreign trade information, the level and nature of demand, the data and other information required, the legal aspects, the implementation strategy (including definition of possible stages), the possibility and nature of a pilot study, the cost of various implementation scenarios, the human, technical and other resources needed, the likely risks and benefits, the timing, other aspects of the implementation strategy and details of the operating strategy. The basic legal framework has also been mapped out, involving laws and regulations to ensure information can be exchanged confidentially and securely.
- The *Nigeria Trade Hub* web-based trade information portal was developed to provide timely trade information and is supplemented by mobile apps for the various platforms. The hub ensures that the trading community has access to timely information on Nigeria's trade processes, anytime and anywhere. It aims to facilitate trade by making the supply chain more transparent, with all the information relating to trade from all the various agencies collected under one roof and readily available for searching and viewing. The portal provides information and guidance for international trade.
- The Central Bank of Nigeria (CBN) has developed the *Nigerian Financial Services Network* (NFSN), a project to provide shared network infrastructure for the Nigerian banking system in order to reduce the annual operating expenses the banks incur in providing and maintaining communication infrastructure. The annual aggregate cost of network and communication infrastructure was found to constitute the most significant recurrent IT expenditure for banks, and ultimately these costs are passed on to customers in the form of high fees, charges, commissions and rates. Generally, the infrastructure will provide an efficient and effective platform for CBN's drive to transform the national e-payment landscape. By leveraging multiprotocol label-switching (MPLS) technology to provide for bandwidth pooling, the proposed shared network infrastructure will securely connect all common financial entities in the country. It will be robust and secure, resilient

and cost-effective. It will offer high availability and support voice, data, videoconferencing and application traffic.

- A *review of the ICT readiness* of the various trade-related agencies and user community for trade processes was conducted. This included assessment of the current organizational and infrastructure status (ICT network, facilities, hardware and software), to ensure that the system to be introduced will be incorporated into the existing infrastructure in such a way as to preserve existing investments in an efficient and appropriate manner. The review included an examination of user operating systems and interoperability, their data-handling capacity, request capacity, transaction/staff capacity, etc.
- The *cash policy project* was launched to facilitate the growth of electronic payments by increasing the availability, reliability and security of electronic channels in the country. The policy's main purpose is to reduce the amount of physical cash circulating in the economy, thereby encouraging more electronic transactions. Some of the policy objectives include modernizing Nigeria's payment system, reducing the cost of banking services, driving financial inclusion through various e-payment channels such as mobile money, improving the effectiveness of monetary policy, reducing high security and safety risks, fostering transparency, and curbing corruption and leakages in the system.

The *African Alliance for e-Commerce*[104] is a regional framework promoting the concept of national and regional ICT systems in compliance with international recommendations for cross-border trade. It is also a framework for exchange and sharing on trade facilitation. It aims to promote the concept of a national and regional single window complying with international recommendations. The single window boosts the development of inter- and intra-regional trade in **Africa**, making businesses more competitive and ready to meet the challenges of globalization.

In **Algeria**, the Ministry of Commerce has introduced the *Dangerous Products Early Warning Network* (SARA). The aim of this online warning system is to allow departments of the Ministry of Commerce to enquire, quickly and effectively, about the possibility of dangerous products presenting a particular risk for consumers entering the market, thanks to control operations or reports from reliable sources, and to take measures to withdraw such products. The integrated early warning system is a computer system that will support the operation of SARA. It was designed on the basis of the European *Rapid Exchange of Information System* (RAPEX) and *Rapid Alert System for Food and Feed* (RASFF). It is a central system that provides the following:

- registration data about products/unsafe services (notifications);
- analyses, statistics and reports based on the stored data;
- notification archiving.

The computer system will also support a computer network comprising:

- the SARA administrative network;
- key stakeholders (economic operators);

104 http://www.aace-africa.net/

- consumers (individuals and associations);
- other system users.

Also in **Algeria**, the Ministry of Commerce has started to implement an *interactive guide for consumer protection* that contains information and advice on consumer rights, enabling consumers to make informed decisions and protect themselves from unscrupulous merchants. Consumers will find the basic information they need to know when they make purchases and sign contracts with suppliers.

In **Ghana**, EKO ICT has introduced a *Mobile/Remote Revenue Collection and Payment System*. This *m-transact* system consists of mobile revenue collection and payment software and devices that will be used for remote revenue collection, balance enquiries and customer registration in real time (connected to reports or communicating transactions to the office software and database server immediately). The system automatically prints real-time receipts for each transaction. Customer balance enquiries and account statements can be printed from the system without visiting the office. Customers will be able to see the amounts they currently have on deposit at the office.[105]

In **China,** China Telecommunications Corporation has introduced *NFC Mobile Wallet*. NFC Mobile Wallet is a client mobile phone application with an SWP-UIM card and NFC mobile phone as safety elements. Based on a Trusted Service Manager (TSM) platform, the application provides users with over-the-air download service to achieve a multipurpose card, while providing convenience and saving the costs involved in the release of the smart card application.[106]

In **Uruguay**, the *Dirección General Impositiva* (DGI) has implemented *e-Factura - Comprobantes Fiscales Electrónicos* (e-Invoice). DGI is responsible for administering Uruguay's tax system and is committed to facilitating tax compliance in order to maximize voluntary compliance, to strengthening tax compliance control so as to minimize non-compliance, tax evasion and fraud, and to contributing to the country's economic development by spearheading tax compliance initiatives designed to improve the modernization of the State, enhance e-government, increase taxpayer productivity, reduce the costs of compliance and increase fair competition between economic agents. Not only does e-Factura play a critical role in fulfilling that mission, it also contributes to the development of e-commerce in Uruguay.

In **Morocco**, Agoramediacom has launched *Jaoubnee,* a social network connecting individuals who need local services with very small enterprises, professionals or individuals who can provide them.

In **Kuwait**, *Tasdeed* allows customers, corporations and government entities the option of effecting payment transactions with government agencies easily and round-the-clock, every day of the year, by electronic means, such as integrated point of sale, payment over the Internet, self-service machine, electronic stamp, supplied and managed by a payment service provider.[107].

---

105 *Project nominated for a WSIS Project Prize 2014*

106 *Project nominated for a WSIS Project Prize 2014*

107 *Project nominated for a WSIS Project Prize 2014*

C7.3 E-health

In line with the Geneva Plan of Action, stakeholders should encourage the adoption of ICTs to improve healthcare and health-information systems and extend them to remote and underserved areas and vulnerable populations, recognizing women's roles as health providers in their families and communities.[108] Many governments see the need to enhance healthcare systems at the national level and to put in place policies on e-health as a priority. Various types of initiatives are being undertaken to raise awareness of health issues, create integrated public health systems and databases and build the capacity of the health sector.

As stated in the *10-Year WSIS Action Line Facilitators' Reports on the Implementation of WSIS Outcomes*, WSIS called for the participation of all stakeholders. In the health sector, this includes governments, multilateral agencies, development partners, healthcare organizations and businesses, academic, research and public health institutions, standards-development organizations, health workers and professional associations, ICT entities, non-governmental organizations, and individuals, families and communities.[109]

The World Health Organization (WHO) and the International Telecommunication Union (ITU) have been working with their partners on a range of activities for the period 2013-2014:

- On the basis of a survey covering 64 countries, WHO and ITU jointly published the *eHealth and innovation in women's and children's health: A baseline review* report, which demonstrates the vital role that ICTs - and particularly e-health - are playing today in helping achieve the targets set under the Millennium Development Goals (MDGs) and how, every day, e-health is saving the lives of women, their babies and infants in the some of the most vulnerable populations around the world, in a wide variety of innovative ways.
- WHO and ITU launched a joint initiative to use mobile technologies to address *non-communicable diseases* through *scalable m-health solutions*. The four-year work plan targets eight countries in the areas of prevention, treatment and policy enforcement. In the Americas region, **Costa Rica** was the first country to implement this initiative by launching a *smoking cessation* programme using mobiles to help smokers quit. In the African region, **Senegal** will be using mobiles for *diabetes prevention and control*, and **Zambia** is set to launch a *cervical cancer screening* programme supported by mobile.
- Recognizing that improving the health of women and children is a global health imperative reflected in two of the most compelling MDGs, which seek specifically to reduce maternal and infant deaths by 2015, ITU published a report in July 2013 on the *use of ICT for improving information and accountability for women's and children's health*. The report highlights the contributions that ICT applications can make in accelerating the attainment of MDG 4 (to reduce by two-thirds the under-five mortality rate) and MDG 5 (to reduce by three-quarters the maternal mortality ratio) by 2015.
- Collaboration between ITU and WHO and industry associations such as the International Federation of Pharmaceutical Manufacturers and Associations (IFPMA), Bupa (a healthcare company) and the Verizon Foundation has resulted in additional budgetary

[108] Geneva Plan of Action, § 18e)

[109] http://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C7_E-Health.Summary.pdf

resources being made available to support the use of *ICTs for maternal and child healthcare* and to combat *non-communicable diseases*.

- Two events were organized to raise awareness about the potential of *mobile health applications*, especially with regard to the reduction of non-communicable diseases: one during the World Health Assembly (WHA) in May 2013, and the other during the United Nations Economic and Social Council (ECOSOC) in July 2013
- The joint ITU-WHO *National e-Health Strategy Toolkit* published in 2012 continues to respond to the growing need for specialized skills and capacities in Member States. The toolkit, which is available in five ITU official languages, is a comprehensive, practical guide for the development of a national e-health vision, action plan and monitoring and evaluation framework. At least five countries have already adopted the toolkit to develop, evaluate or update their national strategies, while many others have started to apply it for their national planning.
- In the Asia-Pacific region, *regional workshops* were organized by ITU and WHO in Manila, **Philippines**, in September 2013, Bangkok, **Thailand**, in September-October 2013, Addis Ababa, **Ethiopia**, in October 2013 and Dakar, **Senegal**, in October 2013 with a view to supporting innovation through ICT in order to improve information and accountability for women's and children's health and to develop participants' understanding of the main steps involved in developing a national e-health strategy.
- The United Nations Economic Commission for Latin America and the Caribbean (ECLAC) prepared an *e-health handbook*, in collaboration with the Spanish Society of Health Informatics, on the management and governance of e-health in Latin America. The handbook has been adopted by university training programmes on *health and medical informatics* in **Argentina**, **Brazil**, **Colombia**, **Ecuador**, **Peru** and the **Bolivarian Republic of Venezuela**. ECLAC also conducted case studies on *telemedicine* in the **Bolivarian Republic of Venezuela** and *e-health* in **Mexico**, and carried out a regional study on *regional public policy protocols on e-health*.[110]

In 2013 and 2014, governments and other stakeholders have clearly continued to work on centralization, monitoring and updating of health data. In many countries, health-information systems were established in order to facilitate access to information and to share data among government agencies and other primary care institutions. It became possible to retrieve patient data from shared health records no matter where they were located. Many projects and initiatives focus on regular electronic communications with patients, such as SMS reminders and online advice. People in rural and remote areas are able to benefit from teleconsultation facilitates thanks to broadband.

ICTs can also help people in need find donors. For example, safe blood and blood products are essential in all countries as part of a comprehensive approach to prevent maternal deaths.[111] According to reported activities, a huge effort was made to put in place unified secure systems of blood donors to supply safe blood and thereby avoid the transmission of disease. Donor registers and computerization of a country's blood banks could serve as a case study to be replicated in respect of many other issues, such as chronic kidney disease.

110 http://unctad.org/en/PublicationsLibrary/a69d65_en.pdf

111 http://www.who.int/campaigns/world-blood-donor-day/2014/event/en/

Eight Millennium Development Goals (MDGs) were agreed by world leaders at the Millennium Summit in 2000; their aim is to reduce world poverty and increase the rate of development.[112] The objective of MDG 4 is to reduce child mortality and of MDG 5 to improve maternal health. According to WHO, achieving MDG 4 will require universal provision of key effective and affordable services: care for newborns and their mothers; infant and young child feeding; vaccines; pneumonia, diarrhoea and sepsis prevention and case management; malaria control; and HIV/AIDS prevention and care.[113] According to WHO data, 6.6 million children under the age of five died in 2012, and 287 000 women died as a result of pregnancy- or childbirth-related complications in 2010.[114] Stakeholders have made significant efforts to prevent women's deaths, and ICTs and e-services have contributed dramatically to those efforts. Automated systems for patients, such as SMS reminders about appointments, examinations or vaccinations, improve the quality and efficiency of medical care. When hospitals share data, women can choose the hospital in which to give birth without depending on the hospital where they live. Some governments have introduced electronic certificates of live birth with a unique identification number attributed immediately after the child is born; this has generated unified vital statistics databases and represents a revolutionary change in data treatment/storage.

Thanks to the latest e-services, in some countries women can access pre-natal, delivery and post-natal information, and view and add information to their child's e-health record. Another issue is illiteracy among women, and programmes to raise awareness about health are therefore playing an important role. Voice calls are excellent means of reaching illiterate women in rural communities. Women in developing countries are roughly 25 times more likely to die from a pregnancy-related illness than women living in developed countries.

In **Oman**, the *Reducing Child Mortality and Protecting Mothers* programme provides quality services to patients, such as SMS reminders to parents and pregnant woman about appointments and vaccination dates for their children. The programme provides a comprehensive service for pregnant women and mothers and furnishes guidance and healthcare advice at home. It eliminates the use of manual patient files and retains the information throughout the patient's lifespan. The automated system enables patients to be examined systematically: the application of mandatory and restricted entry fields ensures that mandatory data are entered and that data, once entered, are not modified after a certain time, so that they do not lose authenticity. Patients are managed better because the system creates defaults and automatically sends SMS reminders for immunization and examination appointments. The information is shared and linked with other health programmes, such as school health and nutrition, which were previously recorded vertically. The system provides better monitoring of the child's health, because data are plotted on a digital growth chart. Mothers can now be assured they will receive quality medical care before, during and after delivery, thus reducing maternal mortality rates.

In **Rwanda,** Jembi Health Systems has launched the *Rwanda Health Enterprise Architecture* (RHEA), which aims to improve maternal health by strengthening ante-natal service provision. Clinical patient data are entered into an electronic point-of-care records system

112 http://www.who.int/pmnch/knowledge/topics/about_mdgs/en/

113 http://www.who.int/topics/millennium_development_goals/child_mortality/en/

114 http://www.who.int/maternal_child_adolescent/epidemiology/en/

(OpenMRS or RapidSMS) and stored centrally in a shared health record. The next time the woman is seen at any clinic or the district hospital, the clinicians can retrieve her data from the shared health record. The data they receive will be the same, no matter where they are located.

In **Australia**, the Department of Health and Ageing has established the *My Child's e-Health Record* mobile app*,* which lets parents add and monitor information like immunizations, height, weight and developmental milestones. Developed in Australia, this is the first smartphone application developed by the Australian Government's e-health record system. Before downloading and using the app, parents must have registered their child or children for a personally controlled e-health record. The app then allows parents to view and add information to the child development part of their child's e-health record. This includes individual information on a baby or young child's head circumference, height and weight, information and reminders about immunizations and child health checks, and observations by parents about their children's personal growth and achievements.

In **Kenya**, the Ugunja Community Resource Centre has implemented the project *Mobile Phones for Integrated Health and Early Childhood Care and Development.* The project uses CommCare, an open-source application installed on mobile phones that community health workers use to register households, counsel pregnant mothers and children, and make referrals to health facilities. The phones enable the community health workers to be effective and efficient, create greater access to content and offer quality health education. They make the community health workers accountable for data integrity. Thanks to the use of sound and images, the counselling sessions offer a deeper understanding and conceptualization of the tips provided.

In the **United States**, the National Healthy Mothers, Healthy Babies Coalition has launched *Text4baby,* which is the only free mobile information service in the United States designed to promote maternal and child health. Women who text "BABY" (or "BEBE" in Spanish) to 511411 receive three free text messages a week, timed to coincide with their due date or their baby's birthday, through pregnancy and up until the baby's first birthday. The messages address topics such as immunization, nutrition, birth defect prevention, safe sleep, and developmental milestones.

In **Uruguay,** 99 per cent of children receive their *Electronic Born-Alive Certificate* with a unique identification number right after they are born. An online application has been designed to issue electronic born-alive and death certificates, generating a vital statistics database. When the professional attending the delivery signs the certificate electronically, the system connects to the National Directorate of Civil Identification (DNIC) and sends information on the mother and child; the DNIC assigns a unique child identification number, which is shared with the Civil Registry to issue the birth certificate. The child's medical history is opened with that identification number. The improved opportunities for and quality of children's clinical records, along with safe and early universal access to a unique legal identity, have resulted in great progress towards achieving the MDGs. [115]

In **India,** the Centre for Development of Advanced Computing (C-DAC), in Hyderabad, has developed the *MOTHER* tool*,* a mobile-based system enabling the beneficiaries to receive

[115] *Project nominated for a WSIS Project Prize 2014*

vital information, in the form of voice calls, related to pregnancy, nutrition and child care. The MOTHER tool demonstrates how effective use of a simple technology can transform delivery of health services for the benefit of underserved communities. It was developed to capitalize on a key strength of mobile phones - voice calls - in rural communities, particularly among illiterate women. The main objectives are:

- to create health awareness among pregnant and nursing women by providing expert health advice through mobile-based voice call alerts;
- to involve men in pregnancy and child care, and to make them aware of pregnancy-related special needs and healthcare issues;
- to encourage women to utilize and participate actively in various government health programmes.[116]

Centralized information systems, analyses, control management and information networks are crucial for the public health sector and for health action and advocacy worldwide.[117]

In **Cuba**, the *Medical Genetics Information System* is used to centralize, monitor and update the following clinical information on the genetic make-up of Cuba's population:

a) information on genetic case histories;

b) information on genetic diseases;

c) information on congenital deformities;

d) information on mental disabilities;

e) information on physical disabilities;

f) system for remote case conferencing (teleconsultation).

Cuba has also established the *international sanitary control management system* in order to prevent and detect new and recurring exotic diseases, keep them from spreading in Cuba, and adopt appropriate mechanisms for providing feedback to the various levels of the national public health system. The system comprises two major subsystems:

- environmental health, for the management of information related to hygiene standards for imported food (international sanitary control with the internal chain of ports);
- epidemiology, for the management of Cuba's epidemiological information, focusing initially on passenger epidemiological surveillance and control of dengue patients and also international sanitary control of aircraft arriving from abroad.

Also in **Cuba**, *INFOMED* was the first and largest Cuban medical information network It emerged from a project undertaken by the National Centre for Medical Science Information (CNICM) to facilitate the electronic exchange of information in a community consisting of the libraries, information centres and other departments constituting the National System of Medical Science Information (SNICM), which is attached to the Ministry of Public Health. The associated plans include enhancing the quality of sources, services and information products, ensuring universal access for healthcare personnel and the public at large, developing permanent functions for medical teaching and research, continuously improving

116 *Project nominated for a WSIS Project Prize 2014*

117 https://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-C7_E-Health.Summary.pdf

the technical, logistic and organizational infrastructure to ensure its efficient and secure use, and enhancing the network's interaction with other national and international networks. INFOMED represents an important experience in the design of a national strategy to improve medical information services nationally, aimed at consolidating an information and knowledge system based on a network of institutions and individuals that participate in its construction.

Still in **Cuba,** the *Public Health Information System (SiSalud)* was developed as part of the Ministry of Public Health's computerization strategy. This comprehensive solution is designed to create a single platform for the administration, processing and transmission of information within the national public health system. It is used to manage information for decision-making across the country at all levels. The associated programme operates a nationwide network and equipment infrastructure.

In the **United States**, Vecna has created *CliniPAK 360*, a simplified electronic medical record system that connects community, clinic and tertiary care with longitudinal patient records, case reviews and referrals, reporting and adherence tracking.

In **Turkey**, the Health Information Head Office has launched its *e-health policy*. The Turkish Health Information System is implemented using ICTs. In this context, the Ministry of Health has carried out an *e-health project* to collect and record the data it has compiled in accordance with international standards, and then to convert the data into usable information that is shared with relevant institutions. The aim of the e-health project is to evaluate the level of access to health services, calculate the cost of health services, calculate costs in the light of health service productivity, enable clinical research, trace prints from services, and provide good quality and productive service results.

Also in **Turkey,** the Presidency of Religious Affairs has introduced the *Electronic Health Records for the Hajj,* which use a proactive approach to reduce health problems and healthcare costs.

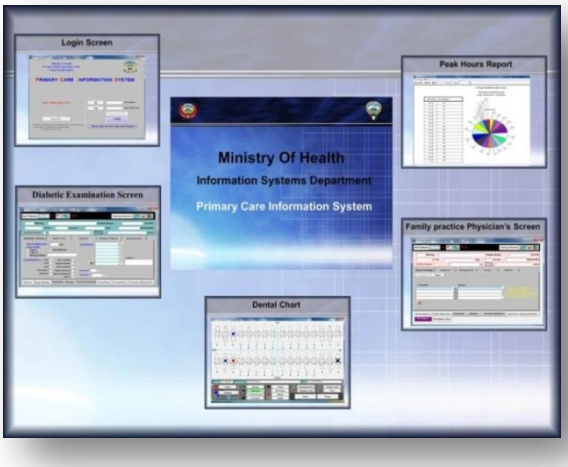
Again in **Turkey**, the Ministry of Family and Social Policy has implemented the *Integrated Social Assistance Services Information System Project*. When this project is finalized, the following services will be provided:

- there will be effective coordination between social assistance institutions, and all operations related to social assistance will be managed using one single system;
- a “Poverty Map” will be produced depicting the distribution of social aid and benefits;
- a more reliable database will be compiled about the beneficiaries of social assistance;
- there will be no repeat recipients of social aid and benefits;
- a household-based approach will be developed for delivering social assistance services, thanks to which normally inaccessible needy people will be reached, families in need will be monitored more closely and needs will be met more promptly.

In **Oman**, the *e-referral system* is a national health system connecting more than 100 public and private healthcare institutions across the country, arranging inter-institutional appointments for inpatient/ambulatory services, laboratory, radiology and other procedures, promoting transparent information and process flows, allowing clinicians to

communicate quickly and without "middlemen", avoiding redundant data entry, and facilitating patient tracking, results sharing and consultation, as well as clinical research. The e-referral system notifies and reminds patients about appointments and allows them to reschedule appointments by SMS/e-mail.

In **Argentina,** the Iberoamerican Foundation of Telemedicine (FIT) is dedicated to the research, development and application of new ICTs in health for the benefit of society. Having regard to primary healthcare processes in Argentina, FIT has developed *Acuario Salud*, a form of digital medical records software, to centralize patient information in a single medical record and provide citizens with better quality healthcare. Acuario Salud is a web application that contains all the information needed for administrative and legal medical management. It avoids concentrations of patients in health centres, provides statistics and epidemiological alerts in real time for preventive purposes, and is flexible and simple to use. The Acuario Salud software is intended for public and private medicine; it can be accessed anytime, anywhere and with complete confidentiality. It leads to better quality and monitoring of patient care, generates immediate savings in health costs and helps protect the environment thanks to the paperless process.



In **Kuwait,** the *Primary Care Information System* has achieved the goal of having a single electronic patient medical record giving every primary healthcare provider access to complete and accurate patient health information. Its successful implementation in all 95 clinics in Kuwait has enhanced clinical research and decision-support systems, thereby helping researchers and policy-makers. The results are improved quality of patient care, enhanced productivity and clinical outcomes, and reduced administrative costs. Overcoming resistance from computer illiterates was a huge challenge. The patient electronic health record is made available to hospitals and tertiary health centres, and will subsequently be accessible via portals and smart devices.[118]

[118] *Project nominated for a WSIS Project Prize 2014*

In **Bulgaria,** the National Insurance Fund (NIF) receives both medical and personal information about patients as a prerequisite for the payment of all the work done by its partners. It has a project to *develop and expand the personalized information system.* The project's aims are to integrate and extend, methodically and gradually, the capabilities of the existing integration information system (IIS), to make online services more accessible, and to report fully on all contractual partners. Its full implementation will provide an opportunity to carry out more online administrative and health services in the health sector, to provide access to patient information, to improve internal connections between the different levels of the system and to enhance the quality of medical services.

In **Saudi Arabia**, the government has implemented the patient referral programme *Ehalati*. The programme allows patient transfer requests to be submitted electronically and approved by the Ministry of Health. It covers hospitals and private hospitals throughout the Kingdom in 13 main regions and all their cities and villages. It encompasses all referral cases (life-threatening, emergency, inpatient or outpatient) and provides a means of facilitating communication between the parties concerned. The system provides Ministry of Health management with dashboards, key performance indicators (KPIs) and statistical reports for the purposes of decision-making, capacity planning and process improvement.

Also in **Saudi Arabia**, the *Online Toxicology Analysis Requests and Results* (OTARR) system automates all services provided by the Kingdom's Poison Control and Forensic Chemistry Centres, including installation, configuration and integration with the laboratories information management system (LIMS). In addition, the system works with call centres and interactive voice response (IVR) systems, and provides staff with access to medical libraries related to toxicology. The project is both an e-health and an e-government project, since multiple government and semi-government agencies send requests to and check results through this integrated system (e.g. Ministry of Interior – for traffic control, police, narcotics control, prison service; Ministry of Finance, Ministry of Civil Services, Ministry of Justice, General Prosecution and Investigation Department, Industrial Safety Sector, Saudi Airlines, etc.).[119]

Centralized registers of health data lead to effective data management and distribution, thereby enhancing patient and donor care and safety.

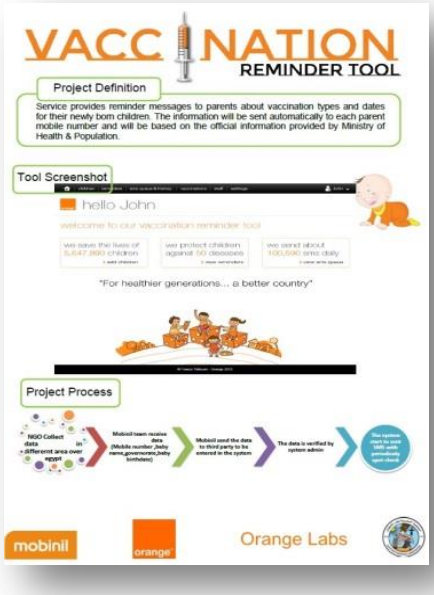
In **Cuba,** the *National Blood Programme*, part of the free Cuban health service, was at the origin of the requirement for a register of donors and computerization of the country's blood banks, with a view to ensuring a supply of safe blood and thereby avoiding the transmission of disease. The results include resource savings and immediate identification of the blood distributed to the country's various hospitals and industries. The project involves establishing a centralized register of donors for effective management of both donors and

[119] *Project nominated for a WSIS Project Prize 2014*

the distribution of blood and blood components, as well as the introduction of the Galen blood bank system in all blood banks. The system is directly linked to the central register module, enabling automated exchanges of information between blood banks, based on local management at each bank. Current work includes stepping up the replication of blood banks within the central register of donors in the INFOMED medical network**.**

Also in **Cuba,** the *Nephrology Network* manages nephrology services, initially focusing on chronic cases of kidney disease within the dialysis and transplant programme and the design of a donor/recipient compatibility process in the various areas of the national nephrology service. It also facilitates management of transplants, using real-time identification of compatibility of deceased donors with the characteristics required by a given recipient. Other benefits include enabling the nephrologists in the national nephrology service to monitor chronic cases efficiently, through simple management of all the information on the patient concerned. The network also supports management of the status of all the nephrology services in Cuba and of information on the studies to be carried out on transplant recipients and donors (in the case of living donors).

In **Bangladesh**, maternal deaths can be reduced if pregnant mothers know their blood type and can find blood donors immediately. Over 70 per cent of female villagers in Bangladesh do not know their blood type. Storing blood is a challenge because of the lack of storage facilities, but it is possible to store donor contact details. This "virtual blood bank" can be accessed at any time by phone or the Internet to find the nearest donor. During the pilot phase, 22 organizations were reached and 3 500 records entered. It is hoped that 20 000 people will be reached in 2014 by collaborating with organizations in Bangladesh and abroad using the proposed business model.[120]



Healthcare becomes more inclusive when patients can receive text messages from their doctors on their mobile devices. Patient reminders, notifications and alerts improve patient follow-up.

In the **United States**, Dimagi Inc. has launched a study of new HIV drugs and ways to help people remember to take their HIV medication. The project utilizes Dimagi's SMS platform, CommConnect, to send *SMS reminders* to patients and to *collect call feedback* in reports.

In **Egypt**, Mobinil, the Egyptian Company for Mobile Services, has developed the *Vaccination Reminder Tool,* a simple SMS-based application that sends reminders to registered parents' mobile numbers about upcoming vaccinations. It ensures that the official information is well delivered.

120 *Project nominated for a WSIS Project Prize 2014*

Also in **Egypt**, the Wireless Intelligent Networks Centre (WINC) of the School of Communications and Information Technology, Nile University, has established a cost-effective, cellphone-based *Patient Monitoring and Advice System* - CellChek. A novel concept of "cost-effective" mobile healthcare has been introduced, and a system prototype for remote patient monitoring and advice has been developed using widely available, affordable mobile phones. This system targets underserved communities around the world in places where healthcare services are either too costly or not immediately available. The CellChek system leverages the multiple wireless interfaces/services available today on most mobile phones (e.g. WiFi, 3G, SMS, MMS, Bluetooth). It utilizes Bluetooth-enabled medical devices and a novel wireless interface selection algorithm to upload patient data at minimum financial cost.[121]

Capacity building in healthcare is crucial, and health personnel need to be properly trained to use ICTs and various e-applications in order to achieve positive results.

The **United States** company Dimagi Inc. developed *CommCare* to deliver better community health to millions throughout **India**. Dimagi is currently deploying mobile solutions to over 50 development organizations in the country. CommCare is an innovative health platform for community health workers that tracks and supports clients. It is the most widely adopted, technically advanced and evidence-based mobile platform in its field. To date, six of the organizations have scaled up their activities to over 600 community health workers serving over 42 000 beneficiaries.

Without connectivity, the use of ICT applications is impossible. In order to increase health system efficiency, hospitals, health centres and rural areas have to be connected. In **Nigeria**, for example, a *connectivity project* was implemented that:

- provided Internet, voice, data and videoconferencing facilities to the National Primary Health Care Development Agency (NPHCDA) head office, 40 general hospitals, six zonal offices and one strategic cold store;
- provided Internet and voice services to 160 primary health centres;
- provided portacabins with an Internet connection and desktops to zonal offices in places such as Benin, Kano, Ibadan, Enugu, Bauchi and Minna;
- connected all 208 locations via virtual private network (VPN);
- trained a staff member at each location, on customer premises, to use the equipment deployed, and provided portal and first-level support staff for the six zonal offices for three months each.

Turkey is committed to transforming Istanbul into the *Capital of Health Tourism.* It aims to be a regional centre for health tourism and to improve its competitive position in the health tourism sector. The project's mission is to help connect patients to the best medical choices and the most affordable care, and to help ease the uncertainties and stress related to their medical procedures.

[121] *Project nominated for a WSIS Project Prize 2014*

C7.4 E-employment

Despite a moderate pick-up in output growth expected for 2013–2014, the unemployment rate was set to increase again: the number of unemployed worldwide was projected to rise by 5.1 million in 2013 to more than 202 million, and by another 3 million in 2014. A quarter of the increase of 4 million in global unemployment recorded in 2012 was in the advanced economies, and three quarters in other regions, with marked effects in East Asia, South Asia and sub-Saharan Africa.[122] In order to address this challenge, various stakeholders continue to work on national e-employment policies and programmes in order to provide an instrument for self-employment and new opportunities through the use of ICTs.

In line with the Geneva Plan of Action, e-employment applications are being developed in order to raise productivity, growth and well-being through investment in ICTs and human resources. One of the most important factors is cost optimization.[123] Teleworking is becoming an efficient tool for empowering citizens, particularly women and persons with disabilities, to enter the workforce. Particular attention is needed to address youth unemployment and provide young people with better employment opportunities. Countries are promoting early intervention programmes such as internships and training courses for young people. According to the International Telecommunication Union (ITU) report, *Digital Opportunities: Innovative ICT solutions for youth employment* published in 2014, young people with mid-level digital skills can earn wages through offshore services, such as information technology outsourcing (ITO) and business process outsourcing (BPO), crowdsourcing and microwork (task-oriented work opportunities for data entry, coding, tagging and other text-based tasks).[124] ITU has created a new *Youth Employment and Entrepreneurship Resources Database* to help young people find and exploit these digital opportunities.[125]

In **Japan**, *telework* is expected to improve business efficiency while maintaining a healthy balance between work and personal life, for example by facilitating the use of home offices, using ICTs. It is also expected to contribute to resolving various social issues, such as gender-equality in society, the declining birth rate and ageing population, and the environmental burden. It is moreover anticipated that telework will contribute to the creation of business continuity plans (BCPs) and to electricity saving in the event of a large-scale disaster or pandemic.

In June 2013, the Government of **Japan** approved the *Declaration to be the World's Most Advanced IT Nation* (June 2013 Cabinet decision and IT Strategic Headquarters decision), and in this context is promoting and publicizing *telework*. The Ministry of Internal Affairs and Communications (MIC) plans to provide private companies nationwide with human-resources support for the introduction and operation of telework, by establishing sound pilot models and thereby encouraging the fully-fledged spread of telework.

---

122 ILO: *Global Employment Trends 2013,* http://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_202320/lang--en/index.htm

123 Geneva Plan of Action, § 19*b)*

124 ITU: *Digital Opportunities: Innovative ICT solutions for youth employment,* 2014

125 http://itu4u.wordpress.com/2014/05/15/innovative-ict-solutions-for-youth-employment/#respon

In **Saudi Arabia**, the Ministry of Higher Education implemented the *Safeer Graduates* initiative. The King Abdullah Scholarship Programme (KASP) has been effectively putting into practice the King's vision of transforming the country into a knowledge society by 2020, by providing unique opportunities for Saudi citizens to pursue academic and vocational training at the world's best universities. While many beneficiaries of the programme are already employed, many more have opted to focus on advancing their education before searching for a career. Safeer Graduates provides a "one-stop shop" for all KASP students wishing to connect with employers even before returning home. The programme is not only a job-search facilitator, but a platform for the KASP community, enabling participants to connect socially and exchange knowledge and opportunities. It offers equal participation opportunities for men and women, with special emphasis on helping citizens with special needs.

The Saudi Ministry of Labour, for its part, launched the *Nitaqat* project in **Saudi Arabia**, as an innovative policy supported by major ICT investment and e-tools. It addresses the issue of the growth of expatriate labour by encouraging employers to hire Saudi nationals in the private sector. Nitaqat was able to respond rapidly and effectively to the nation's unemployment problem, leveraging electronic services to maximize transparency, efficiency and effectiveness.[126]

Another project in **Saudi Arabia** was put in place by TVTC, a Saudi training corporation with about 260 colleges, institutes and training centres, which has set up the *Staff Gate* programme. The main objective of the project is to shorten administrative procedures and allow monitoring of the status of applications from employees and trainers, without affecting the flow of approvals and authorizations. Staff Gate is the main communication channel between all TVTC employees (about 13 000 administrative employees and trainers) and the administrative departments wherever they are.[127]

In **Nigeria**, the National Universities Commission (NUC) as part of its mandate ensures the orderly development of university education in Nigeria and aims to produce globally competitive graduates for the labour market. One of the NUC's goals is to match university graduate output with national manpower needs, and it is with that in mind that the commission instituted the *Labour Market Observatory* (LMO) project to generate data and information for the formulation and implementation of plans and policies at all levels of government, leading to the establishment of the LMO and the *Labour Market Information System* (LMIS).The objectives of the LMO project are:

- To regularly collect, process, store, analyse, use, share and disseminate labour-market data and information among stakeholders in the Nigerian economy
- To guide national policy and programme development on labour-market issues, e.g. national decisions on higher education programmes
- To match university graduate output with national manpower needs (one of NUC's goals)
- To create among stakeholders an awareness of LMIS and its benefits, and of the need for a coordinated Nigerian national labour-market information system
- To identify labour-market information needs of stakeholders.

126 *Project nominated for a WSIS Project Prize 2014*

127 *Project nominated for a WSIS Project Prize 2014*

In **India**, the Network for Information and Computer Technology (NICT) launched the NICT Project *Samman*, the purpose of which is to empower women through ICT. In Madhya Pradesh and Chhattisgarh provinces, NICT has around 1 600 customer service points/common service centres working under the government's Department of Electronics. These centres are in rural areas, and form part of the *National e-Governance Plan* (NeGP) network implemented through a public-private partnership. Some 172 of the 1 600 centres are managed by women entrepreneurs with ICT training. These social IT entrepreneurs are catalysing socio-economic growth at the grassroots level by providing services in various fields, including financial inclusion, microbanking, microinsurance, government services, domicile/birth certificates, utility bill payments and revenue services, electricity bill payments, old age pensions, maternity, and so on.[128]

In **Argentina**, the *Programa de promocion del empleo en teletrabajo* (PROPET) was created in order to promote the implementation of teleworking in companies, ensuring social inclusion for all, especially those whose rights have been violated. The aim of the programme is to offer a solution to the absence of specific legislation and ensure the legal certainty and stability that companies require, through constant and careful monitoring of the teleworker. The programme is based on the creation and application of economic incentives to promote labour-market integration, especially for vulnerable groups.

In **Uruguay**, the National Directorate of Employment (DINAE) and the Ministry of Labour and Social Security (MTSS) introduced *Vía Trabajo*, an IT system for the management of active employment policies. Vía Trabajo is a management platform for public employment services. It facilitates management of different services related to labour and professional training offered to the community, and monitoring of those services by the participating institutions. Workers as well as companies can register in order to match employment supply and demand. It also includes the management of other services aimed at increasing employability (such as employment counselling workshops, training courses, and access to information about training institutions). Vía Trabajo is operated by the Public Employment Network, which is responsible both for meeting employers' requirements and protecting the interests of jobseekers. Another characteristic of Vía Trabajo is that it allows companies and workers to be self-managing on the basis of their own interests.[129]

In **Oman,** the Ministry of Civil Service (MoCS) is responsible for recruiting national jobseekers for government entities. The proposed *National Recruitment System* is an SMS-based system which exploits the country's high mobile penetration rate (above 170 per cent) and is linked to national manpower records. Jobseekers can apply for vacant positions, receive confirmations for exams and make interview appointments. The system has an interview records module, a random examination module as well as data validation and records, which have improved efficiency, accuracy and transparency. With 62 274 current subscribers, the system reduces applicants' travel costs and waiting times. The estimated saving for the government is USD 3 million annually, excluding SMS revenue.[130]

---

128 *Project nominated for a WSIS Project Prize 2014*

129 *Project nominated for a WSIS Project Prize 2014*

130 *Project nominated for a WSIS Project Prize 2014*

In **Egypt,** the Information and Communications Technology Trust Fund (ICT-TF) launched the *Youth Employment Generation Programme*. This programme responds to the urgent need to address the prevailing youth unemployment figures in Egypt. As business leaders express concerns that young people often lack the skills required by different industries operating in Egypt, the programme promotes empowerment based on three main pillars: the MSME (micro, small and medium-sized enterprise) component, which aims to improve the competitiveness and profitability of local MSMEs; the social entrepreneurship component, which seeks to inspire young people to become successful business leaders; and the vocational training and internship component, which focuses on setting up mechanisms to connect private companies with young people wishing to join the job market.[131]

C7.5 E-learning

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is the lead facilitator for Action Line C7: ICT applications (E-learning), and has conducted a number of activities in collaboration with other stakeholders during the period 2013-2014.

The *Virtual Institute for Higher Education in Africa* (VIHEAF) is a collaborative project between the UNESCO Harare Cluster Office in **Zimbabwe** and the National Universities Commission (NUC). It is an online (Internet-based) institute that targets basic and higher education teachers in **sub-Saharan Africa**, to train them on several components of dire needs like HIV/AIDS education, modern methods of teaching and learning (pedagogy), modern research skills for higher education teachers, entrepreneurial education, writing grant award proposals, and development of materials for open and distance learning. VIHEAF is a free online training programme that runs in modules.

The International Commonwealth of Learning (COL) has introduced *Aptus: Classroom without Walls*. Aptus is a device set that allows educators and learners to connect to digital learning platforms and content without the need for grid electricity or Internet access. It is mobile, lightweight and packs into a small box, but carries massive potential. The small set-up can host up to 32 GB of educational content and facilitate interactive, virtual learning anywhere – whether in a remote rural village or a university campus. This kind of "classroom without walls" can be set up within minutes and accessed by any learner with a laptop, tablet or mobile device.

In **Cuba,** several stakeholders contributed to the development of e-learning tools:

- The *New university management system* (SIGENU) project was implemented in 2004 for the integrated development of basic process automation in higher education, aimed at raising the quality of university management. It comprises individual modules which are developed, commissioned and implemented by multidisciplinary groups of specialists from various universities. It includes systematic training of personnel involved in university processes and of senior managers. The project has enabled complete digitization of enrolment, recording of academic results, salaries, student-related organizational information and other processes. It provides decision-support information in the area of development policy to various national and local authorities, and even to other organizations.

[131] *Project nominated for a WSIS Project Prize 2014*

- *Virtual laboratories* were created to serve as education platforms in every university. There are currently over 200 virtual laboratories, which support interactive simulations and virtual modelling of various processes and items of equipment. The laboratories are mainly used for courses such as technical science, psychology, chemistry and biology.
- The "*My Moodle Course"* programme was developed to support courses in the various disciplines, while also providing a platform for interacting, publicizing, assessing and enabling lecturers to monitor the performance of students and customize their approach.

In **Saudi Arabia**, the Ministry of Education (MoE) launched *Leqa'a*, which provides *videoconference service*s. Leqa'a is used mainly for meetings, training, video streaming, recording and the annual ministerial meeting. Users are able to use the current meeting rooms and to join the meeting from their PC, laptop or smartphone, inside or outside the network.[132]

Likewise in **Saudi Arabia**, the Human Resources Development Fund introduced the *National e-Training* programme, which offers an easy-to-use learning and content-management platform made available according to a pre-set schedule. The platform currently provides 46 training modules to an average of 100 000 users per week. [133]

The *Nigerian University System Management Portal* (NUSMAP) is an online application, designed for use by universities in **Nigeria** to process, share and communicate data on enrolment statistics, graduate output, academic programmes, physical facilities, geographic information systems (GIS), budgets, expenditure, staff, student information, research and innovation with the National Universities Commission (NUC), the public and other government agencies, for the purpose of proper planning and management. It captures the activities of all NUC directorates, which include university programme accreditation, university academic standards, university system annual review meeting (USARM), university research and innovation, finance and budget.

In the **United Arab Emirates**, ICTs are increasingly used in the national programmes to improve the education system and the management of education:

- The *Smart Learning* programme is a key element in achieving the UAE Vision 2021, which seeks to ensure that all Emiratis have equal opportunity and access to first-rate education enabling them to develop into well-rounded individuals, enhance their educational attainment and achieve their true potential.
- The *Social Online Learning* (SOL) initiative encapsulates the crucial role of Hamdan Bin Mohammed Smart University (HBMeU) in shaping the future of education and learning through creativity and innovation, while significantly contributing to sustainable social and human development in the region and around the world. This initiative promotes world-class contemporary learning for UAE-based learners of different nationalities and age groups, by offering a convenient learning environment characterized by diversity and quality. SOL provides learners with an innovative social online learning experience

132 *Project nominated for a WSIS Project Prize 2014*

133 *Project nominated for a WSIS Project Prize 2014*

through interactive communication that provides all the necessary support and academic guidance.

- The *e-Citizen* programme is a strategic initiative adopted by the Government of Abu Dhabi that aims to bridge the digital divide in society and to enable the target segment - persons lacking basic skills to use the Internet and e-services on a daily basis - to obtain information, products and services, as well as supporting e-learning. The government proposed this programme in order to achieve common goals in terms of enhancing skills levels in respect of use of the computer and the Internet in the Emirate of Abu Dhabi.[134]

In **Oman**, the Ministry of Education (MoE) established the *Sultanate of Oman Educational Portal*, which aims to gather users - administrators, teachers, parents and students - in one place. It functions as a communication tool between users through learning applications, discussion platforms, social media, SMS services, archiving, finance models and other facilities. It provides transparency, accuracy, speed and availability and reduces costs. Currently, there are 14 046 teachers, 1 052 administrators and 180 991 students in 300 schools as well as 111 892 parents using the system to carry out daily transactions. The future plan is to connect every single school and user in the country.

The *Network for Schools in Europe*, called eTwinning, offers a platform for staff (teachers, head teachers, librarians, etc.) working in a school in one of the European countries to communicate, collaborate, develop projects, share and be part of a learning community in **Europe**. Available in twenty-five languages, the eTwinning portal has reached nearly 220 000 members and given rise to over 30 139 projects between two or more schools across Europe. The portal provides online tools for teachers to find partners, set up projects, share ideas, exchange best practices and start working together immediately, using various customized tools available on the eTwinning platform. Launched in 2005 as the main action of the European Commission's *eLearning* programme, eTwinning has been integrated in the *Lifelong Learning Programme* since 2007. Its Central Support Service is operated by European Schoolnet, an international partnership of 33 European ministries of education developing learning for schools, teachers and pupils across Europe.

In **Azerbaijan**, *the e-Education* system contributes to the development and modernization of the Azerbaijani education system. It introduces and enhances the use of information technology in the process of school administration as well as in teaching/learning in pre-university education.

In **India**, Cognizant Technology Solutions launched the *Perceptual Examination Platform for Differently Abled Aspirants* (EXAM). Around 3 per cent of the world population is disabled and faces challenges in different spheres of life. E-learning helps people to enrich their knowledge through various sources that are available online. Exams/quizzes are still the main means of evaluating the knowledge gained from following a course. Marks/grades obtained in a course help people to move to the next level, which might either be the next standard in school, obtaining a degree/certificate or even getting a job. EXAM is a unique solution that empowers physically challenged people to attend exams in a foolproof environment, at their leisure and without anyone's help.[135]

---

134 *Project nominated for a WSIS Project Prize 2014*

135 *Project nominated for a WSIS Project Prize 2014*

In **Uruguay**, *Scratch MOOC 4 Teens* (SM4T) is a pioneering joint initiative launched by Universidad ORT Uruguay and Plan Ceibal (Uruguay's one laptop per child - and per teacher for public schools and high schools in the country - programme) to provide *massive open online courses* (MOOCs), especially designed for teenager high school students. The project aims at promoting the development of procedural thinking and problem-solving skills through learning the basics of computer programming, and later at building applications (videogames) using the Scratch tool, a programming language designed for young people developed by MIT's Media Lab.[136]

In **Kuwait**, The Office of Engineering Education Technologies (OEET) took the initiative of creating an *Online Class System* (OCS). OEET started small, with an open-source Moodle virtual learning environment, and very slowly started to add new courses every semester and to build a case study to show other instructors how using ICT in education has a positive impact. It had a clear strategy to extend the reach of ICTs to all instructors by conducting awareness workshops and an annual competition to attract more instructors to get involved in using OCS. Instructors started using tools and features in OCS that facilitate peer interaction and synchronous and asynchronous communication.[137]

Innovative Collaboration for Development is a nine-week interactive tutor-facilitated e-learning course on social media and web 2.0 tools. The course was jointly developed by the United Nations Institute for Training and Research (UNITAR) and the Food and Agriculture Organization of the United Nations (FAO). It aims to empower professionals to recognize the potential of social media and web 2.0 tools in changing the way that information is created, organized, shared and accessed, as well as to make innovative use of these tools to improve the efficiency and effectiveness of their work. Participants also learn about online security, privacy and intellectual property rights while using social media applications.[138]

C7.6 E-agriculture

This subchapter covers activities related to e-agriculture, which is the sector that involves the use of ICTs to improve agriculture, animal husbandry, fisheries, forestry and food security by providing ready access to comprehensive, up-to-date and detailed knowledge and information, particularly in rural areas.[139]

Food security has become a key issue in recent years. During the period 2011-2013, an estimated 842 million people, or around one in eight people worldwide, suffered from chronic hunger, regularly not getting enough food to live an active life.[140] ICT applications on e-agriculture could play a huge role in combating hunger and malnutrition and reducing food waste and losses.

Each country has its own specifications depending on its geography, climate and economic situation. In some cases, one or several products could lead to a dramatic rise in a country's gross domestic product (GDP). Policies aimed at enhancing agricultural productivity and

136 *Project nominated for a WSIS Project Prize 2014*

137 *Project nominated for a WSIS Project Prize 2014*

138 *Project nominated for a WSIS Project Prize 2014*

139 Geneva Plan of Action, § 21a)

140 *The State of Food Insecurity in the World 2013*. Available at: http://www.fao.org/publications/sofi/en/

increasing food availability, especially when smallholders are targeted, can reduce hunger even where poverty is widespread.[141]

Governments and other stakeholders have introduced capacity-building programmes, monitoring tools, warning systems, databases, inventories, maps and geographical information systems to help farmers and the rural population be more efficient and reduce food waste and agricultural losses. ICT know-how has been developed using toolkits, case studies, platforms, information sharing and databases. Information systems can be used to check the quality of products.

In the framework of WSIS, the Food and Agriculture Organization of the United Nations (FAO) was assigned the responsibility of organizing activities related to e-agriculture and continues to play the role of lead facilitator for Action Line C7: ICT applications (E-agriculture). The paragraphs below describe projects implemented by FAO, the International Telecommunication Union (ITU) and other stakeholders in order to enhance access to ICTs in the agricultural sector.

Activities relating to the e-agriculture component of Action Line C7 are underpinned by the global *e-Agriculture Community*. Conceived in 2006 and established in 2007 by a multistakeholder group of organizations that believe in the critical role of ICT in agricultural development, the e-Agriculture Community, which is facilitated by FAO, acts as a catalyst for networking and sharing knowledge about the role of ICTs in sustainable agriculture and rural development. In April 2014, it had over 13 300 registered members from 170 countries who had shared over 700 information resources and 2 800 news items and events, as well as expressing their viewpoints on blogs. Over 50 000 participants have made some 3 400 discussion posts on 18 online forums on topics identified as important by the community, producing trilingual policy briefs for each forum. Online activities, which reach tens of thousands of individuals every year, are supplemented with face-to-face events. Partnerships and collaborative efforts have emerged from both the private sector and development organizations.

In 2013, the e-Agriculture Community continued to examine the critical role ICTs can play in communicating knowledge and information that is essential to agricultural development and food security. Content, its availability and accessibility, in the form of both public goods and value-added services, has been identified as a critical issue facing certain challenges. Public-sector policy needs to bridge ICT and agriculture, bringing both topics to the forefront of this fast-moving area of commerce and development. The role of mobile technology, which displays the fastest growth rate of any ICT in the developing world, and the ability to reach people in rural areas, remains a priority among the community's technical interests.

The year's highlights include the *ICT4Ag Conference* in Rwanda, *online discussions* around ICTs that enable rural financial services and ICT and agriculture strategies, and preparations for the *WSIS+10 review*. In addition, more knowledge was shared as a result of collaboration with the Technical Centre for Agricultural and Rural Cooperation (CTA) on the *ICT Update*, the Fostering Agriculture Competitiveness Employing Information Communication Technologies (FACET) project of the United States Agency for International Development (USAID), and Mercy Corps.

[141] Ibid.

Digital communication activities allow the e-Agriculture Community to reach tens of thousands of individuals annually, a level of participation that would not otherwise be achieved. Partnerships with international, regional and national institutions are critical to the community's continuing success. Organizations and individuals offer their time and knowledge to support the community because of the value that results.

The e-Agriculture Community will focus on expanding its mechanisms for knowledge sharing around lessons learned through in-country activities, in particular as they relate to the key topics identified. These lessons will be drawn from the activities of e-Agriculture Community members, encompassing national and regional action on information exchange and communication, from which successful elements will be expanded and scaled up. The mechanisms will foster the capture and sharing of lessons through the e-Agriculture Community's online platform, and through other major participating institutions in support of capacity development. The community has begun to look specifically at the post-2015 scenario through various channels.

In **Kenya**, **Uganda** and **Tanzania**, FAO's *Rural Knowledge Network* (RKN) pilot project for East Africa has supported the emergence of commercially viable market-access services for building effective and efficient rural marketing chains for the benefit of all. The RKN helps smallholder farmers access market intelligence and linkages with key value-chain players. It was developed using a people-centered knowledge-management process that is built on an understanding of farmers' needs. It comprises a range of entrepreneurs, including information board managers operating a frontline market-intelligence service at producer level; market-access companies operating a local market-brokering service at district level; and national marketing companies and their regional managers. An associated initiative, the *First Mile,* has been conducting rental trials to test the affordability, usefulness and appropriateness in rural areas of solid-state laptops that use a SIM-card enabled modem to access the Internet. The pilot project ran from 2007 to 2010, and the programme's most well-established and active offspring is *AgriNet Uganda* (www.agrinetug.net).

The *SIS semences* project was established in line with the **Côte d'Ivoire** government's national strategy for the production of rice focusing on quality seed. FAO, the *Fonds interprofessionel de la recherche et de conseil agricoles* (FIRCA), the *Agence nationale d'appui au développement rural* (ANADER) and the *Association nationale des semenciers de Côte d'Ivoire* (ANASEMCI) have agreed to put in place a low-cost system for the production and commercialization of quality seeds. FAO has provided the know-how and trained local staff from different institutions to handle and manage the information system. The system uses mobile technology, in particular smartphones, to report on the quality of seed production and to facilitate access to markets. The project is ongoing.

In **Bangladesh,** FAO launched a project in 2008 on *ICTs for avian influenza active surveillance* using the SMS Gateway system. Through the system, information on high poultry mortality (i.e. highly pathogenic avian influenza – HPAI) is transmitted daily by community animal health workers in the field and received by the central server. Suspicious information is followed up for further investigation, including sampling and dispatch for laboratory testing. All information is classified and stored in the database. Thanks to this system, more than 86 per cent (2011) of outbreaks were reported by active surveillance using SMS Gateway ahead of the passive surveillance system. Time between detection and response was reduced from

4.5 to 1.5 days, and fewer man-hours were spent entering data at *upazila* (subdistrict) and central level. The project ended in 2013, but the concept has been incorporated into the HPAI programme in **Indonesia** and sparked interest in other countries (e.g. **Egypt**). It has also been rolled out in **Lao P.D.R**.

Member States of the South Asian Association for Regional Cooperation (SAARC) are engaged in a regional cooperation programme for **South Asia** on transboundary animal diseases with a high socio-economic impact. They share information, e.g. immediate notifications, surveillance results, etc., on transboundary and other high-impact animal diseases occurring in the SAARC region, via a weekly electronic newsletter published with the support of FAO (www.saarc-rsu-hped.org).

With the *iMarine initiative*, FAO helps communities gain access to virtual research environments that rely on a well-managed and regularly updated set of software resources and enable collaborative scientific work. Users can thus focus on their own workflows rather than on maintaining and developing the software environment. Examples are generation of species distribution maps, harmonization of statistical datasets, semantic fact sheets, and discovery and processing of geospatial data (www.i-marine.eu).

AppliFish was developed as part of the iMarine initiative. AppliFish is a free application containing fact sheets on 550 species and 7 000 species names in 25 languages. It was developed to disseminate the information contained in existing FAO fact sheets and in various other global sources of species information in a new format. It contains a database that functions with or without an Internet connection.

The *National Aquaculture Sector Overview* (NASO) collection of Google maps shows the location of aquaculture sites and their characteristics at the administrative (country, province, district, etc.) and in some cases even individual farm level, depending on the degree of aquaculture development, the resources available to complete the data-collection form and the level of clearance provided by the country's experts. The NASO map collection aims to assist FAO Member States to inventory and monitor aquaculture. The programme started in 2011 and is ongoing.

The *Aquaculture Information Management System* (AIMS) in **Thailand** (FAO) uses ICTs to improve operational decision-making on aquaculture management and development and enhance aquaculture planning and policy capabilities.

The *Domestic Animal Diversity Network* (DAD-Net) is a global programme managed by the Animal Production and Health Division of FAO and supporting the implementation of the Global Plan of Action for Animal Genetic Resources. The purpose of DAD-Net is to provide an informal forum for the discussion of issues relevant to the management of animal genetic resources. Users are encouraged to post messages on characterization, conservation, utilization, breeding, data and information management, training and education, emergency planning and response, research and technology transfer, and any other subject relevant to animal genetic resources management. Messages can be posted in English, French or Spanish. FAO acts as the moderator and periodically contributes information. The programme was launched in 2007 and currently has more than 2 350 participants.

The FAO *disaster preparedness project* for the **Dominican Republic, Haiti** and **Jamaica** was launched in 2011 and completed in April 2013. The FAO Communication for Development

team supported the project by designing and implementing communication strategies and local information and communication plans (ICP) for community-based agriculture disaster risk management (ADRM). ICPs were implemented to support, *inter alia,* participatory livelihood assessments and awareness raising, community-based early-warning systems for fishing communities, and documentation and sharing of ADRM practices. The whole process was documented in short videos and a photo series. Good practices were also recorded in video and community photo albums to be used to share experiences between farmers and fishermen. The main objective of the ICP activities is to support the design and implementation of community ADRM plans documenting location-specific good practices and technologies, and to facilitate local planning and knowledge sharing at the community level. The Dominican Republic in particular had a fruitful experience applying new ICTs to improve community-based early warning and to enhance knowledge exchange: SMS sent via mobile phone were used to provide timely alerts to fishing communities (see the project manual on the use of SMS at http://taiguey.org/fao/Manual-SMS-GDRA.pdf, available in Spanish only), and a web-based platform was launched for the exchange of knowledge and practices between communities at local level (http://buenaspracticas.socialgo.com/). Both ICT tools are still functioning in the six Dominican Republic communities that participated in the project.

Madagascar is among the pilot countries of the *World Agriculture Watch* (WAW) initiative. The various phases to inventory the available database on farming activities, establish a zoning plan based on stakeholder interests and put in place the mechanism for collecting, analysing and spreading information having been completed, an adapted device is being introduced specifically for the observatory. The indicators used have been rigorously tested, an effort that will be pursued until 2014. These indicators will be input into the electronic device, which will be loaded at both local and national level by each partner involved in the collection of information. The WAW initiative helps bolster the capacity of local and national structures to implement an information system and use ICT. It seeks to monitor and analyse structural transformations of farming systems and their impact on development, food security, poverty reduction and natural resource management, in order to inform policy dialogue and formulation. It intends to develop an international platform for knowledge generation and exchange, based on a network of existing local observation units sharing common objectives and approaches.

Also in **Madagasca**r, a *Food Security and Vulnerability Information System* (SISAV) was set up. This information system aims to follow up food security and vulnerability indicators and to warn all those concerned when localities approach a high level of vulnerability. It is based on the principles of simplicity and low-cost charges in order to ensure its viability. SMS messages are in this case the best option for circulating short items of information quickly, and help improve local farmers' knowledge of the technology. The programme will run from 2013 to 2015.

In **Turkey,** an SMS-based *wheat rust disease monitoring system* serves as a surveillance tool for the rapid monitoring of wheat rust disease in Central Anatolia. Thirty district extension offices send SMS messages reporting on disease severity. The system analyses the data and displays the findings rapidly on a map; it also informs the designated authorities when certain thresholds are exceeded. The programme started in 2013.

The FAO global desert locust early warning system, *eLocust3*, and the preventive control strategy adopted by locust-affected countries rely on the field data collected daily by national survey and control teams in desert locust habitats, and their immediate transmission to national locust centres for analysis. The system is an updated version of the eLocust2 system developed in 2005. It will be fully operational in July 2014.

In southern Africa (**Angola**, **Malawi**, **Mozambique**, **Namibia**, **Tanzania** and **Zambia**), an *Animal Disease Surveillance System* has been introduced that uses digital pen technology and mobile phones. The data collected are fed into the animal disease information systems used by each country, such as the Livestock Information Management System (LIMS) and the Transboundary Animal Disease Information System (TADinfo), and are sent to external organizations such as the Southern Africa Development Community (SADC) and the World Organization for Animal Health (OIE). A web-based back-end server facilitates data editing and validation, the confirmation process and reporting flows. A major benefit has been regional harmonization of the disease form and the data-collection methodology. The use of digital pen technology has also been rolled out in **Kenya, Uganda** and **Ethiopia**.

In **East** and **Central Africa,** a *disaster risk reduction platform* has been developed under the regional European Community Humanitarian Office (ECHO) programme to provide a platform for learning groups and for sharing knowledge of innovations in drought risk reduction. The programme is ongoing (www.disasterriskreduction.net).

In **Uganda**, Nokia mobile data gathering is being used to collect three-monthly surveys by parish chiefs in order to provide input for the *Drought Early Warning System*. The mobile data application streamlines data collection by automatically centralizing all data in the district database, decreasing the number of paper questionnaires that need to be collected from the parishes and manually captured.

The Regional Emergency Office for Africa (REOA) has developed the *Water Inventory and Monitoring System*, a mobile data-collection application that has been provided to NGOs and extension staff in **Kenya**, **Uganda** and **Ethiopia** in order to compile an inventory on water sites in dryland areas. Since its launch in October 2010, data on over 4 000 water sources have been captured. The survey forms have been harmonized with national water information systems. FAO provides training and technical support. Mobile phones have been supplied to multiple partners and exchanged when collection was completed. Oxfam GB piloted the mobile data-collection application for the monitoring of key boreholes in **Ethiopia** and **Kenya**.

In East and Central Africa (**Tanzania**, **Uganda**, **Burundi**, **Rwanda**, **Democratic Republic of the Congo**, **Central African Republic** and **Gabon**), the *Regional Cassava Initiative* used digital pen technology to collect six monitoring questionnaires for the project, covering post-planting, pre-harvest, quality-management protocol, beneficiary list, post-distribution and output assessment. The quality-management protocol was developed by the International Institute of Tropical Agriculture (IITA). Catholic Relief Services (CRS) and FAO harmonized the post-planting and pre-harvest forms**.**

In several African countries (**Djibouti**, **Kenya**, **Uganda**, **Tanzania**, **Rwanda**, **Burundi, Central African Republic**, **South Sudan** and **Sudan**), *SMART FISH Post Harvest Fish Loss*, a mobile-phone application, is being used by enumerators to capture and transmit data on fish losses

to a centralized database. The data are then made available via a website to end users such as policy-makers, fisheries departments, NGOs, fishermen, processors, traders and development agencies. The information shows where losses are occurring, how large the losses are and why they are occurring. All this information is important when it comes to planning where and how to reduce losses and therefore how to make the best use of development resources.

The *Technologies and Practices for Small Agricultural Producers* (TECA) programme is a global FAO initiative based on an interactive web-based platform. It aims to improve access to validated practical information on agricultural practices specifically for smallholders, extension and advisory services, development practitioners, producer organizations and producers themselves, in different languages. TECA has two functions: first, it provides access to FAO's web-based interactive knowledge repository of applied technologies and practices on different agricultural themes, and second, it has two online forums where registered users can exchange information on challenges, experiences and possible solutions (www.teca.fao.org). The communication knowledge brokers of the Grameen Foundation in **Uganda** use TECA to provide farmers with information on practices via mobile phones and a call centre.

In **Somalia**, a *Biometrics Information Transfer System* (BITS) has been developed to improve service and product delivery for various sectors, including livestock, agriculture, fisheries and cash-based activities. The biometrics-based databases allow FAO to register and verify beneficiaries in order for them to receive products and services in a more secure, timely and efficient manner.

In **Eastern** and **Southern Africa,** the *LinKs* project – Gender, Biodiversity and Local Knowledge Systems for Food Security – works in partnership with grassroots organizations to collect and disseminate information on the linkages between gender, local knowledge and agro-biodiversity. The project provides partner institutions with opportunities to document and share what they have discovered about farmers' knowledge and practices.

The *Global Fire Information Management System* (GFIMS) is a global FAO initiative that delivers almost real-time fire information to support natural resource management around the world. The satellite-derived data are delivered to natural resource managers, stakeholders and the general public (www.fao.org/nr/gfims).

FAO Dimitra is a participatory communication and information project that highlights the role of women in agriculture. The project is being implemented in **Niger**, **Burundi**, the **Democratic Republic of the Congo**, **Ghana**, **Senegal** and **Mauritania.** It strengthens leadership by women and provides a platform for the most marginalized to improve their livelihoods and food security. The project is being carried out through participatory communication, more specifically community listeners' clubs. Mobile phones, rural radios and an online database are used to improve information exchanges and network creation (www.fao.org/dimitra).

In **Sri Lanka**, the *Agriculture Management Information System* (AGMIS) is a platform for sharing information between producers, suppliers, transporters and others involved in the value chain. Technologies such as mobile phones and landlines link suppliers and producers

with buyers. Designated officers collect information on the crop, harvest date, quantity, quality, etc., and share it on the AGMIS platform (www.agmis.lk).

In **Central America** and the **Caribbean,** FAO, in partnership with national governments and academic and research institutions, has started to implement an Internet-based *Forestry Education Platform* that will integrate private-sector research and academic and traditional knowledge in the field of forestry. The platform will share online, free-of-charge forestry knowledge and information from Central America and the Caribbean.

The **United States** Department of Agriculture (USDA) *integrated information system for the State Plant Health Service* is a project aimed at creating an integrated information system providing scientific/technical and methodological support to the State Plant Health Service, mainly in terms of plant-disease diagnosis, the introduction and production of biological agents, the introduction of integrated pest-management programmes and the monitoring of pesticide quality and residues. The beneficiaries will be farmers in the various sectors of agrarian production, who will be helped to prevent and reduce losses caused by pests at the smallest possible risk to the environment and on a sustainable basis.

In **Cuba,** the *Urban and Suburban Agricultural Portal* aims to provide an interactive tool to stimulate communication among producers. The portal enables producers to report their results and researchers to publish scientific articles, manuals and other publications as a means of contributing, via this alternative route, to the training of national and international producers. Thanks to this tool, the situation in Cuba is advancing and Cuban urban and suburban farming is being promoted.

In **Uruguay**, the objective of the *National System of Livestock Information* (SNIG) is to ensure the traceability of bovine livestock, as from the animal source (industry individual and group), in accordance with the provisions and regulations of the Ministry of Agriculture, Livestock and Fisheries (MGAP). One of SNIG's two key strategies is to improve the current system of group traceability of the Livestock Control Office (DICOSE), by incorporating new technologies. This process is part of the present regulations and involves no changes in current operations. The territorial distribution of the livestock population, and the details of their movements, is a fundamental factor from the health point of view. This is why SNIG has a fully integrated geographical information system that uses the information collected in the Annual Affidavits and Property Guides and Transit to locate each establishment registered with DICOSE on the map, and display the source and destination of each movement by date, species and category. This technology has rapidly shown good results for both operational and strategic decision-making.[142]

In **Bangladesh,** Grameen Communications has implemented the *Income-generation Project for Farmers using ICT*. The project aims to generate income for rural women farmers in Bangladesh. The model farmers produce quality vegetables (QVegie) using no chemical fertilizers/pesticides and sell them to urban customers. ICT was used for three purposes: (a) to digitize and disseminate advanced farming knowledge to the farmers; (b) to upload product information to the e-commerce site; and (c) to establish smooth farmer-farmer, farmer-expert and farmer-consumer communication. In six farming seasons (three years), two pilot sites engaging 35 to 50 farmers focused on five main vegetables, with QVegie

142 *Project nominated for a WSIS Project Prize 2014*

estimated to double or triple the farmers' incomes. The aim is to franchise the model to other communities.[143]

In **Egypt,** the Egypt Information and Communication Technology Trust Fund (ICT-TF) has launched the *Managing Agriculture Knowledge through the Localized Community Expert System*. The Egyptian agro-community knowledge portal, www.aradina.net, is an online forum for sharing information and networking on agricultural production, agriculture technologies, fisheries and livestock. The portal has various related articles, e-services and forums interconnecting agro-enterprises, experts, consultants and farmers. One of the biggest breakthroughs has been the establishment of a localized agro-expert system that gathers all human experiences to help solve complex agriculture problems. The platform has optimized resource utilization and increased agricultural productivity, thus helping to solve Egypt's food security problem.

In **Turkey**, the Ministry of Food, Agriculture and Livestock has implemented the *Agricultural Monitoring and Information System (*TARBIL) project.

In **Sudan**, more than 90 per cent of people in the agricultural sector, especially farmers, are digitally illiterate. The government has in the past spent large sums developing software programmes that soon collapse because of mismanagement, resistance to change and a shortage of ICT skills and trained staff. Crop prices vary widely, and most of the time farmers sell their crops at low prices for want of information, going out of business or being bankrupted as a result. There is need of collaboration between farmers, shepherds (nomads) and the Forestry Department. Gedaref Digital City Organization (GDCO) has developed a potentially sustainable *e-agriculture project* with many partners to tackle these problems.[144]

The economy in **Ghana** is mostly agrarian, with agriculture, the largest sector, accounting for 40 per cent of GDP and the national government earning huge amounts in foreign revenues from agricultural products and produce. The sector employs a large swathe of the Ghanaian population and is of great importance to the entire country. Foresight Generation Club has implemented the *eAgri Transport Go Network,* the main benefits of which are as follows:

- Farmers have access to a viable means of transporting produce from their farms to villages and selected market centres, boosting the economic standing of farmers and residents in the project's catchment communities.
- Design and implementation of an innovative solution driven mainly by the lack of accessible means of transportation for farmers.
- A project methodology motivated by the non-availability of direct and indirect marketing channels for farming and agricultural produce in most farming and agricultural areas in Ghana.[145]

A database was created and the data stored at the Data Centre. The data consist of registration details and contact numbers for individual members, farming associations and

---

143 *Project nominated for a WSIS Project Prize 2014*

144 http://sudan-e-village.org/index.php?option=com_content&view=article&id=397:2013-07-26-05-39-12&lang=en&Itemid=

145 http://www.fao.org/fsnforum/protracted-crises/re-addressing-food-insecurity-protracted-crises-resilience-building-programming-14

transport owners and drivers who are responsible for transporting the farm produce from the farms to the villages and from the villages to the marketing centres. Requests are sent via text or SMS to members' mobile phones, and a confirmation is sent to the short code. Field agents who are responsible for collecting such data are specially trained to serve also as mobile data centre agents sending information and details of registered members to the head.[146]

In the **United Arab Emirates**, the Abu Dhabi Food Control Authority has implemented a project to sustain the agriculture sector in Abu Dhabi through a *smart irrigation system*. The objective was to introduce wireless soil moisture sensors in Abu Dhabi crop production after an intensive evaluation of the system in terms of its accuracy, precision and irrigation efficiency compared to traditional practices. The system showed consistent water savings, which will help to economize millions of cubic metres annually. It is therefore a good means of automatic smart irrigation scheduling, providing growers with practical solutions for profitable and sustainable agriculture. By combining sensor technology, the Internet and scientific knowledge, growers can continuously monitor and fine-tune their production process throughout the growing season.[147]

In **Bangladesh,** the *e-Krishok* initiative is aimed at providing farmers with extension and market linkage services from which they can benefit in terms of both their farming activities and opportunities for selling their produce. Farmers with any agriculture-related problem, query or issue can go to the nearest ICT-enabled information centre/telecentre and obtain the information they are seeking. The service is also available via mobile phone using the short code 16250. With such timely and appropriate information, farmers are able to maximize their economic gains, enabling them to achieve income growth through agricultural activities.[148]

In **Italy,** the *Biosafety Scanner Software (BSS)* is a tool developed by the Genetic Rights Foundation to meet the need to monitor, assess, manage and control genetically modified organisms (GMOs) in crop production, with particular reference to international trade. The software was developed for interested parties in the agri-food industry, the authorities responsible for GMO supervision and control, the scientific community and the general public. By processing data concerning regulatory frameworks, local production and scientific knowledge, BSS formulates a picture of whether conditions exist that might be conducive to GMO contamination in a selected country and/or for a selected crop.[149]

In **Cuba,** the *information system for integrated and sustainable management of land and soil* is a project that aims to create an integrated information system facilitating control of land use, conservation and soil improvement. It is designed to contribute to decision-making in the fields of tenancy and sustainable land use and management. The system's basic data will provide general information about land (e.g. registration, territorial planning, vulnerability and risk) as well as details of the soils, nutritional status, coefficient of exploitation, conservation and improvement measures, water resources, tree coverage and areas with

146 *Project nominated for a WSIS Project Prize 2014*

147 *Project nominated for a WSIS Project Prize 2014*

148 *Project nominated for a WSIS Project Prize 2014*

149 *Project nominated for a WSIS Project Prize 2014*

special characteristics. The system will support work relating to the balance between land use and tenancy, and controlling that balance; calculation of the land exploitation ratio; selection of land for specific agricultural purposes; categorization of soils according to various scales; and sustainable land management. It will ultimately be available across all of Cuba's municipalities, thereby ensuring that essential basic information is available to the entire small-farm sector, with a view to supporting sustainable food production nationwide.

C7.7 E-environment

In line with the Geneva Plan of Action, governments, in cooperation with other stakeholders, are encouraged to use and promote ICTs as an instrument for environmental protection and the sustainable use of natural resources. [150]

The safe disposal and recycling of discarded hardware and components used in ICTs are key elements in programmes for sustainable production and consumption. Recently, governments have deployed serious efforts in order to raise awareness about consumption behaviour and climate-change issues. However, an estimated 50 million tons of e-waste is still produced each year globally. It is estimated that only 15-20 per cent of e-waste is recycled, the rest going directly into landfills and incinerators. A large proportion of heavy metals in landfills comes from discarded electronics. [151]

Projects reflected in this subchapter are aimed at reducing energy consumption through, *inter alia*, systems for tracking and evaluating environmental changes and ICT solutions for renewable energy and resource monitoring systems and networks.

Particularly in urban areas, governments are putting a lot of effort into taking care of *air and water quality*, as a crucial factor for citizens' health. Various systems and e-services are being developed and provided to manage air quality and levels of CO_2 emissions, water consumption, water leaks and water quality.

In **Turkey**, the Istanbul Metropolitan Municipality developed the *Geographic information system (GIS)-Based Decision Support System for Urban Air Quality Management* in the City of Istanbul. This project focuses on determining air quality in Istanbul and using a decision-making system for urban air-quality management. Preparation of a comprehensive emission inventory and air-quality modelling are the main thrusts of this research. In the framework of this project, it is planned to:

- develop a computer-aided decision support system for air-quality management (now completed);
- prepare the emission inventory and GIS-based air-pollution maps in the city;
- institute a plan of action for improving air quality in Istanbul.

Also in **Turkey,** the Istanbul metropolitan municipality launched the pilot project focusing on the implementation of *water leak reduction in water management*, with the aim of developing innovative practices towards efficiency in the water-management sector in

150 Geneva Plan of Action, § 20a)

151 http://www.unep.org/ietc/Portals/136/Other%20documents/PolicyBriefs/13052013_E-Waste%20Policy%20brief.pdf

Istanbul. Thanks to this project, water leaks will be identified and water supply network faults will be reduced.

Again in **Turkey**, the Istanbul metropolitan municipality implemented the *OUTSMART* future Internet utilities and environment project. The objectives of this project are to: contribute to the development of five innovation eco-systems, contribute to the optimization and accessibility of pilot services, promote sustainability of the benefits acquired through increased efficiency, create innovative software geared to the needs of ICT companies and stakeholders, and develop software including innovative applications with respect to solid waste, electricity, water and disasters. The expected outcomes are to: contribute to the competitiveness of Europe, enhance standardization and benefit from smart computing.

Online portals are being established in many countries to inform the population about environmental problems and to facilitate the exchange of information about preservation and protection of the environment and disaster management.

In the **United Arab Emirates**, the Abu Dhabi Environment Agency established the *EnviroPortal*. The project involves the development of a geoportal that manages and accesses metadata, and a mapviewer that supports the display and querying of geospatial data. The EnviroPortal provides a means of raising public awareness of environment-related issues by displaying the locations of environmentally sensitive elements such as habitats of fauna and flora, protected areas, etc. It helps developers or project proponents to gauge in advance the potential impact of their projects. The EnviroPortal also allows certain data elements to be downloaded. Mapviewer users can benefit from various functions available on the portal, such as adding online services, redlining, measuring and spatial searching, in order to further explore any environmental component in detail, and share their results with their network.

In **Kuwait**, the Environment Public Authority has taken the initiative to establish the *Beatona.net* Kuwait Official Environmental Portal, a GIS-based web portal that aims to share authentic environmental information with the public over the Internet. Beatona.net ("Our environment" in Arabic) is a network that offers information about Kuwait's environment from various national, regional and international organizations on one single platform. It also allows the public to participate and interact in environmental preservation and protection by reporting environmental phenomena and problems. This initiative is expected to play a leading role in raising awareness of the value of the environment in Kuwait.[152]

In **Bulgaria**, the *National Geographic Information System* is under development for the potential, production and consumption of renewable energy sources in the territory of Bulgaria. The main activities also foresee the publication of spatial data, the introduction of electronic administrative services and the development of a geo database with the resources and producers of energy from renewable energy sources.

In 2013, the International Telecommunication Union (ITU) organized regional workshops, forums and symposia on the *role of telecommunications and ICTs in disaster mitigation and*

[152] *Project nominated for a WSIS Project Prize 2014*

management (**Kyrgyzstan**, **Barbados**) and focused on the importance of ICTs in saving lives.[153]

In **Barbados**, ITU organized the forum on *Emergency Telecommunications and Climate Change* for the Caribbean region. The event brought together national agencies involved in disaster risk reduction and disaster management, private telecommunication entities, United Nations agencies and NGOs to share knowledge, discuss and exchange views on how to assist countries and communities to mitigate, respond to and cope with natural disasters.[154]

In many countries, a *smart approach* was applied to reduce energy consumption, including in urban rail systems, transportation systems, infrastructure, buildings and so forth. Performance indicators (KPI) and calculation solutions were developed to track energy consumption. Heating performance for buildings is one of the main issues for conserving energy.

As an example, in **Turkey** several projects were launched to reduce energy consumption:

- The *Optimal Strategy to Innovate and Reduce Energy Consumption in Urban Rail Systems* (OSIRIS) is aimed at introducing a holistic approach for reducing energy consumption in urban rail systems, embracing vehicles and infrastructure. The project will start from the definition of KPIs and standard duty cycles to measure energy consumption in urban rail systems. It will address the issue at the system level, ensuring substantial progress in terms of energy reduction.
- The Energy Market Regulatory Authority introduced the *Information System Development* (EPDK) project, whereby all data related to the energy market (electricity, natural gas, oil and liquefied petroleum gas - LPG) will be managed from one single centre, and the EPDK infrastructure will be modernized to accommodate the e-transformation.
- The Ministry of Energy and Natural Resources has evolved the *Strategic Management and Statistical System* (ESIS) in order to avoid data inconsistencies in the creation of a common energy data infrastructure between related stakeholders, reduce bureaucratic procedures, provide decision-support services to the top-level users, etc.
- *Cooperative Mobility Services of the Future* (CoMoSeF) was established to create cooperative mobility solutions, devices and applications feasible for large-scale deployment and supporting the Intelligent Transport Systems (ITS) action plan and national ITS strategies. It brings existing and emerging sensors, services and communication solutions closer to the market and creates the required business models. CoMoSeF concentrates on nomadic devices with cost-effective services that are easy to implement and deploy in all vehicles.
- The *SMARTSPACES* project (Saving Energy in Europe's Public Buildings Using ICT) was established to use energy efficiently, to ensure energy efficiency in public buildings and to put in place pilot implementations for reducing energy losses and energy consumption. It is planned to develop the Fatih Sport Facility building in Istanbul using

[153] *Tracking four years of achievements: Implementing the Hyderabad Action Plan*, p.62: http://www.itu.int/en/ITU-D/Conferences/WTDC/WTDC14/Documents/BD_E__ITU%20HAP_report_inside.pdf

[154] Ibid, p.63

ICT with a view to increasing energy efficiency, as well as to reduce energy loss in public buildings and share and exchange best practices.

- The *Vital* project supports smart traffic management systems with the use of physical and visual censors, in order to enhance environmental performance and optimize efficiency of the transportation network. The expected results of the project are to implement the pilot phase with Istanbul Technical University and to transform the current traffic data into smart, manageable data.
- The *Viajeo PLUS* project creates benchmarks in order to formulate innovative and green urban transportation solutions that could be implemented in various regions and cities, such as **Europe**, **Latin America**, **China** and **Singapore**.
- The *LOG4GREEN* project contributes to sustainable logistics systems to be used by multidisciplinary R&D activities and to creating a common strategic action plan with six regions for regional knowledge-based innovation. The project connects six logistics clusters – Carinthia (**Austria**), Ruhr area (**Germany**), Wallonia (**Belgium**), Normandy (**France**), Istanbul (**Turkey**) and Odessa (**Ukraine**) – to strengthen their round-trip delay time (RTD) networks, foster transregional innovation dynamics and develop a joint action plan for future activities.[155]
- The *Kit and Application Pilots for Developing Smart City Services* project creates a service ecosystem and service background for disseminating and sharing smart city applications all around Europe.
- The *ADAME* project contributes to energy performance of buildings in terms of energy efficiency and environment. The purpose of this project is to analyse indicators such as CO_2 emissions, energy consumption and heating. In this context, in the pilot phase, buildings without isolation dating back to 1980 were identified, data on energy efficiency of infrastructure in the identified region were compiled, benefiting from the experience of the Paris municipality, and an energy and environment database was created. Heating performance of buildings was measured through geographical information and mapping systems.
- The *Recycling of Waste Containing Cathode Ray Tubes* project aims to use technology effectively for waste recycling in Istanbul and contribute to transforming the economic value of the recovered materials. The goals of this project are to increase the capacity for handling waste containing cathode ray tubes (CRT) such as monitors, TVs, etc., and to ensure transformation of the economic value of waste containing CRTs. The following outcomes were achieved:
  - 1 000 monitor and television CRTs have been recycled
  - As a result, the current database will include information about CRT waste and recovered materials.
- The Istanbul Development Agency initiated the *Software Development for Calculation and Simulation of Energy Performance of Superstructures*. TS 825 ("Standard for Rules of Heat Insulation for Buildings") is the Turkish standard regulating heat insulation for superstructures. Under this project, a software program will be designed and made available free of charge to engineers and architectures.

[155] http://www.ncpwallonie.be/fr/news/181_log4green-workshop-tackling-logistics-challenges-of-tomorrow

In the **United Kingdom**, in the framework of the *Greening Government ICT* strategy**,** the Greening Government commitments were launched in March 2011 to ensure that by 2015 the government will have made substantial reductions in waste generation, water use and greenhouse gas emissions. These commitments will ensure that government will:

- engage with its suppliers to reduce the impact of supply chains, and strive to purchase sustainable, efficient products and services;
- manage and reduce greenhouse gas emissions across government estates by 25 per cent from a 09/10 baseline;
- ensure that redundant ICT is reused within government or the wider public sector whenever practical and, where not, is always responsibly recycled. [156]

The first **Central American** workshop for *Capacity Building on Environmentally Responsible Management of Waste Electrical and Electronic Equipment* (WEEE) was organized by ITU, the United Nations Environment Programme (UNEP) (Secretariat of the Basel Convention for Central America and Mexico), the Partnership for Action on Computing Equipment (PACE), the Central American Commission for Environment and Development (CCAD) and the Ministry of Environment and Natural Resources (MARN) of **El Salvador**. The outcome of the event was the *Central American and Caribbean Agenda for Environmentally Sound Management of Waste Electrical and Electronic Equipment* (WEEE).[157]

At the eleventh meeting of the *Conference of the Parties to the Basel Convention*, which took place in Geneva, **Switzerland**, in May 2013, the mandate of the Partnership for Action on Computing Equipment (PACE) was extended until end 2015.

In the **United Arab Emirates**, Dubai Civil Defence (DCD) introduced the *smart system* (Smart Buildings), which ensures that buildings and residences are kept safe, using a smart comprehensive infrastructure. In October 2009, the smart system linked over 8 000 buildings to a control room for emergencies and other urgent needs. Buildings were categorized into five types, according to risks, and DCD has also surveyed a total of 23 549 buildings for installation purposes. Priority in installing the smart system was accorded to the most hazardous facilities such as factories and high-rise buildings. The smart system monitors firefighting and alarm systems in buildings and keeps the control room informed of the status of water sprinklers, firefighting pumps and faults in lifts, among other things.

C7.8 E-science

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is the lead facilitator for Action Line C7: ICT applications (E-science). An overview of recent activities implemented by UNESCO and other stakeholders in the field of e-science for the period 2013-2014 is given below. The report *Building inclusive knowledge societies. A review of UNESCO's action in implementing the WSIS outcomes* emphasized that access to scientific knowledge and information-sharing has been a major focus for the action line since the first consultation meeting, held in China in 2006. The International Federation of Library Associations (IFLA) and the Electronic Information for Libraries organization (EIFL) have

156 UK government portal: https://www.gov.uk/government/publications/greening-government-ict-strategy

157 *Tracking four years of achievements: Implementing the Hyderabad Action Plan*, p.63: http://www.itu.int/en/ITU-D/Conferences/WTDC/WTDC14/Documents/BD_E__ITU%20HAP_report_inside.pdf

worked closely with UNESCO under this action line to develop approaches to open access which will be of benefit to all stakeholders involved, including policy-makers, researchers, publishers and access providers such as universities and libraries.

The 2013 Report of the United Nations Secretary-General: Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels[158] indicates that:

- UNESCO organized a *forum on using e-science* to strengthen the interface between science, policy and society, which addressed emerging trends in e-science and the development of applications in critical public areas.
- UNESCO and the European Organization for Nuclear Research (CERN) launched *audiovisual training modules in physics* for science teachers during the celebration of World Science Day for Peace and Development. UNESCO also launched the *Global Observatory of Science, Technology and Innovation Policy Instruments* and worked with the Nature Publishing Group to launch the UNESCO *World Library of Science* project.
- The United Nations Economic Commission for Africa (ECA) organized the *Committee on Development Information, Science and Technology* to provide capacity building through knowledge and experience sharing.

In **Cuba**, since 2008, *education technology laboratories* have been established in 17 universities, with the space and technical resources needed for designing, producing and replicating local teaching materials, systematically assessing the quality of teaching aids being developed in the centre for other areas, and training lecturers to participate effectively in the development of teaching aids for the various subject areas.

In **Turkey,** the Istanbul Metropolitan Municipality launched the *Disaster Coordination System* to ensure efficient disaster response by facilitating rapid identification of damage and loss of life and creating updateable risk-analysis infrastructure to meet the contingency of a possible future earthquake in Istanbul.

Also in **Turkey**, the Ministry of Science, Industry and Technology set up the *Research and Development Web Portal,* a web-based application developed to manage grant supports such as the Industrial Thesis Programme and the Techno-initiative Capital Support Programme, and also stipulated exemptions for R&D centres and technoparks established under the ministry's approval process.

The international WorldWideScience Alliance launched *WorldWideScience.org*, a site which facilitates simultaneous searches of 100 national scientific databases containing over 500 million pages. WorldWideScience.org allows users to find the precise information they need, via a single search, without having to know the scope of any particular national scientific database. Offering multilingual translations of queries and search results in 10 different languages, WorldWideScience.org's coverage includes multimedia materials and scientific and numeric databases. The WorldWideScience Alliance provides the necessary multilateral governance structure and its members are WorldWideScience.org source owners and sponsors.

[158] http://unctad.org/en/PublicationsLibrary/a69d65_en.pdf .

In the **United Arab Emirates,** the Emirates Foundation for Youth Development implemented the *Think Science* programme**.** The aim of this initiative is to inspire, encourage and empower UAE youth between the ages of 15 and 24 to embrace careers in science and technology. It was established in response to the nation's demand for scientific talent, and in order to support the creation of a national "critical mass" of citizens capable of participating in science-based policy-making and of using science and technology to promote general prosperity. The programme, which was launched in 2008, comprises three core elements: the national *Think Science Competition*, *Think Science Ambassadors* which empowers youth, and the *Think Science Connect* platform.[159]

In **Kuwait**, Kuwait University launched the *Remotely Operable Scanning Electron Microscope* (ROSEM). This project permits full remote control of a scanning electron microscope though the Internet, so that students and researchers can operate it online and obtain live high-magnification images of specimens. It has been found to be very useful in fostering enthusiasm for science among students and enabling researchers to use otherwise unaffordable technology.[160]

[159] *Project nominated for a WSIS Project Prize 2014*

[160] *Project nominated for a WSIS Project Prize 2014*

Action Line C8. Cultural diversity and identity

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is the lead facilitator for Action Line C8: Cultural diversity. This chapter reports on some of the recent activities implemented by UNESCO and other stakeholders in relation to cultural diversity during the period 2013-2014.

More than 50 per cent of the approximately 7 000 languages spoken in the world are likely to die out within a few generations, and 96 per cent of these languages are spoken by a mere 4 per cent of the world's population. Only a few hundred languages have genuinely been given pride of place in education systems and the public domain, and fewer than a hundred are used in the digital world.[161] ICTs are playing the role of enabler for preserving cultural and linguistic diversity thanks to web- and mobile-based solutions.

The Geneva Plan of Action states that cultural and linguistic diversity, while stimulating respect for cultural identity, traditions and religions, is essential to the development of an information society based on dialogue among cultures and regional and international cooperation. It is an important factor for sustainable development.[162]

In the **United Arab Emirates**, the General Authority of Islamic Affairs and Endowments (Awqaf) has established *E-Fatwa*, a web-based interface accessible via Awqaf's website: www.awqaf.gov.ae, where users can send their religious queries related to Islamic culture, the jurisprudence of worship and transactions. The online interactive service has a global scope. It receives religious queries from all around the world, which are responded to in line with the working procedures adopted by the E-Fatwa centre.

In **Japan**, two funds-in-trust have been set up with the aim of preserving cultural heritage. The purpose of *Funds-in-Trust for the Preservation of the World Cultural Heritage* is to preserve the tangible cultural heritage, including historic monuments and archaeological remains of great value. It finances activities which comply with the above-mentioned objective, such as restoration and preservation work, and the preliminary or general studies and surveys necessary for that purpose. The purpose of *Funds-in-Trust for the Preservation and Promotion of the Intangible Cultural Heritage* is to safeguard, preserve, promote and revitalize priority areas of intangible cultural heritage in danger of degradation and disappearance all over the world.

In **Turkey**, the *Panorama Istanbul* project aims to enhance Istanbul's global competitiveness by ensuring that the services provided are supported by information technology, contributing to total quality management. Its *3D Panoramic Mobile Mapping Technologies* will integrate its geographical information systems, and thereby raise the awareness of personnel and provide them with background information regarding 3D panoramic mobile mapping.

In **Algeria**, the Ministry of Religious Affairs and Endowments has initiated the development of online services *(e-Zaket, e-Fatwa, e-Mawakit, e-Library*) on the website of the

161 http://www.un.org/en/events/motherlanguageday/background.shtml

162 Geneva Plan of Action, § 23

administrations under its supervision. This project was implemented through the development of the website which provides online services, interactive forms, text documents, presentations and so forth for 48 directorates of religious affairs and endowments, Islamic cultural centres and training institutes for executives of religion.

In the **United Arab Emirates**, Sultan Bin Zayed's Culture and Media Centre (CMC) continues to work on the national initiative *Khalifa in World Language.* Launched in December 2012, it is the world's largest heritage gateway, carrying the name of President Khalifa in 200 languages, and a website that includes a biography of HH Shiekh Khalifa in various languages as well as a history of UAE. The initiative translates the people's deep love and loyalty for the UAE leader. The project aims to highlight UAE's culture and national identity and show appreciation to other world cultures.

Also in the **United Arab Emirates**, *Emiratweet* is the first Emirati online social community (virtual majlis) for the Emirati by the Emirati. This social media platform serves as a means of maintaining and preserving national identity by providing information, facts and news about Emirati individuals and society. Emiratweet aims to bridge the existing gap, sustain the Emirati presence through social media, support Emiratis, and increase awareness about UAE through teaching, support, learning, sharing and organizing events.

The ECURED *Cuban Collaborative Encyclopedia Website* is an online, open-source encyclopaedia project in **Cuba** based on a MediaWiki engine. It is the Cuban website that receives the most visits - an average of 129 000 per day. It is open to collaboration by Cubans and foreigners. The website holds 108 000 articles on an extremely wide range of subjects, produced by its 14 000-plus contributors. With a view to facilitating access, there are offline portable versions for PC and mobile phones that do not require web access, and a TV course of 15 class hours has been staged.

Also in **Cuba**, the CUBARTE *Portal of Cuban culture* was created to promote and disseminate information about Cuban culture via the Internet. It constitutes a virtual reference centre, promoting and displaying, in Spanish, English and French, distinguishing elements of Cuba's cultural heritage as well as the latest expressions of traditional popular culture. It is organized by theme: music, visual arts, stage arts, the written word, film, heritage, community and the teaching of art. The portal provides a gateway to over 800 websites about Cuban culture. Among other functions, there is a news and information service, including directories, events, entertainment guides, downloads, galleries of photographs, audio clips and videos.

In **Turkey,** *HAS* is an information diffusion system that serves as a multilanguage and multiplatform news flow system, collecting, translating and relaying news among over 35 countries.

In the **United Arab Emirates**, *UAEpedia* is a centralized online information resource about UAE. The website follows an open-source model, allowing the public to contribute and modify content. Currently in its first phase, UAEpedia is available only in Arabic. Other languages will be added at a later stage. At present, UAEpedia contains more than 1 000

articles distributed over 18 main topics such as geography, history, economy, language and literature, and hundreds of sub-topics related to UAE.[163]

In **Kuwait**, the *Al-Babtain Library* website primarily serves Arabic readers and those interested in Arabic language, poetry, literature and culture, offering its visitors a collection of electronic services, including:

- library information, services, sections, news, photos and FAQ;
- electronic index for searching library collections;
- cultural services and Library Cultural Forum;
- social networking services through which miscellaneous cultural information is published;
- e-registration for training courses;
- audio and electronic publications section;
- assistance services such as WhatsApp, mailing list, Library Mobile, YouTube channel and RSS and smartphone applications (IOS and Android) and the Babtain Cultural E-Magazine.[164]

In **Croatia,** augmented reality (AR) technology has been used to create the *Giorgio da Sebenico AR 3D virtual portal*, in order to promote Croatian cultural heritage. The portal provides a dynamic virtual 3D model of the Cathedral of St. James, built in in the city of Sibenik by the medieval architect Giorgio da Sebenico. The model operates in real time, reflecting the actual location. Visitors can access the portal by phone or tablet and receive historical information in English, Japanese or Croatian. Any change in the environment can be viewed on the screen and photographed.[165]

In **India,** the Centre for Development of Advanced Computing (C-DAC) implemented the *India Development Gateway* (InDG), a nationwide government initiative that seeks to use the power of ICTs to empower the poor and underserved through the provision of information in local languages. The multilingual knowledge portal www.indg.in developed as part of the initiative offers information, products and services covering key livelihood sectors in nine Indian languages, besides English. The portal acts as a catalyst for collaboration and knowledge sharing among development stakeholders. Building on experiences and usefulness, the scope of the portal is currently being enhanced to support collaborative content creation, more languages and region-specific information.[166]

163 *Project nominated for a WSIS Project Prize 2014*

164 *Project nominated for a WSIS Project Prize 2014*

165 *Project nominated for a WSIS Project Prize 2014*

166 *Project nominated for a WSIS Project Prize 2014*

Action Line C9. Media

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is the lead facilitator for Action Line C9: Media. This chapter gives an overview of recent activities implemented by UNESCO and other stakeholders for the period 2013-2014.

The Geneva Plan of Action states that the media — in their various forms and with a diversity of ownership — as an actor, have an essential role in the development of the information society and are recognized as an important contributor to freedom of expression and plurality of information.[167]

In **Bangladesh**, several projects and initiatives were implemented to promote traditional knowledge trough media:

- Free Press Unlimited, together with its long-term partner the Bangladesh NGOs Network for Radio and Communication (BNNRC), is committed to continuing to build the *capacity of 14 community radio station*s, through training of the stations' journalistic and management staff and the production and distribution of quality content.
- *Connecting Voices, Strengthening Voices and Pioneering Voices* is being implemented in collaboration with BNNRC and other partners.
- The *Basic English Language for Outreach Radio Audience Bangladesh* project provides a pilot series of basic English-language learning episodes and curricula that will be developed for radio broadcasting, targeting students and potential residents from rural communities served by the community radio stations in Bangladesh.

In **Cuba**, the *CubaVa* web portal is designed to facilitate the exchange of knowledge among Cubans, using various computing products which support the production and management of content. The facilities available to the *Joven Club* network's users include a blogging platform (*Reflejos*), a social network (*La Tendedera*) and a noticeboard. In addition, a microblogging system (*Pitazo)* and an application to enable the exchange of personal videos and photographs are among other products and services under development.[168]

In the **United Arab Emirates**, the Dubai Press Club put in place the *Digital Initiative Agenda* which hosts a series of virtual seminars, meetings, workshops and talk shows using the latest digital social networking applications. The Agenda forms part of Dubai Financial Centre's efforts to establish a presence and interact with stakeholders across various parts of the Arab region and the world through social networking. Furthermore, the Agenda will serve as a foundation towards establishing a more targeted and comprehensive digital initiative that will benefit Arab media professionals and students. The project will offer training and specialized media education, besides providing information and services.

In **Turkey,** the Radio and Television Supreme Council (RTUK) introduced the *Digital Recording, Archiving and Analysis* (SKAAS) system, designed to record, archive and analyse digital audio/video broadcasting services. The SKAAS system records and archives television

---

167 Geneva Plan of Action, § 24

168 *Project nominated for a WSIS Project Prize 2014*

and radio broadcast services on satellite, cable, terrestrial and cloud. It facilitates effective content inspection by RTUK experts charged with monitoring and effective regulation of television and radio channel broadcasts all around Turkey.

Thailand is in the process of *switching from analogue to digital television broadcasting services*. The move is bringing about major changes in the country's broadcasting industry. The National Broadcasting and Telecommunications Commission (NBTC) has set the period from 1 to 24 April 2014 for trial broadcasts by digital television operators granted licences to operate 24 commercial channels.[169]

In **China,** the China Telecommunications Corporation (CTC) has implemented *IPTV services deployment with ITU-T H.764*. Having launched its IPTV trial as a service and network provider from 2005 until August 2013, CTC has now deployed its IPTV services all over China, with 25 million public and enterprise subscribers. CTC's IPTV services provide a totally new solution for TV-based interactive multimedia services.

In **Nigeria,** the National Broadcasting Commission (NBC) continues to bear the responsibility for *managing the Nigerian broadcasting industry*. This includes, among other things, licensing, monitoring and regulation. In order to increase the Nigerian population's access to international broadcast channels, thereby widening their horizons in terms of information and knowledge, NBC has licensed new entrants for direct-to-home (DTH) satellite operators, breaking the over a decade-long monopoly of broadcasting on this platform. The commission is deploying major efforts to ensure that the operators are fully operational, and a provision to this effect has been inserted in the new edition of the Nigeria Broadcasting Code. Other activities NBC has embarked (or is embarking) upon are listed below:

- Additional network licensing
- Community broadcasting
- Digital broadcasting
- Local content quota
- Production of Nigerian adverts
- Monitoring and regulation using ICT.

In **Turkey**, the Radio and Television Supreme Council implemented the *Terrestrial Radio and Television Electronic Frequency Regulation System.* The project has nine working packages. Its ultimate objective was the planning of terrestrial television channels and radio frequencies through the following: National Frequency Plan for digital terrestrial television (DTT); national, regional and local multiplexes; terrestrial broadcast licence fees and annual channel and frequency usage fees for each emission site; channel and frequency allocation software; ITU electronic notification forms for the DTT National Frequency Plan; Application Plan for the digital switchover; National Frequency Plan for terrestrial radio.

Also in **Turkey**, the Directorate-General of Press and Information has introduced *Training of Media Personnel - Local and Regional Media Gatherings.* Various meetings are organized in different regions in the country with a view to strengthening the local media. The participants from local media have an opportunity to discuss professional issues such as

[169] http://thailand.prd.go.th/view_news.php?id=7187&a=2

interview techniques, modern pagesetting and digital photography, as well as legal arrangements in the media sector. The gatherings also provide a chance for local media to exchange different views among diverse stakeholders in the media sector and keep abreast of the latest developments in the media.

In addition, **Turkey** has established the *State Information System* (DES) in order to convey processed information to the relevant authorities through the collection and compilation of news and comments from diverse sources. DES users can monitor both Turkish and international media round-the-clock, browse articles on Turkey in Turkish and in their original format in 21 languages, and access a huge news archive going back more than ten years. The experienced and specialized personnel evaluate more than 1.5 million foreign news items every day.

In **Canada**, Accessible Media Inc. (AMI) launched *Described Video Best Practices* (DVBP) for the Canadian broadcasting industry. The intent of these best practices, outlined in a series of artistic and technical guidelines, is to bring consistency to the provision of described video (DV) in Canada. The artistic guidelines divide major topics into relevant categories, with recommendations to provide direction to those writing DV descriptions. The technical guidelines provide direction to those creating the final product of post-production DV description, by detailing protocols to be followed. With input from industry, and through public consultation and community advocacy groups representing blind and low-vision Canadians, these best practices will work towards ensuring the availability of good quality DV description in Canada.[170]

In **Ethiopia**, *Infotech TV Show* is aimed at disseminating ICT knowledge through media. A 40-minute weekly magazine-style show broadcast nationally on ETV 3 and globally via Nilesat is dedicated to helping the Ethiopian audience use and understand technology so as to simplify their lives thanks to ICTs.[171]

In **Jordan**, Community Media Network implemented *support and advocacy for community voices in the Arab region (Aswatona* – Arabic for "Our Voices"). This project, which builds on the creation of *ammannet.net*, the Arab world's first Internet radio station, aims to utilize new technology to set up online radio stations, train the stations' journalists and turn the stations into FM broadcasters. Seven stations began initially in **Libya**, **Tunisia**, **Egypt**, **Yemen**, **Jordan**, the **Syrian Arab Republic** and **Palestine**. A parallel advocacy project includes legal studies for community radio, and actions to create an enabling environment for community radio. Two regional conferences (in **Tunisia** and **Egypt**) brought together over 100 radio enthusiasts to share experiences and skills. Out of the seven online stations, five are now also already on FM and many others are learning from them and following in their footsteps.[172]

In **Colombia**, the Ministry of Information and Communication Technologies set up *Red Periodismo de Hoy*, an initiative to provide ICT training for journalists, which has become the biggest virtual journalism academy in the country. Through this technological platform, the

170 *Project nominated for a WSIS Project Prize 2014*

171 *Project nominated for a WSIS Project Prize 2014*

172 *Project nominated for a WSIS Project Prize 2014*

ministry aims to promote freedom of expression, developing online training processes in the adequate use of technologies, for journalists all around the country seeking to build their capacities in order to enhance their journalistic output. *Periodismo de hoy* also promotes the responsible management of information in socially relevant domains, and constantly develops spaces in which discussions, forums, seminars, chats, hangouts and such like on aspects of journalism and digital convergence can take root.[173]

In 2014, the ITU Asia-Pacific Regional Seminar on *International mobile telecommunications (IMT) towards 2020 and beyond – Technology and Spectrum* was organized by ITU, kindly hosted by Ministry of Information and Communication of **Viet Nam**, with support from various sponsoring entities. The objective of this event was to highlight the importance of IMT for ICT development and emphasize the need to adopt harmonized solutions to issues related to technological advancement and spectrum availability for IMT systems in future.

In 2013, UNESCO hosted World Press Freedom Day which focused on *promoting the safety of journalists*. UNESCO adopted a work plan on journalists' safety, and promoted the United Nations Plan of Action on the Safety of Journalists and the Issue of Impunity.

[173] *Project nominated for a WSIS Project Prize 2014*

Action Line C10. Ethical dimension of the information society

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is the lead facilitator for Action Line C10: Ethical dimensions of the information society.

The *Building inclusive Knowledge Societies* report demonstrates that the mandate for this action line reflects both enthusiasm for the opportunities which ICTs present for extending human rights, and concern that ICTs can also be used for purposes which harm society and individuals.[174]

In **Japan**, measures have been taken by the Human Rights Organization (HRO) of the Ministry of Justice against *harmful information on the Internet* which infringes human rights. When HRO receives a complaint of infringement of human rights, such as invasion of privacy or the likelihood of invasion of privacy via the Internet, it undertakes prompt investigation into the case, and if evidence is found indicating that this is indeed a case of human rights infringement, necessary measures are taken to give relief to the victim, such as requesting the provider to delete voluntarily the harmful information.

Also in **Japan,** the Ministry of Internal Affairs and Communication (MIC) held a study group on *Use and flow of personal data*, which released a report in June 2013 laying down a framework on the utilization of personal data and directions on how to implement it.

In **Cuba**, *Estudios de Videojuegos y Materiales Audiovisuales* (EVIMA) - in English: Study of Video and Audiovisual Materials - is a Joven Club programme involving the development of video games with Cuban content that reflects ethical, cultural and historical values and extends to various technological media, including videogames for computers, consoles, tablets, cellphones and the web.

As stated in the *10-Year WSIS Action Line Facilitators' Reports on the Implementation of WSIS Outcomes*, increased convergence between the issues covered under this action line and those addressed in other action lines, in particular Action Lines C3 (Access to information and knowledge), C5 (Confidence and security in the use of ICTs) and C9 (Media) can be expected.

[174] http://www.itu.int/wsis/review/inc/docs/ralfreports/WSIS10_ALF_Reporting-UNESCO.pdf

Action Line C11. International and regional cooperation

International cooperation among all stakeholders is vital for implementation of the World Summit on the Information Society (WSIS) outcomes. This chapter describes ICT projects that have been carried out in response to requests for developed countries and international financial organizations to provide international cooperation and assistance for infrastructure development projects.

WSIS Forum 2013 was held from 13 to 17 May 3013, in Geneva, Switzerland. The event focused on "identifying emerging trends and a vision beyond 2015". The comprehensive programme of the WSIS Forum 2013 featured five High-level Dialogues, a Ministerial Round Table, WSIS +10 Review Plenary sessions, WSIS Action Line Facilitation Meetings, Interactive Sessions, Thematic and Country Workshops, Knowledge Exchanges and an Exhibition. A Ministerial Round Table was organized to explore the vision of world leaders in the WSIS Process beyond 2015, ensuring that ICTs remain a priority in the development agenda beyond 2015*World Telecommunication and Information Society Day* (WTISD) is celebrated every year on 17 May to help raise awareness of the possibilities that the use of the Internet and other ICTs can bring to societies and economies, as well as of ways to bridge the digital divide. The date marks the anniversary of the signing of the first *International Telegraph Convention* and the founding of the *International Telecommunication Union* (ITU).[175] The theme for WTISD-14 was *Broadband for Sustainable Development*.

The *NETmundial* Global Multistakeholder Meeting on the Future of Internet Governance took place on 23 and 24 April 2014, in Sao Paulo, **Brazil**. The meeting concluded by issuing the *NETmundial Multistakeholder Statement*, which is a bottom-up, non-binding outcome.[176]

ITU's sixth World Telecommunication Development Conference (WTDC) took place at the Dubai World Trade Centre in Dubai, **United Arab Emirates**, from 30 March to 10 April 2014 at the kind invitation of UAE. The theme of WTDC-14 was *Broadband for Sustainable Development*. The objective of the conference was to establish work programmes and guidelines for defining telecommunication development questions and priorities and to provide direction and guidance for the work programme of the ITU Telecommunication Development Sector (ITU-D) over the next four-year period. WTDC-14 was preceded by an *Executive Strategic Dialogue* on Broadband for Sustainable Development. WTDC-14 adopted an Action Plan and a Declaration to guide efforts to accelerate the development of telecommunications and ICT worldwide.[177]

ITU TELECOM World 2013 was held from 19 to 22 November 2013, in Bangkok, **Thailand**. The event welcomed key stakeholders from the public and private sectors, including ministers, regulators, industry CEOs from across the entire ICT ecosystem, thought-leaders, consultants, academics and digital innovators. Under the central theme of *Embracing Change in a Digital World*, ITU TELECOM World 2013 focused on five key topics: changes in the way people communicate with each other, the need for new business models in a data-

175 http://www.itu.int/en/wtisd/2014/Pages/default.aspx

176 http://netmundial.br/netmundial-multistakeholder-statement/

177 http://www.itu.int/en/ITU-D/Conferences/WTDC/WTDC14/Pages/default.aspx

centric era, shifting industry dynamics, changes in technology, and the need for new regulatory and standardization approaches.[178]

In line with the UN Millennium Development Goals (MDGs) and the principles of the information society, the *m-Powering* initiative is the result of a series of ITU activities aimed at expanding and enhancing telecommunication services with a focus on the developing world. The first Advisory Board meeting of the m-Powering development initiative was held on 15 October 2013 at ITU headquarters.[179]

Industry leaders met in an advisory capacity on 18 October 2013 to promote ITU's *Smart Sustainable Development Model* (SSDM) initiative. The first meeting of the SSDM Advisory Board brought together leaders of the telecom sector to leverage the transformational power of ICTs to push forward innovation and change at all levels.[180]

The ITU *Kaleidoscope* events aim to increase dialogue between experts working on the standardization of ICTs and academia. By viewing technologies through a kaleidoscope, these forward-looking events will also seek to identify new topics for standardization. The objective is to hold the events once a year in different parts of the world. The ITU *Kaleidoscope* conference 2013, on *Building Sustainable Communities*, was held in Kyoto, **Japan**, in April 2013.181

The ITU *World Telecommunication/ICT Indicators Symposium* (WTIS) was held in December 2013 in Mexico City, **Mexico**. The symposium opened with three High-Level Debates around key priorities for the post-MDG global agenda, and the increasingly vital role of ICT statistics in defining and monitoring national, regional and global development targets.[182]

The *Broadband Commission for Digital Development* continues to perform an important advocacy role, emphasizing how broadband access is fundamental to accelerating progress towards the MDGs by 2015. It explores ways in which broadband infrastructure and services can help lift people out of poverty and achieve the MDGs, and debates policy guidance and best practices for deploying broadband networks and services. The commission provides an additional focus for ITU's contribution to United Nations efforts on the MDGs in the push towards 2015, and, more recently, the process towards defining a single, integrated framework for post-2015 sustainable development.

The *Commission on Science and Technology for Development* (CSTD) continues to serve as subsidiary body of the United Nations Economic and Social Council (ECOSOC). It was established in 1992 to provide the United Nations General Assembly and ECOSOC with high-level advice on relevant issues through analysis and appropriate policy recommendations or options, in order to enable those organs to guide the future work of the United Nations, develop common policies and agree on appropriate actions. The commission is also

178 http://www.itu.int/net/pressoffice/press_releases/2013/57.aspx#.U3yQi9KSw1I

179 www.itu.int/en/ITU-D/Initiatives/m-Powering/Pages/default.aspx

180 http://www.itu.int/en/ITU-D/Initiatives/SSDM/Pages/default.aspx

181 http://www.itu.int/en/ITU-T/academia/kaleidoscope/2013/Pages/default.aspx

182 http://www.itu.int/net/pressoffice/press_releases/2013/Advisory-17.aspx#.U3815NKSwuc

mandated to assist ECOSOC in the system-wide follow-up to WSIS.[183] The last annual CSTD session was held on 12-16 May 2014, one of the key issues discussed being progress made in the implementation of and follow-up to the WSIS outcomes at the regional and international levels.

The BYND2015 Global Youth Summit had the overarching aim of developing a debate about the post-2015 development agenda. The main 'community' online hub for *BYND2015* was the crowdsourcing platform developed by ITU and built around the challenges identified during offline workshops and millennial jams held in mid-June 2013. A major part of the initiative was to stimulate the creation of youth communities around the world, connected by ideas and aspiration, that would persist beyond the event itself. [184]

In 2013, the eleventh *Regional Regulatory Activity in Electronic Communications Sector* conference was held in Budva, **Montenegro**, focusing on protection of the interests of electronic communication users. The event was held within the framework of the *INFOFEST 2013* Festival of ICT Achievements and was co-organized by the Agency for Electronic Communications and Postal Services of Montenegro (EKIP) and ITU. The conference aimed to provide a basis for identifying challenges associated with protecting consumers in the ICT ecosystem, to present current regulatory frameworks in relation to the protection of users in a digital world, to exchange best regulatory practice and to develop recommendations and guidelines for successfully addressing issues related to convergence.[185]

Between 2008 and 2013, ITU implemented a project designed to support the regional *harmonization of ICT policy and legislation* in the African, Caribbean and Pacific Group of States (ACP). This was probably one of the largest global initiatives aimed at both harmonizing and updating polices and legislations to date. It focused on two main areas – cybersecurity and telecommunications – and worked together with the regional organizations and their Member States. In order to support this process, ITU and the European Union decided to co-fund a project which forms part of the ACP Information and Communication Technologies programme within the ninth European Development Fund (EDF).[186]

Enhancing competitiveness in the **Caribbean** through the *Harmonization of ICT Policies, Legislation and Regulatory Procedures* (HIPCAR) is a response to a request from the Caribbean Community (CARICOM) and the Caribbean countries to ITU and the European Commission (EC) for cooperation in harmonizing the ICT policies, legislation, regulatory processes and procedures within their respective territories. It was implemented within the framework of the Caribbean Single Market and Economy (CSME), the CARICOM Connectivity Agenda, and the region's commitments to the WSIS targets and the MDGs. It also relates to treaty commitments in respect of promoting competitiveness and enhanced access to services such as the CARIFORUM states' Economic Partnership Agreement with the

183 http://www.unctad.info/en/Science-and-Technology-for-Development---StDev/Science--Technology-on-the-UN-Agenda/CSTD/

184 Ibid, p.59

185 Ibid, p.42

186 Ibid, p.19

European Union (EU-EPA). The HIPCAR project was officially initiated in 2008 and closed in 2013.[187]

Support for *Harmonization of ICT Policies in Sub-Sahara Africa* (HIPSSA) was initiated in response to the request made by the economic integration organizations in **Africa**, as well as regional regulators associations, to ITU and EC. The project was divided into four subregional programmes: East Africa, Central Africa, Southern Africa and West Africa.[188]

In May 2013, a *Capacity Building Workshop on ICT indicators* took place in Montevideo, **Uruguay,** and was attended by participants representing 11 Latin American countries as well as two experts from the *Asociación Iberoamericana de Centros de Investigación y Empresas de Telecomunicaciones* (AHCIET). The event aimed at strengthening the capacities of participant countries to produce high-quality and harmonized telecommunication/ICT statistics and indicators.[189]

In October 2013, ITU supported the Government of **Burkina Faso** in organizing the *African Forum on Best Practices in ICT*. The forum positions the data revolution as an emerging pillar of Africa's development agenda. It was attended by ICT ministries, regulators, fixed- and mobile-network operators, ISPs and leaders of the content and knowledge industries, bringing them face to face with heads of government, multilateral agencies and international civil society.

The *Transform Africa 2013* event was organized to evaluate progress and achievements arising from the Connect Africa summit held back in 2006. The event was co-hosted by the President of Rwanda and ITU in Kigali, **Rwanda**, in October 2013, and aimed to discuss and develop a new agenda for Africa to leapfrog development challenges through the use and uptake of broadband and related services, exploiting particularly, but not exclusively, the opportunities offered by high-speed Internet and advancing mobile technology.[190]

The ITU *Asia-Pacific Regional Workshop on Satellite Launching and Coordination* was organized in Yogyakarta, **Indonesia**, in 2013. The workshop brought together 112 participants from 15 Member States from the Asia-Pacific region and included satellite operators, experts and practitioners, senior government officials and other stakeholder groups from the satellite industry.[191]

In 2013**,** the *ITU Regional Workshop on Harmonization of Telecommunication/ICT Indicators with International Standards* was held in collaboration with the Ministry of Communication and Information Technologies of **Azerbaijan**. The workshop was attended by 47 participants representing eight countries of the CIS region, as well as the Executive Committee of the Regional Commonwealth in the field of Communications (RCC) and the United Nations (ITU,

187 Ibid, p.22

188 http://www.itu.int/en/ITU-D/Projects/ITU-EC-ACP/HIPSSA/Pages/default.aspx

189 *Tracking four years of achievements: Implementing the Hyderabad Action Plan*, p.56: http://www.itu.int/en/ITU-D/Conferences/WTDC/WTDC14/Documents/BD_E__ITU%20HAP_report_inside.pdf

190 Ibid, p.15

191 Ibid, p.28

UNCTAD). The workshop participants noted the significance of the issues covered, the substantial and balanced programme, and the good working atmosphere.[192]

The *Informatics International Convention and Fair* is held in Havana, **Cuba**, every two years. The purpose of the event is to stimulate exchange of experience and information between professionals, scientists, engineers, businesspersons, exhibitors, representatives of governments and international organizations and the general public, interested in researching, promoting, analysing and keeping abreast of advances in the fields of information technology, telecommunications, electronics, geomatics, medical technology, e-commerce and present-day automation. The theme for the 2013 event encompassed regulation in the telecommunication and IT sectors, security of ICTs and open-source platforms and applications, energy and the environment in ICTs. The 2013 event was attended by 1 888 participants, of whom 1 350 were Cuban and 538 were foreign.

In **Nigeria**, the *International Single Window* conference is an experience-sharing forum on the "single window" concept. The aim is to bring together different regions of the world, with contributions from countries which have a lot of experience in this field, the participation of countries wishing to set up their single window project, and inputs from organizations that support the implementation of single window systems, as well as international experts. A single window is a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfil all import, export and transit-related regulatory requirements. If information is electronic, then individual data elements need only be submitted once. [193]

In **Cuba**, the *National Computing Competition* is held annually. Between 40 and 60 papers from Cuban universities are presented. The *National Forum of Technical Sciences Students*, of which there have been 20 sessions, is held twice a year and always includes a computing committee which reviews more than 40 papers. In addition, jointly with the Cuban Mathematics and Computation Society, students have for several years been encouraged to enter the *Association for Computing Machinery* (ACM) - *International Conference on Computing and Mission* (ICCM) competitions.

In **Jordan**, the Middle East and North Africa (MENA) region *FTTH Council* is a non-profit organization which continues to fulfil its mission to accelerate the deployment of ultrafast broadband in the MENA region through information, education and promotion in order to enhance quality of life, contribute to a better environment and increase competitiveness. Its members are vendors, national and private networks, governments, service operators and utilities, who are all committed to ensuring a sustainable future for the region. In order to facilitate broadband deployment at national and regional level, the council is engaged with its committee's activities. The countries concerned are: **Bahrain**, **Egypt**, **Islamic Republic of Iran**, **Iraq**, **Jordan**, **Kuwait**, **Lebanon**, **Libya**, **Morocco**, **Oman**, **Palestine**, **Qatar**, **Syrian Arab Republic**, **Tunisia**, **Turkey**, **United Arab Emirates**, **Yemen**. The ongoing project runs from 2011 to 2034.[194]

---

192 Ibid, p.56

193 http://www.nigeriatradehub.gov.ng/News/tabid/98/entryid/39/international-single-window-conference.aspx

194 Project nominated for a WSIS Project Prize 2014

In 2013**,** the Iran University of Science and Technology (IUST) in the **Islamic Republic of Iran** established a *Research Centre for ICT Strategic and International Studies* (ICT-SIS). The main goal of the centre is to provide research services as the centre of excellence in international ICT activities and strategic planning in the country, to support major international commitments such as WSIS. The centre is willing to cooperate with the ITU Academy.[195]

In **Tunisia**, within the framework of follow-up of the WSIS outcomes and the Tunis Agenda recommendations, the government has established, since 2006, a follow-up mechanism devoted to supporting international efforts to increase cooperation in an inclusive approach to reduce the digital divide, by hosting the annual international event *ICT4ALL*. This event aims to contribute to implementation of the commitments in the Tunis Agenda adopted at WSIS-05 in coordination with all stakeholders (governments, public and private sectors, international organizations, civil society). *ICT4ALL* targets African and Arab countries, and presents a platform to address fundamental issues, in the context of the achievement of the MDGs and WSIS action lines.[196]

Supported by the European Commission (EC) and the African Union Commission (AUC), *IST-Africa* is a strategic collaboration between the International Information Management Corporation (IIMC) in **Ireland** and ministries and national councils responsible for the information society, ICT and innovation adoption, policy and research in 18 countries of **Africa**. Founded by IIMC in 2002, and co-funded under the European Framework Programme since 2005 (Current Contract 611795), IST-Africa has gradually introducing new partner countries on a phased basis, which are often at different stages of research capacity, technology adoption and socio-economic development. IST-Africa facilitates and supports development of the information society and knowledge economy in Africa through:

- International innovation, research and policy cooperation
- Knowledge-sharing and skills-transfer between IST-Africa partners
- Collaborative innovation, entrepreneurship and adoption of living labs
- Information society, ICT and innovation aspects of the Africa-EU Strategic Partnership. [197]

[195] Project nominated for a WSIS Project Prize 2014

[196] Project nominated for a WSIS Project Prize 2014

[197] http://www.ist-africa.org/home/default.asp?page=initiative

Conclusion

Conclusion

The World Summit on the Information Society (WSIS) Stocktaking Report 2014 highlights projects and initiatives aimed at implementation of the WSIS outcomes, for the period May 2013-May 2014, details of which were provided in response to ITU's official call for updates and new entries. The WSIS Stocktaking Report 2014 has been prepared on the occasion of the WSIS+10 High-Level Event. It bears witness to the magnitude of the efforts made by numerous stakeholders, including governments, the private sector, civil society and international organizations, towards building the information society and bridging the digital divide. In many cases, governments facilitated the collection of information on implementation of the WSIS outcomes at the national level. The progress made has been achieved thanks to multistakeholder collaboration – such solidarity among all members of society being crucial towards achieving the WSIS goals.

This year, the report takes on even greater significance in the context of the 10-year anniversary of WSIS Stocktaking. Every year since 2004 has seen the publication of a report containing an overview, reflecting the multistakeholder approach, of the latest activities and world trends. More and more entities, in cross-cutting sectors and in different countries, are taking part in the WSIS Stocktaking exercise with a view to sharing best practices.

Since 2003, in line with the Geneva Phase of WSIS, the elaboration of *national e-strategies* has become an important issue on the world's agenda, with the aim of improving the quality of life for all and providing citizens with access to information and public services. Governments are taking *outreach initiatives* by launching promotional campaigns and awards designed to raise awareness about the value of ICTs in society and to encourage citizens to use government e-services. *Infrastructure* and *broadband* are essential prerequisites if people are to benefit from a range of *e-services* such as e-education, e-health, e-agriculture, e-learning, e-environment, e-commerce and many others. The International Telecommunication Union (ITU) is committed to achieving universal access to broadband connectivity. Globally, mobile-broadband penetration will reach 32 per cent by end 2014. In developed countries, it will reach 84 per cent, a level four times higher than in developing countries (21 per cent).[198] *National broadband plans and strategies* are being established to ensure universal connectivity, including in rural, remote and underprivileged areas.

In the *public health sector*, various types of initiative are being undertaken, with a focus on regular electronic communication with patients in the form, for example, of SMS reminders and online advice. People in rural and remote areas are able to benefit from teleconsultation facilitates. A particular concern of many governments is reducing child mortality and improving maternal health, as demonstrated, for instance, by a number of initiatives, such as *Reducing Child Mortality and Protecting Mothers* in **Oman**, the *My Child's e-Health Record mobile app* in **Australia**, *Mobile Phones for Integrated Health and Early Childhood Care and Development* in **Kenya** and the *Electronic Born-Alive Certificate* in **Uruguay.** Another current

198 http://www.itu.int/net/pressoffice/press_releases/2014/23.aspx#.U4YLgnKSwuc

issue of major concern is illiteracy among populations, where programmes using ICTs to raise awareness about health are playing an important role.

In the *e-agriculture sector*, capacity-building programmes, monitoring tools, early warning systems, databases, inventories, maps and geographical information systems are all being introduced to help farmers and the rural population be more efficient and reduce food waste and agricultural losses. ICT know-how has been developed by means of toolkits, case studies, platforms, information sharing and databases. Information systems and mobile applications are increasingly being used to check the quality of products and food. Examples of this are the *Food Security and Vulnerability Information System* (SISAV) in **Madagascar**, the *Animal Disease Surveillance System* in **Angola**, **Malawi**, **Mozambique**, **Namibia**, **Tanzania** and **Zambia**, *SMART FISH Post Harvest Fish Loss* in **Djibouti**, **Kenya**, **Uganda**, **Tanzania**, **Rwanda**, **Burundi, Central African Republic**, **South Sudan** and **Sudan**, and the *Agriculture Management Information System* (AGMIS) in **Sri Lanka**.

It is clear from the activities reported that *teleworking* is becoming an efficient tool for empowering citizens, particularly women and persons with disabilities, to enter the workforce. Particular attention needs to be focused on addressing youth unemployment and providing young people with better employment opportunities. Efforts in this regard include the *Programa de promoción del empleo en teletrabajo* (PROPET) in **Argentina**, *Vía Trabajo* in **Uruguay** and the *Youth Employment Generation Programme* in **Egypt.** Countries are promoting early intervention programmes such as internships and training courses for young people.

Where the *environment* is concerned, *e-waste* continues to represent a huge challenge, with an estimated annual 50 million tons of e-waste still being produced worldwide. The safe disposal and recycling of hardware and components from discarded ICT equipment are a key factor in programmes for sustainable production and consumption. Recently, governments have been deploying significant efforts aimed at raising awareness about *consumption behaviour* and *climate-change* issues. In urban areas, there is a trend towards the development of systems and e-services for *managing air* (e.g. air quality and CO_2 emission levels) and *water* (e.g. water consumption, leaks and quality), with projects such as *Water Leak Reduction in Water Management* in **Turkey,** the *National Geographic Information System* in **Bulgaria** and the *EnviroPortal* in the **United Arab Emirates**.

Governments across the world remain committed to building *e-government* strategies, programmes and plans at the national level with the aim of providing the most appropriate responses to citizen and government needs. Through *government-to-government* (G2G) *interaction*, the exchange of information between governments transforms government services into effective and efficient mechanisms. E-government services include the introduction of technical facilities, such as videoconferencing, automated management systems and communication platforms, examples being the *e-Briefcase and Knowledge Centre* in the **United Arab Emirates,** the *Government Shared Platform* in **Japan**, *consolidated and centralized customs and tax systems* in **Poland** and *Project Arrow* in **India.**

Citizen- and business-oriented projects and initiatives provide one-stop *government-to-consumer/citizen* (G2C) and *government-to-business* (G2B) services by creating government contact points and call centres, setting up national emergency numbers and modernizing notarial systems. Customer service has been improved thanks to the development of online

platforms and portals through which citizens can access public services around the clock, such as, for instance, the *Single Portal for Interactive Public Services* in **Uzbekistan**, the *eGov Web Portal* in **Kazakhstan** and *Kuwait Government Online* (KGO) in **Kuwait**. Advanced social security, e-insurance and e-pension systems and e-funds are applications that help to improve a country's social framework. More and more projects are being implemented with a view to providing services designed to enable *people with specific needs* to perform government transactions.

ICT applications can enhance the *business environment* by reducing expenditure, facilitating payment methods, optimizing supply chains, securing document and data exchanges, strengthening logistics and procurement management and promoting local production. Examples found in this report include *Hubco* in the **Islamic Republic of Iran**, the *Dangerous Products Early Warning Network* (SARA) in Algeria, *NFC Mobile Wallet* in **China** and the *Jaoubnee* network in **Morocco.**

Access to information and knowledge remains high on the agenda of many governments. *CONVERTIC*, a national strategy targeting people with visual impairments in **Colombia**, *Integrated and Progressive Teaching Aids* in **Cuba**, *Information System for the Disabled* in **Turkey**, the *Strillone* ("paper boy") application for visually impaired people in **Italy** and *Tamkeen*, an innovation competition for the development of software and mobile applications for people with disabilities in **Egypt**, are just a few examples that highlight the importance of *mainstreaming accessibility initiatives*.

Community centres and *telecentres* are being implemented in order to ensure free access to ICTs and information anytime, anywhere, with rural areas as a primary target to ensure the digital inclusion of their populations. Examples of projects reported include *Programa Escolhas* (Choices programme) in **Portugal**, *Community Centres* (CCs) in **Bhutan**, *Rural Information Technology Centres* (RITCs) in **Nigeria**, the *Information Access Centre* (IAC) in the **Republic of Korea**, the *Siyafunda Community Technology Centre* (CTC) in **South Africa** and the *Salamieh Telecentre* initiative in the **Syrian Arab Republic**. Governments stress the fact that it is important to create a critical mass of *qualified and experienced ICT professionals* by establishing public access points and local ICT training centres.

Capacity building and *ICT literacy* are essential for building an inclusive information society. ICTs are being increasingly integrated into education and training at all levels, as evidenced by the *ICT for Education at Secondary and Higher-Secondary Level* project in **Bangladesh**, the *Educational Ecosystem at the Municipal Level for Intergenerational Population Adaptation to Modern ICTs* (EMAMICT) in the **Russian Federation** and the *National e-Training Programme* in **Saudi Arabia**.

ICT literacy programmes for schools are being developed to familiarize children with ICT tools, through initiatives such as the *Computing and Electronics Youth Club* in **Cuba** and an *Innovation and Education Centre* (CIE) in **Mexico**. The Geneva Plan of Action states that governments, in collaboration with stakeholders, are encouraged to formulate ICT policies that foster entrepreneurship, innovation and investment, and with particular reference to the promotion of participation by women[199]. Examples of efforts to respond to this call are

[199] Geneva Plan of Action, § 13 l)

the *Khalifa Fund E-Space* project in the **United Arab Emirates**, the *Digital High Impact Programme* (HIP) in **New Zealand** and *We support e-business – web.gov.pl* in **Poland.**

In some countries, *adult illiteracy* is still an enormous challenge, particularly in rural and underserved areas. New opportunities have been created to provide ICT education for *citizens in rural areas* through specially equipped vehicles, notably trucks and buses, designed to travel around the country, targeting rural areas. More and more, training is becoming available for *women* and *girls*, with the aim of engaging them with ICTs and increasing the number of women in ICT careers. In many countries, in response to the fact that 2 billion people worldwide will be aged 60 or over by 2050, investments are increasing in ICT literacy for *older persons*.

Many governments are addressing *security issues* as a key concern once they have developed and implemented ICT-related projects. The lack of an institutional framework to deal with cyberincidents and cyberattacks is a genuine challenge when it comes to responding to cyberthreats. In many countries, there is still a need to establish bodies responsible for registering, analysing and responding to security incidents. These challenges are being addressed through the establishment of *national computer incident response teams* (CIRTs), such as *CERTuy* in **Uruguay** and *OCERT* in **Oman**. ITU is working with Member States, with regions and in partnership with the International Multilateral Partnership Against Cyberthreats (IMPACT) to deploy capacity-building capabilities at the national and regional levels.

On behalf of the entire team, we would like to thank all stakeholders who have contributed to the WSIS Stocktaking Database this year, and we encourage and urge stakeholders to continue to submit their latest information – whether new or updated – on a regular basis.

List of Abbreviations and Acronyms

List of Abbreviations and Acronyms

A2I	Access to Information (Bangladesh)
ANASEMCI	Association nationale des semenciers (Côte d'Ivoire)
ACM	Association for Computing Machinery (Cuba)
ACTIVE	Advanced Cyberthreats Response Initiative (Japan)
ADEC	Abu Dhabi Education Council (UAE)
ADRM	Agriculture disaster risk management
AGESIC	Agency for E-Government and Information Society (Uruguay)
AGMIS	Agriculture Management Information System (Sri Lanka)
AIMS	Aquaculture Information Management System (Thailand)
ALERT	Applied Learning for Emergency Response Team
AMI	Accessible Media Inc.
ANADER	Agence nationale d'appui au développement rural (Côte d'Ivoire)
AREGNET	Arab Regulator Network
ASEAN	Association of Southeast Asian Nations
ASG	Augmentative serious game
BDT	Telecommunication Development Bureau
BITS	Biometrics Information Transfer System (Somalia)
BNNRC	Bangladesh NGOs Network for Radio and Communication
C&I	Conformance and interoperability
CBN	Central Bank of Nigeria
CBT	Central Bank of Turkey
CCAS	Council Chambers Automation System (Nigeria)
CC	Community centre
ccTLD	Country code top-level domain name
C-DAC	Centre for Development of Advanced Computing (India)
CEB	United Nations system Chief Executives Board for Coordination
CERD	Centre of Educational Research and Development (Lebanon)
CERTuy	Uruguayan Computer Emergency Response Team
CGS	Conditional Grants Scheme (Nigeria)
CIE	Innovation and education centre (Mexico)
CMB	Capital Markets Board (Turkey)
COL	Commonwealth of Learning
CoMoSeF	Cooperative Mobility Services of the Future (Turkey)

COP	Child online protection
CPC	Child Protection Centre (UAE)
CRT	Cathode ray tube
CSO	Compulsory Social Service (Colombia)
CTC	China Telecommunications Corporation
CYDER	Cyber Defence Exercise with Recurrence (Japan)
DAD-Net	Domestic Animal Diversity Network
DCD	Dubai Civil Defence (UAE)
DCED	Donor Committee on Enterprise Development (UNCTAD)
DE-CIX	German Commercial Internet Exchange
DES	State Information System (Turkey)
DICOSE	Livestock Control Office (Uruguay)
DINAE	National Directorate of Employment (Uruguay)
DNIC	National Directorate of Civil Identification (Uruguay)
DTTB	Digital terrestrial television broadcasting
ECA	United Nations Economic Commission for Africa
ECLAC	United Nations Economic Commission for Latin America
EDDS	Electronic Data Dissemination System (Turkey)
EDM	Electronic Documents Management System
EEADE	Ensuring Equivalence in Access for Disabled End-Users (Turkey)
EKAP	Electronic Public Procurement Platform (Turkey)
eLAC2015	Plan of Action for the Information and Knowledge Society in Latin America and the Caribbean
ELER	Internet-based Earthquake Damage and Loss Estimation Routine (Turkey)
EMAMICT	Educational ecosystem at the municipal level for intergenerational population adaptation to modern ICTs (Russian Federation)
EPDK	Information System Development (Turkey)
EPITOME	Empowerment Programme for IT Use: Outreach for Micro Entrepreneurship (Malta)
ERP	Enterprise resource planning
ESCAP	United Nations Economic Commission for Asia and the Pacific
ESIS	Strategic Management and Statistical System (Turkey)
eSTAS	Symposium on Technologies for Social Action (Spain)
ETR	e-Turkey Awards
EVAS	Electronic Data Transfer System (Turkey)
EVIMA	Study of Video and Audiovisual Materials (Cuba)

EXAM	Perceptual Examination Platform for Differently Abled Aspirants (India)
FATIH	Movement to Increase Opportunities and Technology (Turkey)
FDI	Foreign direct investment
FINTURK	Financial Turkey Map
FTTH	Fibre-to-the-Home
FOSSFA	Free and Open-Source Software Foundation for Africa
FRSC	Federal Road Safety Corps (Nigeria)
FSB	Future Solution for Business (Bangladesh)
FTRA	Forum on Telecommunication/ICT Regulation and Partnership in Africa
G2B	Government-to-business
G2C	Government-to-citizen/consumer
GCC	Gulf Cooperation Council
GCI	Global Cybersecurity Index
GDCO	Gedaref Digital City Organization (Sudan)
GDP	Gross domestic product
GFIMS	Global Fire Information Management System
GINA	Comprehensive Customs Management System (Cuba)
GIS	Geographic information system
GOSI	General Organization for Social Insurance (Saudi Arabia)
HIP	Digital High Impact Programme (New Zealand)
HIPCAR	Harmonization of ICT Policies in the Caribbean
HIPSSA	Harmonization of ICT Policies in Sub-Saharan Africa
HPAI	Highly pathogenic avian influenza
HRDF	Human Resources Development Fund (Saudi Arabia)
IaaS	Infrastructure as a service
IAC	Information Access Centre (Republic of Korea)
IBS	Internet Banking System (Turkey)
ICCM	International Conference on Computing and Mission
ICT	Information and communication technology
ICT4D	Information and communication technology for development
ICTA	Information and Communication Technologies Authority (Turkey)
ICT-TF	Egypt Information and Communications Technology Trust Fund
IDAL	Investment Development Authority of Lebanon
IGF	Internet Governance Forum
IIS	Integrated Information System (Turkey)
IITA	International Institute of Tropical Agriculture

IMPACT	International Multilateral Partnership Against Cyberthreats
IMT	International Mobile Telecommunication
INDG	India Development Gateway
IRC	Information Resource Centre (Nigeria)
ISF	Informatici Senza Frontiere (Italy)
ISP	Internet service provider
ITA	Information Technology Authority (Oman)
ITI	Information Technology Institute (Egypt)
ITO	Information Technology Organization (Islamic Republic of Iran)
IVAS	Information-Based Governance System (Turkey)
IXP	Internet exchange point
KASP	King Abdullah Scholarship Programme (Saudi Arabia)
KDIPA	Kuwait Direct Investment Promotion Authority
KGO	Kuwait Government Online
KIN	Kuwait Information Network
KPI	Key performance indicator
LACNIC	Latin American and Caribbean Internet Registry
LMIS	Labour Market Information System (Nigeria)
LMO	Labour Market Observatory (Nigeria)
MABS	Mobile Search Informatic Stystem (Turkey)
MBRSLP	Mohammed Bin Rashid smart learning project (UAE)
MCMC	Malaysian Communications and Multimedia Commission
MDGs	Millennium Development Goals
MEGSIS	Spatial Property System (Turkey)
MGAP	Ministry of Agriculture, Livestock and Fisheries (Uruguay)
MIC	Ministry of Internal Affairs and Communications (Japan)
MINTA	Marshall Islands National Telecommunication Authority
MoCS	Ministry of Civil Service (Oman)
MoE	Ministry of Education (Saudi Arabia)
MoH	Ministry of Health (Saudi Arabia)
MOOC	Massive open online course
MoU	Memorandum of Understanding
MTSS	Ministry of Labour and Social Security (Uruguay)
MTV	Mobile television
NASO	National Aquaculture Sector Overview
NBC	National Broadcasting Commission (Nigeria)

NBN	National Broadband Network (Jordan)
NBS	National Bureau of Statistics (China)
NBTC	National Broadcasting and Telecommunications Commission (Thailand)
NCA RK	National Certification Authority of the Republic of Kazakhstan
NCS	Nigeria Computer Society
NEGP	National e-Governance Plan (India)
NERIES	Network of Research Infrastructures for European Seismology
NFSN	Nigerian Financial Services Network
NIC	National Information Centre (Saudi Arabia)
NIF	National Insurance Fund (Bulgaria)
NITDA	National Information Technology Development Agency (Nigeria)
NPA	National Police Agency (Japan)
NPHCDA	National Primary Health Care Development Agency (Nigeria)
NSPD	National Software Policy Document (Nigeria)
NITDA	National Information Technology Development Agency (Nigeria)
NUC	National Universities Commission (Nigeria)
NUSMAP	Nigerian University System Management Portal
NUTALP	Nigerian Universities Electronic Teaching and Learning Platform
NZTE	New Zealand Trade and Enterprise
NZTech	New Zealand Technology Industry Association
OCERT	Omani National Computer Emergency Readiness Team
OCS	Online Class System (Kuwait)
ODA	Official Development Assistance (Japan)
OEET	Office of Engineering Education Technologies (Kuwait)
OSIRIS	Optimal Strategy to Innovate and Reduce Energy Consumption in Urban Rail Systems (Turkey)
OTARR	Online Toxicology Analysis Requests and Results (Saudi Arabia)
PaaS	Platform as a service
PACE	Partnership for Action on Computing Equipment
PEPS	Public Electronic Payment System (Turkey)
PGDBIS	National Market Surveillance Information System (Turkey)
POLNET	Police automation system (Turkey)
PPA	Public Procurement Authority (Turkey)
PPP	Public-private partnership
PRACTICE	Proactive Response Against Cyberattacks Through International Collaborative Exchange (Japan)
PROPET	Programa de promocion del empleo en teletrabajo (Argentina)

PTS	Post och Telestyrelsen (Sweden)
PUE	Electronic Services Platform (Poland)
R&D	Research and development
RAFT	Réseau en Afrique Francophone pour la Télémédecine
RAPEX	European Rapid Exchange of Information System
RASFF	European Rapid Alert System for Food and Feed
RCAR	Régime Collectif d'Allocation de Retraite (Morocco)
REOA	Regional Emergency Office for Africa
RFP	Request for proposal
RHEA	Rwanda Health Enterprise Architecture
RITC	Rural Information Technology Centre (Nigeria)
RKN	Rural Knowledge Network
ROP	Royal Oman Police
RTUK	Radio and Television Supreme Council (Turkey)
SAAS	Software as a service
SADC	South African Development Community
SAI	State Audit Institution (Oman)
SAARC	South Asian Association for Regional Cooperation
SIGENU	New University Management System (Cuba)
SIIS	Broadband Infrastructure Information System (Poland)
SISAV	Food Security and Vulnerability Information System (Madagascar)
SISEPSIN	Sistema de Evaluacion y Seguimiento a las Metas del Plan Estatal de Desarrollo (Mexico)
SNICM	National System of Medical Science Information (Cuba)
SNIG	National System of Livestock Information (Uruguay)
SOL	Social Online Learning (UAE)
TBV	Turkish Informatics Foundation
TCM-TF	Tunnelling compressed multiplexed traffic flow
TECA	Technologies and Practices for small Agricultural Producers
TETfund	Tertiary Education Trust Fund (Nigeria)
TRA	Telecommunications Regulatory Authority (UAE)
TSM	Trusted Service Manager (China)
TTS	Text-to-speech
TÜSİAD	Turkish Industry and Business Association
UCI	University of Computer Sciences (Cuba)
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme

UNESCO	United Nations Educational, Scientific and Cultural Organization
UNODC	United Nations Office on Drugs and Crime
USARM	University System Annual Review Meeting (Nigeria)
USDA	United States Department of Agriculture
VIHEAF	Virtual Institute for Higher Education in Africa
VSAT	Very small aperture terminal
VUCE	Single Source for Foreign Trade Information (Nigeria)
WAAS	Wide area application services (UAE)
WAW	World Agriculture Watch
WCO	World Customs Organization
WHO	World Health Organization
WINC	Wireless Intelligent Networks Centre (Egypt)

Telephone: +41 22 730 5896
Telefax: +41 22 730 6453
wsis-stocktaking@itu.int
wsis-info@itu.int

Printed in Switzerland
Geneva, 2014

ISBN 978-92-61-14881-2

Price: 34 CHF