



UN-ESCWA

United Nations Economic and Social Commission for Western Asia

NATIONAL PROFILE OF THE INFORMATION SOCIETY OF MOROCCO, 2013



United Nations
New York, 2013

Distr.
GENERAL
E/ESCWA/ICTD/2013/6/Add.8
ORIGINAL: ARABIC

ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA

**NATIONAL PROFILE OF THE INFORMATION SOCIETY
IN MOROCCO**

United Nations
New York, 2013

CONTENTS

Page

Introduction.....	1
I. THE ROLE OF THE GOVERNMENT AND ALL STAKEHOLDERS.....	2
A. National information society policies and e-strategies.....	2
B. Public/Private Partnerships or Multi-Sector Partnerships (MSP).....	5
II. ICT INFRASTRUCTURE.....	6
A. Market structure and regulatory landscape.....	6
B. Penetration of ICT services.....	7
C. Initiatives/Projects for ICT infrastructure and development of new services	9
III. ACCESSIBILITY TO INFORMATION AND KNOWLEDGE.....	12
IV. ICT CAPACITY BUILDING.....	13
V. BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTS	15
A. Use of electronic transactions and documents.....	15
B. Online and network security	16
C. Privacy and data protection.....	17
VI. ENABLING ENVIRONMENT.....	18
A. Legal and regulatory environment.....	18
B. Domain name management	19
C. Standardization in ICT.....	20
VII. ICT APPLICATIONS.....	21
A. E-Government.....	21
B. E-Business.....	23
C. E-Learning	24
D. E-Health.....	25
VIII. CULTURAL DIVERSITY AND IDENTITY, LINGUISTIC DIVERSITY AND LOCAL CONTENT.....	26
A. Use of ICT in support of cultural and linguistic diversity	26
IX. MEDIA	27

CONTENTS *(continued)*

Page

X. INTERNATIONAL AND REGIONAL COOPERATION	28
XI. BUILDING THE ICT SECTOR.....	30
A. ICT firms	30
B. Government facilitation	30
C. Contribution of ICT sector in the national economy	31
D. R&D and innovation in the ICT sector	31
E. Investment in the ICT sector	34

Introduction

Morocco has seen in recent years, significant and sustained growth in the use and production of information and communication technologies (ICTs). This development has been strengthened by all successive governments through active intervention in the structuring, planning and continuous promotion of the various aspects of information technology and communications.

The main objective of this ongoing effort to shift to the information society is the desire to create value and improve the standard of living and welfare of the citizens. As ICTs is considered as an essential tool for achieving human and economic development, particularly by:

- Effective and efficient use of the information, as one of the main factors for the production of value-added;
- Achievement of significant productivity gains by creating new opportunities to produce, process, record, store and share information, as well as by providing easier access to information.

Thus, the effective use of information technology in all areas of economic and social life of Morocco is an urgent priority to ensure the country's growth and sustainable competitiveness. In this framework Morocco prepared since the mid - nineties three national strategies for information and communication technologies.

Based on a clear vision and aspirations aimed at making Morocco assume its rightful place within the emerging countries active in the field of information and communication technologies, the Ministry of Industry, Trade and New Technologies launched in 2009 the National Strategy for Information Society and Digital Economy "Digital Morocco 2013".

This strategy is designed around four strategic priorities: Social change, Implementation of user-oriented public services, Computerisation of small and medium-sized enterprises and the Promotion of IT industry; with two supporting measures, namely Development of human capital and Promotion of cyber-confidence, as well as two implementation modalities: Management of strategy and Allocation of financial resources .

The orientations of the Digital Morocco strategy combine economic gains with benefits for individual citizens; it aims to achieve the following objectives:

- Provide additional GDP estimated at 27 billion dirham;
- Create 26,000 additional jobs;
- Enable a household of three with Internet access and online services;
- Mainstream the use of new technologies of information and communication, by the equipping a 100 per cent of public schools, as well as students in the fields of science and IT engineering with computers and technologies;
- Increase the number of user-oriented public services from 16 to 89.

I. THE ROLE OF THE GOVERNMENT AND ALL STAKEHOLDERS

The effective participation of governments and all stakeholders is vital in developing the Information Society, which requires cooperation and partnerships among all of them. The processes of adopting proper policies and formulating strategies are essential for mobilizing all stakeholders from a cross-section of the public and private sectors and disseminating the opportunities created by the Information Society.

A. NATIONAL INFORMATION SOCIETY POLICIES AND E-STRATEGIES

For its integration into the global economy of knowledge, Morocco launched in October 2009, the National Strategy for Information Society and Digital Economy "Digital Morocco 2013" with the aim of developing user-oriented public services, improving the competitiveness of small and medium-sized enterprises and developing the local IT industry.

The "Digital Morocco" plan has been designed according to a clear vision and ambitions for Morocco, aiming to:

- Make IT a tool for human development;
- Make IT a source of productivity and added value for other economic sectors and for the public Administration;
- Make the IT sector one of the economy's pillars; and
- Position Morocco as a regional technology hub.

In this framework four strategic priorities have been fixed:

- Social change: Provide individual citizens with access to broadband internet and promote interaction and access to knowledge;
- Implementation of user-oriented public services: Sensitise the public administration about users' needs with regard to efficiency, quality, and transparency, through an ambitious e-government program;
- Computerization of small and medium-sized enterprises: Promote computerization in small and medium enterprises to improve productivity;
- Promotion of IT industry: Develop local IT business potential by providing support to the creation and growth of local actors, as well as by promoting the emergence of areas of excellence with strong potential for export.

With two supporting measures:

- Development of human capital: Ensure the availability of human resources, in terms of both quality and quantity, to meet the sector's needs;
- Promotion of cyber-confidence: Put in place the right conditions for cyber-confidence.

And two implementation modalities:

- Management of strategy: Put in place an overall governance;
- Allocation of financial resources: Ensure the allocation of adequate financial resources.

The achievements of the national strategy are encouraging at many levels as Morocco was able to achieve advanced steps in regards to the objectives underlined within the plan "Digital Morocco 2013".

These encouraging outcomes reflected, in particular, in the development of an appropriate legislative and regulatory framework, and in the processing of small and medium enterprises and microenterprises, and the use of the information technologies, as well as what have been achieved in the e-government program.

Regarding the first strategic priority "social change", it should be noted that in the framework of the first initiative aimed at promoting the wide use of information technology and processing the actors in the education sector with necessary equipment, the program "Injaz" has targeted approximately 90,000 students. Concerning the program "Nafida" which support teachers in order to be equipped with computers connected to the Internet, it reached the underlined goal of 150,000 teachers. At the same time, the program "Genie", which aims to provide all public school (more than 9,000) with multimedia resources connected to Internet, has know a completion rate of 80 per cent.

For the second initiative of the same priority, which aims to create public centres, equipped with computers linked to the Internet, to permit access to Internet services in marginalized areas, 74 centres out of the 400 planned has been established.

For the second strategic priority of Digital Morocco 2013 which concerns the e-government program and aims to implement 89 users -oriented public services, among the major achievements we can mention the setting up of a steering committee in charge of the e-government program in addition to the implementation of nearly 35 online services.

Concerning the third strategic priority which seeks to support the computerization of SMEs' that have branches with strong GDP potential, in order to increase their productivity and improve their competitiveness; 266 enterprises (mainly in branches such textile, leather, automotive and food industry) have benefited from the support program "Moussanada", that represent 67 per cent of the goal. Add to that, more than 3,000 managers of SMEs have benefited of free training in the IT field (program "Infatih"). At the end of the training programs, trainees received a "digital license" which permitted them access to personalized backing to the SME support plans.

In the framework of the fourth strategic priority, which aims to Develop local IT branches by sustaining creation and growth of local actors, and by creating areas of excellence with high export potential, a public-private investment funds such as risk capital and venture capital designed for new IT enterprises has been set up worth 100 million dirham (about US\$ 12 million) for initial financing and development of Moroccan start ups and small-size enterprises facing problems in raising funds, to carry out their first development phase. This fund contributed to the financing of 13 projects.

It should be noted in the same priority, with regard to the set up of "technoparks" and incubation structures that provide entrepreneurs installation and coaching services adapted to their needs, the Rabat-techno park was opened in July 2012 and attracted 35 start ups. In 2013 work beganon the Tangier-techno park.

The support measure "Digital confidence" is intended to establish the right conditions to win the trust of citizens and enterprises in the digital economy. The fulfilment of identified ambitions has required the implementation of three key initiatives:

Initiative 1: Update and reinforce the legislative framework:

In this context, several laws were approved related to:

- The protection of consumers;
- The protection of personal data;
- The encouragement of the dematerialization of electronic transactions

Initiative 2: Put in place appropriate organizational structures

In the framework of implementing support mechanisms to assist social operators on issues related to Information Systems Security, many entities were created such as:

- The National Commission for Data Protection (CNDP);
- The National Computer Emergency Response Team (MA-CERT);
- The Directorate-General for the security of information systems (DGSSI);
- The Strategic Committee in charge of Information Systems Security (CSSSI);

In addition the first service provider of electronic certificates (Poste Maroc), whose role is to ensure electronic exchanges viability, authentication and data integrity by issuing and delivering electronic certificates, was developed and put in to place

Initiative 3: Promote and sensitize social operators to information systems security

Regarding this initiative, several actions have been taken, such as:

- Setting up of a Label of retail websites in order to boost public confidence in e-commerce, in partnership with business federations, and notably the Confederation of Moroccan Companies (CGEM);
- Realization of the national portal on SI security in order to sensitize and inform the actors in the community;
- Completion of a study to prepare a communication plan to organize communication and awareness campaigns on the security of information systems;
- Providing training programs on IT and ISS for engineering students, to help them acquire adequate qualifications according to their area of expertise and in line with the needs of the labour market;
- Providing training to introduce to magistrates and judges to basic IT and ISS skills.

For the other measure of support "human capital", many measures have been taken to promote the development of appropriate mechanisms for human element through a matching training with the needs of the labour market, among them:

- Putting in place a mechanism of management, following-up, and assessment of training plans in the IT sector;
- Designing and launching of training programs that meet the needs of IT sector;
- Updating of education programs to enhance IT graduates employment.

Thus, several agreements with the private sector and the public sector have been enabled, to establish and manage training programs taking into account the expected needs, by:

- Reorienting, in collaboration with professionals, second-cycle university teaching and curricula to better respond to the needs of enterprises and professionalize training by integrating long-duration training in the curricula (minimum of 6 months) to allow student immersion in the professional world;

- Activating and launching, in partnership with the sector's representatives, an emergency training program for complementary IT offshore (around 3,000 graduates) to meet the peak demand forecast of IT offshore operators ("IT Academy" program).

ICT strategy exists	<i>YES "Digital Morocco 2013"</i>
Year of adoption and latest update	<i>2009-2013</i>
Government agency in charge	<i>Ministry of Industry, Trade and New Technologies وزارة الصناعة و التجارة و التكنولوجيات الحديثة</i>
Pace of implementation	<i>Good</i>

B. PUBLIC/PRIVATE PARTNERSHIP (PPP) OR MULTI-SECTOR PARTNERSHIP (MSP)

The strategy for the information society and digital economy is the outcome of a participatory work between public and private actors. In this context, four agreements were signed, between the government, the institutional actors and the banks, in order to apply the strategy “Digital Morocco 2013” on the ground.

The first agreement is related to the pole of user-oriented public services, and aims to identify the obligations of the contracting parties in order to implement an ambitious program on e-government which allow the citizens to access to public services through the Internet, particularly the Digital Civil Registry and services oriented to contractors such as the payment of taxes.

The second agreement relates to social change through education, it seeks to develop the offer of funding ”Injaz“, which extends over five years, and aims to benefit approximately 80,000 engineers and students who are pursuing training in ITC, by making available a laptop connected to Internet at subsidized prices of up to 85 per cent.

The third agreement is also related to social change but through the Internet, it aims to promote internet access and IT use outside the home by setting up public community access centres to extend access to new technologies to a wider range of citizens.

The fourth agreement concerns the IT pole, through the set up of a public-private investment fund such as risk capital and venture capital designed for new IT enterprises, worth a hundred million MAD.

It should also be noted that there are several initiatives emanating from civil society organizations in order to disseminate the culture of information technology use in various fields, as well as to raise awareness of its importance and its role in bridging the distances especially for the rural population. Among them in particular the program TechCamp Morocco, which is a forum where civil society organizations share current challenges, faced by others organizations and associations in the same field with technology experts in order to put forward ideas about the role that technology can play in addressing these challenges. This interactive event brings together technology experts from America and North Africa who are working with NGOs and interested in social networking sites to find innovative and low-cost technology solutions to address real social problems.

II. ICT INFRASTRUCTURE

Infrastructure is central in achieving the goal of digital inclusion, enabling universal, sustainable, ubiquitous and affordable access to ICTs by all. It takes into account relevant solutions already in place in developing countries and in countries with economies in transition, to provide sustainable connectivity and access to remote and marginalized areas at national and regional levels.

A. MARKET STRUCTURE AND REGULATORY LANDSCAPE

Since the late nineties, Morocco embarked on the process of restructuring the telecommunications sector, which transpired mainly through the adoption of the law 24-96, and is considered a turning point in the management of the sector through specific objectives. The law:

- Ensures that the telecommunications sector has an effective and transparent regulatory framework that promotes fair competition for the benefit of users of telecommunications services and networks;
- Follows the development of these networks and services through the promotion of initiatives to adapt them to the technological development and scientific progress;
- Provides public services to all segments of society , in the framework of a scheme for economic and social development;
- Provides to national economy the means of communication based on constantly evolving technology to allow greater openness and effective integration into the global economy;
- Boosts the postal sector by opening the international courier to competition;
- Encourages the creation of job opportunities, directly or indirectly linked to the sector.

Law 24-96 allowed for the liberalization of the telecommunications sector and the opening of the various components of the telecommunications market to competition. It also separated postal activities from those related to communication, via the creation of:

- A public institution in charge of post activities: Post of Morocco;
- A Joint Stock Company in charge of telecom activities: Morocco Telecom.

Moreover, this law permitted the creation of the National Agency of Telecommunications Regulation entrusted with the regulation and control of the telecommunications sector to ensure honest competition between various stakeholders for the benefit of users of telecommunications networks and services.

This major economic choice adopted by Morocco, based on liberalism and openness to international markets, contributed to revolutionize communications within Moroccan society through massive development in the use of the phone and the Internet. It permitted the telecommunications sector in Morocco to occupy a privileged position at the Arab regional level and experience great development in recent years, given to the size of the investments allocated to its modernization.

This qualitative leap has been strengthened in particular after the liberalization policy of the sector, especially the privatization of the historical actor (Morocco Telecom), and the granting of many licenses in the field of mobile and fixed phone and in the field of satellite communications for national and international companies.

The Moroccan Telecommunications market is shared between the historical operator “Morocco Telecom”, "Meditel", a subsidiary of the French group "Vivendi" and "Inwi", which is the result of a partnership between the two companies, Moroccan "Wana Corporate" and Kuwaitien "Zine Telecom".

The entry of a number of the world's leading companies in the telecommunications market in Morocco contributed significantly to the reduction of unit prices of telephone and has increased the quality of services

provided to consumers. The strengthening of the infrastructure in the sector in recent years and the increase of networks lines in various regions of the Kingdom had also a positive impact both on the level of foreign investment and on the development of the level of services provided to the Moroccan consumer.

The percentage of coverage by telecommunications network for local communities was at the end of 2012:

- 99 per cent for coverage by mobile technologies GSM, which provides voice services and Internet services with a low flow;
- 50 per cent for coverage by ADSL Internet, which provides Internet services with broadband;
- 55 per cent for coverage by mobile technologies 3G, which provides mobile Internet services with broadband.

Mobile services	<i>competitive</i>
Fixed-line services	<i>competitive</i>
Internet services	<i>competitive</i>

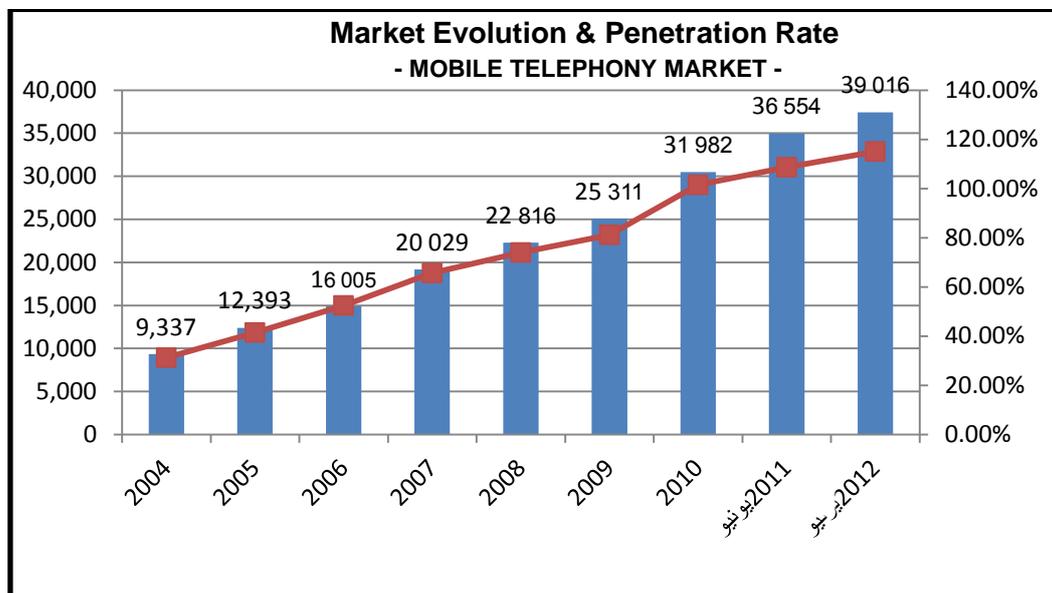
B. PENETRATION OF ICT SERVICES

Morocco has improved its global ranking in terms of the ICT Development Index (IDI), moving from 92nd place in 2010 to rank 90th in 2011.

And according to figures from the 2012 annual report of the National Agency of Telecommunications Regulation, the past year has reported significant progress in the rates of penetration and use of ICT. Indeed, all the key indicators rose, except the number of fixed telephone lines, which has been in decline for several years.

The mobile telephone has continued to increase its market penetration; it was close to 120 per cent at the end of 2012. The number of mobile's subscribers reached 39 million, recording an increase of 7 per cent compared to 2011. In terms of market share, the incumbent operator holds 45 per cent of the mobile subscribers market followed by Medi Telecom with 29 per cent and Wana corporate with 25 per cent.

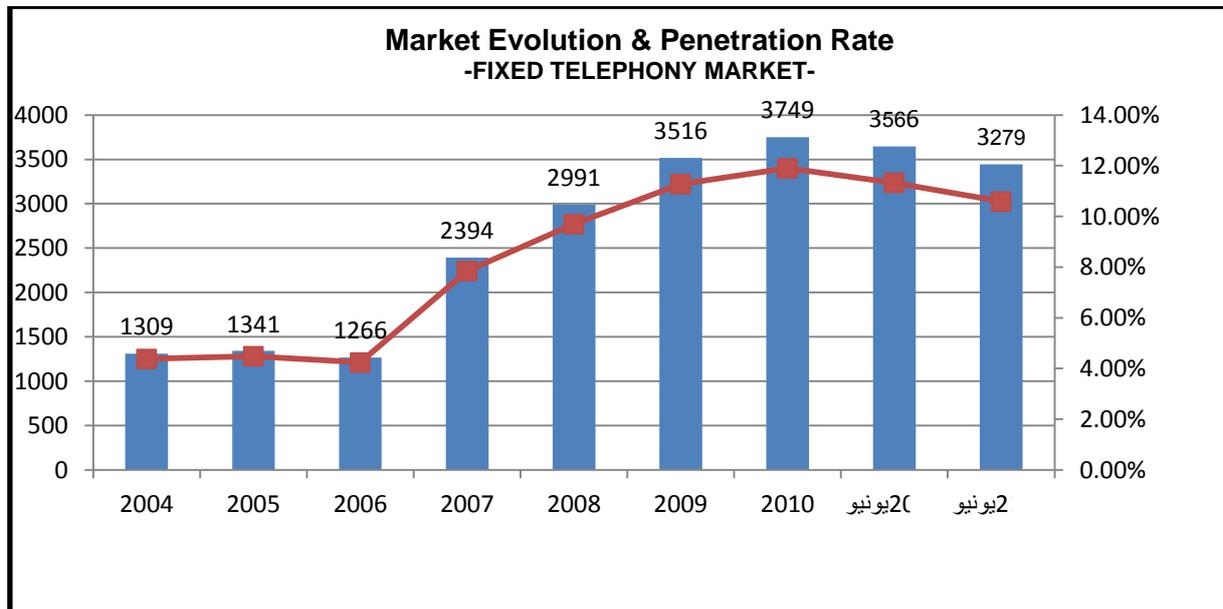
Figure 1. Market Evolution and Penetration Rate- Mobile Telephony Market



(*) Source: National Agency of Telecommunications Regulation

At the end of 2012, the number of subscribers reached 3.28 million against 3.57 million in 2011 of which 57 per cent (2 million subscribers) use fixed telephony with restricted mobility. The fixed telephony penetration rate decreased to 10.8 per cent at the end of 2012.

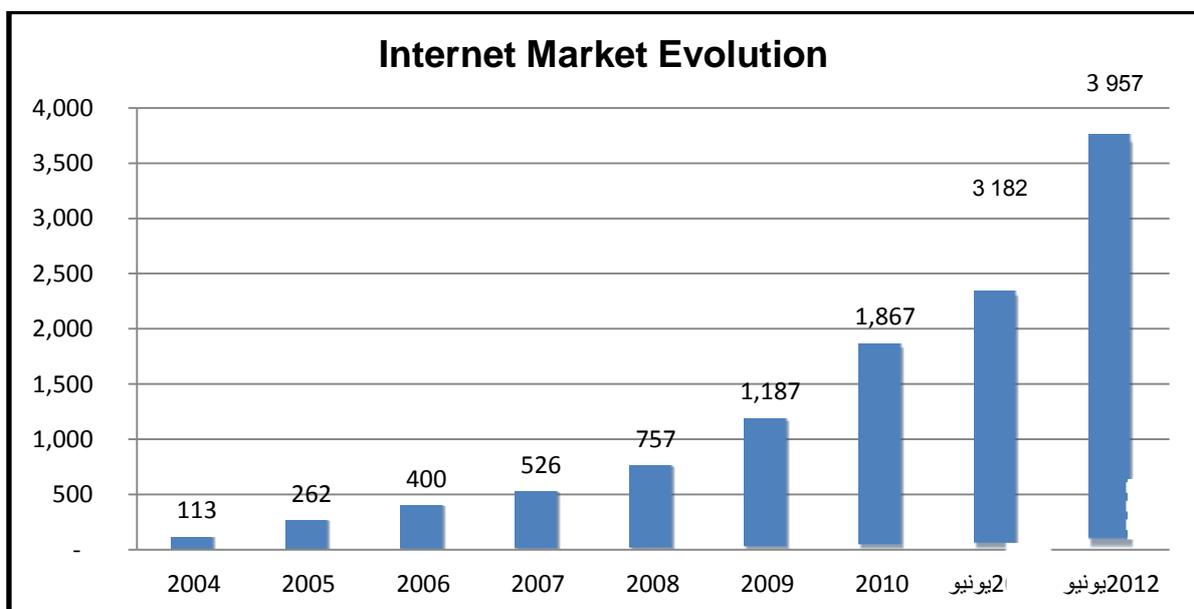
Figure 2. Market Evolution and Penetration Rate- Fixed Telephony Market



(*) Source: National Agency of Telecommunications Regulation

The total number of Internet subscribers has exceeded 4 million in 2012, recording an annually growth rate of 25 per cent. Internet penetration was about 12 per cent. The 3G internet access, represents 83 per cent (3.3 million subscribers) of the global Internet market. The total number of Internet users in Morocco reached about 10 million.

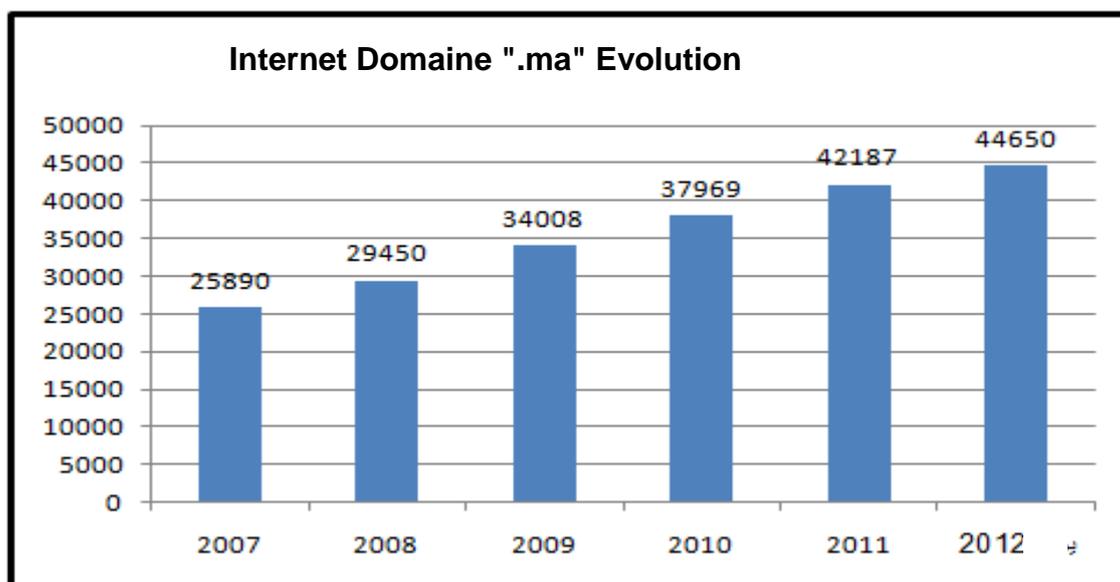
Figure 3. Internet Market Evolution



(*) Source: National Agency of Telecommunications Regulation

Internet market growth gave a qualitative leap to the number of Internet domain names ".ma", which exceeded 46,800 subscribers at the end of 2012, recording a growth of 11 per cent compared to 2011.

Figure 4. Internet Domains ".ma" Evolution



(*) Source: National Agency of Telecommunications Regulation

The computer equipment rate at home has reached 43 per cent in 2012 (4 points more than in 2011). 24 per cent of equipped Moroccan households have two computers and 7 per cent of equipped households have three computers or more. In total, 31 per cent of households are a multi-equipped and on average, equipped households have 1.4 computers.

Laptops are more and more prevalent in households: 57 per cent of equipment in 2012 against 56 per cent in 2011 and 45 per cent in 2010.

C. INITIATIVES/PROJECTS FOR ICT INFRASTRUCTURE AND DEVELOPMENT OF NEW SERVICES

In the framework of general orientations for the development of the telecommunications sector in 2013, several measures have been taken, aimed primarily to:

- Support investment in the sector as a major pole in the development of the Moroccan economy;
- Establish suitable infrastructures to bridge the digital divide;
- Expand access to telephone and Internet services by providing the right conditions for reductions in prices in order to make them more accessible to all segments of society;
- Enable regulation mechanisms in order to stimulate competition between the different actors.

In this regard, the focus was on:

- The activation of regulation measures;
 - The developing a national action plan to advance broadband Internet;
 - The reviewing of the legal framework;
- Activating regulation measures: the procedure for fixing measures interconnection costs has been activated to stimulate lower prices for telecommunication services.

The average revenue per minute (ARPM) of mobile telephones had dropped from 0.78 DHFoT/min (0.09 US\$ per minute) at the end of 2011 to 0.62 DHFoT/min (0.07 US\$ per minute) at the end of 2012, thus recording a 21 per cent drop. The average outgoing use per mobile customer has risen between 2011 and 2012 from 57 to 67 minutes/customer/month producing a growth in use of 16 per cent.

Regarding fixed telephones, the ARPM showed a decline of 11 per cent, moving from 0,94 DHFoT/min (0.11 US\$ per minute) in 2011 to 0,84 DHFoT/min (0,10 US\$ per minute) in 2012.

Concerning the Internet, the downward trend in prices measured by the average monthly bill for Internet customer is confirmed. Indeed, it had dropped from 75 DHFoT/month/customer (9.07 US\$) at the end of 2011 to 54 DHFoT/month/customer (6.53 US\$) at the end of 2012 showing a decline of 28 per cent.

The bill of 3G Internet has dropped from 54 DHFoT/month/customer (6.53 US\$) at the end of 2011 to 37 DHFoT/month/customer (4.47 US\$) at the end of 2012 showing a 31 per cent drop. In the case of ADSL, it moved from 132 DHFoT/month/customer (15.96 US\$) at the end of 2011 to 125 DHFoT/month/customer (15.12 US\$) at the end of 2012, therefore showing a 5 per cent decline.

- Developing a national action plan to advance broadband Internet: the advancement of very high speed Internet is one of the main projects in 2013. This is within the framework of supporting development plans and major projects that are launched in Morocco and that require the use of new technologies. Indeed, the support of such projects requires the set up of extremely efficient telecommunication infrastructure which permits access to broadband Internet and very high speed Internet across the whole national territory.

Most important axes of action plan to activate and complete very high broadband program

- Granting licenses for the completion and exploitation of mobile Telecommunication networks of the fourth generation (4G);
- Setting up Wireless networking external WIFI (WIFI Outdoor);
- Equipping new buildings and areas of activities with very high broadband infrastructure through optical fibre;
- Review the legal framework applicable to the establishment of infrastructure for very high speed.
- Review of the legal framework: Several amendments have been introduced to the law on post and telecommunications and to its application texts, it concerned in particular:
 - Including of new concepts of access to operators networks and national roaming services;
 - Framing of aspects in the relationship between operators and consumers;
 - Clarifying the requirements governing infrastructure sharing between operators, through the fixation of the obligations associated to them , including for the dissemination of technical and financial offers and for sharing and creating a database of infrastructures of operators ;
 - Including requirements in order to adapt telecommunication law to others legal regimes governing some areas closely related to the development of the telecommunications sector such as the area of urbanization, planning and occupation of the public domain;
 - Clarifying the responsibilities of the National Agency of Telecommunications Regulation especially in the area of markets control.

Action plan for the transition to the use of the sixth version of the Internet Protocol

To cope with the problem of the depletion of Internet addresses of the fourth version of the Internet Protocol (IPv4) and to ensure the continuity of the growth of new technologies in Morocco, a strategy and a

national action plan have been prepared to support the transition to the sixth version (IPv6), which is based on:

- Setting up the structures in charge of supervising the transition plan and coordination among stakeholders, promotion of awareness on the transition process and providing the necessary expertise to facilitate this process;
- Setting up the national portal of the sixth version of the Internet Protocol;
- Adopting international standards for this protocol and take it into account in public transactions;
- Undertaking initial measures, needed to activate the plan, in order to establish governance structures needed to oversee the process and ensure a smooth transition.

III. ACCESSIBILITY TO INFORMATION AND KNOWLEDGE

Morocco realized early, in the mid-nineties, the importance of the problem of access to information, that's why the country proceeded to liberalize the telecommunications and the audio visual sectors, allowed private radio stations to broadcast and ensured the attainment of digital networks especially the Internet.

Morocco has become, since 2011, the first Arab country to introduce a constitutional text guaranteeing the right of access to information, and the government is currently in the process of issuing a law guaranteeing the right to access to information in support to a transparency legal framework.

If from the beginning, the issue of accessibility has been well identified, the major challenge that has remained, after the tremendous progress that has been made in providing citizens with a mobile phone, was to focus on accelerating the democratization of Internet at home and to urge citizens to adopt the new technologies in their daily lives. This point has formed one of the strategic priorities of the Plan "Digital Morocco 2013".

In this context, several initiatives have been undertaken in order to enable to individuals, organizations and communities to benefit from access to knowledge and information, particularly:

- Liberalization of telecommunications services through deregulation, and the issuance of licenses to new companies;
- Liberalization of computer markets and of service providers;
- Tendency to the drop for many services ;
- Setting up of strategies to strengthen the infrastructure for information and communication technology and reduce the digital divide ;
- Development of laws governing: the security of electronic transactions and networks, encryption and electronic authentication, personal data protection and other areas;
- Prompting ministries to establish government portals to facilitate access to models, information , policies and legislation by electronic ways to increase the availability of information to the public;
- Development of online administrative services to facilitate the relationship with citizens;
- Launching a national information portal on the Internet (www.maroc.ma).

Multi-purpose community public access points

In order to expand the circle of people who benefit from new technologies, Morocco implemented a program to set up community access centres , which use the existing Telecommunications infrastructure, especially in areas where home Internet offers are not available or financial resources are not sufficient to have it. This program aims to set up 400 community centres in four stages (100 centres per year) with a total financial cost estimated at 80 million dirham.

In this context, 74 centres have been realized, while preparations are underway for the completion of 26 others in collaboration with the Ministry of Youth and Sports.

Regarding the rest of the program, and due to some difficulties emerged in its realization to youth houses and women centres, it was decided to improve the economic model adopted in order to better the completion rate.

IV. ICT CAPACITY BUILDING

Everyone should have the necessary skills to benefit fully from the Information Society; therefore capacity building and ICT literacy are essential. 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.

In the framework of the strategic priority "social change" of "Digital Morocco 2013", particularly the first initiative which aimed to mainstream the use of information technologies and provision of necessary equipment for the actors in the education sector, several achievements are to be noted:

- "Injaz" program: aims to provide engineering students with subsidized laptops and Internet access.

After the success of the first and second part, during seasons 2009-2010 and 2010-2011, and a growing number of requests by university students and educational institutions, the program was extended to additional 51,000 students in master's and doctoral cycle of public university . The total of potential beneficiaries has become about 118,000 students and a budget of 410 million dirham has been allocated for the program in its current form.

The third version of this program benefitted 37,500 students out of total of 50,044, spread over 108 academic institutions throughout the country, with a budget exceeding 134 million dirham and had a success rate of more than 84 per cent.

- "NET-U" program: aims, over three years, to equip academic institutions with mobile Internet broad infrastructure. To initiate this program, a preliminary study was completed and has identified 108 academic institutions and 25 university campuses which will be equipped with 150 stations for mobile Internet.

It should be noted that during 2012, a pilot university was chosen to host the project before its distribution to the other Moroccan universities.

- Program "GENIE": This program represent the operational dimension of the national strategy for the dissemination of information and communication technology in the education sector, in line with the terms of the National Charter for Education and Training, which consider the integration of ICT in the educational process necessary in order to raise the quality of education. This program was launched in the beginning of 2006 and was amended in 2009 with a new road map, stretching over five years (2009-2013).

This program covers 9,260 public educational institutions; it is based on four main themes focussing in the following areas:

- Infrastructure: develop multimedia equipments connected to the Internet;
- Teacher training: Set up several training workshops for inspectors , directors and teachers;
- Digital resources: Acquisition of digital resources, the establishment of a national laboratory for digital resources, and the development of a national portal for information and communication technology in public education.

At the end of July 2012, 85 per cent of the targeted institutions benefited from the program::

- 2,838 institutions were equipped with multimedia rooms connected to Internet;
- 6,500 institutions were equipped with multimedia suitcases connected to Internet;
- 100 institutions were equipped with interactive blackboards and interactive mobile equipments.

With regard to the provision of digital resources, several actions are being completed, namely:

- The set up of a national laboratory of digital resources and the providing of approximately 90 per cent of the digital resources of appropriate quality;
- The creation of a national portal dedicated to information and communication technologies in the education sector which will secure the deployment of digital resources.

For the training and the development of use, 148,000 educational supervisors have been trained that represent 70 per cent of the number targeted in the program. 200 workshops have been organized and almost 200,000 digital suitcases have been prepared for distribution to teachers. Also noteworthy is the completion of the establishment of the National Observatory for the use of ICT in the educational field.

Generalization program of information technology in higher education (E-SUP)

The projects included in this program aim to fund initiatives for the creation of scientific research laboratories, the provision of technical and informational equipment necessary for the integration of information and communication technologies in the educational process as well as the development of digital content . A budget of 120 million dirham has been allocated to this program for the years 2011 and 2012.

- Program "Nafid @": this program aims to enable managers of Education getting a computer connected to Internet. After the success of this program, which has benefited 150,000 persons, the second phase is being realized, and it concerns supporting monthly Internet subscriptions up to 40 dirham (about 5 US\$ per month) per beneficiary over three years.

In addition to these programs, it should be noted the launch of several educational projects for the integration of information and communication technology in the educational system in the framework of the Memorandum of Understanding between the Ministry of National Education of Morocco and Microsoft Morocco. These educational projects are part of cognitive and technological transformations defined by the international communities, which reflects the conviction of Morocco on the importance of economic takeoff towards a knowledge economy with technological education as major base. It also reflects the strategic dimensions of technological innovation in the framework of qualitative reforms of the education system in Morocco.

Thus was launched a program for certification in informatics and information and communication technologies in education (IT Academy), it is the outcome of a partnership between the Ministry of National Education and Microsoft Morocco and was designed to enable educational managers to receive training culminating in a certificates in the field of information and communications technologies in education. This initiative, which stretches over three years, is a supplementary step in order to improve offers of training to use new technologies.

There is also a project to expand the offer of training in the pedagogical use of information and communication technology through e-learning, in the framework of the Strategic Plan of the Ministry 2013-2016. The project provides a national base for exchange and cooperation and helps to intensify the efforts of all stakeholders in the integration of information and communication technology in education.

We should also mention the launch of a new version of the platform "Taalim.ma" partnership between the Ministry and Microsoft Morocco, which envisages the strengthening of interaction and improvement of communication between the components of the educational and administrative departments in order to permit them to be provided regularly with all necessary data and enable them to develop their pedagogical skills and provide an opportunity for collective action.

V. BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTS

The sensitivity and value of digital information and the need to protect it are increasing. This area tackles specific requirements with regard to security and privacy, in particular the protection of personal data and confidential information.

A. USE OF ELECTRONIC TRANSACTIONS AND DOCUMENTS

The Moroccan legislator sought to create a legal environment adapted to the development of electronic transactions; in this context Law 53-05, concerning the electronic exchange of legal data, was enacted.

This law regulates the aspects related to legal data exchanged electronically, the equivalence between the physical documents and digital ones and electronic signature. It also sets the legal framework applied to operations realized by providers of certification services and rules to follow by both the service providers and the owners of electronic certificates.

Considering that Law 53-05 was the first on electronic exchanges, it has treated several innovative themes as well as addressed the theme of e-commerce in particular aspects related to digital certificates, digital signatures, among others.

Encryption

Under the legal texts framing electronic transactions, the governmental authority in charge of new technologies (Ministry of Industry, Trade and New Technologies) is charged with regulating the field of encryption through the preparation of draft legislative and regulatory texts, oversee their implementation, and it participate in the organization of the field of electronic authentication in collaboration with the National Agency for Telecommunication Regulation.

In order to avoid illegal uses and to protect the interests of national defence and internal and external security of the state, the government authority in charge of new technologies, studies the declarations and the demands for licenses related to the import, export; supply, exploitation or the use of means or encryption services and fixes the conditions and the ways to obtain the license.

Moreover, the government authority in charge of new technologies guarantees the processing of applications from people who do not have accreditation as service providers and wish to import encryption services subject to licensing. It also ensures the inspection and control through accredited experts to ensure that the activities exercised by the holder of the approval are in compliance with the regulatory requirements of the law 53-05.

Electronic Certification

Under the legal texts framing electronic transactions, the National Agency for Telecommunications regulation is tasked with organizing the field of electronic certification and proposing projects of legislative and regulatory texts relating to encryption and authentication. Accordingly many tasks have been entrusted to the National Authority which can be categorized as follows:

- Objective tasks: such as accreditation of services providers, the proposition of a standards system to the government and the taking of the necessary measures for its activation.
- Procedural tasks: such as the publication of the accreditation decision in the Official Bulletin and the keeping of a register of the accredited providers of electronic authentication services.
- Regulatory tasks: such as the monitoring of the activity of service providers mentioned above, being sure that their activities respect the dispositions of the law, with the possibility to control the taken technical measures and mechanisms.

B. ONLINE AND NETWORK SECURITY

The Digital Confidence is an essential element for the protection of electronic transactions activities, as its evolution is closely linked to the confidence of users, to the security of network and electronic exchanges, to the protection of personal data and private life and to the fight against cybercrime. Digital trust is one of the support measures of the national strategy "Digital Morocco 2013". It aims to introduce the necessary conditions to raise confidence in digital economy of individual citizens and enterprises

The fulfilment of identified ambitions requires the implementation of three key initiatives:

- Initiative 1: Update and reinforce the legislative framework.
- Initiative 2: Put in place appropriate organizational structures.
- Initiative 3: Promote and sensitize social operators to information system security.

For the first initiative, the main actions carried out are:

- Adoption of Law No. 09-08 on the protection of personal data and the corresponding text for regulating its execution;
- Adoption of Law No. 53-05 concerning the electronic exchange of legal data and the corresponding text for regulating its execution relating to the electronic certification and encryption;
- Adoption of Law No. 31-08 concerning protection of consumers (including consumers online) and the corresponding text for regulating its execution;
- Conduct a study on strengthening of the legal and legislative framework in the field of information technology and digital confidence;
- Signing of the Arab Convention to combat crimes of Information Technologies;
- Signing the Budapest Convention on combating cyber crime and its Additional Protocol;
- Signing European Convention 108 concerning the protection of personal data.

With regard to the second initiative mentioned above, it concerned the consolidation of digital confidence through several measures aiming to put in place the organizational structures charged to provide expertise in the field of information system security and to ensure the security of sensitive infrastructures.

These measures included:

- Setting up of the Strategic Committee in charge of Information Systems Security;
- Creation of the Directorate-General for Information Systems Security;
- Creation of the centre of coordination and response to incidents related to Information Systems Security (ma-Cert);
- Putting in place the National Commission for Data Protection (CNDP);
- Adoption of the Morocco Post as the first provider of electronic authentication services in Morocco.

In the framework of the third initiative, several actions were taken:

- Preparation of a communication plan to launch awareness campaigns about the security of information systems toward citizens and companies;

- Completion of the national portal of information systems security in order to sensitize and inform the different actors;

- Elaboration of training programs about the security of information systems at the level of some engineer's schools and universities aimed at engineers students. In this context, the following has been organized :

- a Regional Conference on Cyber Security;
- a National Conference on training in the field of security of information systems for the exchange of national and international experiences and elaborating a plan of action for the generalization of these trainings;
- Organization of training courses for judges on cybercrime and security of information systems;
- Elaboration of a charter for commerce sites online (Label e-thiq@) in the framework of a partnership agreement between the Ministry of Industry, Trade and New Technologies and the General Confederation of Moroccan Companies in order to build confidence among consumers and to promote the development of e-commerce. It should also be noted that the national agency for the promotion of SMEs has reserved a budget to support companies wishing to obtain "Label".

C. PRIVACY AND DATA PROTECTION

Keen to protect the private lives of citizens and support freedom and human rights, Morocco has issued on 18 February 2009 Law No 09-08 concerning the protection of personal data. On 31 August 2010 the National Commission for Data Protection (CNDP) was set up, and was charged with implementing this law.

The publication of the law No 09-08 purports several objectives, including:

- The support and consolidation of human rights protection and individual and collective freedoms through the establishment of rules for the collection and processing of personal data;
- The establishment of a regulatory framework governing the free flow of information across borders in the era of globalization and the rapid development of information technology;
- The improvement of conditions of foreign investments reception, particularly Europeans, allowing Morocco to set up an attractive legal framework for off shoring activities.

Aware of the responsibilities that the new law has placed in it, the National Commission for Data Protection began its work by adopting a policy of priorities. In this context, several meetings were organized with key economic sectors such as banks, finance companies, insurance companies and actors in the field of Telecommunications in order to accompany them in their efforts to comply with the provisions of Law No. 09-08. The National Committee has so far received more than 1,000 reports and request authorization for the processing of personal data from national and international private companies. The new challenges posed by the Internet and social networks have led the National Committee to engage in an international effort to protect the personal data of individuals, and to continue its effort to activate its application to benefit from the recognition of the appropriate level of protection of personal data from the European Commission.

VI. ENABLING ENVIRONMENT

The provision of an enabling environment is crucial in order to mobilize resources and create a climate conducive to the acquisition and dissemination of ICT. Moreover, a trustworthy, transparent and non-discriminatory legal, regulatory and policy environment constitute essential bases for cooperation between the public and private sectors.

A. LEGAL AND REGULATORY ENVIRONMENT

The recent decades have witnessed a veritable revolution related to information and telecommunication means embodied by the development of computers, software and networks. This enabled reconciliation between people and the emergence of new opportunities for trade and transactions online.

This development has nevertheless led a new type of crime: cybercrime which is one of the negative aspects of this development. These crimes have infringed the fundamental values of individuals, institutions and even countries. They also developed a sense of insecurity and strongly altered confidence of persons in the use of new technologies.

Faced with this alarming situation, the international community has given a lot of interest to cybercrime, in this regard, the United Nations was interested in aspects of the fight against cybercrime in the Tenth and Eleventh United Nations Congress for the prevention of cybercrime respectively held in Vienna from 10 to 17 April 2000 and in Bangkok from 18 to 25 April 2005.

Moreover, under the advanced status granted to Morocco in October 2008 in its relations with the European Union, the Council of Europe suggested the gradual accession of Morocco to several conventions including those relating to computer crimes adopted in Budapest on 23 November 2001.

International conventions

- Arab Convention to combat cyber crimes ratified by Morocco under Law No. 12.75 promulgated by Dahir No 43.13.1 on 13 March 2013;
- The Budapest Convention on combating cyber crime and its Additional Protocol ratified by Morocco under the law No 12.136 on 7 March 2013;
- Council of Europe Convention on the protection of children from sexual exploitation and abuse, concluded in Lanzarote on 25 October 2007;
- European Convention No 108 for the Protection of people toward data processing of a personal nature.

National laws

- The new Moroccan Constitution;
- Law No 34.05 dated 14 February 2006 concerning the change and to complement Law No. 2.00 on the rights of copyright and related rights;
- Law No 24-96 concerning Post and the Telecommunications;
- Law No 03-03 on combating terrorism in complement of the Criminal Procedure on intercepting phone calls or communications through connections;
- Law No 03-07 in complement of the Penal Code relating to crimes toward automated processing systems for data;

- Law No 09-08 on the protection of people toward data processing of a personal nature;
- Law No 53-05 on the electronic exchange of legal data;
- Law No 31-08 on the protection of the consumer;
- Law No 77-03 on audiovisual communication.

e-transactions law available	<i>Yes</i>
e-signature law available	<i>Yes</i>
Management of PKI available	<i>Yes</i>

B. DOMAIN NAME MANAGEMENT

Moroccan government began registering domain names in 1999. The national DNS zone contains the 1st level “.ma” domain and the descriptive subextensions “.co.ma”, “.ac.ma”, “.net.ma”, “.org.ma”, “.gov.ma” and “.press.ma”.

- “. gov.ma” for government institutions;
- “. co.ma” for commercial uses;
- “. net.ma” for Internet activities;
- “. org.ma” for non-profit organizations;
- “. press.ma” for Media and Press;
- “. ac.ma” for academic institutions.

The National Agency for Telecommunication Regulation is responsible for managing domain names “.ma”, as such it must put in place the necessary measures to ensure administrative, technical and commercial management of the domain “.ma” consistent with international practices.

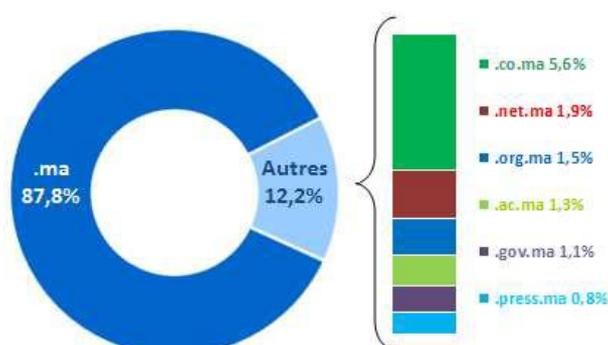
The “.ma” domain names are commercialized by ANRT’s accredited registrars. At the end of December 2012, the total number of “.ma” registrars was 28.

At the end of December 2012, the total number of “.ma” domain names reached 46,800, registering an increase of 11 per cent compared to December 2011. There is, on average, approximately 1,050 new domain names every month.

88 of “.ma” domain names are registered directly under “.ma”. This situation can be explained by two essential elements:

- The simplicity of the web address directly under “.ma”;
- Registering a domain name under a descriptive extension isn’t opened to the public, but reserved to the related industry (eg, registration of domain names under “.gov.ma” is limited to government institutions).

Figure 5. Distribution of « .ma » domain names by extensions



Name of ccTLD registrar	الوكالة الوطنية لتقنين المواصلات National agency of Telecommunication Regulation
URL of registrar	www.anrt.ma
Total Number of ccTLD registered in the country for the years 2008, 2009, 2010, 2011, 2012.	2008 : 29.450 / 2009 : 34.008 / 2010 : 37.969 / 2011 : 42.187 / 2012 : 46.806

C. ICT INVESTMENTS AND GOVERNMENT-SUPPORTED FACILITATION MEASURES

In regards to the axis of IT industry, the national strategy "Digital Morocco 2013" highlights the need to encourage the development of local IT branches by sustaining creation and growth of local actors, by creating areas of excellence with high export potential and by boosting offshore activities.

In this framework, several measures have been taken, such as:

- Implementation of national governance for innovation, setting up financing solutions for IT actors and putting in place regional technoparks;
- Putting in place a mixed governance structure involving different actors: government, corporations, SMEs, universities, aimed at helping with the creation of innovative and high-added value projects in the following four niches of excellence:
 - Mobile services;
 - Electronic banking/management of digital copyrights/ security;
 - Web design/computer graphics/Multimedia;
 - Domestic developed software to meet the needs of government and enterprises.

Moreover, it is worth mentioning that to sustain the competitiveness of Morocco as offshore destination and in order to bring in more investors in this sector, the Government has accelerated since 2011:

- The adoption of legal regulations to protect personal data;
- The implementation of infrastructure of dedicated zones;
- The training of skilled human resources in terms of quality and quantity.

VII. ICT APPLICATIONS

ICT thematic applications can support sustainable development, in the fields of public administration, business, education and training, health, and employment, within the framework of national e-strategies. The ICT applications could be back-office applications, web-based or mobile applications.

A. E-GOVERNMENT

This important priority in "Digital Morocco 2013" aims to stimulate the use of e-government in order to modernize administration both at the central level as well as locally to serve the citizens and companies. To this end, in 2012 several actions were taken to boost the development of the governance framework in order to ensure harmony between the various initiatives of stakeholders to achieve common goals. In this context, we can particularly mention the setting up of:

- E-Government Inter-ministerial Committee CIGOV: «set target and assesses»

Roles and responsibilities:

- Spell out vision and ambitions;
- Define the strategy and action plan;
- Ensure the allocation of necessary means and resources;
- Carry out interdepartmental arbitration;
- Assess results and reorient undergoing programs' difficulties.

- E-Government Steering Committee DPGOV: «steer the implementation of the entire program»

Roles and responsibilities:

- Prepare e-government strategy;
- Propose and assess action plans ;
- Follow up the implementation of the defined plan;
- Highlight and draw on interdepartmental synergies;
- Prepare results assessment.

- E-government Steering Structure SPGOV in each ministry or public institution: «steer the implementation within its entity»

Roles and responsibilities:

- Prepare the ministry's or public institution's strategy;
- Propose action plan and evaluate the necessary means;
- Follow up the implementation of the defined plan;
- Report to CIGOV on achievements as well as discrepancies with the initial plan.

As for the e-government projects , it should be noted that at the end of 2012, 35 online services were provided out of 89 scheduled for the end of 2013 , noting that 25 other services are now in the process of completion.

The following is a list of projects achieved and those in the process of completion:

- Services that improve efficiency and reduce administration costs :

- Projects achieved :
 - Integrated management of public expenditure;
 - Development of national portals;
 - Database of electronic certification authorities;

- Human resource management;
 - Management of wage system for salaries.
- Projects in progress :
 - Online bidding for public tenders;
 - Integrated information system for local communities;
 - Electronic system for relations with the judicial officers;
 - Common identifiers and inter-operability among administrations.
- Services that put in place an administration at the service of individual citizens :
- Projects achieved :
 - Online payment of taxes (www.tgr.gov.ma);
 - Electronic consulate (www.consulat.ma);
 - Health service refunds;
 - National biometric card (<http://www.cnie.ma>);
 - Retirement-related services in both the public and private sectors (www.cmr.gov.ma);
 - Biometric passport (www.passeport.ma);
 - E-tourism portal for Morocco (www.visitmorocco.com / www.tourisme.gov.ma);
 - Portal of public administration (www.service-public.ma);
 - Appointment in public hospitals (www.rendezvous-sante.ma);
 - Portal for consumers (www.khidmat-almostahlik.ma);
 - Civil registry and local collective information systems;
 - E-learning platform and online registration.
 - Projects in progress:
 - Driver's license and registration of cars;
 - Human resources portal for education;
 - School Management Information system for Morocco;
 - Request of criminal record.
- Services that facilitate administrative procedures for enterprises:
- Projects achieved :
 - Employee online social claims (www.cnss.ma);
 - Online VAT claims (www.tax.gov.ma);
 - Online Customs declaration (www.douane.gov.ma);
 - Paying Corporate Tax and Income Tax (www.tax.gov.ma);
 - Digitalization of import and export procedures (www.douane.gov.ma);
 - Investment in Morocco (www.invest.gov.ma);
 - National Observatory of ICT's (www.omtic.gov.ma);
 - Services relating to the protection of industrial property and patents (www.ompic.gov.ma).
 - Projects in progress:
 - Enterprise creation;
 - Unique identifier for companies;
 - Unified portal for service-oriented Companies.

Name of Authority in Charge of ICT in Public Administrations	وزارة الصناعة و التجارة و التكنولوجيا الحديثة <i>Ministry of Industry, Trade and New Technologies</i> (http:// www.mcinet.gov.ma)
Name of e-Government authority	اللجنة المشتركة بين الوزارات للحكومة الإلكترونية (CIGOV) <i>Interdepartmental Committee for e-government</i> (http://www.egov.ma)
Number of implemented government e-services	35
Number of planned government e-services	89

URL of e-government portal: http://www.service-public.ma		
Information	General	yes
	Laws	yes
	Directories	yes
Services	Static Info	yes
	Downloadable Forms	yes
	Interactive	yes
e-payment		yes
Online account		yes
Bilingual		Ar/En/Fr
Citizen Participation	Blogs	yes
	Polls	yes
Social Media	Facebook	No
	Twitter	No
	LinkedIn	No
	YouTube	No
	Other	No
Additional Services	RSS	yes
	Web Statistics	yes
	Search	yes
Mobile version	Support for smartphone/tablet	yes
	Dedicated App (iOS or Android based)	yes

B. E-BUSINESS

The e-commerce sector in Morocco has experienced remarkable developments in recent years, as is evident from various sector indicators. The number of commercial Web sites has increased from 40 sites in 2008 to more than 400 sites at the end of 2012. During the same period, the total amount of transactions rose from 31 million dirham to about 743 million dirham and the number of transactions online reached about 1.25 million.

The estimated number of buyers online in 2012 was about 300,000 people and it has doubled in comparison with the previous year. 50 per cent of them, spend annually between 1.000 and 5.000 dirham and more than 75 per cent of them are buying on Moroccan sites.

This important development of electronic commerce is due to several factors, in particular:

- Democratization of mobile Internet of the third generation "3G";
- Considerable increase of Internet users : almost 15 million persons ;
- High number of bank card holders : about 10 million persons;

- High number of e-commerce sites and sites of government services online ;

- Update and reinforcement of the legal framework governing the sector (Law No. 53-05 on the electronic exchange of legal data, Law No. 09-08 on protection of personal data , Law No. 08-31 on protection of the consumers , which also includes requirements related to establishing of measures to ensure the development of e-commerce) .

In addition to that, an important initiative was taken to encourage e-commerce, especially on the outside sites of Morocco, it is reflected in the possibility of individuals to get a grant not exceeding 10,000 dirham per year (20,000 dirham for businesses) intended for purchase online loaded on an international card.

Another interesting initiative is related to the creation of the trust mark (Label e-thiq@) for online trading sites. It poses a real guarantee of quality commercial relations, and represents a sign of confidence, proving that the company meets its commitments on transparency of commercial transactions, timeliness and terms of delivery and payment security.

Availability of e-banking services	<i>Yes</i>	Law number:	
Availability of e-commerce law	<i>Yes</i>	Law number:	
Availability of e-transactions law	<i>Yes</i>	Law number:	
Name other laws on e-services	<i>Yes</i>	Law number:	

C. E-LEARNING

Morocco has given great importance to the integration of information and communication technologies in the national education system to improve the quality of education and to enhance students' knowledge.

In this regard, several measures has been taking in order to promote this new culture and expand the use of this technology to increase the performance of education in Morocco, such as the implementation of several actions in the framework of "Digital Morocco 2013" and the establishment of a national committee to monitor the use of information and communication technologies in the education system headed by the chief of the government.

Because of the many changes experienced by the global education system, it was imperative for Morocco to join this dynamic system through greater integration of ICT in the education system, with regard to the vital role it can play in this process, by placing educational institutions at the centre of preoccupations as an essential driving force for sustainable development.

In this context, a frame of reference has been prepared for the integration of information and communication technologies in the educational system fixing the pedagogical approaches that should be adopted in order to optimize the integration of these technologies and thereby achieve greater quality of education.

Thus, in order to activate the pivotal role played by the National Laboratory of digital resources in the integration of ICT's in the educational system, and in the context of the axis of GENIE program concerning the development of uses, a pedagogical guide has been prepared accordingly. Specialized pedagogical guides were also published for the integration of ICT in the teaching of mathematics and the life and earth sciences.

Student to computer ratio	84 percent
Percentage of schools with Internet access	85 percent

D. E-HEALTH

The domain of healthcare is considered as a vital sector, thereby the states and governments gave it great interest in order to preserve their human health. This interest is reflected in a strong mobilization of financial resources, a development of scientific research to deal with diseases and epidemics and the increasing use of new technologies to facilitate the management of health care and provide patients with quality services.

Morocco has made significant progress in matters of diseases treatment, but it is noted that there are a number of reproaches concerning reception in hospitals, the making of appointments and other aspects of the management of the relationship between the citizen and the hospitals. Therefore, a focus was made on this aspect and it was decided to use of information and communication technologies to overcome these obstacles.

In this context, and in order to bring services closer to citizens' health and facilitate access under the best conditions, a system of making appointments online has been implemented via the website www.rendezvous-sante.ma. This system initially was deployed at 12 regional hospitals before his next generalization.

VIII. CULTURAL DIVERSITY AND IDENTITY, LINGUISTIC DIVERSITY AND LOCAL CONTENT

Cultural and linguistic diversity, while stimulating respect for cultural identity, traditions and religions, is essential to the development of the Information Society. Digital content, particularly on the Internet, preserves the language, facilitates its evolution and promotes cultural diversity while sustaining socio-economic development. In addition, digital content development can play a major role in preserving the national heritage.

Statistics show a very shy presence of Moroccan Arabic digital content on the web. Indeed, Morocco occupies the eighth place in Arab level in terms of volume of publications on the various sites (it represents 1.6 per cent of total publications of Arabic digital content) and is ranked tenth in regard to annual income generated by the Arab digital content (approximately US\$ 26 million which represents 1.83 per cent of total annual revenues Arabic).

The statistical studies has revealed (Observatory Statistical of digital content Arab «Maarab») that the intellectual, cultural and literary content of Moroccan public institutions on web sites are ranked in the first place by about 400,000 units, comes next the legal political content with 192,000 units, then thirdly social and humanities sciences content with 178,000 units, and ranked in the fourth and fifth place is the economic content and scientific research content, while the content relating to information and communication ranked sixth and came in the penultimate place the educational content with 99,000 units and finally the military and security content in the last place with 42,000 units.

The sites are the most important publishing channels for Moroccan digital content; they publish nearly 45 per cent of the total units, the forums come in second place with 23 per cent, then blogs in the third place with 17 per cent, followed by social networks with 5 per cent, and by video networks with 1 per cent, and finally Twitter and mailing lists.

A. ARABIC DOMAIN NAMES

Morocco, has recently decided to use domain names ending in ".morocco" in Arabic after approval of the Internet Corporation for Assigned Names and Numbers (ICANN), on request of Morocco. These new domain names are subject to the same conditions as those domain names ".ma" set by the National Agency for Telecommunication Regulation (ANRT).

The adoption of domain names in Arabic will broaden the base of Web sites, and increase the number of Internet users in Arabic which will enrich the Arabic content on the Net.

IX. MEDIA

The media sector and its various and diverse forms are part of the digital world that encompasses all sectors of the economy. The Media systems have an essential role in the development of the information society and are recognized as an important contributor to press freedom and plurality of information.

There is no longer a need to demonstrate the importance of electronic journalism in the lives of Moroccan citizens, especially for the youth. According to figures released recently regarding Internet use by Moroccans, it's employed first to communicate via e-mail with 66 per cent, to get news (the media) with 62 per cent, for professional purposes (45 per cent), to be connected with relatives (40 per cent) and for shopping via the Web (7 per cent). For the social networks, which occupy the first place in terms of usage, the primary motivation is to have access to news.

The electronic newspapers in Morocco have shown an important rise during the last decade, as their number reached about 500 Moroccan sites in 2012, due to the fact that many journalists have transferred their activities to the Web. All this, reinforced the presence of electronic journalism in the revitalization of political and social life in Morocco and the development of Moroccan democracy. Moroccan electronic journalism is facing several challenges such as the terms used, the definition of professional journalism practicing in this field, the technological challenges, the problematic of digital content, and the challenges of ethics.

Among the problems that have been identified in a field study performed on the reality of electronic journalism in Morocco, were (in order of importance) : the difficulty to obtain news and information, the weakness of financial and human resources in the field of electronic journalism, the absence of law regulating the profession, the lack of training and qualifications, the technical constraints, the amount of working hours, the problems with the editorial line and objectives of the e- newspaper, the difficulty to protect intellectual property rights of articles, the lack of awareness in the field of electronic media.

Recently a white paper was published in Morocco on the rehabilitation of electronic journalism. It was the result of several workshops and wide consulting with actors and stakeholders in the sector in order to set up a law to regulate this field. This paper is divided into two main parts; the first one is dedicated to the challenges and the second one to the recommendations.

The first part addresses the challenges in five axes and mentions the main problems faced today by Moroccan electronic press, which are basically:

- Technological challenge;
- Economic challenge;
- The challenge of developing digital content;
- The challenge of supporting the ethics of the profession;
- The challenge of training.

In its second part, the white paper seeks, through recommendations which followed the wide discussions expanded on the reality and the prospects of Moroccan electronic journalism, to be a base of a national project aiming to rehabilitate the sector and to promote it.

X. INTERNATIONAL AND REGIONAL COOPERATION

The successful implementation of the information society requires cooperation among all stakeholders at both an international and regional level, especially in financing and implementation of ICT development and the establishment of plan of actions for building the Information Society.

Morocco has strengthened in recent years, its involvement in the globalization of knowledge through the strengthening of its relationships with regional groupings and international organizations active in the sector of information and communication technologies, among them:

- The Organization of the United Nations;
- The International Telecommunication Union;
- The Universal Postal Union;
- The World Bank;
- The European Union;
- The League of Arab States;
- The World Trade Organization.

In addition to its active participation in many international and regional events in the field of information and communication technologies, Morocco has hosted many international materializations in this field among them, the Fourth International Conference for Information and Communication Technologies in the Islamic world organized in Rabat at headquarters Organization of the Islamic Educational, Scientific and Cultural Organization (ISESCO). This is evidence of the great interest given to such meetings in order for exchange experiences and benefit from successful experiences in the sector for the promotion of information and communication technologies.

Thanks to his experience and numerous skills in ICT's sector, Morocco has put its capabilities and expertise in the service of the neighbouring countries to help them to reduce the digital divide that separates them from the rest of the world, playing its role as a regional hub in this domain. In this context, several cooperative relations have been established between Morocco and some African countries, among them Mauritania, Senegal, Cameroon and Gabon since 2011.

On the other hand Morocco has been involved in the international efforts to combat cyber crime through the endorsement of several international conventions.

Examples of international and regional cooperation

- *Moroccan – Korean partnership through the Korean Agency for International Cooperation (KOICA)*
 - Creation of the Moroccan centre of coordination and response to incidents related to Information Systems Security (ma-CERT) for a total amount of approximately US\$ 3.4 million. The Centre responds to security incidents, coordinates these responses at the national level, suggests various services associated with the treatment of these incidents, analyzes the weaknesses and restores the systems which were exposed to attacks;
 - Creation of the Moroccan-Korean Centre for training in information and communication technologies in the field of education (CMCF-TICE) for a total amount of approximately US\$ 2 million;
 - Creation of the innovation centre in the field of information technology in collaboration with the University of Akhawayn in the framework of human development for a total amount of approximately US\$ 7.1 million. It aims to reduce the digital divide and to develop resources in the sector of information and communication technologies.

- *In the framework of the United Nations Development Program (UNDP)*
 - Launching of the ART ISI@MED program, which aims to use ICT's to support and modernize the local management in local communities. The first experiment was in 2012 in Chefchaouen community before its generalization.

- *In the framework of the Programs of U.S. Agency for International Development (USAID)*
 - Putting in place a software for receiving citizens' complaints in local communities in partnership with the General Directorate of the local communities of the Interior Ministry in the framework of local governance program (PGL). The first experience has been launched with the Municipality of Sefrou and currently this experience is transferred to municipalities of El Jadida, Kenitra and Safi.

XI. BUILDING THE ICT SECTOR

Building the ICT sector requires public-private cooperation, in addition to the availability of many factors including investments and finance facilities, industry structure, and RDI capacities. The sector could include operators of telecommunications services, computer hardware manufacturing, software development, service provision, call centres, technical training, web design and development, digital content development and Arabization, and providing electronic solutions.

A. ICT FIRMS

Several companies considered as global leaders in the sector of information and communication technology are based in Morocco. This has made Morocco an exemplary case and contributed to the development of qualified and competent national resources in the sector. Among these companies, are Alcatel - Cisco - Compaq - 3 com - Dell - Fujitsu - Siemens Computers - France Telecom - HP - IBM - Microsoft - Motorola - Oracle - Sagem - Samsung - SAP - ST Microelectronics - Telefonica - Obisoft.

Main characteristics of the actors in the sector of information technology and communications:

- Major companies highly specialized, especially in the Telecommunication sector, with a large number of foreign investors;
- Services companies medium-sized, often in the form of local representatives of international groups;
- Some cases of Moroccan success stories shows the presence of a nucleus for the manufacture of electronic programs able to innovate and to export skills;
- Many companies in selling equipments, programs and software packages.

B. GOVERNMENT FACILITATION

Sector supported by a voluntary public policy:

Aware of the importance of new technology in the field of information and communication, the Moroccan government has launched the "Digital Morocco" plan, which has been designed according to a clear vision and ambitious for Morocco, aiming to position it among emerging and dynamic countries in the field of Information Technologies. The steering of this national strategy is based on close collaboration between public and private stakeholders.

This strategy aims in the framework of the priority "SME's Productivity" to encourage the computerization of SME's in order to increase their productivity and improve their competitiveness. In this regard, the implementation of the program "Moussanada" was focused on branches such as textile, leather, food industry, automotive and aeronautics. It supports up to 60 per cent, within the limit of 400,000 dirham, of the total cost of acquisitions of IT business solutions.

At the end of 2012, the following results have been recorded:

- For the textile and leather sector: 50 companies have benefited from the support and more than 9,000 have made a request;
- For the food industry sector: 16 companies have benefited from the support and more than 70 have made a request;
- For the automotive and aeronautic sectors: 22 companies have benefited from the support and more than 40 have made a request;
- For the chartered accountants: 13 companies have benefited from the support and more than 25 have made a request.

- Others Sectors: 170 companies have benefited from the support and more than 600 have made a request.

- Concerning the support of SMEs in their projects of electronic exchange dematerialization with their main contractors: a first experience was made with OCP, and in this context, we note the adoption of standard and international standard for the electronic exchange of business documents (EDIFACT).

- The support of proximity trade companies within the framework of the program «Rawaj TI».

- The implementation of the project to support small and micro businesses to obtain a digital license «Infatih», 2,450 digital licenses have been issued and 219 training programs have been provided.

C. CONTRIBUTION OF ICT SECTOR IN THE NATIONAL ECONOMY

The total amount of transactions in the ICT sector in Morocco reached nearly 85 billion dirham in 2012 (approximately US\$ 10.2 billion). The sector enabled the creation of nearly 125,000 jobs during the same year. The ITs sector contributed 42 billion dirham's (approximately US\$ 5.13 billion) which represents 7 per cent of GDP, it's a source of work for more than 32,000 people. The Telecommunications sector has meanwhile contributed 35 billion dirham, while the participation of the local industry (distribution, hardware and services) has reached about 7 billion dirham. The offshore IT sector has contributed by nearly one billion dirham and has employed about 28,000 persons. The budget allocated to the sector of information and communication technologies in Morocco is 2,7 per cent of the total budget.

In 2012, the total volume of investments in ICTs sector in Morocco reached 1.7 billion MAD, recording an increase close to 10 per cent compared with the year 2011, which puts Morocco at the forefront of the North African countries in terms of the volume of investment spending on ICT's projects.

Moreover, Morocco intensifies its integration into the knowledge economy by increasing its exports in highly specialized fields of the IT's sector such as the electronic banking transactions. Studies have revealed that more than 30 Moroccan companies have exported their products worth over 300 million MAD (approximately US\$ 37 million), 70 per cent of them are companies providing services in information technology and in electronic banking transaction. West Africa and Western Europe are the two main regions enjoying Morocco's experience in this domain.

The Moroccan exports to African markets, including the Maghreb and West Africa account for 40 percent of the international sales of the Moroccan sector of information and communication technologies. The Middle East is also a promising zone despite the fact that the volume of exports remains poor at the moment, which explains the decision of stakeholders in the sector and of authorities to take measures to strengthen the Moroccan in the trade show GITEX organized in Dubai, which enjoys international renown due to its support for the advancement of trade sector in the region.

D. R&D AND INNOVATION IN THE ICT SECTOR

In order to make Morocco a member in the club of countries producing technology, allow the emergence of an economy with a high added value and strengthen its image at the international level and thereby its attractiveness among investors, the country launched a National Innovation Strategy entitled "Innovation Morocco Initiative".

This new strategy of innovation in Morocco, implemented by the Ministry of Industry Trade and New Technologies; the Ministry of National Education, Higher Education, Executive Training and Scientific Research; and the General Confederation of Moroccan Enterprises (CGEM), set the following quantitative objectives:

- Producing 1,000 Moroccan patents by 2014;
- Creating 200 innovative start-ups by 2014.

Morocco Innovation Initiative intends to meet the major challenges:

- To reinforce Moroccan enterprises' competitiveness through innovation;
- To enable Morocco to be a producer of technology;
- To exploit Moroccan universities R&D capacities;
- To make Morocco attractive for R&D talents and projects;
- To foster a real culture of innovation and entrepreneurship.

For this purpose 13 fields of action were identified:

- Governance and framework:
 - Setting up a National Innovation Committee;
 - The creation of a dedicated structure (Moroccan Innovation Centre);
 - Fostering a flexible and effective legal framework.
- Infrastructure:
 - Technological infrastructures;
 - Technology transfer infrastructures (implementation of Innovation cities in some universities);
 - Clusters.
- Funding and Support:
 - Developing a portfolio of products/schemes to support innovation;
 - Stimulation of the venture capital system;
 - Development of the intellectual property market;
 - Mobilization of international funds for innovation.
- Attracting Talents:
 - Creation of the Moroccan Innovation Club;
 - Promotion of the innovation culture;
 - Positioning Morocco R&D and innovation offer.

The main realizations during 2012 were:

- *Moroccan Centre for Innovation*: In the framework of the development of the governance of the Moroccan Centre for Innovation, it has changed its legal framework to a public limited company and has strengthened its functional structure. An annual budget estimated to 2.5 million MAD (approximately US\$ 300,000) has also been allocated to the centre. As part of the process of improving the management of innovation and research projects under the requests for innovation financing fund mechanisms, an informatics platform has been launched to provide services allowing to manage and to follow-up the projects treatment process through the site ww.cmi.net.ma.

- *Innovation fund*: in view of the needs and peculiarities of the Moroccan local industry, a financing fund for innovation has been established in order to finance 800 projects for innovation in the Horizon of 2014 with a budget worth 380 million MAD (approximately US\$ 47 million). 26 projects have been selected in 2012 in order to benefit from the support of Innovation fund.

The innovation fund consists of three funding mechanisms:

- Program "Intilak": supports development of innovative start-ups that are less than two years old, by granting interest-free loans and advances that must be repaid over a five-year period. This mechanism supports innovation's investment, up to 90 per cent of cost up to a limit of one million MAD (approximately US\$ 150,000).

- Program "Tatwir": It is aimed at businesses that are more than two years old and provides them with up to 50 per cent of the funding they need for research and development (R&D) projects within the limit of four million MAD (approximately US\$ 500,000);

- Software development centre: it supports innovation in the field of software research and development. It helps companies in the information technology sector by enabling them to produce innovative software cheaply. The software centre seeks to harness the skills of researchers, PhD students and engineering students at universities across Morocco.

- *Innovation Awards*: as part of its efforts to raise awareness of the importance of innovation through communicating success stories, the Ministry of Industry, trade and new technologies has launched since 2010 on the fringes of the second edition of the National Innovation Summit, "The Innovative Enterprise Awards", together with the General Confederation of Enterprises of Morocco and the Moroccan Association for R & D. These awards are dedicated to the gratification of the efforts of companies or resource centres, engaged in development projects or innovative technology, the results of which research may contribute to improving the competitiveness of the industrial sector (marketing new products, expanding markets flow, productivity improvements, repositioning technical and/or commercial companies, etc..).

Gratification, under the Innovative Enterprise Awards, is meant to serve as a label that can be used by the company at many levels, such as marketing, access to finance, and talent hiring.

- *Innovation Club*: as part of the Technology Dissemination Network (RDT) and in partnership with the Moroccan Office of Industrial and Commercial Property (OMPIC), the Ministry of Industry, Trade and New Technologies has established the Moroccan Innovation Club.

This platform is meant to create a social network bringing together innovation players, such as researchers, students, heads of businesses, academics and innovative project holders to exchange information, point of views and create work and research groups on innovative projects.

The Moroccan Innovation Club also offers abundant information on the financing instruments available for innovations, scholarships, calls for research papers and cooperation programs, as well as general information on the development of technology sectors in particular and innovation in general. It also provides members with all the news pertaining to innovation in Morocco with links to the key players, as well as newsletters.

- *Clusters*: the promotion of clusters is one of the main projects of the strategy "Innovation Morocco Initiative." It aims at laying the foundations, following international experience in this respect, for the emergence of innovative market-oriented projects and supports the most proactive companies and players, as well as those that are most likely to constitute high-level clusters.

Within the framework of the completion of this strategy, a fund to support the creation of clusters has been established with a budget of 62 million MAD (approximately US\$ 8 million) for three years.

Since the launch of the Innovation Morocco Initiative, four clusters have been supported under a pilot operation:

- ICT Cluster (four niches of excellence);

- Microelectronic cluster of a group of companies working in the sector and MAScIR Foundation (Moroccan Foundation for Advanced Science, Innovation and Research);

- Electronic and mechatronic Cluster;

- Pole of competitiveness and innovation in the field of marine resources in Tan-Tan (Cluster Oceanopole Tan-Tan).

- *Innovation cities*: due to its predisposition to develop an ecosystem liable to spread the culture of innovation, Morocco has reflected on the ways and the tangible measures necessary to promote the creation of an innovative environment in line with the requirements of competitiveness and market needs. The objective is to stimulate the creation of value and skilled jobs, improve Moroccan researchers' potential, both nationally and internationally, generate industrial and intellectual property and help Morocco to successfully shift from the logic of technology consumer to that of technology developer or even creator.

"Innovation city" within universities feature among the major projects recommended by the strategy "Morocco Innovation". This is part of the objectives set in the context of the policy drawn up by the Ministry of Industry, Trade and New Technologies to strengthen the competitiveness of enterprises, as planned by the "National Pact for Industrial Emergence," and to support innovation and encourage the promotion of research and technology transfer among productive sectors.

Hence, four innovation cities were planned to be established within the following universities:

- Mohammed V University of Agdal in Rabat;
- Cadi Ayyad University in Marrakech;
- Hassan II University of Ain Chock in Casablanca;
- Med Ben Abdellah University in Fez.

E. INVESTMENTS IN THE ICT SECTOR

Morocco has bet on the ICT sector to sustain the progress that has been made on the integration of Morocco in the global knowledge economy through the deployment of these technologies on a wider scale, and its introduction to each society actor: the state, departments, enterprises and citizens.

In this regard great importance was given to the development of the information technology sector and communication through the set up of appropriate conditions to encourage investment in this sector. They centred it around three essential elements: first an incentive framework through an income tax fair and equitable, then a system of development of skilled human resources through support to training and finally a varied offer of industrial lands adapted and meeting the best international standards.

In addition, the Moroccan offer is enhanced by proposals of financing solutions adapted to the needs of investors in the sector. Furthermore, due to the low cost of labour in Morocco and the financial incentives offered, the country has a strong competitive advantage in this sector with respect to the costs of exploitation compared to southern Europe countries for example.

Competitive advantages

- Multi-lingual skills (Arabic, French, Spanish, English);
- Constitutional framework ensuring a political stability and a sustained development;
- Open and transparent legal space;
- Telecommunication infrastructures conform to international standards;
- Modern Transportation Infrastructures;
- Liberal economic policy opens to foreign actors;
- Tax policy encouraging the export of services;

- Qualified and competent workforce mastering new technologies, at competitive cost;
- Basic infrastructure, both Public and private, dedicated to ICT training available in quantity and quality.

A Legal framework encouraging the investments in the sector of information and communication technologies

- Law No 18 - 95 establishing an investment charter: it provides specific financial, tax and customs advantages to investors, as part of agreements or investment contracts to be concluded with the State, provided that they meet the required criteria. This includes:

- The contribution of the state to certain investment expenses: Investment Promotion Fund;
- The contribution of the state to certain expenses for the promotion of investment in specific industrial sectors and the development of modern technologies: the Hassan II Fund for Economic and Social Development;
- Exemption from customs duties under Article 7.I of the Finance Act No. 12/98;
- Exemption from import VAT under Section 123-22-b of the General Tax Code.

- Law No 17-97 on the Protection of Industrial Property: Industrial property is an exclusive right that gives its holder the right to enjoy the benefits or use the property concerned. It concerns the following intangible assets:

- Technical creation: Patents
- Decorative designs: Designs and Industrial Models
- Distinctive signs: Trademarks, company names, trade names, appellations of origin and geographical indications.

The law introduced new provisions such as the trademark opposition system, border measures for suspected counterfeit goods, protection of sound marks and olfactory marks and trademark submission in electronic form. The formalities for protecting the rights of Industrial and Commercial Property and applying international and national legislation are made at the Moroccan Office of Industrial and Commercial Property (OMPIC).

- Law No 06-99 on free pricing and competition: it sets the rules for the protection of competition and aims to boost economic efficiency improve the welfare of consumers and ensure transparency and fairness in trade relations. The Law prohibits anti-competitive economic practices that may prevent, restrict or distort competition in the domestic market. These practices are: unlawful agreement, abuse use of a dominant position and abuse use of a position of economic dependency.

The penalties provided by law are essentially pecuniary. The levels of penalties are determined based on the seriousness of the offense and the harm suffered by the market or by operators and the circumstances justifying them: bad faith, recurrence.

Competition policy in Morocco is not intended to impose constraints on companies; it is intended to enable them to operate in open markets, whose working procedures are not impeded by anti-competitive behaviour from other companies.

- The Law No. 09-08 on the protection of individuals with regard to processing of personal data introduced a set of legal provisions aimed at protecting the identity, rights and individual and collective freedoms as well as privacy against all attacks that may affect them through use of computers. The Law

defines, among others and with precision, the right of access to databases containing personal data, to object to certain treatments, to request correction of erroneous data and delete outdated information or those whose purpose of treatment was performed.

With the adoption of the Law 09-08, Morocco is among the first Arab and African countries with a complete protection system, and ranks among the safe destinations in terms of movement of personal data.

- Law N° 02-00 on copyright: these measures aim to harmonize national legislation with the commitments made by Morocco in the framework of the international treaties and agreements, including the TRIPS (Trade Related Aspects of Intellectual Property Rights) of the World Trade Organization (WTO), the WIPO Internet Treaties: WIPO Copyright Treaty (WCT), WIPO Performances and Phonograms Treaty (WPPT), and the Free Trade Agreements (FTAs) concluded with other partner countries, mainly the one between Morocco and the United States of America. The Moroccan Office of Copyright is responsible for the protection and exploitation of copyright and its sister rights.

- Arbitration and Mediation: the legal arbitration arsenal is characterized by a series of innovations aimed at harmonizing the Moroccan trade law with international principles. Among the novelties of this paper are broadening the scope of arbitration to legal entities under public law. The implementation of the arbitration judgments relating to these acts remains however subject to the exequatur which returns to the administrative jurisdiction in the competence of which the judgment will be executed, or in the administrative court of Rabat, when the arbitration judgment concerns the whole national territory.

The text also gives the tribunal the right to rule, either automatically or at the request of either party, on the validity or limits of its powers, or the validity of the arbitration agreement. It can also take, at the request of either party, any interim measure it deems necessary within the limits of its mission.

- Labour Code: this Code matches the basic principles set by the Constitution and international standards as given by the United Nations conventions and its specialized organizations in connection with the field of work. The protected rights include:

- Trade union freedom and effective adoption of the right to organize and to bargain collectively;
- Prohibition of all forms of work coercion;
- Effective abolition of child labour;
- Prohibition of discrimination in terms of employment and professions;
- Equal wages.

- Laws concerning the liberalization of the Telecommunication sector: Law 24-96 establishing the National Agency for Telecommunication Regulation and Law 55-01 which provides for the reduction of the contribution of the actors and the creation of special funds to finance these contributions.

Incentives for business support and for development of technology companies

- Programs to support R&D projects;
- Creation of a fund for public service funded at 2 per cent of the turnover of the actors;
- Creation of a fund for research in the field of information technology and communication funded at 0.29 per cent of the turnover of actors;
- Creation of a fund for training and standardization funded at 0.75 of the actors' turnover;
- The granting of licenses of a new generation;
- Publication of a national plan for the allocation of frequency ranges;
- The possibility of payment by credit card on the Internet;
- Act on offenses relating to systems for automatic processing of data.

Institutional support for the creation and development of companies in the ICT sector

- Regional Investment Centres;
- Association of IT and communication professionals;
- Moroccan Centre for Information and Communication Technologies;
- Moroccan Investment Development Agency;
- Moroccan Centre for Export Promotion;
- Moroccan Association for exporters;
- Moroccan Association for Research and Development;
- Pole of scientific competencies and ICTs;
- GIAC program of Technology;
- Moroccan network for the dissemination of technology;
- Moroccan network of incubators for new companies;
- Creation of technoparks in major cities of Morocco (Casablanca, Rabat and others)

ANNEX 1

Core ICT Indicators

Table 1. Core indicators on ICT infrastructure and access

Core indicator		Definitions and notes	2010	2011	2012
A1	Fixed telephone lines per 100 inhabitants	<p><i>Fixed telephone lines per 100 inhabitants</i> is calculated by dividing the number of fixed telephone lines by the population and then multiplying by 100.</p> <p><i>Fixed telephone lines</i> refer to telephone lines connecting a subscriber's terminal equipment to the public switched telephone network (PSTN) and which have a dedicated port on a telephone exchange. This term is synonymous with the terms "main station" and "Direct Exchange Line" (DEL) that are commonly used in telecommunication documents. It may not be the same as an access line or a subscriber. The number of ISDN channels and fixed wireless subscribers are included.</p>	11,90	11,08	10,08
A2	Mobile cellular telephone subscribers per 100 inhabitants	<p><i>Mobile cellular telephone subscribers per 100 inhabitants</i> is obtained by dividing the number of mobile cellular subscribers by the population and then multiplying by 100.</p> <p><i>Mobile cellular telephone subscribers</i> refer to users of portable telephones subscribing to a public mobile telephone service using cellular technology, which provides access to the PSTN. This includes analogue and digital cellular systems, including IMT-2000 (Third Generation, 3G). Post-paid and prepaid subscribers are included. Prepaid subscribers are those that have used their account within a reasonable period of time. This period (e.g. 3 months) should be indicated in a note. Inactive users, which refers to owners of a prepaid card that have not made or received a call within the last 3 months, should be excluded.</p>	101,5	113,6	120,0
A3	Fixed Internet subscribers per 100 inhabitants	<p><i>Fixed Internet subscribers per 100 inhabitants</i> is obtained by dividing the number of fixed Internet subscribers by the population and then multiplying by 100.</p> <p><i>Fixed Internet subscribers</i> refer to the total number of Internet subscribers with fixed access, which includes dial-up and total fixed broadband subscribers: cable modem, DSL Internet subscribers, other fixed broadband and leased line Internet subscribers.</p>	5,92	9,89	12,17
A4	Fixed broadband Internet	<p><i>Fixed broadband Internet subscribers per 100 inhabitants</i> is obtained by dividing the number of fixed broadband Internet subscribers by the</p>	1,58	1,83	2,10

	subscribers per 100 inhabitants	<p>population and then multiplying by 100.</p> <p><i>Fixed broadband Internet subscribers</i> refer to users of the Internet subscribing to paid high-speed access to the public Internet (a TCP/IP connection). High speed access is defined as being-at least 256 kbit/s, in one or both directions. Fixed broadband Internet includes cable modem, DSL, fibre and other fixed broadband technology (such as satellite broadband Internet, Ethernet LANs, fixed-wireless access, Wireless Local Area Network, WiMAX etc.)</p> <p>Subscribers with access to data communications (including the Internet) via mobile cellular networks are excluded.</p>			
A5	Mobile broadband subscribers per 100 inhabitants	<p><i>Mobile broadband subscribers per 100 inhabitants</i> is obtained by dividing the number of mobile broadband subscribers by the population and then multiplying by 100.</p> <p><i>Mobile broadband subscribers</i> refer to subscribers to mobile cellular networks with access to data communications (e.g. the Internet) at broadband speeds (here defined as greater than or equal to 256 kbit/s in one or both directions) such as WCDMA, HSDPA, CDMA2000 1xEV-DO, CDMA 2000 1xEV-DV etc, irrespective of the device used to access the Internet (handheld computer, laptop or mobile cellular telephone etc). These services are typically referred to as 3G or 3.5G and include:</p> <ul style="list-style-type: none"> -Wideband CDMA (W-CDMA), an IMT-2000 3G mobile network technology, based on CDMA that presently delivers packet-switched data transmission speeds up to 384 kbit/s and up to 2 Mbit/s when fully implemented. It is known as <i>Universal Mobile Telecommunications System (UMTS)</i> in Europe. -High-speed Downlink Packet Access (HSDPA), an upgrade to W-CDMA to allow downlink data transmission at speeds of typically 8-10 Mbit/s. It is complemented by High-Speed Uplink Packet Access (HSUPA), which offers uplink speeds of around 5 Mbit/s. -CDMA2000 1xEV-DO (Evolution, Data Optimised), an IMT-2000 3G mobile network technology, based on CDMA that delivers packet-switched data transmission speeds of up to 4.9 Mbit/s. 	4,34	8,06	10,07
A6	International Internet bandwidth per inhabitant (bits/second/inhabitant)	<p><i>International Internet bandwidth per inhabitant</i> is obtained by dividing the amount of bandwidth (in bits/second) by the population.</p> <p><i>International Internet bandwidth</i> refers to the capacity which backbone operators provide to carry Internet traffic. It is measured in bits per second.</p>	75000	12440 0	26600 0

A7	Percentage of population covered by a mobile cellular telephone network	<i>Percentage of population covered by a mobile cellular telephone network</i> refers to the percentage of a country's inhabitants that live within areas served by a mobile cellular signal, irrespective of whether or not they choose to use it. Note that this measures the theoretical ability to use mobile cellular services if one has a cellular telephone and a subscription.			99%
A8	Fixed broadband Internet access tariffs (per month), in US\$, and as a percentage of monthly <i>per capita</i> income	<i>Fixed broadband Internet access tariffs</i> are the lowest sampled cost in US\$ per 100 kbit/s per month and are calculated from two different broadband prices, low and high speed monthly ISP charges. <i>Low speed monthly charge</i> refers to a typical 'entry-level' broadband lower-speed connection (download speeds of 256 – 1,024 kbit/s). <i>High speed monthly charge</i> refers to a faster and typically more expensive offer. Monthly charges do not include installation fees nor modem rentals. The <i>lowest sampled cost in US\$ per 100 kbit/s</i> is the most cost-effective offer for a country based on the criterion, the 'lowest cost per 100 kbit/s'. The cost per 100 kbit/s is calculated by dividing the monthly subscription charge in US\$ by the theoretical download speed, and then multiplying by 100. <i>As a percentage of monthly per capita income</i> refers to the lowest sampled cost in US\$ per 100 kbit/s divided by the average monthly gross national income <i>per capita</i> (World Bank, Atlas method, current US\$) and expressed as a percentage. To ensure international comparability, this indicator is compiled by ITU.	9,80 US \$ per month	6,49 US \$ per month	5,14 US \$ per month
A9	Mobile cellular prepaid tariffs, in US\$, and as a percentage of monthly <i>per capita</i> income	Mobile cellular prepaid tariffs are based on the methodology of the <i>OECD monthly low-user basket</i> ¹ (version 2001), includes the cost of monthly mobile usage for 25 outgoing calls (on-net, off-net and to a fixed line) in predetermined ratios plus 30 SMS messages. <i>As a percentage of monthly per capita income</i> involves dividing the price of the-monthly low user basket by the average monthly gross national income <i>per capita</i> of the country. To ensure international comparability, this indicator is compiled by ITU.	0,16 US \$ per minute	0,10 US \$ per minute	0,07 US \$ per minute
A10	Percentage of localities with public Internet	<i>Percentage of localities with public Internet access centres (PIACs)</i> is computed by dividing the number of localities with at least one PIAC by the total			

¹ For definition, see: <http://oberon.sourceoecd.org/vl=15177325/cl=12/nw=1/rpsv/sti2007/ge11-1.htm>.

	access centres (PIACs) by number of inhabitants	<p>number of the country's localities and then multiplying by 100.</p> <p>A <i>public Internet access centre (PIAC)</i> is a site, location, or centre of instruction at which Internet access is made available to the public, on a full-time or part-time basis. PIACs include telecentres, digital community centres, Internet cafés, libraries, education centres and other similar establishments, whenever they offer Internet access to the general public. All such centres should have at least one public computer for Internet access. <i>Localities</i> can refer to a country's villages, towns, cities or enumeration areas used by the national statistics office for survey purposes.</p> <p>Note that this indicator is used to measure the WSIS target "to connect villages with ICTs and establish community access points" by 2015.</p>			
--	---	---	--	--	--

Table 2. Core indicators on access to, and use of, ICT by households and individuals

Core indicator		Definitions and notes	2010	2011	2012
HH1	Proportion of households with a radio	<p>The <i>proportion of households with a radio</i> is calculated by dividing the number of in-scope households with a radio by the total number of in-scope households.</p> <p>A <i>radio</i> is a device capable of receiving broadcast radio signals, using popular frequencies, such as FM, AM, LW and SW. It includes a radio set integrated in a car or an alarm clock but excludes radios integrated in a mobile phone, a digital audio player (MP3 player) or in a computer.</p>			
HH2	Proportion of households with a TV	<p>The <i>proportion of households with a TV</i> is calculated by dividing the number of in-scope households with a TV by the total number of in-scope households.</p> <p>A <i>TV</i> (television) is a stand-alone device capable of receiving broadcast television signals, using popular access means such as over-the-air, cable and satellite. It excludes TV functionality integrated into another device, such as a computer or a mobile phone.</p>			
HH3	Proportion of households with telephone	<p>The <i>proportion of households with a telephone</i> (fixed or mobile) is calculated by dividing the number of in-scope households with a telephone (fixed or mobile) by the total number of in-scope households.</p>			

Core indicator		Definitions and notes	2010	2011	2012
	Proportion of households with fixed telephone only	<p>The <i>proportion of households with a fixed telephone only</i> is calculated by dividing the number of in-scope households with a fixed telephone only by the total number of in-scope households.</p> <p>A <i>fixed telephone line</i> refers to a telephone line connecting a customer's terminal equipment (e.g. telephone set, facsimile machine) to the public switched telephone network (PSTN) and which has a</p>	39%	35%	31%
		<p>dedicated port on a telephone exchange. This term is synonymous with the terms main station or Direct Exchange Line (DEL) that are commonly used in telecommunication documents. It may not be the same as an access line or a subscriber. The number of ISDN channels and fixed wireless subscribers is included.</p>			
	Proportion of households with mobile cellular telephone only	<p>The <i>proportion of households with a mobile cellular telephone only</i> is calculated by dividing the number of in-scope households with a mobile cellular telephone only by the total number of in-scope households.</p> <p>A <i>mobile cellular telephone</i> refers to a portable telephone subscribing to a public mobile telephone service using cellular technology, which provides access to the PSTN. This includes analogue and digital cellular systems, as well as IMT-2000 (3G). Users of both post-paid subscriptions and pre-paid accounts are included.</p>	84%	85%	92%
	Proportion of households with both fixed and a mobile cellular telephone				
HH4	Proportion of households with a computer	<p>The <i>proportion of households with a computer</i> is calculated by dividing the number of in-scope households with a computer by the total number of in-scope households.</p> <p>A <i>computer</i> refers to a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants or TV sets.</p>	34,1%	39%	43%

Core indicator		Definitions and notes	2010	2011	2012
HH5	Proportion of individuals who used a computer (from any location) in the last 12 months	<p>The <i>proportion of individuals who used a computer</i> is calculated by dividing the total number of in-scope individuals who used a computer from any location in the last 12 months by the total number of in-scope individuals.</p> <p>A <i>computer refers to</i> a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants or TV sets.</p>			
HH6	Proportion of households with Internet access at home	<p>The <i>proportion of households with Internet access at home</i> is calculated by dividing the number of in-scope households with Internet access by the total number of in-scope households.</p> <p>The <i>Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer – it may also be by mobile phone, PDA, games machine, digital TV etc.). Access can be via a fixed or mobile network.</p>	25%	35%	39%
HH7	Proportion of individuals who used the Internet (from any location) in the last 12 months	<p>The <i>proportion of individuals who used the Internet</i> is calculated by dividing the total number of in-scope individuals who used the Internet (from any location) in the last 12 months by the total number of in-scope individuals.</p> <p>The <i>Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.). Access can be via a fixed or mobile network.</p>	49%	51%	53%

Core indicator		Definitions and notes	2010	2011	2012
HH8	Location of individual use of the Internet in the last 12 months	The proportion of individuals who used the Internet at each location can be calculated as either: the proportion of in-scope individuals or the proportion of <u>Internet users</u> , using the Internet at each location. Access to the Internet is not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc. Individuals should be asked about all locations of Internet use (that is, the survey question used by countries should specify multiple responses ²). Note that, except for mobile access, the locations are associated with the equipment used e.g. a PC installed at work or at an Internet café.			
	Home				
	Work	Where a person's workplace is located at his/her home, then he/she would answer yes to the home category only.			
	Place of education	For students. Teachers and others who work at a place of education, would report 'work' as the place of Internet use. Where a place of education is also made available as a location for general community Internet use, such use should be reported in the <i>Community Internet access facility</i> category.			
	Another person's home	The home of a friend, relative or neighbour.			
	Community Internet access facility	Internet use at community facilities such as public libraries, publicly provided Internet kiosks, non-commercial telecentres, digital community centres, post offices, other government agencies (such as schools); access is typically free and is available to the general public.			
	Commercial Internet access facility	Internet use at publicly available commercial facilities such as Internet or cyber cafés, hotels, airports etc, where access is typically paid (i.e. not free of charge).			

² Some countries may ask about location of use as a series of yes/no questions, each referring to one location of use.

Core indicator		Definitions and notes	2010	2011	2012
	Any place via a mobile cellular telephone	Use of the Internet at any location via a mobile cellular telephone (including handheld devices with mobile phone functionality).			
	Any place via <i>other</i> mobile access devices	Use of the Internet at any location via other mobile access devices, e.g. a laptop computer or handheld device that uses wireless access (at a WiFi 'hotspot') or a laptop computer connected to a mobile phone network.			
HH9	Internet activities undertaken by individuals in the last 12 months (from any location)	<p>The proportion of individuals who undertook each activity can be calculated as either: the proportion of in-scope individuals or the proportion of <u>Internet users</u> who undertook each activity.</p> <p>Note that these activities are restricted to private purposes and therefore exclude activities such as purchasing over the Internet undertaken as part of a person's job.</p> <p>Individuals should be asked about all Internet activities (that is, the question used by countries should specify multiple responses. Activities are not mutually exclusive.</p> <p>Access to the Internet is not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.</p>			

Core indicator		Definitions and notes	2010	2011	2012
	Getting information about goods or services				
	Getting information related to health or health services	Includes information on injury, disease, nutrition and improving health generally.			
	Getting information from general government organizations	<i>General government organizations</i> should be consistent with the SNA93 (2008 revision) concept of general government. According to the SNA "... the principal functions of government are to assume responsibility for the provision of goods and services to the community or to individual households and to finance their provision out of taxation or other incomes; to redistribute income and wealth by means of transfers; and to engage in non-market production." (General) government organizations include central, state and local government units.			
	Interacting with general government organizations	Includes downloading/requesting forms, completing/lodging forms on line, making on-line payments and purchasing from government organizations. It-excludes getting information from government organizations. <i>General government organizations</i> should be consistent with the SNA93 (2008 revision) concept of general government. According to the SNA "... the principal functions of government are to assume responsibility for the provision of goods and services to the community or to individual households and to finance their provision out of taxation or other incomes; to redistribute income and wealth by means of transfers; and to engage in non-market production." (General) government organizations include central, state and local government units.			
	Sending or receiving e-mail				
	Telephoning over the Internet/VoIP	Using Skype, iTalk, etc. Includes video calls (via webcam)			
	Posting information or instant messaging	Posting messages or other information to chat sites, blogs, newsgroups, online discussion forums and similar; use of instant messaging.			

Core indicator		Definitions and notes	2010	2011	2012
	Purchasing or ordering goods or services	Refers to purchase orders placed via the Internet whether or not payment was made on line. Orders that were cancelled or not completed are excluded. Includes purchasing products, such as music, travel and accommodation bookings, etc. via the Internet.			
	Internet banking	Includes electronic transactions with a bank for payment, transfers, etc. or for looking up account information. Excludes electronic transactions via the Internet for other types of financial services such as share purchases, financial services and insurance.			
	Education or learning activities	Refers to formal learning activities such as study associated with school or tertiary education courses as well as distance education involving on-line activities. (A more narrow interpretation is likely to be less meaningful as it could include a range of activities such as using the Internet to search for information.)			
	Playing or downloading video games or computer games	Includes file sharing games and playing games on line, either paid or free of charge.			
	Downloading movies, images, music, watching TV or video, or listening to radio or music	Includes file sharing and using web radio or web television, either paid or free of charge.			
	Downloading software	Includes downloading of patches and upgrades free of charge.			
	Reading or downloading on-line newspapers or magazines, electronic books.	Includes accessing news websites, either paid or free of charge. Includes subscriptions to on-line news services.			

Core indicator		Definitions and notes	2010	2011	2012
HH10	Proportion of individuals with use of a mobile cellular telephone	<p>The <i>proportion of individuals with use of a mobile cellular telephone</i> is calculated by dividing the total number of in-scope individuals with use of a mobile cellular telephone by the total number of in-scope individuals.</p> <p>A <i>mobile cellular telephone</i> refers to a portable telephone subscribing to a public mobile telephone service using cellular technology, which provides access to the PSTN. This includes analogue and digital cellular systems, as well as IMT-2000 (3G). Users of both post-paid subscriptions and pre-paid accounts are included.</p> <p><i>Use of a mobile cellular telephone</i> does not mean that the telephone is owned or paid for by the person but should be reasonably available through work, a friend or family member, etc. It excludes occasional use, for instance, borrowing a mobile phone to make a call.</p>			
HH11	Proportion of households with access to the Internet by type of access (narrowband, broadband (fixed, mobile))	<p>This indicator should be calculated as the proportion of in-scope households with Internet access that use each type of access service, for instance, the proportion of households with Internet access that use a broadband service as their means of access.</p> <p>It is expected that countries will collect data at a finer level than ‘narrowband’ and ‘broadband’. The categories chosen by countries should allow aggregation to total narrowband and total broadband, as well as fixed and mobile broadband, as defined below.</p> <p>As households can use more than one type of access service, multiple responses are possible.</p>			

Core indicator		Definitions and notes	2010	2011	2012
	Narrowband	<i>Narrowband</i> includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and <i>i-mode</i> .			
	Fixed broadband	<i>Fixed broadband</i> refers to technologies such DSL (Digital Subscriber Line) at speeds of at least 256kbit/s, cable modem, high speed leased lines, fibre-to-the-home, powerline, satellite, fixed wireless, Wireless Local Area Network and WiMAX.			
	Mobile broadband	Mobile broadband access services include <i>Wideband CDMA</i> (W-CDMA), known as <i>Universal Mobile Telecommunications System</i> (UMTS) in Europe; High-speed Downlink Packet Access (HSDPA), complemented by High-Speed Uplink Packet Access (HSUPA); CDMA2000 1xEV-DO and CDMA 2000 1xEV-DV. (See A5). Access can via any device (handheld computer, laptop or mobile cellular telephone etc.).			
HH12	Frequency of individual use of the Internet in the last 12 months (from any location)	The <i>frequency of individual use of the Internet</i> can be calculated as: either the proportion of in-scope individuals or the proportion of <u>Internet users, using the Internet with each frequency</u> . It is recommended that countries collect this information in respect of a typical period; therefore, respondents should ignore weekends (if they only use the Internet at work) and breaks from their usual routine, such as holidays. Access to the Internet is not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.			
	At least once a day	Once a working day for respondents who only (or most frequently) use the Internet from work.			
	At least once a week but not every day				
	Less than once a week				
Reference indicator					

Core indicator		Definitions and notes	2010	2011	2012
HHR 1	Proportion of households with electricity	Electricity is not an ICT commodity, but is an important prerequisite for using many ICTs. It is therefore included in the core list as a reference indicator. Electricity access may be by a grid/mains connection, or from power generated locally (including at the dwelling). Local power includes electricity generated by a fuel-powered generator, or from renewable resources such as wind, water or solar. It excludes sole use of energy storage devices, such as batteries (though these may be used to store electricity from other sources).			

Table 3 - Core indicators on use of ICT by businesses

Core indicator		Definitions and notes	2010	2011	2012
B1	Proportion of businesses using computers	The <i>proportion of businesses using computers</i> is calculated by dividing the number of in-scope businesses using computers during the 12-month reference period by the total number of in-scope businesses. A <i>computer</i> refers to a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants or TV sets.	98%	100%	100%
B2	Proportion of persons employed routinely using computers ³	The <i>proportion of persons employed routinely using computers</i> is calculated by dividing the number of <i>persons employed routinely using computers</i> (in all in-scope businesses) by the total number of <i>persons employed</i> (in all in-scope businesses). <i>Persons employed</i> refer to all persons working for the business, not only those working in clerical jobs. They include short-term and casual employees, contributing family workers and self-employed persons, who may be paid or unpaid.			
B3	Proportion of businesses using the Internet	The <i>proportion of businesses using the Internet</i> is calculated by dividing the number of in-scope businesses using the Internet by the total number of in-scope businesses. The <i>Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide	91%	96,4%	99%

³ Note that this indicator is not equivalent to the employment weighted indicator 'proportion of persons employed working in businesses with a computer'.

Core indicator		Definitions and notes	2010	2011	2012
		Web and carries email, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.). Access can be via a fixed or mobile network.			
B4	Proportion of persons employed routinely using a computer with access to the Internet ⁴	The <i>proportion of persons employed routinely using a computer with access to the Internet</i> is calculated by dividing the number of <i>persons employed routinely using a computer with access to the Internet</i> (in all in-scope businesses) by the total number of <i>persons employed</i> (in all in-scope businesses).			
B5	Proportion of businesses with a web presence	The <i>proportion of businesses with a web presence</i> is calculated by dividing the number of in-scope businesses with a web presence by the total number of in-scope businesses. A <i>web presence</i> includes a website, home page or presence on another entity's website (including a related business). It excludes inclusion in an on-line directory and any other web pages where the business does not have control over the content of the page.	48%		
B6	Proportion of businesses with an intranet	The <i>proportion of businesses with an intranet</i> is calculated by dividing the number of in-scope businesses with an intranet by the total number of in-scope businesses. An <i>intranet</i> refers to an internal communications network using Internet protocols and allowing communication within an organization (and to other authorized persons). It is typically set up behind a firewall to control access.	41%		
B7	Proportion of businesses receiving orders over the Internet	For international comparability, the <i>proportion of businesses receiving orders over the Internet</i> is most simply calculated by dividing the number of in-scope businesses receiving orders over the Internet by the total number of in-scope businesses. Alternatively, output can be presented as the proportion of in-scope businesses using the Internet. <i>Orders received</i> include orders received via the Internet whether or not payment was made on line. They include orders received via websites, specialized Internet marketplaces, extranets, EDI over the Internet, Internet-enabled mobile phones and email. They also include orders received on behalf of other organizations – and orders received by other	11%	14%	

⁴ Note that this indicator is not equivalent to the employment weighted indicator 'proportion of persons employed working in businesses with Internet access'.

Core indicator		Definitions and notes	2010	2011	2012
		<p>organizations on behalf of the business.</p> <p><i>Orders received</i> exclude orders that were cancelled or not completed.</p>			
B8	Proportion of businesses placing orders over the Internet	<p>For international comparability, the <i>proportion of businesses placing orders over the Internet</i> is most simply calculated by dividing the number of in-scope businesses placing orders over the Internet by the total number of in-scope businesses. Alternatively, output can be presented as the proportion of in-scope businesses using the Internet.</p> <p><i>Orders placed</i> include orders placed via the Internet whether or not payment was made on line. They include orders placed via websites, specialized Internet marketplaces, extranets, EDI over the Internet, Internet-enabled mobile phones and email.</p> <p><i>Orders placed</i> exclude orders that were cancelled or not completed.</p>	17%	28%	
B9	Proportion of businesses using the Internet by type of access (narrowband, broadband (fixed, mobile))	<p>This indicator should be calculated as the proportion of in-scope Internet-using businesses that use each type of access service, for instance, the proportion of Internet-using businesses that use a broadband service as their means of access.</p> <p>It is expected that countries will collect data at a finer level than 'narrowband' and 'broadband'. The categories chosen by countries should allow aggregation to total narrowband and total broadband, as well as fixed and mobile broadband, as defined below.</p> <p>As businesses can use more than one type of access service, multiple responses are possible.</p>			
	Narrowband	<p><i>Narrowband</i> includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s.</p> <p>Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and <i>i-mode</i>.</p>			
	Fixed broadband	<p>Fixed broadband refers to technologies such as DSL (Digital Subscriber Line) at speeds of at least 256kbit/s, cable modem, high speed leased lines, fibre-to-the-home, powerline, satellite, fixed wireless, Wireless Local Area Network and WiMAX.</p>			
	Mobile broadband	<p>Mobile broadband access services include <i>Wideband CDMA (W-CDMA)</i>, known as <i>Universal Mobile Telecommunications System (UMTS)</i> in Europe;</p>			

Core indicator		Definitions and notes	2010	2011	2012
		High-speed Downlink Packet Access (HSDPA), complemented by High-Speed Uplink Packet Access (HSUPA); CDMA2000 1xEV-DO and CDMA 2000 1xEV-DV. Access can be via any device (mobile cellular phone, laptop, PDA, etc.)			
B10	Proportion of businesses with a local area network (LAN)	<p>The <i>proportion of businesses with a LAN</i> is calculated by dividing the number of in-scope businesses with a LAN by the total number of in-scope businesses.</p> <p>A <i>local area network</i> (LAN) refers to a network connecting computers within a localized area such as a single building, department or site; it may be wireless.</p>	78%		
B11	Proportion of businesses with an extranet	<p>The <i>proportion of businesses with an extranet</i> is calculated by dividing the number of in-scope businesses with an extranet by the total number of in-scope businesses.</p> <p>An <i>extranet</i> is a closed network that uses Internet protocols to securely share a business' information with suppliers, vendors, customers or other businesses partners. It can take the form of a secure extension of an Intranet that allows external users to access some parts of the business' Intranet. It can also be a private part of the business' website, where business partners can navigate after being authenticated in a login page.</p>			
B12	Proportion of businesses using the Internet by type of activity	<p>The proportion of businesses that undertook each activity can be calculated as: either the proportion of in-scope businesses or the proportion of Internet-using businesses that undertook each activity.</p> <p>For international comparability, output is most simply presented as the proportion of in-scope businesses undertaking each activity, for instance, the proportion of businesses using the Internet for sending or receiving emails. An alternative presentation is the proportion of business Internet users undertaking each activity.</p> <p>The <i>Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.). Access can be via a fixed or mobile network.</p> <p>Businesses should be asked about all Internet activities (that is, the question used by countries should specify multiple responses). Activities are not</p>			

Core indicator		Definitions and notes	2010	2011	2012
		necessarily mutually exclusive.			
	Sending or receiving e-mail				
	Telephoning over the Internet/VoIP, or using video conferencing	Using Skype, iTalk, etc. Includes video calls (via webcam)			
	Use of instant messaging, bulletin boards				
	Getting information about goods or services				
	Getting information from general government organizations	<i>General government organizations</i> should be consistent with the SNA93 (2008 revision) concept of general government. According to the SNA "... the principal functions of government are to assume responsibility for the provision of goods and services to the community or to individual households and to finance their provision out of taxation or other incomes; to redistribute income and wealth by means of transfers; and to engage in non-market production." (General) government organizations include central, state and local government units.			
	Interacting with general government organizations	Includes downloading/requesting forms, completing/lodging forms on line, making on-line payments and purchasing from, or selling to, government organizations. It excludes getting information from government organizations.			
	Internet banking	Includes electronic transactions with a bank for payment, transfers, etc. or for looking up account information.			
	Accessing other financial services	Includes electronic transactions via the Internet for other types of financial services such as share purchases, financial services and insurance.			
	Providing customer services	Customer services include providing on-line or emailed product catalogues or price lists, product specification or configuration on line, after sales support, and order tracking on line.			
	Delivering products on line	Delivering products on line refers to products delivered over the Internet in digitized form, e.g. reports, software, music, videos, computer games; and on-line services, such as computer-related services, information services, travel bookings or financial services.			

Core indicator		Definitions and notes	2010	2011	2012
	Internal or external recruitment	Including having details of vacant positions on an intranet or website.			
	Staff training	Includes e-learning applications available on an intranet or from the WWW.			

Table 4. Core indicators on the ICT (producing) sector

Core indicator		Definitions and notes	2010	2011	2012
ICT 1	Proportion of total business sector workforce involved in the ICT sector (expressed as a percentage)	<p><i>ICT workforce</i> (or ICT employment) consists of those persons employed in businesses that are classified as belonging to the ICT sector. <i>Total business workforce</i> represents all persons engaged in domestic production in the business sector. In a national accounts framework, employment can be measured in terms of headcounts, jobs, full-time equivalents (FTE) or hours worked.</p> <p>For countries using ISIC Rev. 3/Rev 3.1 (or national equivalents), the ICT sector is defined per the OECD's 2002 definition. This can be found in Box 1 and is discussed in detail in OECD (2007).</p> <p>For countries using ISIC Rev. 4 (or national equivalents), the ICT sector is defined per the OECD's 2007 definition. This can be found in Box 2 and is discussed in detail in OECD (2007).</p> <p>The total business sector is defined on an activity (industry) basis per ISIC Rev. 3.1 as divisions 10–67 and 71–74. It therefore excludes: agriculture, hunting, forestry and fishing; real estate activities (because a significant proportion of the value added of the latter consists of imputed rent of owner-occupied dwellings); and, community, social and personal services (which consists mainly of non-market activities such as public administration, education and health services).</p> <p>For countries using ISIC Rev. 4, the total business sector is not so easily defined. It will most likely include the equivalent divisions 05 to 36, 41-66, 69-82 and 95. Discussions are ongoing on whether it should include some industries that were not included in the Rev. 3.1 definition of the total business sector (divisions 37-39, 90-93 and 96).⁵</p>			
ICT 2	ICT sector share of gross value added (expressed as a percentage of total business sector gross value added).	<i>Gross value added</i> for a particular industry represents its contribution to national GDP. It is sometimes referred to as GDP by industry and is not directly measured (but is estimated in a national accounts framework). In general, it is calculated as the difference between production (gross output) and intermediate inputs (the energy, materials and services required to			

⁵ See draft ISIC Rev. 4: <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27>.

Core indicator		Definitions and notes	2010	2011	2012
		produce final output). See also Table 7. Definitions of the ICT and total business sector are per ICT1.			

Table 5. Core indicators on international trade in ICT goods

Core indicator		Definitions and notes	2010	2011	2012
ICT 3	ICT goods imports as a percentage of total imports	<i>ICT goods</i> are defined per the OECD's 2003 ICT goods classification, based on the 1996 and 2002 Harmonized System classification. It can be found in UNCTAD (2007). Other concepts are per the <i>UN COMTRADE</i> database e.g. re-exports and re-imports are not netted out, and data are presented in US dollars (converted by the UN from country currencies).			
ICT 4	ICT goods exports as a percentage of total exports	<i>ICT goods</i> are defined per the OECD's 2003 ICT goods classification, based on the 1996 and 2002 Harmonized System classification. It can be found in UNCTAD (2007). Other concepts are per the <i>UN COMTRADE</i> database e.g. re-exports and re-imports are not netted out, and data are presented in US dollars (converted by the UN from country currencies).			

Table 6. Core indicators on ICT in education

Core indicator		Definitions and notes	2010	2011	2012
ED1	Proportion of schools with a radio used for educational purposes (by ISCED level 1 to 3)	Schools offering radio-based education as a percentage of the total number of schools in the country for each ISCED level (1-3).			
ED2	Proportion of schools with a TV used for educational purposes (by ISCED level 1 to 3)	Schools offering television-based education as a percentage of the total number of schools in the country for each ISCED level (1-3).			
ED3	Proportion of schools with a telephone communication facility (by ISCED level 1 to 3)	Schools with telephone communication facilities as a percentage of the total number of schools in the country for each ISCED level (1-3). Note that the facility should be directly associated with the school. For instance, a mobile phone which is owned by an individual working at the school would not constitute a school <i>telephone communication facility</i> .	99,05	99,5	99,64
ED4	Student-to-computer ratio (by	Average number of students per	0,68	0,92	0,94

Core indicator		Definitions and notes	2010	2011	2012
	ISCED level 1 to 3)	computer in schools that offer computer-assisted instruction (CAI) by each ISCED level (1-3).			
ED5	Proportion of schools with Internet access, by type (by ISCED level 1 to 3)	Schools with access to the Internet as a percentage of the total number of schools in the country for each ISCED level (1-3).	8,9%	15,5%	30%
ED6	Proportion of students who have access to the Internet at school (by ISCED level 1 to 3)	Total number of students with access to the Internet in schools as percentage of the total number of students in schools offering internet-assisted instruction in a given country by each ISCED level (1-3).			
ED7	Proportion of students enrolled by gender at the tertiary level in ICT-related fields (for ISCED levels 5 and 6)	Number of students currently admitted in ICT-related fields ⁶ by gender as a percentage of all students enrolled in educational institutions in a given country by gender for ISCED levels 5 and 6 (combined).	7,84%	7,4%	
ED8	Proportion of ICT-qualified teachers in primary and secondary schools	Number of primary and secondary teachers who have received ICT training, expressed as a percentage of the total number of teachers at these levels of education.	1,03%	1,13%	1,17%
Reference indicator					
EDR1	Proportion of schools with electricity (by ISCED level 1 to 3) ⁷	Schools with electricity as a percentage of the total number of schools in the country for each ISCED level (1-3).	92,92	92,43	93%

Classificatory variables

The main classificatory variable used for the ICT in education indicators is the 1997 version of ISCED (the International Standard Classification of Education, maintained by UNESCO). ISCED recognizes several levels of education as follows:

- ISCED 1 – Primary education or first stage of basic education;
- ISCED 2 – Lower secondary or second stage of basic education;
- ISCED 3 – Upper secondary education;

⁶ ICT-related fields include computer science, computer engineering, information and communication technology, information systems, multimedia systems, ICT management, system support and software development, informatics, etc. These are represented by ISCED97 Fields of Study 48-Computing, together with elements of 21-Arts (audio-visual, media production and design) and 52-Engineering (electronics and automation). These fields involve substantial work in understanding the technical aspects of ICT rather than a more generic or basic use of ICT.

⁷ Since electricity is not specifically an ICT commodity, but an important prerequisite for using many ICTs, it is not included in the core list, but included as a reference indicator. International studies reviewed by UIS revealed that the lack of electricity is such a significant barrier in many developing economies that monitoring trends of its provision is as relevant as monitoring the supply and use of ICT.

- ISCED 4 – Post-secondary non tertiary education (programmes that lie between the upper-secondary and tertiary levels of education);
- ISCED 5 – First stage of tertiary education (not leading directly to an advanced research qualification); and
- ISCED 6 – Second stage of tertiary education (leading to an advanced research qualification).

Table 7. Core indicators on ICT in government

Core indicator		Definitions and notes	2010	2011	2012
EG1	Proportion of persons employed in central government organizations routinely using computers	The proportion of persons employed in central government organizations routinely using computers is calculated by dividing the number of persons employed in central government organizations, who routinely use computers, by the total number of persons employed in central government organizations. The result is then multiplied by 100 to be expressed as a percentage. An optional indicator may be calculated separately for male and female persons employed (or other individual characteristics).			
EG2	Proportion of persons employed in central government organizations routinely using the Internet	The proportion of persons employed in central government organizations routinely using the Internet is calculated by dividing the number of persons employed by central government organizations, who routinely use the Internet, by the number of persons employed by central government organizations. The result is then multiplied by 100 to be expressed as a percentage. An optional indicator may be calculated separately for male and female persons employed (or other individual characteristics).			
EG3	Proportion of central government organizations with a Local Area Network (LAN)	The proportion of central government organizations with a Local Area Network (LAN) is calculated by dividing the number of central government organizations with a LAN by the number of central government organizations. The result is then multiplied by 100 to be expressed as a percentage.			
EG4	Proportion of central government organizations with an intranet	The proportion of central government organizations with an intranet is calculated by dividing the number of central government organizations with an intranet by the number of central government organizations. The result is then multiplied by 100 to be expressed as a percentage.			
EG5	Proportion of central government organizations with Internet access, by type of access	The proportion of government organizations with Internet access, by type of access is calculated by dividing the total number of central government organizations with Internet			

Core indicator		Definitions and notes	2010	2011	2012
		<p>access (by each type of access and ‘any’ access) by the total number of central government organizations. The result is then multiplied by 100 to be expressed as a percentage.</p> <p>Note that the sum of percentages of each type of access is likely to exceed 100, as many central government organizations will have more than one type of access service.</p>			
EG6	Proportion of central government organizations with a web presence	<p>The proportion of central government organizations with a web presence is calculated by dividing the number of central government organizations with a web presence by the number of central government organizations. The result is then multiplied by 100 to be expressed as a percentage.</p>			
EG7	Selected Internet-based services available to citizens, by level of sophistication of service	<p>Unlike indicators EG1 to EG6, this indicator refers to both central and state/provincial levels of government. This is necessary to ensure international comparability as the services selected may be offered by different levels of government across countries. Because the approach taken to measuring Internet-based services is relatively untested⁵ and because responses may be somewhat subjective, the indicator is initially considered to be ‘experimental’.</p> <p>The indicator is weighted by population in order to show the significance of government Internet-based services at the national level.</p> <p>The indicator is expressed in terms of the percentage of a country’s population that is theoretically able to access each Internet-based service. Note that this does not refer to whether a citizen has the equipment or knowledge necessary to access those services, whether s/he needs to access those services or whether s/he directly benefits (for example, most of the services are not relevant to children). The ability to access each service will usually be linked to the relevant jurisdiction, for example, a citizen residing in a particular state will theoretically be able to access Internet-based services offered by that state government, though may not need to, wish to, or be technically capable of doing so.</p>			