UN-ESCWA

United Nations Economic and Social Commission for Western Asia

National Profile of the Information Society - 2013

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INTRODUCTION

In mid-2010, an e-Government strategy roadmap was devised by the Office of the Minister of State for Administrative Reform (OMSAR) with the main purpose of translating the set strategies of 2002 and 2007 into an actual action and time plan. The formulated roadmap was submitted to the Office of the Prime Minister (OPM) for revision and approval. The OPM has established a unit to follow up on all set national strategies for Lebanon and to coordinate among all such initiatives. As a first actual step towards the implementation of the e-Government strategy, the OMSAR is working on launching the e-government portal (Dawlaty.gov.lb) during the year 2013.

1. THE ROLE OF THE GOVERNMENT AND ALL STAKEHOLDERS

A. National information society policies and e-strategies

The latest e-Strategy was developed in 2003. One of the pillars of this strategy is the Lebanese e-Government strategy which was updated in 2008. Within this strategy a unit had to be established to drive and monitor the e-Government implementation action plan.

The e-Government Program Unit was established on the 12 January 2012 by decision number 13 of the Minister of Administrative Reform at OMSAR. The creation of the Unit was possible due to decision number 12 of 2011, by the Council of Ministers, that gives the Ministry the authority to establish and manage an information repository and an e-Government programme portal including running it.

Within this Unit, there are four groups working to achieve the plan set for e-Government in collaboration with each other and all stakeholders. These groups are:
1. Central Office for Transactions;
2. Data Center and Portal;
3. Simplification of procedures and Government Process Reengineering; and
4. Interoperability.

The mission of the Lebanese e-Government Strategy is concerned with the following programmes:
1. Enhancing service efficiency and reinforcing the relation between the administration and citizens; and
2. Enhancing IT usage and creating an e-Government Portal.

The e-Government Unit has the following responsibilities:
1. Develop and Implement the e-Government Programme Plan;
2. Develop and suggest common standards for the e-Government;
3. Implement e-Government projects;
4. Manage and operate the e-Government Portal;
5. Manage and Operate the Call Center;
6. Support the Single Window projects;
7. Support the Business Process Reengineering of the internal procedures of the government agencies;
8. Support the government agencies in:
   - Placing the electronic transactions in working process;
   - Binding the electronic transactions using Interoperability;
   - Integrating it with the e-Government Portal.

An e-Government portal (www.dawlati.gov.lb) has been created in addition to the E-Government website (www.e-gov.omsar.gov.lb). They both went live in July 2013. Within this project, mobile applications are being developed that will bring e-Services to the citizens and diaspora through their mobile phones and gadgets.

In addition, a Data Centre has been constructed and built within OMSAR during the first quarter of 2013 to manage the portal. A team is also being trained to support it. Several workshops have been conducted, in collaboration with the Presidency of Council of Ministers, to discuss the various plans to implement the e-Strategy and the e-Government strategy.

A task force has also been established by the Presidency of Council of Ministers (PCM) in collaboration with the OMSAR and related stakeholders. Its purpose is to establish and develop the workings of the Unique ID Number which will be used by Lebanese citizens, foreigners, visitors and all persons in Lebanese territory.

A set of initiatives by the PCM have also been triggered to work on the national ICT indicators. This is in cooperation with relevant stakeholders and in accordance to the United Nations directives.

An e-Services project under the e-Government programme was implemented in the second quarter of 2013 to cater for the following agencies' transactions:

Ministry of Agriculture:
- Transaction Tracking
- Transaction Status Update
- Complaints Module
- Deletion of current transaction
- Request prior/permit authorization to import fruit seedlings, seeds, except for potatoes seeds
- Request a certification of Origin\ Only fruits, vegetables, seeds
- Request health permission prior importing poultry and poultry products
- Request to import horses
- Request permission to import veterinary medical preparations\Drugs
- Application for a license to practice the profession of:
  - importing agricultural medicines
  - selling agricultural medicines
  - filling and packing agricultural medicines
  - preparing agricultural medicines
- Application for a license to practice the profession of :
  - committing the agricultural use of medicines (Sterilization using gaseous materials for wood and wood packaging materials)
  - committing the agricultural use of medicines (Sterilization of soil using gaseous materials)
  - committing the agricultural use of medicines (Spraying medicines on the farm fields and trees)
- Application for a license to practice the profession of :
  - manufacturing agricultural drugs

Ministry of Interior – General Security Forces:
- Transaction Tracking
- Transaction Status Update
- Complaints Module
- Deletion of current transaction
- Write-off house servant
- Replace passport number for an entry visa
- Certificate of departure
- Visa renewal
- Visa cancellation

The above sectoral services will be functional as part of the portal in the last quarter of 2013. It is envisaged that by the end of the year 2013 more sectoral e-services will be built on top of the portal.

The e-Government programme is progressing rapidly. Several projects are in the pipeline such as the Lebanese Government Interoperability framework and its implementation in several ministries.

TABLE 1
TITLE OF TABLE ONE

ICT strategy exists	Yes
Year of adoption and latest update	2008
Government agency in charge	Office of the Minister of State for Administrative Reform
	مكتب وزير الدولة لشؤون التنمية الإدارية
Pace of implementation	progressing

Source: Office of State for Administrative Reform

B. Public/Private Partnership (PPP) or Multi-Sector Partnership (MSP)

The Lebanese government is working on fortifying the Public/private Partnership. In July 2011, the President of the Republic, General Michel Sleiman, called for greater role for the private sector to participate in the implementation of development projects. The private sector represents a real partner of the State, the two together can provide a network protection for the Lebanese economy according to its potential, and could play a key role and contribute to human and economic development especially in terms of youth employment, in addition to its important role in increasing the national income, and reduce dependence on imports and increase exports.

The Lebanese Parliament approved Act No. 228 for the establishment of the Higher Council of privatization in 2000, and later ratified law No. 431 (on 23/7/2002) and Act No. 462 (on 5/9/2002) on the privatization of the electricity and telecommunications sectors. Privatization faced however, many constraints, including the lack of political agreement on the principle of selling the assets of the public sector to the private sector. In October 2007, the Government approved the first version of the legal project but it was not discussed in the Prime Ministers Council. Then a similar version was proposed to the Council in April 2010 but was not discussed in the parliamentary committees. In late 2012 the Government issued its economic and social action plan for the years 2012-2015, and placed on the Council of Ministers discussion agenda in January 2013. The plan included seven main topics for amelioration of the economic and living standards of citizens and among its main topics was the privatization of the energy, transport, communication sectors. As a result, the Government decided to rely on the private sector and national and external capital to attract the investments required, reducing the reliance on the Government budget[1] and as such fuel the information society with many project prospects.

On another hand, in 2011 the World Bank, and as part of its support to the Arabic spring wave, launched a joint initiative with the Islamic Development Bank, to provide funding and support for public-private infrastructure projects across the countries of the region. The initiative consisted of four main components, one being for technical support for a period of two to three years targeted for the preparation of infrastructure projects and awareness-raising and capacity-building, and the second for raising Arab financing mechanism for the funding of infrastructure projects in the region, and the third a unified funding mechanism financed from the world Bank for reconstruction and development, to support government financing public-private partnership projects, and the fourth is a forum for dialogue and discussion with key stakeholders in the region[2].

Lebanon has several previous experiences under the framework of the partnership between the public and private sectors, including operation contracts with cellular companies, namely Alpha and MTC, and the postal service company, LibanPost. This is in addition to Ondeoplant, which has been awarded the water treatment contract in Tripoli, and NEAD Company who is responsible for the establishment and operation of the parking meters in Beirut. According to a report published by the Bank of Credit Libanais in November 2011, the reform plan for the electricity sector was the first of its kind as an example for Public-Private Partnership with an investment of around US$ 3.52 billion, representing about 54 per cent of the total cost of the plan. According to the expectations of the Economic Research Department at the Bank of Credit Libanais, the implementation of this plan in the set time schedule, together with the increase in tariffs by 32.98 per cent on an incremental scale for the period 2011-2014, could lead to a reduction in government expenditure in 2014 from US$ 14.22 billion to US$ 12.80 billion.

In May 2011, the Institute of Finance (Institute BasselFleihan) launched a regional training course on modes of partnership between the public sector and the private sector as a model for financing infrastructure projects. The training was organized in cooperation with the Islamic Research and Training Institute, a member of the Islamic Development Bank Group targeting the public sector employees. The aim of the course was to familiarize participants with legal and administrative framework that fosters public-private partnership, with some successful experiences, best practices and experiences.

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[1]   Al-Liwaa, 23 January 2013
[2]   NNA, 22 May 2012

C. Role of Non Governmental Organization

In June 2012, a Lebanese initiative calling for better telecom services, AlloFail, promoted the signing of a Declaration of Internet Freedom to ensure transparent and participatory processes for making Internet policy and the establishment of five basic principles:

1. Expression: Don't censor the Internet.
2. Access: Promote universal access to fast and affordable networks.
3. Openness: Keep the Internet an open network where everyone is free to connect, communicate, write, read, watch, speak, listen, learn, create and innovate.
4. Innovation: Protect the freedom to innovate and create without permission. Don't block new technologies, and don't punish innovators for their users' actions.
5. Privacy: Protect privacy and defend everyone's ability to control how their data and devices are used.

The initiative was initiated by a group of non-sectarian and politically independent Lebanese individuals, which includes a lawyer, a telecommunication engineer and Lebanese public relations experts in a bid to exert pressure on the mobile operators to provide better products and services by listening to and acting upon customer complaints[3].

In addition, in December 2012, a website was launched by a Lebanese citizen initiative to help citizens in sharing their experiences with bribery of public employees. Rabih Sfeir launched rashwe.com, the first portal in Lebanon which handles such sensitive matters, to encourage citizens to exercise their rights and highlight complaints. The intention was mainly to collect data and issue analytical reports that shed light not only on the cost of bribery to the Lebanese economy, and to help change the bitter reality by exposing the most corrupt departments. To attract more traffic and claims, a plan is set to reach out to a bigger audience through social media and advertisements, encouraging people to overcome their fears and report any incidents[4].

2. ICT INFRASTRUCTURE

A. MARKET STRUCTURE AND REGULATORY LANDSCAPE

The telecommunication market in Lebanon is a monopoly of the Lebanese Government, specifically the Ministry of Telecom(MOT) and owns and/or licenses all fixed, mobile, and wireless networks. Organisme de Gestion et d'Exploitation de l'ex Radio Orient (OGERO), established in 1972 and 100 per cent owned by the government, is the only entity in Lebanon responsible for the operations, maintenance, sales, marketing, billing and management of the fixed telecom network in the country.

In 2002, a new law was issued for the privatization of the telecom sector. Up to 2004, the two mobile providers in the country were "Cellis" and "Liban Call" and in June of the same year the government transferred the management of the mobile sector to two different operators "Alfa" and "MTC Touch" respectively. As for the land line privatization, different efforts were put to complete the privatization process of "Liban Telecom" and fixed lines by mid-2007 but that did not go through.

With the launch of the Telecom Regulatory Authority (TRA) in Lebanon in 2007 the sector started witnessing a promising future, and the market soon introduced new telecom services in several fields.

The current number of licensed Internet service providers (including unlicensed providers) in Lebanon is around 16 with the availability of hundreds of unlicensed providers. In the broadband market (Wireless and ADSL), there are currently around seven ADSL services and 16 wireless services. In February 2012, IDM and Cyberia, the two leading Internet Service Providers (ISP) in the country, agreed to merge, pending the required approval of official authorities. Together, they will become the largest ISP provider. The deal is

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[3]   Naharnet, 23 July 2012
[4]   The Daily Star, 31 January 2013

valued at an estimated US$ 100 million. Joined, the two companies will be owned by a newly established holding that will also include GDS, a data service provider (DSP).

Initially, both companies will operate under their established brands, although their operations will be merged together. Cyberia will also become a DSP. The deal includes only the local operations. IDM had earlier created Intrasky through a merger with Lunasat, for its operations outside Lebanon.

TABLE 2
TITLE OF TABLE ONE

Mobile services	Two companies, both state-owned
Fixed-line services	Monopoly (state-owned)
Internet services	Competitive

Source: Ministry of Telecommunication

B. PENETRATION OF ICT SERVICES

To date, the best Internet provision in Lebanon does not exceed the 8 Mbps. The cost is around US$ 121 (including VAT) per month with a download limit of 30 GB and does neither include national and international communications nor cell or streaming digital television. The cost represents 26 per cent of an average Lebanese wage despite a recent increase[5].

In the year 2011, cellular penetration grew by 11 percentage points and cellular phone penetration rate in Lebanon to 68 per cent at the end of the year 2010, making Lebanon ranked at fourteenth in the region and ranked 144th in the world. This ratio is still below the global average of 77.73 per cent, and lower by a margin greater than the regional average of 90.495 per cent.

As for the fixed-line phone subscriptions, Lebanon recorded, according to the International Federation, the highest penetration rate in the region, where there are 21 fixed telephone lines per 100 inhabitants (penetration of 21 Per cent). The rate of penetration in the region reached 9.19 per cent and, globally, Lebanon ranked ninety-seventh among the 233 countries, bringing the total rate of penetration of fixed telephony to 16.83 per cent[6].

In the first half of 2011, the number of subscribers to cellular lines reached 3 million in Lebanon placing the country twelfth among the Arab countries with a mobile penetration of 72per cent.

The International Telecommunication Union (ITU) reported that the first half of 2011 showed a 189 thousand increase in cellular phone subscribers in Lebanon and 200 participants during the first half of 2011, as such the total number of subscribers in Lebanon reached 3.6 million versus 2.88 million at the end of 2010[7].

In May 2012, Alpha launched the U-Chat prepaid package exclusive to its subscribers, which include reductions in voice and Internet call rates and SMS up to 72 per cent, compared to current rates for prepaid packages. The plan is to expand the use of cell phones in the market, especially among the younger generation and let them make maximum use of the latest cellular technology offered at affordable prices. There are two types of U-Chat cell lines, each offers different advantages, deductions and reduced fees on calls. The packages provided:

TABLE 3
TITLE OF TABLE ONE

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[5]   L'orient-Le Jour, 21 October 2011
[6]   Al Akhbar, 20 July 2011
[7]   Al Watania, 10 May 2012

Line	Expiry period	Price	Total num of min	Num of min in weekdays	Num of min in weekends	Num of SMS	Included Data	Additional Freebies
U-Chat 9	30 days	$9	30	10	20	200	50MB	Unlimited calls to one
U-Chat 17	30 days	$17.5	60	20	40	200	250MB	Alfa number during weekends

Source: www.alfa.com.lb

The World Bank published a report in August 2012, entitled "Information and communication for development 2012", stating that 80 per cent of the families in Lebanon in 2010 acquired cellular phones, compared to 50 per cent in 2005.

The report said that 19 per cent of Lebanese use the Internet via cell phones in 2011, i.e. at a rate higher than that recorded in Egypt (15 per cent), Mexico (18 per cent), India (10 per cent) and Pakistan (6per cent).

As for the demand indicator, which indicates the percentage of families with a cellular phone and the percentage of individuals who used the Internet via mobile phones during the period, Lebanon 0.97 point for a global index in 2010 compared with 0.94 points in 2005, and 0.37 compared to 0.25 points for demand in 2010, with an increase of 185per cent and 68per cent, respectively.

In November 2012, the Communications Minister Nicolas Sehnaoui, during the launch of the annual report of the Ministry, presented the comparative figures for the telecom sector between September 2011 and September 2012. Key figures are as follows:
- Cellular subscribers rose by 15 per cent per cent.
- The number of subscribers to mobile Internet (data) multiplied by 3 times.
- The number of customer services centers increased by 42 per cent.
- The Internet via cellular is 27 times faster.
- Cellular communications cost fell from US$ 40 to US$ 35.
- Better business environment for Internet companies to provide mobile Internet services.
- The percentage of the chips from the device to the device Machine To Machine rose by 45 per cent.
- Number of programmes and services provided by cellular companies rose to 121 from 70.
- The number of Internet subscribers rose from 260,000 to 460,000.
- Lebanon's international Capacity increased by 231 per cent.
- Fast DSL Internet speed has increased from 128 KB to 1 MB, or 8 times the theoretical speed, the increase was 15 times for actual consumption.
- The average monthly consumption per capita broadband Internet increased by 200 per cent.
- Broadband tariff dropped by 80 per cent[8]

According to the figures, published by the International Telecommunication Union (ITU), the rate of Internet use in Lebanon (rate of penetration) increased to 31per cent in 2010, compared to 14.8per cent in the previous year, a development that is expected to be completed in the next phase with completion of special projects at this level on top of which is the G3 and the optical fiber network.

In 2010, the number of Lebanese who were using the Internet reached 1.3 million compared with 1 million in 2009, resulting in a higher rate of penetration of 7.5 percentage points, improving the status of Lebanon by this index in the region and globally.

The statistics contained in the report included 233 countries, and revealed that Lebanon is at the 10th place in the Middle East and North Africa (MENA) among 17 countries, and ranks 100 in the world. Remarkably, the penetration rate in Lebanon is higher than the region's Union at 27.28 per cent, and even higher than the

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[8]   Al Akhbar, 19 November 2012

global average of 30.25 per cent[9].

According to Internet World Stats, Lebanon ranked twelfth in the Arab world with 1,367,220 users at end of 2011 with a penetration rate of 33 per cent and 52 per cent penetration with 2,152,950 Internet users for June 30, 2012 numbers[10].

The report of the International Telecommunication Union indicated that Lebanon ranked twenty-ninth among 187 countries at the end of 2011 in fixed broadband penetration compared to 100th in 2010, and ranked fifth among 17 Arab countries and forty-second among the middle-income countries globally.

The number of fixed broadband subscribers in Lebanon is 5.17 for every 100 person in 2011, compared with 37.4 in 2010.This is less than the world average of 8.5 subscribers per 100 people. Broadband penetration rose highly in Lebanon by a cumulative annual growth rate averaged to 2.7 per cent during the period 2007-2011, compared with a rate of 23.6 per cent, in the Arab world and 23 per cent in the Arabic States and 20.8 per cent in developing economies, according to the weekly newsletter of Byblos Bank Lebanon this week[11].

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

The Ministry of communications in Lebanon supports the software industry and has provided a sound legal and administrative foundation for development and in this context the Ministry reduced the cost of internet and accelerated the speed of the telecommunication industry and ameliorated the broadband services and fiber optic lines, which reflects positively on all sectors, and contributes directly to strengthening the software industry and helps to create hundreds of new jobs.

In that respect, in August 2011, the Cabinet approved a reduction in Internet fees by around 80 per cent. The latter comes within the Ministry of Telecom's framework for the development of the sector.

As such, the cost of corporate Internet line (E1) was reduced to US$322 down from levels reaching sometimes more than US$2,000.

This coincided with increased Internet speed of 4 and 8 times. The move comes in the context of the implementation of the plan of restructuring the sector, including investments in infrastructure and development of a general perception of how the private sector becomes a producer and generator of jobs[12].

D. ICT CONNECTIVITY

In 2011, a group of Lebanese opened a page on Facebook under the name "Lebanese want fast Internet" to express their anger towards poor Internet service in the country. The number of members of the page reached 38,445 along with synonymous campaigns launched via the same site with dozens of supporters. The claims did not stop at that, but the group presenters held a press conference at which they announced the threat to Lebanon if the lagging in electronical and computation levels remain that low, and considered that broadband is a human right. Parallel claims were also declared to lower the price of Internet services that are among the most expensive in the region, requesting to open the market to competition between private companies and refused the State's monopoly on the telecommunications and Internet services for citizens[13].

On another note, the Ministry of communications has been working to accelerate and secure faster internet and to introduce 3Gand 4G (which was recently launched in 2013). The two mobile companies (Alfa and MTC) have also been working on providing 3G technology to its users which has been put in place since 2012.

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9   Al Akhbar, 20 July 2011
10   Intenet World Stats: http://www.internetworldstats.com
11   Annahar, August 2012
12   Al Akhbar, 25 August 2011
13   Al Hayat, 5 February 2011

E. INTERNET INFRASTRUCTURE

In October 2011, Ogero announced that it has finally received the equipment it needs to deliver satisfactory ADSL broadband services across its national network, after a shortage of funding caused it to stop connecting new high speed customers. However, full national rollout of the new ADSL2+ services requires Ogero to complete equipment upgrades including finishing its fiber-optic transmission backbone to all parts of the country, which was expected by mid-2013.

In July 2011, the Ministry of Telecommunications announced the launch of the fiber-optics project stretching over 4,000 km. At its completion, every citizen will have the broadband Internet service via broadband.

The project not only provides optical fiber, but also creates new phone lines in all the Lebanese territory along 746-kilometre, and provides fiber to the home (FTTX). The cost of this project amounted to US$ 40 million.

This modern infrastructure has high level technical protection and security through phone parallel paths. It will be followed by the implementation of the "DWDM" project, which will double the transmission and provide advanced services on fiber network such as "broadband" and others[14].

Many Local Internet Service Providers (ISP) in Lebanon are providing WiFi hotspots in some public areas, hotels, restaurants, hospitals and others. Visitors and/or customers can use controlled connection which sometimes is provided as paid or unpaid service by the location management. IDM, for example, is the WiFi provider in the Rafic Hariri airport providing travelers a free 30 minutes WiFi Internet access in the boarding and travelling area. In addition, ISPs have been offering prepaid WiFi cards through which customers pay up front for WiFi Access which is available at many key locations around the country. The ISP providers' websites provide the coverage areas of the WiFi hotspots each one cover.

Some of the ISPs also provide WiMax technology with I-FLY being the first WIMAX Network in Lebanon made available by IDM, Cyberia, Sodetel and Farah Net Solely. WiMax is a communications technology that can transfer multi-megabits of data in seconds. Similar to WiFi, WiMax also brings with it the ability to transmit over longer distances and to carry much more data. WiMax is based on standards that are regulated by one association which makes it a solid fourth generation (4G) technology.

In October 2011, the Minister of Telecommunication announced that the fiber-optic project will be ready as of October 2012. However, to date the project is still under development[15], the fiber-optic network will be ready by the third quarter of 2013. The fiber-optic network will increase Lebanon's Internet connection to 20 megabits per second and improve the country's global Internet seed by 10 ranks.

In addition, another project is under preparation, namely the fiber-to-the-x (FTTX) project, including fiber to the home and fiber to the office components that will allow the Internet speed to reach the 100 MG per second for households.

3G service became available in Lebanon in October 2011, but due to infrastructure constraints, download speeds were not as fast as the technology would potentially allow. The upgraded networks, which are should be ready at the end 2013, will allow download speeds to increase to 21.6 Mbps as oppose to 4.3Mbps currently available.

Prior to the launch of 3G in many parts of the country, users who wanted to access Internet on their phones had to rely on EDGE networks, capable of minimum download speeds around 0.4 Mbps. When 3G was first launched, MTC touch offered it to the cities of Beirut, Saida, Jounieh, Tripoli, and Zahle and their environs, and national coverage was secured by end 2012. On the other hand, Alfa's 3G coverage first extended on the coast and some inland areas such as Aley, some South area up past Tripoli in the North and in a south of Akkar. By the third quarter of 2012, Alfa offered 3G for the entire country. Both MTC Touch and Alfa

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[14]   Al Akhbar, 30 July 2011
[15]   The Daily Star, 5 April 2013

customers can activate 3G services without needing a new SIM card, but a 3G-capable phone is required.

TABLE 4
TITLE OF TABLE ONE

Prepaid and Postpaid Phone		Prepaid and Postpaid Data SIM		Additional Download
Download Cap	Monthly Cost	Download Cap	Monthly Cost	
100MB	US$ 10	100MB	US$ 10	US$ 0.1/MB
500MB	US$ 19	500MB	US$ 19	US$ 0.08/MB
1GB	US$ 32	1GB	US$ 32	US$ 0.07/MB
3GB	US$ 79	3GB	US$ 79	US$ 0.07/MB
5GB	US$ 99	5GB	US$ 99	US$ 0.06/MB

Source: www.mtc.com.lb, www.alfa.com.lb

As for 4G, the two mobile companies started offering limited service in certain areas of Beirut as of May 2013. The limitation of 4G services is mainly due to technical limitations of the available smartphones and wireless devices currently sold in Lebanon and accessing it comes at a high cost to consumers. At the time being, there are around 41,000 devices in the Lebanese market that are capable for 4G including the Nokia Lumia 920, the LG Optimus G, the iPad mini, and compatible Galaxy S3 and Note 2 models.

To access the network, however, users must have a new generation mobile broadband-enabled SIM card or a dongle, a USB flash drive router that is plugged into a laptop. The 4G network was launched June 2013 only supporting data and eligible devices allowing text messaging and calls. It is planned that voice over Internet calls will be made available beginning in 2014.

It is perceived that a 4G network will offer connection speeds that are 10 times faster than 3G, with a price varying from US$99 per month for a 10-gigabyte data package to $149 for a 40-GB plan. Coverage currently is limited to central Beirut with plans to expand to Dbayeh, Jounieh and Kesrouan in November 2013, and major cities such as Tripoli, Saida and Zahle in 2014.

In September 2009, Lebanon joined the IPv6 Forum with the establishment of the IPv6 Forum Lebanon. The Telecom Regulatory Authority (TRA) organized a roundtable meeting on 29 September 2009, to discuss the introduction of IPv6 and its implications. The main topics of discussion were:
- Status of IPv6 capability in the current ISP setup (including the scarcity of IPv4 real IP addresses)
- The main cost factors to upgrade any premises that do not support the dual stack,
- Available plans for a smooth IPv6 introduction including, double running, as well as the readiness of their Tier-1 providers to IPv6 transition and parallel running,
- The status of lb domain registrar towards the double running and the technical and financial implications,
- the status of the existing IXP Node, and
- The role of industry and other stakeholders.

The ISOC Lebanon chapter in partnership with Beirut Internet eXchange and the local ISPs, promoted IPv6 migration and supported its deployments where relevant and launched the "IPv6 Taskforce Lebanon" as one of its main activity for 2012-2013[16].

The IPv6 Taskforce Lebanon is a holistic project starting from raising awareness around IPv6 by reaching out to ISPs, banks, government agencies and large service providers and institutions, complemented by the facilitation of hands-on training on IPv6 and coordination of IPv6 deployment starting with ISPs, government agencies and banks and assigning IPv6 compliance and measuring and advertising IPv6 penetration in Lebanon.

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[16]   Naharnet, 22 June 2012

According to the Regional Internet Registrar (RIR) statistics, Lebanon ranks as the 68[th]world wide in the convergence to IPv6 with only 0.025 per cent[17].

In early May 2012, the Telecoms Ministry and the Cyprus Telecommunications Authority announced sharing capacity on the ALEXANDROS submarine cable subsystem between Cyprus, Egypt and France. The two sides also signed a memorandum of understanding for the construction of the EUROPA system, a high-capacity submarine cable to link Cyprus and Lebanon, which is expected to be ready by 2015.

The EUROPA system will enhance and gradually replace the existing CADMOS cable system, also connecting Lebanon and Cyprus, thus providing an alternative route to IMEWE, which has suffered failures before. In addition, EUROPA will form a bridge between the IMEWE and ALEXANDROS cables landing in Cyprus, providing better connectivity between Europe and the Middle East[18].

Lebanon's root server is located and maintained by the American University of Beirut (AUB). The AUB manages the Lebanese root domain LB-DOM and Lebanese academic sub-domain, ac.lb.

In late 2010, the Lebanese government bought an additional 45 gigabytes of international Internet bandwidth. The new bandwidth was secured from India via Egypt, through a submarine cable that reaches Tripoli.

This main challenges that remain for this initiative is for the administration to make use of it in a good way by establishing new system of bandwidth distribution to ISPs in addition to imposing on them new price policies that are suitable with the demand of consumers.

3. ACCESSIBILITY TO INFORMATION AND KNOWLEDGE

A. Public domain information

The United Nations Educational, Scientific Organization (UNESCO) in Lebanon has been working on promoting access to information in public domain, and promoting freedom of expression as to strengthening the Lebanese communication capacity. The UNESCO Communication and Information section has led many awareness campaigns embodied by many workshops.

In October 2012, the municipality of KfarRomman announced the launching of its electronic office and website in collaboration with "the Blue Foundation". The site secures electronic communication with the village families living in KfarRomman and abroad.

In August 2008, the municipality of Beirut in cooperation with the Association "friends of the public libraries" opened the third public library in Monot (first two libraries were in Bachoura and Geaitawi) in addition to mobile public library "alkitabas". Those libraries are within the network of public libraries initiated based on Assabil study upon the request of Beirut municipality and funded by the Regional Council of Ile de France. "Alkitabas" provides free lending of about 1,500 books and documents for students of all ages. In addition, a website http://search.assabil.com was developed providing its visitors access to reference books, reading books, magazines and newspapers, search for information and training on documentary research. The site is more of catalogue than a full-text digital library.

The two libraries come under an ambitious initiative signed between the French Foreign Ministry and the Lebanese Ministry of culture in 2006 for a project of 1.5 million euros in the aim to strengthen the network of public libraries in Lebanon.

In January 2013, the Finance Minister, Mohammed Safadi, launched the "e-transformation" project in the Lebanese Tobacco and Cigarettes Company (regie). The project includes a new archive programme for

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17   http://www-public.it-sudparis.eu/~maigron/RIR_Stats/RIR_Delegations/World/IPv6-ByNb.html
18   The Daily Star, 16 May 2012

managing documents and archive storage according to international specifications for archive centres to enable the management to have rapid and accurate access to files and support the development of action plans in the sector.

B. Access to information and public information

OMSAR upgraded its information portal (informs) to create the Lebanese Government Portal (www.dawlaty.gov.lb) that uses newer technology and provides a more user-friendly interface. This was done to provide the public with official information that can be easily searched. In addition, OMSAR is working on adding e-services to the portal and making them available to the public. In June 2011 they also standardization a 100 government transaction forms and posted a number of them in an interactive format on the government portal. In April 2013, OMSAR added another 80 standardized forms and provided instructions on how to fill and submit the government transaction forms.

The website of Lebanon Central Bank (bdl.gov.lb) and the Ministry of Finance, provide free access to Newsletters, reports and publications. Also, though restricted, university libraries, such as the American University of Beirut, offers its students online books, archives, journals, and references[19]. Some websites do provide access to open journals to raise public awareness on the latest technological innovations, such as the Lebanese Medical Journal[20].

C. Multi-purpose community public access points

As of June 2011, internet users can surf the Web free of charge in the Sioufi garden, through ADSL technology and a speeds up to 20 Mb/s. This is part of an initiative to cover 10 other parks in the capital, and a park in Tripoli. This operation was done in collaboration with Sodetel (50 per cent State owned), who provides the technical maintenance and the Association of Banks of Lebanon (ABL), who covers the costs[21].

In March 2012, Solidere announced that it intends to set up a technology park as part of a drive to turn the Beirut Central District into an advanced technology and IT hub that will attract small and medium sized companies. Solidere recently announced plans to upgrade its broad fiber-optics network so it can reach a speed of 100 MB per second. The service will be provided to all the homes and offices in Solidere for a charge[22.] The project is still under development.

Different NGOs work on providing portals for posting information and sharing knowledge. The Collective for Research and Training on Development-Action (crtda.org.lb) and Lebanon Support websites (www.lebanon-support.org) post information on different aspects of the community and latest updates.

4. ICT CAPACITY BUILDING

A. ICT in education and training

According to updated information from UNESCO in 2012, a Teaching and Learning How to Use Information Technology Literacy Programme was launched and was designed and developed in consultation with the Ministry of Social Affairs through the National Committee for Literacy (NCL). It was born out of the realisation that traditional methods of combating illiteracy require the training of sufficient numbers of adult education teachers and facilitators. The programme had two main components. The first targeted the working class, who cannot pursue daily tutoring, and a second, a more structured, programme with three levels, each comprising 160 hours of instruction over nine months and averaging about five hours per week. These programmes are accompanied by textbooks, workbooks and instructor's manuals. In the case of the

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19 http://wwwlb.aub.edu.lb/~webjafet/
20 http://lebanesemedicaljournal.org/
21 Lebanese Ministry of Telecomunication
22 The Daily Star, April 2012

structured programme, books are distributed for each level and organized into lesson units[23].

In May 2012, the first interactive digital classroom was opened in Lebanon in the "Secondary Public School of Dhour, which was equipped by cooperation between the school, the municipality of shweir, Microsoft, and the Information Technology Unit in the Ministry of Education and the Higher Education and the Educational Centre for Research and Development that provided the programme content. The Interactive classroom contributes to changing the traditional teaching methods and provides advanced educational tools to bridge the gap between the new generation and the traditional educational methods. It also makes planning lessons easier for teachers and enriches the educational material. It will also render teaching more interesting and attractive and improve the quality of learning and performance for students as well as improve the performance of teachers and raise their capacity and professionalism[24].

Lebanese information technology developers and Microsoft experts met in berytech on 21 March 2013 in Beirut within TechDays 6 Beirut events entitled "digital is business", an event organized by Microsoft to define information technology developers on the latest Microsoft development software and design tools and technologies used the recently launched Windows 8, and Windows Phone 8.
TechDays 6 Beirut Conference focused on the establishment of solid knowledge base for skill development among developers interested in the latest operating systems from Microsoft to enable local developers and trainers to better generation of in the creation of business applications, and introducing applications.

Many initiatives have taken place to promote ICT in the public community and in education in general through establishment of ICT training centers, public access points and community centers established by NGOs such as WIT (Women in IT) and Safadi Organization.

OMSAR is currently working on launching an e-Learning Project for the Government of Lebanon (Project KAFAATI - كفاءاتي). At present, OMSAR is in the process of preparing a list of potential consultants for this assignment. The e-learning project targets the employees of the public sector in Lebanon as part of the capacity building initiatives. The project will include delivery of a Training Portal for the Lebanese Government that will be embedded in the E-Government Portal. The provided courses will cover Management Topics and ICT Topics[25].

B. Training programmes for capacity building in the use of ICT

As part of the Courts' automation project, launched at the Ministry of Justice in the cooperation with OMSAR, training of 800 Judges and Clerks on ICT literacy, to ensure their readiness to use the automated systems that will be made available for case and document management, will be conducted. The training is set to take place in the fourth quarter of 2013.

On 14 April 2011, the Safadi Foundation, a local NGO, signed an agreement with the CEP at LAU (the Continuing Education Program at the Lebanese American University) to support development of the workforce for the North Lebanon community. The CEP Program will be the first of its kind in the region and a step towards achieving developing human capabilities and building professional on the job skills.

The Continuing Education Program (CEP) offers innovative learning opportunities for future business leaders of the community while enhancing performance, promoting professional advancement, and encouraging achievement. It gives adult learners necessary information through continuing education programs designed for the 21st century workplace, while acquiring pertinent knowledge and developing specialized skills.
On another note, and in 2012, the Canadian NGO-Digital Opportunity Trust (DOT) and the YMCA of Lebanon launched "WAKIB" project or "Lebanon Income Generation through ICT for Development Project" with main aim to contribute to Lebanon's reconstruction and rehabilitation of livelihood. It targets

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[23] www.unesco.org.lb
[24] Assafir, 23 May 2012
[25] www.omsar.gov.lb

disadvantaged groups (Youth &Women) in south Lebanon and provide needed training and income generation opportunities to small businesses thereby stimulating economic growth. To date, 84 (over 50% women) young leaders have been trained and deployed to 34 communities to deliver DOT's programs. Over 4,343 Lebanese (over 60% women) have been equipped with İCT and small enterprise development skills. The results are increased incomes, new jobs and establishment of small businesses in rural communities[26].

32 young ICT leaders (interns) have been trained from different regions in Lebanon over the period of "WAKIB project". It is projected that at least 1500 community beneficiaries will be impacted during the life span of the project[27].

In addition, in December 2012, Microsoft led an event "Experience 2013 to encourage computer literacy in Lebanon". The event brought together a number of professionals to discover and experience the latest technologies. The main objective is to promote the culture of innovation in Lebanon.

The event included in-depth sessions tailored and focused on the latest available technologies in these areas, in addition to a special developer section and another for the NGOs to highlight the use of technology to ensure online safety, particularly in relation to children.

5. BUILDING CONFIDENCE AND SECURITY IN THE USE OF ICTs

A. Use of electronic transactions and documents

With the introduction of the electronic transactions law back in 2002, many concerns were raised notably that despite the urgent need to adopt this law for Lebanon, to keep pace with the electronic world, the proposed Bill before the general body of the Council has very significant gaps and inconsistencies, mixing between legal and technical management of electronic transactions, raising concerns of data privacy.

As such, the use of electronic signature in Lebanon has been obstructed by the revision of the IT draft law. Though, the draft Law tackles the issue of certification and authentication through articles 4 and 5, thus setting the fulfillment of the authentication and certification conditions, it remains obstructed by its continuous revisions.

B. Online and network security

There does not exist a current national security strategy or an action plan for the government of Lebanon, however, the OMSAR has been working on a security strategy as part of its e-government programme.

A current national security strategy or an action plan for the government of Lebanon does not exist currently; however, the OMSAR has an established ICT help desk and support team since August 2002 to provide IT technical support for all ministries and public agencies (network administration and desktop applications, phone-based as well as on-site visits). The average 2013 yearly calls supported by the help desk team is around 900 calls (3 calls daily) compared with 2200 in 2010, and the onsite support average is around 100 onsite visits compared with 140 in 2010. The noted decrease between 2013 and 2010 is mainly due to the fact that a lot of Lebanese Government agencies have been establishing IT units and working on enhancing the staff knowledge in the ICT field.

In October 2012, the Faculty of Law, Political and Administrative Sciences-French Section at the Lebanese University hosted a workshop on capacity-building in the area of security and safety in cyberspace. One of the main topics was to highlight how this crime is treated in different legal systems, from one country to another and the need to work on the standardization of legislation between governments, particularly the terms of procedures and how to improve international cooperation in assisting in the suppression of violations. Additionally, assisting in the establishment of bodies for the control and protection of intellectual

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26   http://lebanon.dotrust.org/programs/projects/wakib
27   www.beyoundassociation.com

property rights and recommending secure means of backup when crashes in the Cyberspcae of the government happens as a result of an attack. This is called an emergency strategy. Lastly to create a legislative framework that allows for the creation of a department specialized in the protection of cyberspace, and build and coordinate sustainable experiences that follow the latest developments and risks.

The Telecom Regulatory Authority organized, at the beginning of 2013, a series of workshops, projects and activities towards finding solutions that best suit the community for Internet safety which has been a main concern for parents, teachers, NGO's, Ministries and other stakeholders in Lebanon for many years. During the International Internet Safety day, that is organized every February of every year, the slogan "rights and duties on the Internet" was proposed where Web users were encouraged to communicate with respect. This year's ceremony included the launch of a new curriculum on Internet security, and a school competition among the students was initiated, together with the performance of a theater play about Internet security which was held on 9 February at UNESCO Theater in addition to an extensive media campaign to support the cause.

Given the importance of the protection of children while surfing the net, the TRA has developed several projects including:

- Launched of website on Internet security (www.e-aman.com) to increase awareness on the risks that children face while surfing online, thus building a dedicated national website that would offer comprehensive tips and exhaustive information for parents, youngsters and teachers to help them avoid facing Internet risks[28]
- Created pages on Facebook to raise awareness on this topic.
- Customized an account on Twitter and hash tag for the event: @sidlebanon, 13sidlebanon13
- Launched a huge media campaign by sending more than 3 million text message to the Lebanese public during the first week of February to promote the website www.e-aman.com.
- Cooperation with the various stakeholders in this area about legal issues, technical and organizational on this subject (Ministry of Social Affairs, the Ministry of the Interior, service providers in Lebanon, NGOs specialized in this field, etc.)
- Carry out a study on this subject with all States online Arabic regulators as Commission member.
- Build measures for Internet providers to adopt the necessary means to ensure the protection of children in cyberspace.

Almost all Lebanese banks offer secure online banking transactions by applying different types of security measures to provide their customers with 24/7 banking services, even limited in nature. To date, no cross bank transfers are allowed online. However, transfer from one account to another for the same customer; currency exchange transactions and account inquiry are all made available through secure online banking.

The Lebanese law needs to be modernized in order to address the growing threat of cybercrime. The Ministry of Justice is in the process of finalizing a new draft-law that organizes the electronic sectors and it will soon be passed to Parliament for endorsement. Civil society members and various ministers contributed to the draft-law, and it is to replace a much criticized proposal that was withdrawn in 2011.

Additionally, OMSAR has also established a Cyber Security Committee whose members are from strategic stakeholders who are working on several initiatives to protect the Government websites which have been hacked on several occasions.

With the introduction of new network connections, such as DSL, hackers find ways to hack subscribers DSL network and consume their bandwidth leaving them with high Internet usage costs by the end of each month. In order to overcome this shortcoming in their provided modems, Ogero posted on its site a manual on how to check if anyone is hacking the subscribers' network and provide steps on how to protect against it (http://www.ogero.gov.lb/admin/BillDetails/DSL/ThomsonModemSecurityGuide.pdf).

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[28]http://www.e-aman.com/

C. Privacy and Data protection

The data protection law (enlisted as part of the draft Lebanese IT law) covers any electronic manipulation of "personal data" that is defined as any information related to a physical entity (i.e. a person) and that can be used to identify him/her in a direct or indirect manner (article 129 of the law). The law does not cover the data protection of the information that deals with the physical person's activities (article 128 of the law). Electronic manipulation is defined as any transaction or a series of transactions that affects the "personal information" despite the mean, notably data compilation, registration, saving, altering, or exchange among others (article 130 of the law).

In January 2013, the Office of the Prime Minister organized, in collaboration with the Information and Communication Technology Department at ESCWA, a workshop on the electronic transactions and data protection Bill where ESCWA cyber legislation guidance were presented, on the occasion of the adoption of the draft law on electronic transactions and data protection by the Cabinet and sent to Parliament for approval.

Topics revolved around ESCWA's cyber legislation guidance and a detailed presentation on the electronic transactions and personal data protection Bill was presented. The presentation covered three main components, focusing on "evidence and electronic signature and electronic contracts" and the second theme, addressed the topic of "protection of personal data", and the third and last theme focused on "crimes and other miscellaneous provisions".

D. Countering misuse of ICTs

Lebanon is working to bolster legal measures to deal with cybercrime and to modernize the law in order to address the growing threat of cybercrime. The Ministry of Justice is in the process of finalizing a new draft-law that organizes the electronic sectors in close coordination with the Lebanese security forces to develop methods to curb the spread of cybercrime and help implement the much needed legal frameworks that help to fight such crime.

According to the World Information Technology and Services Alliance (WITSA), Lebanon is still among 33 worldwide countries who have not updated their laws to respond to cyber-attacks on the public or private sector[29]. The United Nation Office on Drug and Crime (UNODC) conducted in February 2013 a comprehensive study on the status of cybercrime in the general community highlighting the importance of legal support to properly combat and prosecute such acts. According to the study, Lebanon was among the League of Arab States members who did not sign the League of Arab States Convention agreements between states that create legal obligations towards acting against cybercrime[30].

In December 2011, the Conference of Arab police and security to combat electronic crime was concluded setting the strategic mode of Arabic e-crime fighting and security, providing the police visibility through community policing concepts in Arabic countries and tourism security and Arab security performance. The Conference also included subjects on protecting people's right of expression, and discussed the recommendations of the heads of the security sectors and Committee meetings held within the General Secretariat of the Arab Interior Ministers Council in 2011.

The most important was discussing and highlighting the best measures to ensure adequate protection and dissemination of the latest technical methods against cybercrime and sharing of knowledge among the Member States.

In October 2012, a digital virus launched a "surgical attack" against computers in Lebanon as part of a multi-wave espionage operation to control computers and steal information. The latest reported virus "MiniFlame" is a small fully functional espionage module designed for data theft and direct access to infected systems. It allows hackers to control the computer's operation or take information from it from command servers in

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[29] www.witsa.org
[30] www.unodc.org

other countries.

"MiniFlame" followed the virus Guass that was discovered infiltrating many computer systems in Lebanon in August of 2012, mining personal information, particularly that related to bank accounts. To counter protect themselves, banks in Lebanon were requested by Central Bank to upgrade their antiviruses and try to shield their mainframes from internet connection[31].

In September 2013, the Office of cybercrime and intellectual property protection at the internal security forces, got reports of computers being broken into and then being requested to pay an amount of money in order to release the stolen information. This falls under "Ransomware" viruses that spread in most countries of the world under different names, mostly taking the identification of local police in each country as a fake name for it, including EU Police Virus that has spread in European countries, the Australian Federal Police Virus which struck Australia, and metropolitan Police Virus which emerged in Britain and British police and others. Currently, it spreads in Lebanon taking the internal security forces and the Ministry of the Interior as cover to deceive citizens and achieve the desired objective, namely receive the money. The aim of these pirates is not only information but also blackmailing citizens by requesting the payment of US$200, payable by credit card "CashU". This virus is a Trojan virus that lurks on websites, often pornography. Once the user enters the mined sites their system gets infected.

In this context, the Office of Cyberia Security advised citizens to download the latest antivirus and malware protection programmes (Antivirus) on their computers, and not to enter the suspicious websites. Moreover users are to communicate with internal security forces and report any incidences[32].

In addition, the year 2012, witnessed a series of attacks on the government websites by a group calling itself "Raise Your Voice", repeatedly hacking 16 Lebanese government and security-related websites.

Visitors to security-related sites like that of the police and State Security as well as ministry websites were confronted with a message from the group to the government raising their anger towards government performance. The different government agencies' IT units worked on checking their implemented security measures in an attempt to identify or locate the source of the attack.

6. ENABLING ENVIRONMENT

A. Legal and regulatory environment

The initiative of the Ministry of Communications to reduce Internet prices and enhance its speed, together with the introduction of new and sophisticated third and fourth generation services is considered an effective start to stimulate the economy.

In addition, the TRA signed in October 2011, a contract for the purchase of a quality management system with the Wicom company as a final step to implement the integrated solution which will allow to measure performance indicators of the telecommunication services and networks of information and analysis of the quality of traffic. The new system will allow periodic reporting on key performance indicators for fixed and cellular services and information transfer services in Lebanon. This will allow the TRA to access and monitor performance indicators for each type of communication services in each region of Lebanon and take necessary actions to improve the quality of telecommunications services.

Moreover, the following have been achieved:
- An official committee has been created and is currently working on the Privacy Law;
- A draft law on using an official Unique ID Number (which has not been decided on) has been adopted by the parliament on the 2nd of July 2012. The new Law is 241/25/2012. The Law demands that public agencies have to adopt this number which identifies a Lebanese citizen in

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[31]   The Daily Star, 16 October 2012
[32]   Annahar, 9 April 2013

exchanging data electronically amongst themselves.
- A Council of Ministers' decision number 55 dated 2/5/2012 dictated that all government agencies must abide with the Website Standards which OMSAR has developed in 2011.
- A Council of Ministers' decision number 16 dated 18/8/2011 dictated the developed standard forms for several government agencies which OMSAR and coordination with the Research and Guidance Administration must be adopted.

With the Internet revolution, the issue of intellectual property poses a real dilemma in how to ensure the rights of authors and creators. Despite differences in the philosophy and objectives of copyright protection from one country to another, intellectual property protection has a serious effect on the economy where the mechanism of the economic and social development is affected, resulting in the need for public awareness of the importance of protecting intellectual property rights.

In this context, the joint committees in the House of Member of Parliament approved the two proposed treaties: WIPO Copyright treaty (WCT) and the WIPO performances and Phonograms Treaty (WPPT).

The Internet treaty establishes international rules aimed at preventing access to and use of creative works on the Internet or other digital networks without permission. And those two treaties are of great importance in promoting the development of electronic commerce and information industries by ensuring the quality and authenticity of digital content, possible creators, producers of phonograms, and related industries.

In parallel to these legislative actions, the Ministry of Economy and Trade increased the number of observers of the intellectual property protection to enable them to follow up complaints and launched its online service for trademark registration.

Despite the above measures, the International Intellectual Property Alliance asked the United States Trade Representative to keep Lebanon on the Watch List for the ineffective and inadequate protection of intellectual property rights, and for severe copyright problems.

Lebanon has received numerous warnings from the United States and European Union that if it does not combat intellectual property violations, it will have no chance of joining the World Trade Organization. Lebanon is one of 25 countries recommended for the Watch List.

The IIPA indicated that Lebanese authorities had made incremental progress in copyright protection. It noted, however, that it was premature to remove Lebanon from the "Special 301" list, given the importance of establishing a proper legal framework for copyright protection and fully implementing Lebanese laws to reduce piracy and foster growth in the country's creative sectors.

It cited problems like end-user piracy of business software that continues to cause enormous losses to software companies; book piracy in the form of illegal photocopying on and around university campuses; the export of pirated books to Gulf countries; retail piracy of all kinds of copyright materials such as movies, music and entertainment software; cable and pay TV piracy; growing Internet-based and mobile device piracy; hard-disk loading of software onto computers at points of sale; and the sale of circumvention devices such as pay TV decoders.

The IIPA also said the Lebanese government uses unlicensed software on its equipment. It noted that the government needs to lead by example in protecting IPRs and in ensuring that its own software usage is licensed. It added that authorities had to take the lead in driving local education, awareness and enforcement to combat software piracy in the country[33].

The TRA adopted a consumer protection system in addition to its extensive work on raising awareness on protecting children surfing online. The body has distributed educational kits for public and private schools in Lebanon containing educational information and guidelines for staff, parents, and students on Internet safety.

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[33]   The Daily Star, 22 February 2013

TRA also initiated various awareness and information campaigns in collaboration with stakeholders such as ELLF and UNESCO.

The telecommunication ministry also worked on enforcing parental control tools and safety and security requirements for all Internet connections provided by ISPs to the youth sites, in order to limit the access of children and youth to dangerous sites.

E-signature and e-transaction:
The e-transaction law is still undergoing revisions, despite a series of meetings held by the ICT parliamentary committee to revise and finalize its terms. The current proposed law is an updated version of the draft law presented back in July 2002 by MP Ghinwa Jalloul. The proposed law faced many concerns and disagreements from different parties including the PCA, the private sector and many government agencies. The Ministry of Justice has revised the law and it is now under revision in the house of parliaments with an unclear deadline for enactment.

E-commerce and e-payment:
In May 2013, the Ministry of Finance announced that Lebanese taxpayers will soon be able to pay their taxes electronically instead of having to go to the Finance Ministry. E-payment will be introduced soon to facilitate the lives of taxpayers and complete their transactions 24/7 without any hassle. The taxpayer can log on to the Finance Ministry's website and use a special credit card issued by the ministry to make payments.

In July 2012, the national strategy Unit for information and communication technology in the Office of the President of the Council of Ministers organized, in cooperation with the Department of Informatics at the University of Balamand, a workshop on open source software. The workshop targeted information technology officials in various ministries to highlight the importance of open source software as one of the viable options to developers and users, at various levels, including governmental institutions, as well as to contribute to the acceptance and willingness to adopt free and open source software in the government.

- Refer to Table 42 of the Regional Profile of the Information Society in Western Asia - 2009 and update the information pertaining to your country on the status of the following international agreements: WTO, Paris Convention, PCT, WCT, Madrid Agreement, Hague Agreement, PLT and TRIPS.

TABLE 5
ICT LEGAL AND REGULATORY ENVIRONMENT IN LEBANON

Type	Status
e-transactions law available	Under revision
e-signature law available	Under revision
Management of PKI available	Under revision

Source:

B. Domain name management

Lebanon's country code domain name is lb. The Lebanese Domain Name Registry (LBDR) is managed, supervised and administered by the American University of Beirut (AUB) by creating new domains, updating a domain record, changing the delegation of a domain, and reactivating an expired domain. The registry handles requests from different entity types in different manners.

TABLE 6
TITLE OF TABLE

Name of ccTLD registrar	American University of Beirut (AUB) الجامعة الأميريكية في بيروت

URL of registrar	http://www.aub.edu.lb/lbdr/Pages/index.aspx
Total Number of ccTLD registered in the country for the years 2008, 2009, 2010, 2011, 2012.	Cumulative total number for: 2008: 2812 2009: 2965 2010: 3168 2011: 3332 2012: 3413

Source: American University of Beirut Website: www.aub.edu.lb

C. Standardization in ICT

Two projects are under way:
- Terms of Reference and an RFP have been developed for the upcoming Lebanese Interoperability Framework. This is scheduled to be launched towards the end of 2013.
- Terms of Reference are being developed for the implementation of an interoperability project between two administrations: Ministry of Public Health and the Ministry of Education and Higher Education. This scope was defined by the request formulated by the Ministry of Public Health (MOPH) asking that the "Authorization for Practicing Medical Profession in Lebanon" transaction which relies on the "Accreditation and results of official exams in Lebanon" at the Ministry of Education and Public Health (MOPH) be made interoperable between the two administrations so as to make life easier for the citizen and the public sector as the information is already available in the relevant departments within the MOPH and the MEHE. In addition, this method of cooperation between the two ministries will speed the process, assure the accuracy of information, and reduce any kind of fraud.

Within the above interoperability projects, two smaller projects have been initiated to standardize the following:
- Ownership of data within the agencies. Who is the party legally responsible to create, update and publish the data?
- What is the information being exchanged amongst the agencies?

A great deal of research has taken place on what other countries have done to develop their Interoperability Framework. Currently OMSAR is proposing to build on the experience of other countries and the lessons learnt. It envisaged that the Lebanese Government Interoperability Framework will be built on the five-layer model of interoperability recommended in the European Interoperability Framework (EIF) for European Public Services: Political, Legal, Organizational, Semantic and Technical.

D. ICT investments and Government-supported facilitation measures

(a) Entrepreneurship, innovation and incubator schemes
Berytech[34] is the first facility in Lebanon to offer entrepreneurial experience, technological innovation, mentoring, business matching, and research and development. Since its inauguration, it has been very active in facilitating entrepreneurial and technological innovations. In June 2013, Berytech, in partnership with Intel, ended its Innovation Challenge contest with the winning project "Arab Interns", represented by Mooneer El-Assaad. "Arab Interns" is an innovative platform designed to connect college students and fresh graduates with growing companies in the Gulf and MENA regions through internships. It is a unique service solution that will enhance the cultural and economical status regionally.

(b) Government investment funds
The total value of the investment projects financed by the IDAL during the year 2012 was worth US$ 247.76 million, which provided for the promotion of investments in Lebanon.

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[34]   www.berytech.org

During 2012 the authority provided, through its one-stop shop for licensing, about 35 new project propositions and request of expanding existing projects to benefit from the provided incentives and facilities. The financed projects covered the industry, hotels and information technology sectors.

(c) Investment promotion strategies
Kafalat is a Lebanese financial company established to assist small and medium sized enterprises (SMEs) in accessing commercial bank funding. The company helps SMEs by providing loan guarantees based on business plans and feasibility studies that show the viability of the proposed business activity among others.

(d) Software export support activities
The limited size of the domestic market causes companies to look for neighboring markets to expand their activities. Lebanon is perceived to become a center of software development in the coming years. Several companies are already competing to get outsourcing contracts from international software development companies. Many Lebanese ICT companies rely heavily on the gulf market and recently have been targeting underdeveloped countries such as in Africa.

7. ICT APPLICATIONS

A. E-government

(a) ICT in public administration
    (i) Computerizing Public Administration
In July 2012 and in a step towards the developing the work of the judiciary in Lebanon, the minister of Justice, Chakib Cortabaoui, announced the initiation of the automation of the courts procedures through a donation from the European Union and the support of the Ministry of State for Administrative Reform. The computerization will be implemented in the courts in Beirut with the aim of promoting access to justice, access to information and legal references. At later stages, the judicial palaces and courts will be linked in one network and the system will allow interoperability with other government institutions, allowing secure exchange of judicial data in a quick and effective manner as well as high security levels. In addition, the Software application will allow saving electronic versions of paper cases and configure the archival, and the adoption of the electronic communications and petitions, regulations and documents via email.

In August 2012, the Minister of Justice announced the readiness of the AlMustachar application which offers a lot of laws and jurisprudence in electronic format and will be made available for the judges for free in the Ministry during office hours. The initiative comes in the context of the programme called for by the Ministry with the support of the European Union and the United Nations development programme, with a view to automate data and material necessary for courts. AlMustachar is a collection of about 20 volumes of laws. The software contains a set of jurisprudence, which has a large number of provisions of the Court of Cassation since 2002 and a large section of folders containing provisions made in the previous period. The application not only contains laws and jurisprudence, but extends to include the releases of the official Gazette since its issuance. The main importance of AlMustachar is, however, the possibility of updating its content through the Internet easily and quickly.

    (ii) Computerizing customs processing
The first automation achievement of the Lebanese Customs Administration was in the mid 1990s through the NAJM project that adopted the International Harmonized Tariff System, ASYCUDA, through a World Bank loan. The latter was followed by the NAJM Online Operation (NOOR) project that was implemented in May 2001 in phases and that allows traders or customs brokers to track declarations from their offices. With further attempts to ease the customs processing, the customs administration set up the customs intranet that connects all regional offices together with a main connection line and a backup line in 2007. At the end of 2005 customs started its upgrade from ASYCUDA++ to its latest version, namely ASYCUDAWorld (AW).

    (iii) Computerizing taxation and revenues management systems

Ministry of Finance: in May 2013, the Ministry of Finance announced that Lebanese taxpayers will soon be able to pay their taxes electronically instead of having to go to the Finance Ministry. E-payment willbe introduced soon to facilitate the lives of taxpayers and complete their transactions 24/7 without any hassle. The taxpayer can log on to the Finance Ministry's website and use a special credit card issued by the ministry to make payments[35].

Ministry of Finance-Built-up Property Tax Directorate, in August 2012, launched the on-line tax query system through its website (www.finance.gov.lb), which aims to facilitate the process of querying on built-up property taxes. In a first step in this context, tax payers can inquire about the cost of property tax by entering the property information. In a later step, it will allow payment of the tax on the Ministry's website via electronic payment through credit cards.

The Ministry also reported that it will soon add other tax query services. The electronic declaration is intended to facilitate for registered tax payers all tax related issues and eliminate the possibility of errors in the declarations, and the registration of declarations outside the working hours.

In the second quarter of 2013, the ministry announced the launch of a mobile application for Apple and Android that enables a search on accumulated property tax dues based on lot number and regional location.

(iv) Digitizing Information

In April 2012, the American University of Beirut announced that it will use all its experience in the service of the State for the development of a successful e-Government in Lebanon. The latter is in the context of two projects: the National Research Fund, the 7th framework programme of the European Union, led by the University to evaluate the transition to e-Government supporting research and technology.

In May 2013, the Lebanese University President, Dr. Adnan Sayyed Hussein, signed, together with Chief Judge Awni Ramadan, head of Courts of Audit, a cooperation protocol to digitize all decisions, legislative texts and judicial decisions in the court based on the latest developments in Information technology.

(b) E-government services

- G2G (Government-to-Government)interaction between local and central governments

    The office of the Minister of State for Administrative Reform (OMSAR) was appointed by the Council of Prime Ministers to lead and manage the first rank employment in the public sector in 2011. In that regard, OMSAR developed a web application through which public servants posts are published and interested candidates can apply online. The system automatically filters CVs based on set criteria (as per the approval of the Council) and follows a very systematic approach of filtering and shortlisting.

- G2C (Government-to-Citizen) delivery models and government portals

    o   Ministry of Justice (MOJ): in June 2011, www.almustachar.com was launched as a website available for lawyers to consult on the agenda of hearings of Beirut courts and as such make available to them all respective updates and schedules from the comfort of their offices.

    o   In March 2012, the MOJ declared the installation of a LCD screen that will be displayed in the main entrance of the Judicial Palace of Beirut showing the agenda of hearings of the courts of Beirut available to the public as they enter the Judicial Palace.

    o   The minister also announced that the judicial and legal information center at the Ministry is to launch two versions of the ministry's website in French and English. The website aims to explain the administrative management of the Ministry and the judicial organization of the public prosecution and juvenile justice and courts. The site will include information about the courts and the composition, terms of reference and geographic locations, the various judicial bodies entrusted with the supervision and control of the judiciary, and will provide social services to the judges and human rights sector. The site also publishes the work in progress of the policies of modernization and development in the Ministry and the courts, conferences and seminars that the Ministry is involved in or is organizing.

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[35]   The Daily Star May 15, 2013

o   The Judges will be offered e-mail addresses connected to the ministry's messaging system to allow communication with judges electronically quickly and easily, and inform them of the latest news from the ministry (seminars, lectures and mutually supportive judges and Ministry Fund and miscellaneous news and others). Judges will be able to access their e-mail from the ministry's website as a tool in the work of the legal research and the exchange of legal information.

o   General Security: in March 2012, the General Security declared two new services to the public: SMS services to inform the citizens of the expiry of their in-service help a month prior to the set expiry date and another SMS service to inform them of the expiry of their respective passport also a month ahead of the passport expiry date.

o   In November 2012, the General Security announced the launch of its website (www.general-security.gov.lb) on which all laws, decrees and strategies will be published.

o   Ministry of Labour: in July 2012, the Ministry of Labor launched its website containing information that allows citizens and foreigners residing in Lebanon full access to information on their rights and duties with regard to transactions with the Ministry, with clear notation of transaction deadlines and fees.

o   Ministry of Tourism: in November 2012, the Minister of Tourism opened the One Stop shop for the Tourism permits with the assistance of the Office of the Minister of State for Administrative reform. This project comes as a step undertaken by the ministry of tourism towards simplifying the procedures and enhancing tourism and investment in this sector. The one stop shop will minimize the interaction between the citizen and the public sector employee and free him/her from the burden of following on the transaction from one department to the other.

- G2B (Government-to-Business) interaction between local and central government and the commercial business sector

TABLE 7
TITLE OF TABLE

Name of Authority in Charge of ICT in Public Administrations	Office of the Minister of State for Administrative Reform وزارة الدواة لشؤون التنمية الإدارية URL:www.omsar.gov.lb
Name of e-Government authority	Office of the Minister of State for Administrative Reform وزارة الدواة لشؤون التنمية الإدارية URL: www.omsar.gov.lb
Number of implemented government e-services	*40*
Number of planned government e-services	*assessing with several government agencies*

Source: Office of Minister of State for Administrative Reform

(c) E-procurement applications
There is a current project on the implementation of online procurement in the government. However, given the obstacles facing an e-procurement application based on the old law and given the status of the modernization of that old law, OMSAR and the Development Gateway Foundation teamed up to implement a pilot e-procurement system in five public entities and to concentrate on a technical assistance. The project is currently in the bidding phase.

TABLE 7
TITLE OF TABLE

URL of e-government portal: www.informs.gov.lb		
Information	General	Yes

	Laws	No
	Directories	Directory of Government agencies
Services	Static Info	No
	Downloadable Forms	Yes
	Interactive	Yes
e-payment		Under Development by the Lebanese Ministry of Finance
Online account		No
Bilingual		Trilingual
Citizen Participation	No	No
	No	No
Social Media	No	No
	No	No
	Yes	Yes
	Applets	Applets
	No	No
Additional Services	RSS	Yes
	Web Statistics	Yes
	Search	Yes
Mobile version	Support for smartphone/tablet	Under Development
	Dedicated App (iOS or Android based)	Under Development
Other features		*None*

Source: Office of the Minister of State for Administrative Reform

B. E-business

Upon the spread of the news of the [Gauss] virus attack, the Central Bank called on commercial banks to take the necessary measures to protect their computer systems. As a result, the Lebanese banks upgraded their software security systems to block any virus designed to spy on transactions and operations as of September 2012. In addition, banks have developed a security system to prevent any outside party from penetrating their computers regardless of how strong the virus. The measures adopted by the Central Bank and all commercial banks are capable of limiting and even preventing any attempt to penetrate the software systems, because the computers are not connected to the Internet, but operate on a system specially developed for the banks[36].

As for e-commerce portals, Mizalla, a Lebanese website set up in July 2011 was launched as the region's first online mall which sells products from local stores. The wave of online shopping has begun to merge in the past couple of years with some Lebanese companies, including florist Exotica and sweet shop Hallab, establishing websites alongside their physical stores. Companies have adapted to the local market, with many that deliver in Lebanon, including Mizalla, offering payment on delivery, removing people's key fear of online purchasing.

According to a recent survey by group-buying website GoNabit, consumers are becoming increasingly comfortable with making online purchases in the Middle East. GoNabit and other group-buying websites provide substantial discounts on products provided by local businesses on deals that last around 48 hours.

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[36]   The Daily Star, 14 September 2011

Lebanon now has several of these websites, including Groupon, Cobone and GoNabit, operating in the country.

An increasing level of trust and convenience are the two main factors that are bringing about more business. The new sites are doing the work of the businesses and the consumers: promoting products, making deliveries and transactions without requiring their customers' full credit card information[37]. Research conducted in April 2012 by "Visa" showed that more than 64 per cent of local companies are currently dealing with their consumers via e-commerce services. This type of commerce has changed the way companies interact with consumers, with one out of every two Lebanese companies (55 per cent) use a wide range of online services to interact and do business .As for online shopping, statistics showed that Lebanon has 74 per cent of the purchasers buy their goods and services via the Internet through the use of electronic payment cards, such as credit cards, debit cards and prepaid credit cards and Internet card services.

PayPal announced that it will launch in Lebanon in 2013. Paypal is fully enabled – meaning buyers and sellers with locally issued bank accounts can do complete transactions, customers can also open accounts to pay purveyors.

In October 2011, the Central Bank of Lebanon launched a website for entrepreneurs, implemented by "ClearTag". It aims at promoting cooperation and coordination between the different economic bodies and highlighting their role and importance in providing citizen services. In order to facilitate the task, a database of information and addresses was put online to help entrepreneurs launch their projects and promote them and ensure funding through the website. The site promotes economic growth plans in Lebanon, leading to the expansion of the production sector and creates new jobs.

Customs administration and the EU funded project with the Lebanese Ministry of Economy & Trade have created a website for e-commerce in par with use of international e-business models for trade.

With the launching of the e-payment gateway, the Ministry of Finance will mark the beginning of a local standard for all e-businesses to use and follow instead of reverting to international and foreign e-payment gateways which usually forces higher interest rates and following foreign laws, rather than the ones the country is setting.

TABLE 8
TITLE OF TABLE

Availability of e-banking services	Yes	Law number:	-
Availability of e-commerce law	Under Revision	Law number:	-
Availability of e-transactions law	Under Revision	Law number:	-
Name other laws on e-services	-	Law number:	-

Source:

C. E-learning

(a) Primary and secondary education
   (i) Use of e-learning systems and applications in all school levels
MEHE launched an Education Management Information System (EMIS) to manage schools and education that encompasses a number of activities: (i) EMIS at the ministry, (ii) a School Information System (SIS), (iii) a National Education Network; (iv) Geographical Information System (GIS)/School Mapping; and (v) and the Information Management Unit (IMU) at the ministry. Despite the difficult periods Lebanon is going through, good progress has been made on all fronts.

   (ii) Internet connectivity in schools

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[37]   The Daily Star, September 28, 2011

Technology is not widespread in most Lebanese government schools. Technology provision and Internet connectivity are major impediments to development in the educational sector.

Some major private-sector initiatives, along with other public sector initiatives have laid the foundation for at least some schools to gain the connectivity and technology training necessary to embark on many of the ICT in educational programs. According to 2008 data from the Center for Educational Research and Development (CERD), 5.7 per cent of government schools reported having Internet access compared to 52.7 per cent of private schools. Because of a lack of national data, an updated percentage level of Lebanon's public schools with Internet connectivity cannot be deduced[38]. Due to the small-scale and informal programs and donations taking place, it is envisaged that the number of computers and level of connectivity in public schools is in fact under-represented

(iii) PC penetration in schools
In May 2012, the ministry of telecommunications announced that it will provide 15,000 reduced-cost tablet PCs to public school students as a step aiming to improve the quality of education and boost a knowledge-based economy. The pilot project will also provide 1,500 free tablets devices to tenth and eleventh grade classes in 15 public high schools across the country. The tablets would include the educational curriculum of the two classes.

The Central Bank also announced that it will offer interest free loans to help reduce the costs for the devices, allowing students to pay in installments over two years. The devices will feature both Wi-Fi and 3G connectivity, allowing Internet access even for schools in in remote areas, where a wireless connection would not be readily available. In addition, the country's telecom operators Alfa and MTC Touch will subsidize 3G subscription rates for the users of the 15,000 tablets. The initiative aims at providing every public high school student with a tablet PC by 2014[39].

(iv) Educational Portals
In the early 2000, a project under the name of SchoolNet was established. SchoolNet-Lebanon[40] is the first of its kind of education portal and aims at interconnecting all public and private schools and make available libraries together with the MEHE over a stable telecommunications infrastructure with a gateway to the global Internet. Its objective is to build a knowledge-based society by providing continuing education through multimedia learning, facilities and resources. The ultimate goal is to expand the SchoolNet coverage to cover all public and private schools via direct communications connections.

(b) Higher education
In July 2011, the Olayan Business School in the American University of Beirut launched a new section under the name "Faisal Ali Motawee for technology", consisting of three computer laboratories and a Conference Hall, and included more than sixty work spaces fully equipped.

(i) Virtual Universities
In Lebanon, MEHE does not accredit virtual universities. However, some universities, such as the Arab Open Universities, do provide some level of virtual learning, whereby the student can attend some courses on-line but nevertheless has to show up at least once a week. The latter is described as blended learning university rather than virtual.

(ii) E-learning systems and applications
In 1999, through a project supervised by OMSAR, the Lebanese University was furbished with a Student Information System with its related underlying infrastructure. Due to different reasons, the system was not put in full use. CISCO has worked on the initiation of a School Information System (SIS) automating the administrative work of the public schools and connecting them to the ministry's central database. In addition, MEHE has been working on installing the SIS on all PCs that it is distributing to the public school

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[38] "Technology Teaching and Learning, Research, Experience and Global Lessons Learned", Education Development Center, Inc
[39] The Daily Star, 16 May 2012
[40] http://www.schoolnet.edu.lb

administrations, to speed up the process.

(iii) Libraries of E-content

Microsoft, in partnership with the public education sector in Lebanon, has created the "Partners in Learning" project through which Microsoft has provided a Help Desk and Support Center and Innovative training center at MEHE, to provide innovative teacher's portal for e-content development by teachers and program to reach out to the subject-matter teachers assigned by MEHE in 2008-2009. However, the e-content sector in Lebanon remains behind many other countries due to some major bottlenecks such as: The high cost of Telecommunications, the status of the Intellectual Property Law, and the absence of Arabic enablement of the Internet.

(iv) On-line learning programs/distance learning degrees: availability and accreditation

Due to restrictive MEHE rules and regulations, accreditation of distance learning or on-line learning programs is not granted. Some universities have engaged in affiliations with universities abroad such as the "Ecole Superieur des Affaire" (ESA) whose graduates would attend courses in the university campuses in Lebanon and will eventually receive their degrees confirmed from the affiliated university (in the case of the ESA, from the ESCP-EAP European School of Management in France).

TABLE 9
TITLE OF TABLE

Student to computer ratio	Content not available
Percentage of schools with Internet access	Content not available

Source:

D. E-health

(a) Availability and access to medical In May 2013, the Ministry of public health launched the first mobile application as part of its national programme for e-health "your right in your hand, it is our duty to help you".

The application is designed to provide:
- Public service delivery through the dissemination of information on the services provided by the Ministry through technology and modern communications and social media.
- The right of a citizen to obtain appropriate information from the administration in the best and fastest way possible.
- Activation mechanism of accounting through a complaints mechanism.
- The prices of medicines and the terms of access provided by the Ministry for either chronic or incurable diseases, hospitals and health care centers.

(b) Telemedicine and medical use of teleconferencing for underserved areas and vulnerable populations

In 2011, and through the Science Talents show, Ziad Sankary, a Lebanese young man, introduced his medical innovation "CardioDiagnostic" that will allow to reduce the rate of death due to hear attacks. The invented equipment will monitor the heart rates of a patient and reveals any signs of heart attaches before it will occur and sends an SMS to a specific mobile number as an alert to allow immediate medical intervention even in the patient's daily life. Gathered data is analyzed by the equipment and charts and medical indicators are sent to the patient's doctor and send the necessary alert. The equipment can alert on the possibility of a heart attack between hours or days from its occurrence which will allow enough time for any necessary medical intervention.

(c) Maturity and implementation of health care information systems

In May 2013, The Syndicate of pharmacists announced the project of "common informatics system" to be used by all pharmacists that will be provided by the syndicate only and should not be used by any other computer system. The system aims to organize the work of pharmacists and ensure the centralization of information and data. However, this was rejected by the pharmacists who described it as a disturber to the profession and feared if passed would lead to building a database of pharmaceuticals' procurement and sales

with the names of patients and the doctors which is a clear violation of personal liberty guaranteed by the Constitution. In addition, pharmacists feared if information is leaked to some commercial companies it could be used to monitor the performance of their products and monitor doctors' prescriptions which will allow those companies to eliminate the costly and inevitably studies necessary for the continuity of the medication use and would increase their profitability dramatically. As a result, the project has been stopped and it will be re-examined in the presence of the objecting pharmacists.

The MOPH's Visa Issuing system uses now a unified form that is required by all hospitals, which is available securely online with the use of codes for diagnostics in the form of coded medical information. The MOPH is also working on another upcoming project to be known as M-HEALTH (mobile-health) that will enable hospitals and physicians with the use of mobile phone applications to send information to the vital registry, and also send death certificates through the mobile phone application.

(d) Use of ICT based information systems to alert, monitor and control the spread of communicable diseases and for providing medical and humanitarian assistance in disasters and emergencies.
The MOPH publishes on its website Expanded Program on Immunization (EPI) including videos such as TV advertisement, documentaries in Arabic and subtitled documentaries. The site also includes a wide range of statistics related to communicable diseases through Epidemiological surveillance gathered on a monthly basis based on gender, age, and location (governates or municipalities).

In addition, the Epidemiology Surveillance unit (ESU) in the MOPH has been using the National Epidemiology Information System to properly observe the spread of communicable diseases. The ESU has been installing equipment to support a ministry network between the different municipalities and governments to secure a nationwide timely notification on any reported communicable disease.

E. E-employment

(a) Use of ICT as means to locate employment
The National Employment Office (NEO) at the Ministry of Labor has been working on improving its services to the public since it last has automated its procedures back in 2002 and provided a portal through which job seekers and employers can register to and upload job opportunities, resumes and conduct necessary searches. In end 2011, the Canadian International Development Agency (CIDA) provided the National Employment office with a fund and management support to further enhance the services of the NEO to the public. In July 2012, the CIDA finalized its mission and ended the project "support to public employment services" through which the NEO portal was updated and enhanced in addition to the provision of new hardware and peripherals to the NEO offices. The project also has put possible aspects that would ensure sustainability of the support provided to the NEO through this project. The new portal was officially launched in January 2013.

(b) Employment Portal and national databases of résumés
In September 2012, the Lebanese Prime Minister, Najib Mikati, inaugurated the first opportunity project for youth to improve employment levels. The project is worth US$2.2 million and is run by the national employment office, under the auspices of the Ministry of Labour, and with technical support and material from the World Bank. The project provides youth skills training, advice and assistance in finding employment, in addition to on-the-job training for a period of 12 months in a private institution,. The project includes eligibility criteria and a clear choice for job seekers and employers[41].

In January 2013, the national employment office and the International Labor Organization launched the electronic job exchange system that allows job seekers to access online information on jobs and careers and connect with employers. The project is funded by the Canadian Government through the Canadian International Development Agency, and aims to support employment services in Lebanon and strengthen the capacity of the national employment office to improve its capacity, provide support to employment services and improve the communication between the different municipalities, employers and job seekers through the

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[41]   Annahar 11 September 2012

network on labor market information, and promote entrepreneurship opportunities for women and men.

(c) Teleworking

Teleworking using ICT in Lebanon is mainly restricted to business-to-business or within government such as grants and contracts part-timers and consultancies or research assistants. Some of the organizations that use tele-working are the European Commission and the United Nations and Specialized Agencies. Nevertheless there exists some presence of websites such as http://lb.thehomeworkerjob.com/ which provides opportunities of tele-working from home by recruiting employees online and for employers to post vacancies on the site.

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

A. Use of ICT in support of cultural and linguistic diversity

The Youth and Culture Center (YCC), established in 2009, is a simple public library of a cultural complex, both modern and traditional. In collaboration with the Lebanese University of Fine Arts (ALBA), it was built as the first municipal cultural complex in Lebanon. Among other sections, the YCC has a multimedia center offering a large and diverse collection of CDs, DVDs on different cultural issues. The main aim of the center is to create a space for dialogue, which seeks to increase communication among all segments of society, Promote a sense of participatory democracy and citizenship through meetings and exchanges and promote culture and art as catalysts for universal communication[42].

Different universities and newspapers hold a large digital archive of educational and scientific information. For the first time in Lebanon, in June 2013, the Modern Heritage Observatory was celebrated by archivists by coming together to allow the public to discover the unique heritage that they preserve. An open house was organized in Beirut, with all partnering institutions opening their doors to the public, offering guided tours and displaying examples from their collections. Participating institutions included the Annahar Information Centre, the Arab Center for Architecture, the Arab Image Foundation, the Fouad Debbas Collection, IRAB Association for Arabic Music, Instituto Cervantes de Beirut, the Lebanese National Library and UMAM Documentation and Research.

The Ministry of Tourism provides through its website (www.destinationlebanon.gov.lb) different cultural information with a map stating different religious and touristic attractions in the country.

According to the business week, 33 per cent of the Lebanese population is Facebook users, the fourth highest penetration rate among the Arab countries. The majority of users are between 15 and 29 years old. Furthermore, Lebanon is the most gender-balanced Arab country in terms of Facebook and LinkedIn usage. Females represent 45 and 43 per cent of Facebook and LinkedIn users respectively. With 77,700 Twitter users, Lebanon has the sixth highest penetration rate at 1.8 per cent. Many politicians (such as Pres. Michel Sleiman, Najib Mikati, Saad Hariri and others), Statesmen and Economists (Ghassan Salame, Nasser Saidi), journalists, Scholars and Political Analysts, activists, and even media made use of this fact, by having presence on the social media notably Twitter.

B. Local and national digital content development

Mid 2013, the Information and Communication Technology Division at ESCWA published the "Business Models for Digital Arabic Content (DAC)" to help young entrepreneurs to have a better understanding about the DAC market. This report comes as a result of the ESCWA's initiative in 2012 to promote the Digital Arabic Content Industry in the Arab Region. The report describes the challenges, business models and recommendations for development and proposed business models for the Digital Arabic Content industry[43].

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[42] http://ycczouk.wordpress.com
[43] http://www.escwa.un.org/information/publications/edit/upload/E_ESCWA_ICTD_13_TP-1_E.pdf

C. ICT software, tools, and R&D programmes in Arabic language processing

Yamli website (www.yamli.com), a Lebanese invented portal, was designed to convert Latin alphabets to Arabic for enhanced Arabic search. The site is powered by Google aiming at solving everyday problems Arabic users face on the internet. The site offers two main products: the Smart Arabic Keyboard, and Yamli Arabic Search.

The Smart Arabic Keyboard allows users to type Arabic without an Arabic keyboard, from within their web browser. This technology is based on a real-time transliteration engine which converts words typed with Latin characters to their closest Arabic equivalent. Yamli Arabic Search is a search engine focused on providing more relevant search results for an Arabic query by expanding it to its most frequently used Latin representations.

In May 2012, the Arab Foundation announced the launch of an innovative project, the first of its kind in the Arab world, which is to create an interactive statistical database on the website .The aim is to provide digital data and statistics related to the qualitative and quantitative presence of digital Arabic content available at various online channels of dissemination .The content is expected to exceed 10 million units of information. Digital and audiovisual content intended for the purposes of this project are all available online in Arabic.

The project is labeled under the automated digital monitoring data and information, and is characterized as a digital semantic-oriented study based on substantive 400 specialized sub-divisions Thesaurus taken from specialized repositories and includes eight main contents: economic, social, science and scientific research, educational, cultural, military and security, information and communication, political, legislative, and their respective subtopics

D. Arabic domain names

Despite the fact that SEOUL, the private body that oversees the basic design of the Internet, voted at the end of October 2010 to allow Web addresses be expressed in characters other than those of the Roman alphabet, and despite the adoption of the Internet Corporation for Assigned Names and Numbers, or ICANN, to the subject, Arabic domain names have not yet been adopted in Lebanon. Lebanon, being a multicultural country, has not witnessed demand for Arabic domain names, and as such no efforts were exercised on the matter by the Lebanese Domain Name Registry (LBDR).

9. MEDIA

A. Media diversity, independence and pluralism

TABLE 9
TITLE OF TABLE

Media outlets	Number	Language(s)	Ownership			
			Private	Mixed	Government	Foreign
News papers	24	Arabic, Armenian, English and French				
Electronic newspapers	7	Arabic and English				
Magazines	184	Arabic, Armenian, English and French				
News agency	7	Arabic, English and French	6		1	
Radios	6	Arabic, English and French				
Televisions	15	Arabic, Armenian, English and French	14		1	

Source: www.wikipedia.com, worldpress.org, www.lebweb.com

In a region where tight restrictions on press freedom prevail, the Lebanese government has shown a greater degree of support for press freedom and freedom of expression than most neighboring regimes. The result has been the development of a vibrant, open and pluralist media.

With the enactment of the Audiovisual Media law, many of the small operators of illegal stations were closed and mostly influential politicians and corporate conglomerates were the ones to receive the bulk of the private licenses. Furthermore, and in order to enforce the endorsed media law, the National Council for Audio-visual Media (CAN) was established. Irrespective of all the direct enforcements, there are always indirect influences that will weaver the respective media towards its own nest. Financial pressure and instability, believes of some "interest groups" and even managerial influence represent just a mere example of major indirect influences on the media's flow.

Across the years and due to the diverse ethnicity of its population, Lebanon has been enjoying positive plurality of press information.

Women in Lebanon have made great emergence in the private sector and are highly visible in the mainstream media as presenters, journalists, producers and even news managers. Women have become a partner in media making in Lebanon and with different NGOs working on empowering women, female presence has started to shine in the field.

B. The media and its role in the Information Society

Forbes magazine – the Middle East announced in November 2011 the list of "most powerful 63 online presence in newspaper the Arab world for 2011" where El Nahar Newspaper ranked in the 10th place. This annual event aims to bridge the gap between the Arab and Western media, as sought by the Department of research and studies in Forbes magazine – the Middle East and contribute to the growth and development in the media, in addition to creating the right environment for institutional investments with the latest methods and techniques to cope with global changes.

Lebanese TVs have reserved technology dedicated shows to provide the latest news on new innovations and developments. In addition, different blogs and social media (such as Twitter) have provided a good space for technology. A local website, http://techtodayshow.com, provides weekly news program that features the latest in computer information, communication and electronics technology.

C. Convergence between ICT and the media

The rise of digital communication in the late twentieth century has made it possible for media organizations to deliver text, audio, and video material over wired, wireless, or fiber-optic connections. Almost all Lebanese broadcasting TVs have secured their internet existence via websites (www. mtv.com.lb, www.lbcgroup.tv, www.almanar.com.lb, www.nbn.com.lb, and www.aljadeed.tv). This digital convergence of news media has also expanded to cover mobile applications in the Apple Store and the Android store, whereby mobile apps are available as free downloads on smart phones.

10. INTERNATIONAL AND REGIONAL COOPERATION

A. Financing of ICT networks and services

In 2011, the EU Commission in Lebanon announced the call for proposals to fund projects aimed at "strengthening the role of civil society in support of human rights and democratic reform", with the financial support of the "European instrument for democracy and human rights". This mechanism aims to contribute to the development of democracy and the rule of law and promote respect for all human rights and fundamental freedoms with focus on projects tailored to improve transparency and accountability in the

public sector, including better access to information and public participation and access to justice .The funds ranged between 50,000 euros and 250,000 euros[44].

The International Finance Corporation (IFC), a member of the World Bank Group, is working on providing jobs and supports the growth of the technology sector in Lebanon, through its investment in 2011 in "mobintes" company which specializes in mobile software worth US$ 2 million .This investment will support the company in the implementation of an ambitious plan to expand into new global markets, as well as providing many high-level jobs in the areas of programming and software engineering in the technology sector in Lebanon.

In December 2011, "the EU Commission" in Lebanon announced the social and economic reform program of the Government and its priorities for the future .The Council of Ministers had adopted some reforms that require immediate implementation and carried out forward the reforms most needed by Lebanon as a number of EU-funded programmes require that these reforms be approved by the Council of Ministers before the end of the year 2011 in order to bring positive changes in the daily life of the Lebanese people[45].

B.   Infrastructure development projects

The number of projects funded by the Economic and Social Development Fund (established within the framework of the Euro-Mediterranean partnership) during the first quarter of 2011, reached 401 projects with a total value of LBP 7.5 billion, securing 109 new jobs. This brings the number of small and medium-sized enterprises financed by the Fund since the beginning of 2003 until June 2011, to 5,848 loans totaling LBP 77 billion, in addition to creating 3,594 jobs.

In terms of sectoral distribution, the services sector has received 2,220 loans, 2,048 commercial loans, 941 industrial loans, and 639 agricultural loan.

The EU announced in August 2011 a financial package for Lebanon worth US$42 million to go toward justice reform, the Environment Ministry and training in various municipalities.

The Annual Action Program for Lebanon will allocate US$7 million to help reform the justice system in the country by training clerks and funding public debates and conferences to open up a national debate on the independence of the judiciary. Around US$ 11 million will go to the Environment Ministry to better plan and implement environmental policy including law enforcement. Municipalities will receive US$28 million which aims to improve the municipal finance system[46].

In May 2012, the ICT ministerial Committee approved the law to permit the establishment of an agreement between the Lebanese Government and the Italian Government for a cooperation project to build a secure information technology infrastructure[47].

C.   WSIS Follow-up

Below is an updated list of recent initiatives on national and governmental projects:
- Policies and Procedures: Implementation of the One-Stop-Shops in the Ministry of Tourism which went live in the first quarter of 2013.
- Ministry of Justice – Courts automation of its entire links. This project is being implemented and is envisaged to be operational by the last quarter of 2013.
- Computers and Networks: The OMSAR has launched mid 2011 one of its biggest HW and NW equipment project serving 30 public institutions. The project catered for around 550 PCs, 40 servers, 80 laptops in addition to various NW components and printers;

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44 Annahar, 27 August 2011
45 NNA, 7 December 2011
46 Daily Star, 19 August 2011
47 NNA, 3 May 2012

A survey conducted by opinion polling and consulting firm Gallup on home Internet access in 148 countries worldwide shows that 45 per cent of respondents in Lebanon said that they have Internet access at home, compared to 32 per cent of participants worldwide who reported having home Internet access.

The share of Lebanese who have access to the Internet at home was the fifty-fourth highest worldwide, higher than the share of respondents who have home Internet access in Greece (44 per cent), Moldova (42 per cent) and Jamaica (41 per cent), and lower than that in Trinidad & Tobago (46 per cent) and Chile and Venezuela (48 per cent, each).

It was also the seventh highest percentage among 19 Arab countries included in the survey, but lower than the UAE (85 per cent), Bahrain (84 per cent), Kuwait (83 per cent), Qatar with 77 per cent, and Saudi Arabia and Oman with 74 per cent each. Lebanon was among 100 countries globally where less than half of the population has Internet access at home.

In parallel, the survey showed that 55 per cent of survey participants in Lebanon indicated that they do not have Internet access at home, compared to around 68 per cent of respondents worldwide who reported that they do not have home Internet access.

It was also the thirteenth highest among Arab states. The survey's results are based on telephone and face-to-face interviews with approximately 1,000 adults per country, aged 15 and older, conducted in 148 countries and territories in 2011. The survey in Lebanon was conducted through face-to-face interviews with 1,003 adults[48].

Several Lebanese government websites won, in June 2011, design and creativity awards, for example: The Central Statistics Administration website (www.cas.gov.lb) won the Arabic e-Government award for creative design. The National News Agency's website won the award for best strategic website design in the Lebanese Republic.

In May 2012, the Cooperative of Government Employees won the first prize of the United Nations Public Service Awards to the year 2012 for the category of improvement of public service delivery and streamlining procedures.

On another level, A Lebanese app, DerManDar Panorama, has named the world's best app in the m-Entertainment & Lifestyle category at the United Nations-based World Summit Award for Mobile Content (WSA-mobile). DerManDar Panorama is considered the "easiest-to-use panoramic picture app" by The Wall Street Journal. The application, available on both iOS and Android, reached 6 million downloads since its launch in June 2011. The successful Lebanese app producers received their award in a grand gala that highlighted this year's WSA-mobile global congress in Abu Dhabi[49].

The Arab Goldenchip Awards 2011 results were announced on 28 March 2011 during the AGCA ceremony that was held in the Four Seasons Hotel, Damascus - Syria. For the category of Best Web 2.0 Social Media, four Arab companies competed to win the AGCA award. Because of the high competition and the fact that there was very closed levels of projects submitted by the competing companies, the Jury decided to give the award to three companies of which iSpice Photos from Lebanon is one of them. The Arab Goldenchip Award comes as one of the activities held within the MENA ICT WEEK 2011, which is an IJMA3 annual event

The OMSAR launched the e-government portal in June 2013 as a window to government information, government best practices and standardization of government transaction forms and websites.

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48   Less than half of Lebanese population has Internet access at home, January-26-13 , Source http://www.iloubnan.info
49   http://www.iloubnan.info

D. Participation in Internet Governance activities

In February 2012, the ESCWA organized the Arab Forum on Internet governance Conference, in cooperation with the Presidency of the Council of Ministers and the Arabic League. The conference dealt with resulting experiences and lessons learned, and the need for the Arab Forum on Internet governance with the required hierarchy. The forum also discussed the Internet governance mechanism for the implementation of the road map of the Arabic Internet governance, the components of the mandate, the location of the forum within the stages of the global forum, and secretarial and Advisory Group for all interested parties.

In a move that could be seen as the beginning of a new phase for the Web with the most historic change in the Internet's addressing system since its inception in 1984, the Board of Directors of the Internet Corporation for assigned names and numbers, known as ICANN, decided to expand domain names at a high level for businesses, governments, communities, public or private organizations to apply network address of their choice and the language that they want, including Arabic and Chinese.

Lebanon through its registrar, the American University of Beirut, will allow registration of such new domains but not effective until 2013. Anyone can apply for a domain name, whether the companies or organizations or even individuals cities[50].

In June 2012, the ICAAN nominated Danny Shehadeh, Lebanese national, to be the next Chief Executive and to begin operating officially on 1 October 2012, noting that the signed contract lasts until July 2015.

11. BUILDING THE ICT SECTOR

A. ICT Firms

Lebanon came in sixty-fifth place on the ICT Development Index according to the International Telecommunication Union (ITU)'s recent report "Measuring the Information Society 2012". The report assessed ICT access, usage, and skills in 155 economies worldwide. Among Arab states, Lebanon came in sixth place. The local ICT sector kept up very well with the region's high-income countries with a score of 4.48, above the global average of 4.15.

The local ICT sector is one of the most dynamic globally. But much infrastructure improvements are needed before it can be fully leveraged to make a wider impact on society.

The Ministry of Telecommunications (MoT) has taken, during 2012, a number of steps supporting ICT innovation, most significantly through launching the first digital district in Bachoura (BDD 1499). It also launched the first phase of fiber optics interlinking stations, and the 'fiber to home' project set to be operational in 2015.

However, Lebanon was almost unnoticeable in the seventh annual report of the United Nations Conference on Trade and Development (UNCTAD) for 2012. Not only were statistics in the software sector missing, but the concerned Lebanese Government and ministries failed to request free advice or collaboration with the ICT department in the ESCWA, to develop the telecommunications sector in general and the software industry in particular, and benefit from the transfer of experience and knowhow of other countries.

The software industry in Lebanon is developing, but its size is still small and there is no government strategy to support, develop and stimulate investment in this sector, though it doesn't need huge funds. All it needs is to develop an ICT infrastructure available at affordable prices.

In a pioneering initiative and on the occasion of the "Girls in Information and Communication and Technologies (ICT)" Day, Alfa, managed by Orascom Telecom, organized a celebration with the participation of 20 female students, from secondary classes especially from baccalaureate 1 and 2 classes /

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[50]   Annahar, July 2011

Life Sciences and General Sciences sections from several Lebanese schools that took part in this year's event. This initiative is part of Alfa's commitment to encourage girls to participate and engage in the ICT sector and to have a better understanding of employment opportunities offered to them in this field; especially with Alfa being a main supporter for the integration of women in the workplace with women constituting about half the number of employees in the company, and 30 per cent of women holding key and managerial positions especially in the departments of technology, where the role of women is essential.[51]

B. Government facilitation

The Ministry of Economy and Trade in partnership with the Ministry of Industry and the European Union has inaugurated in 2004 the SME Support Programme (ISSP). The program aims at promoting and creating in Lebanon one of the best environments for business in the world. ICT has also gained a lot of attention from the ISSP.

In addition, Kafalat is a Lebanese financial company established to assist small and medium sized enterprises (SMEs) in accessing commercial bank funding. The company helps SMEs by providing loan guarantees based on business plans and feasibility studies that show the viability of the proposed business activity among others.

On 21 February 2013, H.E. Minister of Telecommunication Nicolas Sehnaoui officially launched, in a press conference at the Ministry, the second edition of the National Mobile Programming Contest for university students and announced the winners of the 'Be the Minister" game, along with a blogging contest for Lebanese bloggers.[52]

Concentrated Solar Power Plant – The U.S. Trade and Development Agency (USTDA) provided a US$ 338,270 grant to the private sector Lebanese company Zeenni's Trading Agency to fund a feasibility study for a 50 MW CSP Power Plant in Lebanon. This study will follow the success of the solar thermal industry and develop a plan for effectively implementing Concentrated Solar Power (CSP) technology in the Byblos region with good potential to replicate this technology in other areas[53].

C. Contribution of ICT sector in the national economy

The competitiveness of the Lebanese economy is impaired by significant weaknesses in the information and communications technology sector. "The Global Information Technology Report 2012," ranked Lebanon ninety-fifth among 142 countries and in eleventh place among 15 Arab countries in terms of networked readiness. Lebanon also ranked low – twenty-seventh – among 33 upper-middle income countries[54].

(a) ICT Expenditures
The size of the ICT sector in Lebanon was estimated at US$ 364 million in 2013, according to forecasts by the "Business Monitor International", representing an increase of 6.8 per cent compared to the previous year. The company expects that the sector will benefit from new investments in infrastructure, achieve a very important improvement in the area of Internet broadband. As the private sector is expected to grow by a compound annual rate of 12 per cent by 2017, the ICT sector's size is expected to reach US$ 571 million[55].

(b) Export of ICT goods and services
The information and communication technology sector achieved marked growth in 2011 in Lebanon, and is considered today a focal sector for many other productive sectors, especially that technology is being utilized in the work of more than 20 per cent of the total number of Lebanese companies. As such, it contributes to the economic and social development and the growth of the investment and job creation for specialized

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51   Reference http://www.ameinfo.com/alfa-celebrates-girls-ict-day-participation-339664
52   Reference http://www.berytech.org
53   The Daily Star, 4 September 2012
54   The Daily Star, 10 April 2012
55   Annahar, 26 February 2013

human resources.

The volume of investments in this sector was estimated at US$ 287 million in 2010, with a growth of 12 per cent for the year 2011. In addition, exports of information and communications technology sector represents around 2.9 per cent of total exports, and one third of the sector's production is exported abroad, with more than 7,000 job allocations[56].

According to the research department at InfoPro, the ICT goods import for the year 2011 reached US$ 498 million representing 2.77per cent of total imports for the country. As for the ICT goods exports, it totaled US$ 302 million (7.11 per cent of total country's export level)[57].

(c) Contribution to the GDP
According to the Professional Computer Association (PCA) President during "Regional ICT competitiveness survey and ICT public policy workshop" in May 2010, the ICT sector in Lebanon can contribute to a 30 per cent growth in GDP by 2020 if properly supported by government.

The main criterion is to increase the competitiveness of the ICT sector in Lebanon to be able to better compete on a regional and international level. ICT is one of the main industries in Lebanon especially at the level of Small and Medium Enterprises (SMEs) which include 650 firms. The ICT industry also plays a great role in the success of a number of other industries such as banking, tourism organizations, media and others[58].

The Beirut Digital District, a high-rise building in the Bashoura district with 3,200 square meters of office space, just footsteps from Downtown, is promising to offer advanced infrastructure – including broadband Internet and state-of-the-art information technology facilities. The hub also aims to become a center for IT startups. It will be the third of its kind, after Berytech's facilities in Mar Makallas at St. Joseph University and near the National Museum. The creation of a center with high-speed Internet will curb Lebanon's brain drain[59].

(d) Employment in the ICT sector
With the launch of the "Digital Beirut region" in Bashoura in September 2012, the ICT sector is expected to secure about 3,000 to 4,000 jobs in the areas of computer science, technology and industry for innovation and creativity.

This project is a partnership between the public and private sectors and spread over 5,000 square meters and expected to expand to cover 40,000 square meters by the year 2016. Within a year several digital cities throughout Lebanon will be opening. The project aims to create an integrated environment to encourage companies and individuals working in these areas to open their offices in Lebanon by providing the basis for starting their business, taking advantage of the incentives and facilities provided such as rental offices in Beirut, in a place that has an integrated infrastructure of the Internet and Telecom[60].

D. R&D and Innovation in the ICT sector

In June 2011, the American University for Culture and Education (AUCE), during the "innovation through the use of information technology in higher education" Conference, shared its study on the use and adoption of green technology. The study mentioned the following main recommendations:
1. Use more green technology to increase the level of contribution to the University community through the dissemination of green technology culture.
2. Use of green technology in the management and coordination meetings to ensure better performance and to ensure better quality.

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[56]   Investment Development Authority of Lebanon: www.idal.com.lb
[57]   Lebanon Opportunities, July 2012
[58]   The Daily Star, 13 March 2010
[59]   http://www.dailystar.com.lb/Business/Lebanon/2012/Sep-04/186617-tech-hub-opens-in-heart-of-beirut.ashx#axzz2MBuYSocu
[60]   Annahar, 6 September 2012

3. Work on the development of digital teaching skills.
4. Adoption of the educational approach based on the use of learning outcomes in higher education to contribute to serious, in-depth and effective achievements in the national framework of qualifications.
5. Work on the development of a system based on green technology and multimedia to communicate between the different geographic locations.
6. preparation for the reception of new generation technology (3G and 4G) of mobile communications and the latest technological developments in the world of communication through green technology such as the use of digital library, encouraging experimentation and testing of technologies dealing with audio-visual data transfer and digital television broadcasts via the Internet, and open software.
7. Coordination with the concerned authorities and professionals to change and remove legislative barriers that hamper digital development.
8. Focus on the culture of openness and cooperation with peers in universities and research centers through studies, scientific research, and joint ventures.

In terms of innovations in information technology, a local Lebanese company has launched a service under the name "Dyer ManDar" as mobile app for smart phones that allows taking instant photos in panoramic style. The developed app was among the list of the best programs on the Apple Store in 2011.

ADTech Company won the first prize in the second round of the competition "Grow My Business" launched by the Beirut Traders Association in February 2011, in collaboration with the MIT Enterprise Forum of the Arab world and with Bank Audi Sal. ADTech co. The company presented an innovative project for the collection of computers and electronic machinery and dismantling them through specialized plants to export them as raw materials to prevent pollution and secure a cleaner environment in a way that properly planned economic returns. In addition each of Olive Trade: House of Zejd, and Wixel Studios won the second and third prizes respectively. Audi Bank gave the winners cash prizes worth LBP 50 million for the first winner, ADTech, and LBP 20 million and LBP 10 million for the second and third runners up respectively.

Microsoft held a worldwide competition to address the challenges facing the world through technological applications. The winners, two students, created a game called "IMAGINE CUP", an electronic video game for awareness on environmental challenges in the world. It is an entertaining and educational innovation in the form of a video game for computer users between the ages of 7 and 12 years old, entitled "the story of little tree". Through this game, children will learn the importance of the environment in an entertaining way. The game runs on computers and mobile phones and includes nine stages. It was also made available on the Internet and will be issued in an English version.

Microsoft sponsors a yearly contest entitled "Imagine Cup" for students majored in technology for contestants all over the world to participate in the reflection on the challenges facing the world, especially in conjunction with the United Nations Millennium goals, which include eradicating poverty and hunger, universal education, and equality between men and women, child health, maternal health, and combating HIV/AIDS, and environmental sustainability[61].

Formatech, a Lebanese institution, held a Conference on green information technology in December 2011 to raise awareness on the "green approach" in information technology, environmental feasibility of this process and how money can be saved while preserving the environment at the same time. The Conference also addressed the subject of Cloud Computing, which is one of the newest technologies in the world that allow individuals to find everything on the Web, and no longer need big equipment, which reduces space constraints in the workplace and reduce the energy discharge damage on the environment[62].

E. Investments in the ICT sector

In June 2012, the Ecole Superieure des Affaires produced a policy paper on the essential role of Investment

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61   Al Hayat, 17 July 2011
62   Annahar, February 2011

in ICT for economy growth. The paper stated that the development of a digital world is significant to be strategically led and governed at national level. A major policy recommendation put forward by the report is developing a pan-Mediterranean cloud computing platform and boosting cloud computing to enhance various sectors, ranging from Internet security and electronic commerce to usage and production of renewable energy.

In addition, the paper called on regional countries to define a clear user and reference charter and a Mediterranean Information and Communications Technology label to encourage standardized practices and compatibility, encourage industrial production of content particularly software. Lastly, the report called on governments to create an investment fund devoted to ICT businesses[63].

The Lebanese Government established in 2001, the Investment Development Authority of Lebanon, IDAL, as the Lebanese governmental Investment Promotion Agency responsible for attracting private capital investments to Lebanon and assisting investors in the development and implementation of their projects. IDAL currently provides package deals to different industries in Lebanon among which is the ICT sector.
In end 2010, IDAL approved the support of "Waves" project that intends to introduce MBWA (Mobile Broadband Wireless Access System) a breakthrough in IP-centric wireless architecture, designed to extend the broadband internet to wherever people are based on the mobile WIMAX technology. The investment size reached USD$12.4 million. The project is planned to become operational in 2014[64].

In October 2011, the United Nations Information Centre in Beirut and during the United Nations Conference on Trade and Development (UNCTAD) launched the information economy report for the 2011 for the region and Lebanon in particular. The report focused on having ICT as an enabler for the development of the private sector with several recommendations regarding public policies, including the following recommendations: integrating the information and communication technologies in the training programmes designed to develop business skills, taking advantage of information and communication technologies in support of women's entrepreneurship, harnessing mobile financial services to increase employment opportunities

Access to financial markets, using information and communication technology tools to reduce the cost of trade transactions and help small and micro enterprises in the delivery of their goods and services to the domestic and international markets, adopting regulatory frameworks for building confidence in the use of new technologies or new applications of technologies and setting guidelines to assist donors in making use of the possibilities offered by information and communication technologies in its strategies for private sector development.

According to research conducted by InfoPro (a Lebanese company) in 2012, the total local ICT investment reached US$ 12.6 billion of which US$ 11.6 billion were from the private sector and US$ 0.8 billion from the Public sector[65].

In August 2011, Berytech Fund announced its latest investments in three companies specializing in the field of technology and led by young entrepreneurs. This brings the total of Berytech's investment to eight. The three new projects are: Yalla Play, Butterfleye and Wext. The investment reached a total of US$ 1.05.

ButterflEye is a technological revolution for heart rate measurement of infrared methods. Specific technology can be used to measure a large number of health-related information. As for the Internet-based application, WEXT, it is a mobile text service similar service to Whatsapp, and BBM of BlackBerry, yet it is the only application of this kind that can work on any smart phone or even non-smart phones with any kind of Internet connection. Finally, YallaPlay is an application that provides all types of card games online (but not gambling) known in the Middle East.

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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	*Fixed telephone lines per 100 inhabitants* is calculated by dividing the number of fixed telephone lines by the population and then multiplying by 100. *Fixed telephone lines* 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.			
A2	Mobile cellular telephone subscribers per 100 inhabitants	*Mobile cellular telephone subscribers per 100 inhabitants* is obtained by dividing the number of mobile cellular subscribers by the population and then multiplying by 100. *Mobile cellular telephone subscribers* 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.			
A3	Fixed Internet subscribers per 100 inhabitants	*Fixed Internet subscribers per 100 inhabitants* is obtained by dividing the number of fixed Internet subscribers by the population and then multiplying by 100. *Fixed Internet subscribers* 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.			
A4	Fixed broadband Internet subscribers per 100 inhabitants	*Fixed broadbandInternet subscribers per 100 inhabitants* is obtained by dividing the number of fixed broadband Internet subscribers by the population and then multiplying by 100. *Fixed broadband Internet subscribers* 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 beingat 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.) Subscribers with access to data communications (including the Internet) via mobile cellular networks are excluded.			

A5	Mobile broadband subscribers per 100 inhabitants	*Mobile broadband subscribers per 100 inhabitants* is obtained by dividing the number of mobile broadband subscribers by the population and then multiplying by 100. *Mobile broadband subscribers* 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: -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 *Universal Mobile Telecommunications System* (UMTS) 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.			
A6	International Internet bandwidth per inhabitant (bits/second/inhabitant)	*International Internet bandwidth per inhabitant* is obtained by dividing the amount of bandwidth (in bits/second) by the population. *International Internet bandwidth* refers to the capacity which backbone operators provide to carry Internet traffic. It is measured in bits per second.			
A7	Percentage of population covered by a mobile cellular telephone network	*Percentage of population covered by a mobile cellular telephone network* 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.			
A8	Fixed broadband Internet access tariffs (per month), in US$, and as a percentage of monthly *per capita* income	*Fixed broadband Internet access tariffs* are the lowest sampled cost in US$ per 100 kbit/s per month and are calculated from two different broadband prices, low and high speed monthly ISP charges. *Low speed monthly charge* refers to a typical 'entry-level' broadband lower-speed connection (download speeds of 256 – 1,024 kbit/s). *High speed monthly charge* refers to a faster and typically more expensive offer. Monthly charges do not include installation fees nor modem rentals. The l*owest sampled cost in US$ per 100 kbit/s* is the most cost-effective offer for a country based on the criterion, the 'lowest cost per100 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. *As a percentage of monthly per capital income* refers to the lowest sampled cost in US$ per 100 kbit/s divided by the average monthly gross national income *per capita* (World Bank, Atlas method, current US$) and expressed as a percentage.			

		To ensure international comparability, this indicator is compiled by ITU.			
A9	Mobile cellular prepaid tariffs, in US$, and as a percentage of monthly *per capita* income	Mobile cellular prepaid tariffs are based on the methodology of the *OECD monthly low-user basket*[66] (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. *As a percentage of monthly per capita income* involves dividing the price of the monthly low user basket by the average monthly gross national income *per capita* of the country. To ensure international comparability, this indicator is compiled by ITU.			
A10	Percentage of localities with public Internet access centres (PIACs) by number of inhabitants	*Percentage of localities with public Internet access centres (PIACs)* is computed by dividing the number of localities with at least one PIAC by the total number of the country's localities and then multiplying by 100. A *public Internet access centre (PIAC)* 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. *Localities* can refer to a country's villages, towns, cities or enumeration areas used by the national statistics office for survey purposes. Note that this indicator is used to measure the WSIS target "*to connect villages with ICTs and establish community access points*" by 2015.			

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

Core indicator	Definitions and notes	2010	2011	2012

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

Core indicator		Definitions and notes	2010	2011	2012
HH1	Proportion of households with a radio	The *proportion of households with a radio* is calculated by dividing the number of in-scope households with a radio by the total number of in-scope households. A *radio* 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.			
HH2	Proportion of households with a TV	The *proportion of households with a TV* is calculated by dividing the number of in-scope households with a TV by the total number of in-scope households. A *TV* (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.			
HH3	Proportion of households with telephone	The *proportion of households with a telephone*(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.			
	Proportion of households with fixed telephone only	The *proportion of households with a fixed telephone only*is calculated by dividing the number of in-scope households with a fixed telephone only by the total number of in-scope households. A *fixed telephone line*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			
		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.			
	Proportion of households with mobile cellulartelephone only	The *proportion of households with a mobile cellular telephone* only is calculated by dividing the number of in-scope households with a mobile cellular telephone only by the total number of in-scope households. A *mobile cellular telephone* 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.			
	Proportion of households with both fixed and a mobile cellular telephone				

Core indicator		Definitions and notes	2010	2011	2012
HH4	Proportion of households with a computer	The *proportion of households with a computer* is calculated by dividing the number of in-scope households with a computer by the total number of in-scope households. A *computer 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.			
HH5	Proportion of individuals who used a computer (from any location) in the last 12 months	The *proportion of individuals who used a computer* 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. A *computer 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.			
HH6	Proportion of households with Internet access at home	The *proportion of households with Internet access at home* is calculated by dividing the number of in-scope households with Internet access by the total number of in-scope households. The *Internet* 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.			
HH7	Proportion of individuals who used the Internet (from any location) in the last 12 months	The *proportion of individuals who used the Internet* 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. The *Internet* 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.			
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 Internet users, 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[67]). 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				

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[67] 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
	Work	Where a person's workplace is located at his/her home, thenhe/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 *Community Internet access facility* 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).			
	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 *other* 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)	The proportion of individuals who undertook each activity can be calculated as either: the proportion of in-scope individuals or the proportion of Internet users who undertook each activity. 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. Individuals should be asked about all Internet activities (that is, the question used by countries should specify multiple responses. Activities are not mutually exclusive. 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.			

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	*General government organizations* 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. *General government organizations* 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.			
	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.			

Core indicator		Definitions and notes	2010	2011	2012
	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.			
HH10	Proportion of individuals with use of a mobile cellular telephone	The *proportion of individuals with use of a mobile cellular telephone* 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. A *mobile cellular telephone* 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. *Use of a mobile cellular telephone* 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.			
HH11	Proportion of households with access to the Internet by type of access (narrowband, broadband (fixed, mobile))	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. 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. As households can use more than one type of access service, multiple responses are possible.			

Core indicator		Definitions and notes	2010	2011	2012
	Narrowband	*Narrowband* 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-mode*.			
	Fixed broadband	*Fixed broadband* 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 *Wideband CDMA* (W-CDMA), known as *Universal Mobile Telecommunications System* (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 *frequency of individual use of the Internet* can be calculated as: either the proportion of in-scope individuals or the proportion of Internet users, using the Internet with each frequency. 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					
HHR1	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 *proportion of businesses using computers* 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 *computer* 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.			
B2	Proportion of persons employed routinely using computers[68]	The *proportion of persons employed routinely using computers* is calculated by dividing the number of *persons employed routinely using computers* (in all in-scope businesses) by the total number of *persons employed* (in all in-scope businesses). *Persons employed* 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 *proportion of businesses using the Internet* is calculated by dividing the number of in-scope businesses using the Internet by the total number of in-scope businesses. The *Internet* 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.			
B4	Proportion of persons employed routinely using a computer with access to the Internet[69]	The *proportion of persons employed routinely using a computer with access to the Internet* is calculated by dividing the number of *persons employed routinely using a computer with access to the Internet* (in all in-scope businesses) by the total number of *persons employed* (in all in-scope businesses).			
B5	Proportion of businesses with a web presence	The *proportion of businesses with a web presence* is calculated by dividing the number of in-scope businesses with a web presence by the total number of in-scope businesses. A *web presence* 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.			
B6	Proportion of businesses with an intranet	The *proportion of businesses with an intranet* is calculated by dividing the number of in-scope businesses with an intranet by the total number of in-scope businesses. An *intranet* refers to an internal communications network using Internet protocols and allowing			

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

[69]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
		communication within an organization (and to other authorized persons). It is typically set up behind a firewall to control access.			
B7	Proportion of businesses receiving orders over the Internet	For international comparability, the *proportion of businesses receiving orders over the Internet* 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.			
		Orders received 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 organizations on behalf of the business.			
		Orders received exclude orders that were cancelled or not completed.			
B8	Proportion of businesses placing orders over the Internet	For international comparability, the *proportion of businesses placing orders over the Internet* 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.			
		Orders placed 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.			
		Orders placed exclude orders that were cancelled or not completed.			
B9	Proportion of businesses using the Internet by type of access (narrowband, broadband (fixed, mobile))	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.			
		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.			
		As businesses can use more than one type of access service, multiple responses are possible.			
	Narrowband	*Narrowband* 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-mode*.			
	Fixed broadband	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.			

Core indicator		Definitions and notes	2010	2011	2012
	Mobile broadband	Mobile broadband access services include *Wideband CDMA* (W-CDMA), known as *Universal Mobile Telecommunications System* (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. Access can be via any device (mobile cellular phone, laptop, PDA, etc.)			
B10	Proportion of businesses with a local area network (LAN)	The *proportion of businesses with a LAN* is calculated by dividing the number of in-scope businesses with a LAN by the total number of in-scope businesses. A *local area network* (LAN) refers to a network connecting computers within a localized area such as a single building, department or site; it may be wireless.			
B11	Proportion of businesses with an extranet	The *proportion of businesses with an extranet* is calculated by dividing the number of in-scope businesses with an extranet by the total number of in-scope businesses. An *extranet* 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.			
B12	Proportion of businesses using the Internet by type of activity	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. 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. The *Internet* 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. Businesses should be asked about all Internet activities (that is, the question used by countries should specify multiple responses). Activities are not 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 informationabout				

Core indicator		Definitions and notes	2010	2011	2012
	goods or services				
	Getting information from general government organizations	*General government organizations* 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.			
	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
ICT1	Proportion of total business sector workforce involved in the ICT sector (expressed as a percentage)	*ICT workforce* (or ICT employment) consists of those persons employed in businesses that are classified as belonging to the ICT sector. *Total business workforce* 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.			
		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).			
		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).			
		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).			
		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).[70]			
ICT2	ICT sector share of gross value added (expressed as a percentage of total business sector gross value added).	*Gross value added* 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 produce final output). See also Table 7.			
		Definitions of the ICT and total business sector are per ICT1.			

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[70] See draft ISIC Rev. 4: http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27.

Table 5 – Core indicators on international trade in ICT goods

Core indicator		Definitions and notes	2010	2011	2012
ICT3	ICT goods imports as a percentage of total imports	*ICT goods* 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 *UN COMTRADE* 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	*ICT goods* 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 *UN COMTRADE* 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 *telephone communication facility*.			
ED4	Student-to-computer ratio (by ISCED level 1 to 3)	Average number of students per 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).			
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[71] 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).			
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.			
Reference indicator					
EDR1	Proportion of schools with electricity (by ISCED level 1 to 3)[72]	Schools with electricity as a percentage of the total number of			

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[71] 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.

[72]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

Core indicator		Definitions and notes	2010	2011	2012
		schools in the country for each ISCED level (1-3).			

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;
- 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	The proportion of central government organizations with an intranet is calculated by			

suchasignificant barrier in many developing economies that monitoring trends of its provision is as relevant as monitoring the supply and use of ICT.

Core indicator		Definitions and notes	2010	2011	2012
	intranet	dividing the number of centralgovernment organizations with an intranet by the number of central government organizations. The result is then multipled 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 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. 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.			
EG6	Proportion of central government organizations with a web presence	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.			
EG7	Selected Internet-based services available to citizens, by level of sophistication of service	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'. The indicator is weighted by population in order to show the significance of government Internet-based services at the national level. 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.			