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

United Nations
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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 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.

1. The role of the government and all stakeholders

A. National information society policies and e-strategies

In 1998 the first IT national policy and strategy was developed. This encompassed both public and private initiatives. An e-Government strategy that included 4 frameworks: legal, technical, capacity building and services followed in 2002. In 2008, this strategy was upgraded based on 4 new pillars that modernize the strategy and form new indicators with a new situational assessment to provide clear and realistic goals to be achieved.

In October 2003, the Lebanese Government, through the United Nations Development Programme (UNDP) and OMSAR, completed the development of the "National e-Strategy" and e-readiness report. The e-Strategy vision aimed at "moving the economy and society of Lebanon towards a Knowledge Based Society in the shortest possible time while at the same time addressing related challenges and opportunities that Lebanon is facing".¹ Thirty-two policies, grouped under seven initiatives², were proposed as vehicles for implementing the strategy. A portal³ was designed and developed to incorporate all information and data pertaining to the various initiatives that are related to the project.

Mid 2010, the OMSAR prepared an action plan for the prepared E-government strategy of 2008. The plan divided the implementation of the strategy to 4 phases:

- 1- Phase 1: Informational, E-Forms, E-Payment and Pilot E-Services;
- 2- Phase 2: E-Services and Pilot E-Gov Interoperability;
- 3- Phase 3: E-Services and E-Gov Interoperability;
- 4- Phase 4: Signature based E-Services and E-Gov Interoperability.

The plan runs over 5 years (from 2011 to 2015).

In addition to the set plan, the OMSAR is currently working on One-Stop-Shops (OSS) for 4 ministries (Ministry of Education and Higher Education-MOPH, Ministry of Tourism, Ministry of Agriculture-MOA and Ministry of Public Health-MOPH). A memorandum of understanding has been signed with each of the respective ministries to build One-Stop-Shops for each of them with the main purpose of centralizing the citizen's interaction with each of the selected ministries in one place.

The OSS will cover 250 transactions, 130 in MEHE, 40 in MOPH, 38 in MOA and 43 in MOTourism.

For each phase of the e-government action plan a set of projects were identified, some of which have already been initiated.

For phase 1 the main project is the E-Government Portal. In May 2011, the OMSAR launched the Request for Proposals (RFP) for the E-government Portal Phase 1. The first phase of the portal will encompass standardized government transaction forms (from OMSAR's Standardization of Government Transaction Forms project which will end June 2011) and Pilot E-Services from different government entities such as the Ministry of Economy and Trade, Ministry of Public Health and the National Social Security Fund.

In addition, OMSAR has been working on the preparation of an Interoperability Framework as a preparation for Phase 2 of the e-government action plan. The framework is currently under revision.

¹ National e-Strategy for Lebanon, executive summary, page 1 (<http://www.e-gateway.gov.lb>)

² <http://www.omsar.gov.lb/Cultures/en-US/Publications/Strategies/Pages/National%20eStrategy.aspx>.

³ <http://www.e-gateway.gov.lb>

ICT strategy exists:	E-government strategy
Year of adoption	2008
Government Agency in charge (in English and Arabic)	Office of the Minister of State for Administrative Reform مكتب وزير الدولة لشؤون التنمية الإدارية
Pace of implementation (Excellent/ Good/ Average/ Limited)	Limited

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

In May 2010, CISCO announced the launching of the Cisco Entrepreneur Institute (CEI) in Lebanon, a school-like institute that teaches entrepreneurs how to maximize the development of their businesses and make the most efficient use of their facilities to benefit themselves and the population.

CEI is a major milestone for helping entrepreneurs and teaching them how to use IT in their daily operations.

The school was launched on June 5 2011 and will be hosted by AMIDEAST, a leading American educational and training organization. Classes like starting a business, growing a business, career essentials, as well as workshops such as computer literacy and IExec (Cisco's Entrepreneur Institute) for public and private sectors will be offered. These will be taught by fellow entrepreneurs.

C. Role of Non Governmental Organization

1. *Ijma3 (Ittihad Jameyet Maaloumatyah Arabiya)*⁴

In October 2010, IJMA3 in cooperation with US Commercial Service, organized the first "U.S - Lebanon" ICT Forum. The project was supported by the American Lebanese Chamber of Commerce and the National U.S.-Arab Chamber of Commerce in order to display the latest U.S. trends in the ICT sector through an exhibit and a series of seminars in ways to promote ICT relations between Lebanon and the U.S. The event hosted exhibitors which included Acom Solutions, Apple, Cisco Systems, Computer Associates, Harris Corporation, HP, IBM, Intel, Lexmark, Microsoft, Mirage Networks.

2. *Women in Information Technology (WIT)*⁵

Emedia Project

The purpose of this project is to teach representatives from local NGOs how to build their digital infrastructure and capacity to use digital technology effectively to tell their stories, build memberships and support bases. Through these strategies, the program will create networks of diverse individuals and organizations that share knowledge, skills, and best practices. It started on May 2011 and will end April 2012.

Science Days

The 4th «Science Days» event will take place in October 2011. For the first time, ICT will be featured in a special exhibit area showing the benefits of ICT for banking, education, health, geography, business solutions, media, and more.

Each year, fifteen thousand university students, young professionals, students, and families visit "Science Days" at the Hippodrome of Beirut. The event is modeled after the Geneva "La Nuit de la science" and is organized in cooperation with Ayam El-Ouloum, the Municipality of Beirut, the Ministry of Culture, the city of Geneva and the Women in IT. The event will be held at the Hippodrome of Beirut during October 2011.

VISIT to School

⁴ <http://www.ijma3.org>

⁵ <http://www.wit.org.lb>

The purpose of this awareness activity is to encourage more youth and especially girls to be interested in choosing a career in ICT, in addition, to insights on Internet Safety and new technologies and applications.

MEPI's Women in Technology (WIT) Program in Lebanon

This initiative consists of training women in underserved areas on Microsoft Unlimited Potential and on professional development (leadership, conflict resolution, resumé writing techniques, interview tips) 750 women had graduated by November 2010.

Empowerment Project for Women

The project creates an enabling environment for local economic development, creating jobs, increasing incomes, and improving livelihoods Development (EMLED) or "Al Baladiyat" project. The project was initiated in January 2009 to provide relevant expertise in technical areas to contribute to the EMLED project goals through workshops trainings and focus group meetings with beneficiaries from all NBC (Nahar Al-Bared Community) cluster in Akkar. WIT concluded 15 interventions and trained around 400 women in Akkar, Jezzine and Jbeil. Discussions are to proceed with Relief International for the possibility of enrolling a new contract for the Women Empowerment.

Women at Work

The project started in January 2009 in collaboration with the British Council, for cross cultural development on the digital future. Phase I was completed with the task to promote the women at work project to students and women in different areas in Lebanon. Phase II: which ended in April 2010 was to arrange a visit of professional women from the IT sector from both Lebanon and the UK so as to implement outreach activities in schools to encourage girls to choose ICT careers.

From WIT to WORK

The program was aimed at the social integration of women in business creation or finding employment. The program started in August 2009 and ended December 2010, whereby 111 women were selected to follow advanced training on entrepreneurship and business skills: 12 women were employed and 3 women opened their own businesses.

WIT Computer Training Center @Zico House

The purpose of this initiative was the creation and use of training centers to promote ICT development for women in order to gain a competitive advantage in the job market. The training center constitutes of a computer lab with a capacity of 40 participants per term (160/year).

2. ICT infrastructure

A. Market structure and regulatory landscape

The telecommunications are a monopoly of the Lebanese Government (Ministry of Telecom-MOT) that owns and/or licenses all fixed, mobile, and wireless networks. OGERO (Organisme de Gestion et d'Exploitation de l'ex Radio Orient), established in 1972 and 100% 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 especially that the privatization of the telecom sector has become imperative. The Lebanese Ministry of Telecom has been asked on many occasions to speed up the privatization process, which seems to be more difficult than expected since 38% of the state budget comes from telecom revenues. However, the Ministry of Economy & Trade and Ministry of Finance, being the main players, were putting all possible efforts to complete the privatization process of "Liban Telecom" and fixed lines by mid-2007.

With the launch of the Telecom Regulatory Authority (TRA) in Lebanon in 2007 the sector started witnessing a promising future. The TRA is set to privatize and liberalize the market and soon introduce new telecom services, as well as sell new licenses in several fields.

	Indicate whether competitive, monopoly or duopoly
Mobile services	Two companies, both state-owned
Fixed-line services	Monopoly (state-owned)
Internet services	
Internet Market (incl. unlicensed providers)	Around 16 licensed providers, hundreds of unlicensed providers
Broadband Market (Wireless and ADSL)	Around 7 for ADSL services Around 16 for wireless services

Source: TRA report Dec 2010

B. Penetration of ICT Services

- Fixed and mobile telephone networks and penetration

Lebanon was able in the past couple of years to decrease its mobile penetration gap with other countries where it has reached a 70 percent penetration rate⁶.

Figures issued by the Ministry of Telecom indicated that the number of mobile users reached 2,984,387 users at the end of March 2011, constituting an increase of 4.2% from end-March 2010 and a 1.3% rise from February 2011.

Mobile Interim Company (MIC2), operated by MTC Touch, had a 53.8% market share at end-March 2011, up marginally from 53.1% from the same period last year; while MIC1, operated by Alfa, has the remaining 46.2%. It attributed the larger market of MTC Touch to a higher growth in subscribers of 5.5% compared to a growth rate of 2.7% for Alfa.

In parallel, the number of prepaid subscribers increased by 4.7% from end-2010 to 2,495,576 subscribers at end-March, while the number of postpaid subscribers increased by 1.9% to 488,811 subscribers. As such, prepaid subscribers accounted for 83.6% of total mobile subscribers at end-March 2010, while postpaid subscribers accounted for the remaining 16.4%, despite the fact that the tariff per minute for postpaid subscribers is around one-third that of prepaid subscribers. In parallel, the number of landlines subscribers increased marginally by 0.4% from end-December to 835,309 at end-March 2011, according to le Commerce du Levant⁷.

- Broadband, ISPs and penetration

According to the Daily Star Newspaper interview with Mr. Hedi Larbi, country director of the Middle East department at the World Bank in the MENA region, since June 2010, Lebanon had only 225,000 broadband subscribers and therefore the potential of market growth is considered huge in the country⁸. In a survey conducted by the Telecom Regulatory Authority (TRA) early 2011, figures till December 2010 show that there is a 31% penetration in the internet market with 24% in the broadband market (wireless and ADSL). There are around 16 private ISPs in Lebanon 7 ADSL and 16 wireless service providers.

- PC Dissemination

PC dissemination in the country early 2011 was reported at only 15% as per the Lebanon Weekly Monitor issued by Audi Group reported⁹.

C. Initiatives/Projects for ICT infrastructure and development of new services

Content not available

⁶ Daily Star, October 2010

⁷ Lebanon this Week Bulletin, Byblos Bank May 2011

⁸ Daily Star, October 20, 2010

⁹ Daily Star, February 18, 2011

D. ICT connectivity

Content not available

E. Internet Infrastructure

- Internet backbone

The Ministry of Telecom is currently working on the installation of a 3G infrastructure through the two mobile companies, Alfa, which is run by Orascom Telecom, and MTC Touch which is managed by Zain. Both companies are state-owned companies, which has led to allegations by a local ISP, Cedarcom that the ministry had allowed for unfair competition in the sector by unlawfully hiring foreign firms to undertake the work that would allow for third-generation mobile internet technology in Lebanon. Despite the legal measures taken against the MOT, it is still moving forward with the project.

- Broadband network infrastructure, including delivery by satellite and other systems

In a 2008 survey done by the TRA, Lebanon was judged to have the most expensive DSL Internet in the region. 46 percent of the people surveyed reported that their monthly subscription rate was too high¹⁰. In a news conference in September (2010), The minister of telecom said that new projects will be implemented during 2010 to increase the capacity by 168 times. In the 2010 budget, HE Charbel Nahhas, has requested a 65Million USD for the launching of the Broadband project¹¹. The request was granted approval by the council of prime ministers and the bid was advertised. The project was awarded early 2011 to ERICSON for the infrastructure and Khatib and Alami, a local company, for supervision. Unfortunately the project was not launched due to the resignation of the current government. If the project was to be launched, the private sector would initially benefit followed by the citizens from an Optical Transport Network with 100 folds of speed compared to the current provided Internet speed. The holdup was blamed on the mismanagement at the MOT and Ogero, the state-owned telecoms operator, as well as a failure to liberalize the industry – as was mandated in 2002’s Law 431 – which restricts investment in infrastructure.

In early 2011, (Ontor.net; Ontor being “to wait” in Arabic), was launched. That was the second independent social campaign to be initiated after the “Broadband Fiesta” which was launched in 2008. In addition, a recent Facebook group, Lebanese Want Fast Internet, has gained over 20,000 fans since it started in March 2011. A separate protest took place in April 17, 2011 in Tripoli at the site of the IMEWE cable to demand faster and cheaper connections.

The bottom line is that slow Internet is a barrier to investment and growth. A 2009 World Bank assessment, requested by the Ministry of Finance, reported that a 10 percent increase in speed could lead to a 1.38 percent increase in GDP growth¹².

With the latest security breach issues, The minister of telecom has warned against the misuse of telecom in a way that could harm the people’s freedoms or national sovereignty, noting that this sector has been previously subject to spy operations by Israel. Nahhas was hinting at the arrest in June 2010 by Lebanese security authorities of a senior executive at state-owned mobile telecom firm Alfa on suspicion of spying for Israel.

- WiFi hotspots and WiMAX

The Ministry of Telecom provided wireless data networking licenses in 1997. The licenses were activated in 2003 and the companies started providing fixed wireless services in 2004 based on iBurst technology. The technology enabled the licensed providers to use frequencies ranging between 1.9 GHz, 2.6 GHz and 3.5 GHz for point to multi-point applications and 7 GHz for point-to-point links. In total, there are four licensed wireless network providers: Cedarcom, GDS, Pesco, and Cable One. The microwave connection was made through the registered microwave providers. The bandwidth came in packages of 128, 256 and 512 Kbits. The prices for monthly connections started at \$50 and increased in proportion to the bandwidth.

- Fiber optics network on the national level

¹⁰ Daily Star, March 28, 2011

¹¹ Al Akbar, 12 April 2010

¹² www.lebanonwire.com

The minister of telecom announced in March 2010 that a fiber optic network will be launched in Lebanon which will provide subscribers with easy access to international calls as well as an increase in Internet speeds to all subscribers by 10 to 20 percent.

It is foreseen that the expansion in the fiber-optics network would have a positive and direct impact on the cellular services and fixed telephone network.

In addition, in the same month, the Ministry of Telecom (MOT) launched the expansion of the high speed internet (DSL) services in call centers in Aley, the Chouf and Metn and declared a further perceived expansion in the centers of Ain Dara, Ain Zhalta, Barouk, Baysour, Bhamdoun, Sawfar, Mokhtara, Hammana, Kfarheem, Barja, Maghdoushe, Zefta, Deir al- Zahrani, Haboush, Tibneen, Abbasiyeh, Jouwayah, Kherbet Selem and Sarafand. Furthermore, the MOT started DSL operations of eight new centers in Batroun mid 2010.

Till March of 2010, and according to the MOT, 16,000 subscribers in the Chouf region are able to access the DSL internet service.

Out of 810,000 households subscribed in the fixed telephone service there are 705,000 who are capable of accessing the DSL while 162,000 have already accessed the service.

- National and regional Internet Exchange Centers and connection to Internet submarine cables;

As mentioned earlier, the MOT has commissioned the IMEWE submarine cable project late 2010 as an ultra high capacity fiber optic submarine cable system which links India & Europe via Middle East. This 3 fiber pair system with total length of approximately 12,091km is complemented with 9 terminal stations forming a consortium of 9 leading telecom carriers from 8 countries. The national fiber-optic backbone is expected to be completed by July of this year (2011), to improve the reach and reliability of Internet connections¹³.

- Regional root servers

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.

- International bandwidth

A technical study conducted in 2010 on internet bandwidth in 185 countries stated that Lebanon is the worst. It was ranked last among the surveyed countries as download speed reported at 0.47Mb/sec compared with 39.26Mb/s in South Korea who was ranked first, and the Latvian republic with 35.87Mb/sec followed by Letwania with a download speed of 25.69Mb/sec.

As for the upload speed, Lebanon ranked before last with a speed of 0.10Mb/sec compared with 20.99Mb/sec download speed by the first ranked country, South Korea.

The reported numbers highlight the fact that Lebanon's infrastructure is weak¹⁴.

3. Accessibility to information and knowledge

A. Public domain information

- Development and promotion of public domain information

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

- Use of ICTs as a fundamental working tool.

Under the umbrella of e-government, the OMSAR has been promoting the use of ICT as a tool to overcome the fundamental work challenges by setting ICT standards and guidelines. On another hand, the role of the different NGOs has been imperative in dispersing the use of ICT. The efforts put focused on underprivileged areas were coupled with awareness campaigns on the essential and vital role of ICT in general and in the work and education advancement in particular.

¹³ <http://www.imewecable.com/>

¹⁴ Al Akhbar, February 25, 2011

- Availability and development of a digital public library and archive services.

In 2005, the National Archives and the OMSAR worked jointly on the digitization and indexing of all historic documents available at the directorate. To save deteriorated microfilms, there was a need to transfer all information to a more sustainable medium. The project provided an application to insure the transfer and storage of millions of graphics, the digitization of 19,000 microfilms and digitization of a total of 3,000,000 images together with the refurbishing of the National Archives with microfilm equipment.

B. Access to information and public information

- Availability of adequate access to public official information

The OMSAR upgraded its information portal (informs) to newer technology in order to provide the public with official information in a more user friendly manner and much easier search capabilities. On another hand, the OMSAR will finalize in June 2011, the “Government Transaction Forms Standardization” project with an output of 100 standardized government transaction forms distributed on 14 ministries provided in hard copies and interactive digital formats. The interactive forms will be made available on the Informs for access by the public. The main advantage of the aforementioned project is that it is providing to the public a clearer and more transparent list of government transaction forms that are easier to fill and explicitly state the requested supporting documents with clear instructions on how to fill the transaction forms.

In addition to the latter, the OMSAR has also launched the “Government Website Standardization” project in November 2010 to standardize the general design, look and feel (site categories, navigation flow, links, etc.) of government sites, based on best practices, allowing web visitors to correlate government sites with specific standard layout to ease the public entities’ site surfing. The project is expected to end November 2011.

- Access, including free and affordable access, to open journals, books, and scientific archives.

Lebanon Central Bank’s website bdl.gov.lb, and Ministry of Finance, provide free access to Newsletters, reports and publications.

Most of the existing newspapers offer new free access to much of the content of journals as well as affordable access to their archives. Also, though restricted, university libraries such as the American University of Beirut offers its students online books, archives, journals, and references¹⁵.

C. Multi-purpose community public access points

- Availability of sustainable, affordable or free-of-charge access multi-purpose community public access points
- NGOs in Lebanon play a major role in building and maintaining internet and information technology access points and community centers to empower the public and connect it to the latest technologies. Section C (Role of Non Government Organizations) explains further the NGOs intervention in that area.

- Provision of help services and assistance to users

LibanPost, the national *mailing service in Lebanon*, has been extending its services to the public to include a multitude of government related services in full cooperation and coordination with the respective public entity. Being dispersed all over the Lebanese territories, and conducting government related transactions on behalf of the citizen, Liban Post has relieved the citizen from the burden of commuting and travelling to near cities to carry out the respective government transaction. Liban Post site (www.libanpost.com.lb) provides a detailed list of all its services.

- Use of information and sharing of knowledge.

The OMSAR has launched at end of May 2011 a bid for the e-government portal phase I. The objective of this project is to develop a national portal as a single unified interface for all ministries, agencies, departments, boards and councils within the Lebanese government and the public sector. This project

¹⁵ <http://www.lb.aub.edu.lb/~webjafet/>

will provide easier access to government information and better service for all citizens, businesses, Diaspora, as well as the international community.

4. ICT Capacity building

A. ICT in education and training

- The use of ICTs for basic literacy.

As previously mentioned a lot of initiatives, from public private partnerships, multinationals and from NGOs, have taken place to promote the use of ICT for basic literacy.

- Integration of ICTs in education

All schools in Lebanon are required, by law, to follow a prescribed curriculum designed by the Ministry of Education and Higher Education. In 1999, a new Curriculum was put in use, as devised and applied by the Center for Educational Research and Development (CERD). The new curriculum, embedded Information Technology, or as referred to by the CERD as “informatics” as a new instructional subject emphasizing the teaching of the most common computer skills and concepts, and encouraging the use of computers in teaching/learning other subjects. The introduction of the “Informatics” in the new curriculum is based on known international and local experiences in the area of computer education, and is in line with the principles of the Educational Reform Plan set by the National Center for Educational Research and Development¹⁶. However, due to lack in ICT teachers and proper IT administration and maintenance of the ICT labs and equipment, ICT in Education was not introduced as a mandatory teaching material nor as part of the official government examinations and it became at the school’s own assessment and capabilities to apply the “Informatics” curriculum. Only 20% to 25% of public schools have incorporated the “Informatics” in their curriculum¹⁷.

- Education and training programmes

Lebanon has three main types of institutions for delivering vocational education in Lebanon: technical schools, vocational high schools and technical institutes (with 37,317 graduates for the year 2009-2010 with graduates in the ICT sector between ICT specialist, System/NW administrator, and HW Specialist¹⁸).

- Existence of local ICT training centers with the cooperation of all stakeholders and taking advantage of existing facilities

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.

- Availability of distance learning, training as part of capacity building programmes.

Content not available

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

- E-literacy skills for all

The OMSAR launched an e-learning pilot project in December 2010. This project targets a sample of one hundred employees from the Lebanese public sector to provide them with training courses through an OMSAR’s e-learning portal and to test their response to this modern approach to knowledge transfer. OMSAR has organized a series of Orientation Sessions regarding the project that includes twenty management courses and a vast number of IT courses. The Orientation Sessions have stressed on the importance of the trainees’ commitment to learning and self-development. The project was successfully completed in mid-March 2011. Due to the positive results of the project and the demand of employees to widen its scope, OMSAR is planning to launch a wide scale e-learning project this year that shall address a bigger number of employees in the public sector.

This aimed e-learning Project has different objectives:

¹⁶ www.crdp.org

¹⁷ MEHE

¹⁸ www.crdp.org (statistics 2006-2007)

- Provide public sector employees with modern Management, ICT and English Language skills;
- Expose them to the latest learning techniques via ICT tools;
- Give them access to a vast amount of information that is relevant to modern Management, ICT and English;
- Improve job efficiency and productivity at the workplace;
- Transfer the culture of knowledge and technology across the civil service of Lebanon.

The project targets public sector employees from various ministries, control bodies, public agencies and municipalities with different specializations and grades. The total number of trainees is one-thousand (1000) for a two-year period. Every individual user will get a license to access any course from the available list of courses, as per OMSAR's approval.

- Training programmes (Governmental and/or NGO)

The OMSAR launched in September 2010, the fifth government wide ICT training project for government employees. The project launched end of 2010 included 63 high end ICT courses and is expected to span over a period of one year and a half. Unlike previous government wide ICT training projects, this project did not target end user training. It, however, focused on high end ICT training and will cover around 2500 trainees.

5. Building confidence and security in the use of ICTs

A. Use of electronic transactions and documents

- Use of electronic documents and transactions.

The use of electronic signature in Lebanon has been obstructed by the revision of the IT draft law.

- Certification and authentication measures.

The IT draft Law tackles the issue of certification and authentication through articles 4 and 5, setting the fulfillment of the authentication and certification conditions. Nevertheless, the latter remain obstructed by the revision of the IT draft law.

B. Online and network security

- National security strategy or action plan

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

- Presence of CERT

There is no CERT for the government of Lebanon; however, the OMSAR has an established ICT help desk and support team since August 2002. The team's main responsibilities are to:

- Provide IT technical support for all ministries and public agencies (network administration and desktop applications, phone-based as well as on-site visits);
- Troubleshoot and diagnose hardware-related or software-related problems and provide fast solutions;
- Install, re-install, configure and upgrade new or existing hardware, networks and peripherals as well as commonly used software packages;
- Participate in the review and evaluation of ICT-related bids;
- Take part in acceptance committees of ICT-related projects.

The number of incidents recorded for the year 2010 were:

1. On-site support: 140 visits;
2. Phone calls support: more than 2200 calls.

However, currently there are discussions taking place on where and how to establish a CERT in Lebanon

- Presence of a national awareness plans or initiatives

As part of the security strategy aimed to be prepared by the OMSAR, the office will be working on an awareness campaign to relay to the public the best security practices and strategy put for the country.

- Secure and reliable applications facilitating online transactions.

EcomLeb advises five steps for facilitating e-commerce transactions through the use of Verisign.

- Cyber-Security measures.

OMSAR and the Ministry of Economy and Trade offer best practice information. In addition to that, Ogero (DSL) offers parental monitoring services, Ecomleb offers information on how to protect one's computer and avoid viruses, adware and malware and other cyber piracy applications that result from internet browsing¹⁹. Moreover, ISF's cybercrime and intellectual property unit received a grant that covers technical assistance, and equipment related to cybercrime.

- Good practices in the field of information security and network security.

The Cyber Crime and Intellectual Property Bureau at the ISF launched its site in April 2009 listing best practices and awareness campaigns on information and network security. Furthermore, the Information System Audit and Control Association (ISACA) has established in February 2005 a Lebanon Chapter²⁰ dedicated to promote and develop awareness on IT controls, standards, audit and practices among IT professionals and users of information technology in Lebanon. The chapter has been very active inviting chapter members and the Lebanese information society in general to security related workshops, awareness campaigns targeting topics such as Digital Signature and E-fraud, Governance and Road Map toward Management Support for Security among others.

- Protection of data and network integrity, information security and network security issues.

The Ecomleb portal links other e-commerce websites and provides additional network security.

C. Privacy and Data protection

- Laws addressing 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).

- Initiatives or guidelines with respect to privacy and data protection.

Content not available

- User education and awareness about online privacy and the means of protecting privacy.

As a complementary effort, the government of Lebanon is planning to launch an awareness campaign after the enactment of the IT Law in order to spread the knowledge on its content, its stipulations and its enforcements and to allow a proper and effective implementation.

D. Countering misuse of ICTs

- Prevention and detection and prosecution of cyber-crime and misuse of ICTs.

Latest reported figures on cyber-crime in 2010 as reported by the TRA are as depicted below:

Nature of Attack	Number of incidents	%
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¹⁹ <http://206.131.241.189/acb5/stores/4/Security.aspx>

²⁰ <http://www.isaca-lebanon.org/>

Threat of Reputation Abuse, Extortion and Defamation via Internet / Phone	285	56%
Theft of Electronic Account and Use it for Criminal Purposes	92	18%
Online Fraud and Impersonating ID's	48	9.8 %
Disturb and Bullying over the Internet / Phone	27	5.35 %
Theft and Use of Stolen e-mail	8	1.6 %
Credit Card Fraud	8	1.6 %
Falsification of Touristic Sites and Disseminate them via Internet	4	0.8 %
Online Gambling Games	11	2.18 %
Money Embezzlement and Bank Accounts Fraud	4	0.8%
Fraud of Telephone Calls	2	0.4 %
Software Piracy and Theft of Programs& Designs	1	0.2 %
Sexual Exploitation of Children Online	14	2.8 %
Total:	504	

Source:
TRA

Presentation in Haigazian University, ICT Security, 13 January 2011

- Fighting spam at national and international levels.
Even internationally, fighting Spam has not been effective, despite the large number of tools and utilities being made available over the web. On the national level, no serious effort has been done.
- Real-time incident-handling and response and effective mutual assistance efforts.
Mutual efforts have been put in order to control cybercrime on the national level between the Cyber Crime and Intellectual Property Bureau and the local ISPs. Coordination with the Ministry of Telecom and the TRA has also been established, however, the efforts on that level are still very conservative. In addition, with the lack of electronic exchange of information among respective parties, real-time incident-handling is not applied. However, Lebanon has been putting efforts to join the Budapest Convention on Cyber Crime as a rectifying member. With that in mind Lebanon can start adopting and applying the convention's articles on real-time interception means and methods. On another note, Lebanon, through the Cyber Crime and Intellectual Property Bureau coordinates with the Interpol for international assistance and exchange of cybercrime instances and notifications.

6. Enabling environment

A. Legal and regulatory environment

- Supportive, transparent, and pro-competitive, legal and regulatory framework

In February 2011, the TRA announced the approval of its board on allowing telecom company providers to use the public properties for the installation of related equipments. The approval was based on item number 35 from the telecom law number 431/2002 which authorizes the usage of public properties but within specific conditions most importantly that the equipments' installation would not hinder the use of these public properties.

The board decision came after a survey that has been made on the status of the current public properties. The survey showed that Lebanon has vast spaces of public properties and their use by the telecom sector based on item 35 of law number 431/2002 will actually lower telecom infrastructure costs and boost the telecom infrastructure and hence the industry.

It is worth noting that the TRA board approval was accompanied by an in-depth study lead by local and international consultants in the field, the Ministry of Public Works, the Ministry of Interior and Municipalities, and the Ministry of Water and Energy. The study was also based on the best international practices using Lebanese standards. As a result, exact conditions and specifications required to be met by

the Telecom companies and their respective projects in order to make use of available public properties were clearly stipulated²¹.

- Intellectual property (IPR).

The intellectual property laws in Lebanon are governed by the Copyright Law no 75/99 that was amended and updated to account for intellectual property rights for the Information technology related subjects and make it in conformity with the WCT treaty. In addition, Intellectual property rights are ruled by the new Trademark Law that has been approved by the Council of Ministers on October 27, 2007, the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT).

- Telecom and Internet regulation.

In June 2010, the MOT began activating the new hardware and software which they had acquired, to enforce the ban on VoIP communications. The new equipment, which was tested in recent months, now effectively blocks internet telephony for good.

As a consequence to this, many companies were affected, as part of their office-to-office business communications and videoconferencing with other companies in and out of Lebanon has therefore come to a halt. This activity has also disturbed and affected as the telemarketing centers, outbound support centers, and businesses that also use VoIP.

To some, now Lebanon thus joins a host of dictatorial or pseudo-democratic countries which in the past have blocked, or continue to block, VoIP. As in many cases around the world, VoIP blockades were made to censor the freedom of expression, to protect corrupt practices, to harness national security, or to pave the way for the provision of the same VoIP services, but this time by those who blocked it.

In April 2011, the Telecom Regulatory Authority (TRA) issued a circular requesting all property and building owners and cable distributors to get prior approval from the TRA before the installation of any equipment in an effort to control the illegal distribution of TV cables and the use of non-licensed equipment. The circular enforced strict abidance to the matter and declared the authority of the TRA to take legal measures towards any violations to it. Never less, till date, Lebanon witnesses continuous installations and usage of non-licensed equipment.

- Cyber legislation description (other than those already mentioned)

In December 2010, the Ministry of Justice announced its commitment to ensuring Cyber security and is ready to partner with specialized parties to develop the legal measures and laws to create a secure and dependable cyber space.

On another note, the Ministry of Social Affairs (MOSA) has drafted a law against child pornography. The draft law suggests strict legal measures towards children and teenagers' pornography. This initiative is a joint effort between the MOSA and Microsoft (MS). The law will be sent shortly to the presidency of council of ministers then to the parliament for adoption.

In addition to this law, the MOSA-MS initiative includes also raising awareness for parents and the youth on safe and secure internet surfing in order to protect and guide the young community from any mis-conception and mis-information that might be available over the web.

On the other hand, a team has been formed from several government entities including the ISPs and the Cyber office for the observatory of the cyber security within the Ministry of Interior to raise awareness and work on cyber security issues in Lebanon.

o E-signature and e-transaction;

A series of meetings have been held during 2010 by the ICT parliamentary committee to revise and finalize the terms of the e-transaction law. The current proposed law is an updated version of the draft law presented back in July 2002 by MP Ghinwa Jalloul. The drafted e-transaction law in its

²¹Annahar Newspaper, 17 February, 2011

current format proposes the creation of an authority for the e-signatures and e-transactions in the form of a public institution with administrative and financial independence. The private sector has been calling for its involvement and revision of the drafted law as it is the first to be affected by its implementation. The latest revision meetings particularly those held in July 2010 involved the private sector through participation by representative from the Professional Computer Association (PCA) and the Chamber of Industry and Commerce.

From the main concerns relayed by the private sector was the role and authority level allocated to the unit in charge. As is drafted the said unit will have unlimited and uncontrolled decision making and authority that can negatively affect the application and management of the e-transactions if abused. Another concern was related to the actual law items set on the e-transaction some of which were reported to contradict with the current bank secrecy law.

With the above issues, and with a resigned government, the e-transaction and e-signature law are still under revision with an unclear deadline for enactment.

- E-commerce and e-payment;

In May 2010, the Ministry of Finance launched the e-payment gateway bid. The gateway was designed in coordination with the banking sector and is expected to provide facilities for e-payment through the citizen's e-banking account. The project was implemented using MS technology and is expected to be made available for public use around end 2011.

- Software Piracy;

According to Business Software Alliance (BSA), a US based industry group representing the world's leading computer software developers, Lebanon was ranked 39th place worldwide and fifth in the Middle East and North Africa region (MENA) in terms of software piracy rate in 2010.

In addition, Lebanon came in 12th place among the 29 upper middle-income countries (UMICs) included in the survey. Lebanon's piracy rate reached 72% last year, unchanged from 2009, but down from 74% in 2008 and 73% in each of 2007 and 2006²².

To account for that some leading International ICT companies are trying alternative measures to boost awareness and readiness of the Lebanese market on that regard. Adobe, for example, plans to make its leading creativity and business productivity applications more accessible to Lebanon's business community and design industry professionals via a new productivity strategy that will center on its immensely popular Creative Suite 5 (CS5) and the Adobe Acrobat application software with discounts of up to 70 per cent on the published Middle East price of CS5 and Acrobat.

e-transactions law available (yes/no)	Under revision
e-signature law available (yes/no)	Under revision
Management of PKI available (yes/no)	Under revision

B. Domain name management

- Management and supervision, of respective country code top-level domain name (ccTLD)

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) through 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.

C. Standardization in ICT

- Development, use and promotion of open, interoperable, non-discriminatory and demand-driven standards.

In June 2010, the OMSAR launched the "Government Transaction Forms Standardization" project for the unification and simplification of 100 government transaction forms distributed on 14 different ministries. The project will end June 2011 with its main output being 100 standardized government transaction forms provided in hard copies and interactive digital formats, Guideline for the

²² www.lebanese-forces.org

standardization activity, training of trainers on the set standards and transformation into interactive formats. The project also provides a plan to transform the standardized forms into e-services and a recommendation on the unit to be in charge of the management of standardized government transaction forms.

On another hand, the OMSAR has also launched the “Government Website Standardization” project in November 2010 to standardize the general design, look and feel (site categories, navigation flow, links, etc.) of government sites, based on best practices, allowing web visitors to correlate government sites with specific standard layout to ease the public entities’ site surfing. The project is expected to end November 2011.

- Awareness and adoption of international interoperability standards.

OMSAR has initiated work on an interoperability framework based on international practices. The framework is currently being revised to reach its latest versions. In addition, the OMSAR is researching on best practices and organizing different meetings with leading companies from the private sector and getting other countries’ experiences through exchange of expertise.

D. ICT investments and Government-supported facilitation measures

- Entrepreneurship, innovation and incubator schemes

Berytech²³ is the first facility in Lebanon to offer entrepreneurial experience, technological innovation, mentoring and business matching, and Research and Development. Since its inauguration, it has been very active in facilitating entrepreneurial and technological innovations. In addition to its success projects between 2008 and 2009, the fund signed a new equity investment with Active Identity, a technology startup specialized in UHF Radio Frequency Identification (RFID) in February 2010 and a new investment in a technology startup focused on online digital image processing in September 2010.

- Government investment fund

The Lebanese Government has 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.

On another note, 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.

- 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.

- 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 centre 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.

²³ www.berytch.org/

- Availability of venture capital investments
Content not available

7. ICT applications

A. E-government

- ICT in public administration

The UN e-government development index for Lebanon in 2008 was 0.484 with a rank of 74. It has witnessed a noticeable drop in 2010 with an index of 0.4388 and a rank falling to 93.

Most ministries and autonomous agencies are currently working on making their Web sites more interactive and trying to provide transactional services. The Standardization of Government Transaction Forms project will provide a push in that direction whereby standardized interactive government transaction forms will be made available on some government web sites.

- Computerizing Public Administration

In April 2011, the Minister of Water and Energy, announced the launching of the WEAP, an electronic system for the ministry that interrelate the ministry's information that was for years distributed on different automated systems of different platforms. The system will help the ministry to provide a water forecast much like the available weather forecast, which will help the ministry to better plan water distribution and usage strategy.

- Computerizing customs processing

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

- Computerizing taxation and revenues management systems

The Ministry of Finance announced on February 2011 the launching of its e-taxation service together with its new portal. The E-taxation service is now available for public use on the ministry's portal: www.finance.gov.lb.

- Digitizing Information

Many initiatives have been taking place since the early 2000s to digitize public information in the Lebanese Government. The National Archives and the OMSAR worked jointly on the digitization and indexing of all historic documents available at the directorate in 2005. Furthermore, many government agencies' sites were initiated as information portals with Informs.gov.lb (OMSAR's information portal) being a centralized nationwide government information portal.

- E-government solutions

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

The OMSAR is currently working on a Workflow, Document Management and Archiving System Enterprise project to be implemented for the Lebanese government. The WFS/DMS and Archiving System Enterprise Project will select a single product that will cater for the government workflow, document management and archiving automation needs in a systematic, standardized and cost effective approach. One of the Project's aims is to allow common platform for a strong G-2-G interaction.

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

-Early 2010, the Ministry of Displaced launched in a press conference its website www.ministryofdisplaced.gov.lb developed in collaboration with the OMSAR. The developed

website will enable rights holders to communicate with the Ministry through the Internet in order to inquire about their applications. It also allows local and international, private and official communication with the Ministry, getting to know better about its experience, action plans and achievements;

-Through an OMSAR project, the MOET has embedded on its website, in late 2010, an e-ticketing system for the registration and tracking of all citizen complaints. The system is to serve the consumer protection department in receiving and tracking incoming transactions. The system has been posted on the site for public use;

-In December 2010, the COOP initiated an enhancement project to its medical compensation automated system. The project was launched in cooperation with the OMSAR to allow civil servants to pay their yearly subscription dues through banks rather than having to visit the COOP's offices as is currently done. In addition the enhanced system will allow the COOP to automatically wire doctors' and hospitals' financial entitlements directly to the respective bank account, minimizing contact and speeding up the process between the COOP and the medical institutions (Doctors and hospitals);

-Early 2011, the National Social Security Fund (NSSF) announced the launching of the automation project of the Marjeoun and Hasbaya offices and extension of the provided services. This effort comes as a continuation to the automation being implemented in different regional locations and the wide area network being built among the different regional offices. The main goal of this latest computerization effort is to speed up the NSSF's service provision in the rural areas allowing regional offices to complete some transactions (such as hospitalization pre-approvals, and affidavits) without having to send them physically to the central location²⁴;

-In January 2011, the Internal Security Forces announced the launching of a website and a hotline targeted for the complaints of tourists in Lebanon connected to the Tourism police section in the Judicial Police unit of the directorate. The www.destinationlebanon.gov.lb site and the 1735 hot line will collect tourists' complaints and forward them to the respective unit/section at the Ministry of Tourism for the appropriate measures;

-As mentioned earlier, the OMSAR has launched end of May 2011 a bid for the e-government portal phase I. The objective of this project is to develop a national portal as a single unified interface for all ministries, agencies, departments, boards and councils within the Lebanese government and public sector in order to provide easier access to government information and service for citizens, businesses, Diaspora, as well as international community. The portal phase I is expected to be done in one year followed by another year for maintenance.

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

-The MOET requires all supermarkets and businesses to report on their imported and local product list as supplied to the consumer. The latter is required every month. To ease up the private sector's reporting and the MOET gathering of data, the MOET has built in its latest website version the ability of the supermarkets to report their local and imported product prices on-line;

-As mentioned early this section, the Ministry of Finance announced on February 2011 the launching of its e-taxation service together with its new portal. The E-taxation service is now available for use by the public on the ministry's portal: www.finance.gov.lb

- Availability, adoption and use of E-procurement applications

There is a current project for the implementation of an 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 5 public entities and to concentrate on a technical assistance. The project has been on halt for the time being in the hope of re-launching it in the near future.

²⁴ Annahar Newspaper, 24 January, 2011

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	Added mid 2011 to the portal
e-payment		Being prepared by the Ministry of Finance
Online account		No
Bilingual		Trilingual
Citizen Participation	Blogs	No
	Polls	No
Additional Services	RSS	No
	Web Statistics	No
	Search	Yes
Other features		Applets

Name of Authority in Charge of ICT in Public Administrations (in English and Arabic)	Based on Prime minister's circular issued in 2001: Office of the Minister of State for Administrative Reform مكتب وزير الدولة لشؤون التنمية الإدارية
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B. E-business

- Availability and quality of e-business services

Banks in Lebanon have been providing various forms of online banking for many years. The Internet, as an enabling technology, has made banking and financial products and services available to more customers and eliminated geographic and proprietary systems barriers.

With time, banks and financial institutions have in their vast majority introduced new technologies for the delivery of their services, which has brought up a multitude of issues and concerns on top of which is security, authentication, privacy, and liabilities.

Currently, the following three basic kinds of Internet banking are being employed in the marketplace:

- Informational: information about bank products and services;
- Communicative: e-banking/financial services system allowing some interaction between the bank/financial institution' systems and the customer. The interaction may be limited to electronic mail, account inquiry, loan applications, or static file updates (name and address changes);
- Transactional: e-banking services allowing customers to execute transactions. Customer transactions can include accessing accounts, paying bills, transferring funds, etc.

- Extent and maturity of applications

The most mature sector in B2C and B2B applications in Lebanon is notably the banking sector. The central bank has been very active in promoting and supporting ICT initiatives in the banking sector.

- Use of international e-business models for trade

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

- Availability and use of e-business standards

As mentioned earlier, in May 2010, the Ministry of Finance launched its e-payment gateway bid. The gateway was designed in coordination with the banking sector and is expected to provide facilities for e-payment through the citizen's e-banking account. The project was implemented using MS technology and is expected to be made available for public use around end 2011.

Availability of e-banking services (yes/no)	Yes	Law number:	<ul style="list-style-type: none"> • Circular no. 69 dated March 2000 relating to electronic banking and financial transactions • Circular no. 92 dated January 2003 relating to Electronic Clearing House for Credit Cards and Payment Cards and Debit Cards Issued in the Lebanese Market and Used on ATM's
Availability of e-commerce law (yes/no)	Under Review	Law number:	
Availability of e-transactions law (yes/no)	Under Review	Law number:	
Name other laws on e-services	None	Law number:	

C. E-learning

- Primary and secondary education

- Use of e-learning systems and applications in all school levels

The MEHE has launched an Education Management Information System (EMIS) 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.

- Internet connectivity in schools

A memorandum of understanding was established between the MOT and the MEHE to make the MEHE an Internet hub for all public schools. A broadband connection was established between MOT and the main MEHE building (UNESCO Palace) together with the necessary equipment and relevant infrastructure. The initiative charged the MEHE only 10% of the set up fees and waived all recurrent future fees (the monthly or yearly Internet fees), allowing through that to offer all public schools free Internet connectivity and play the role of a secure filter for the schools Internet usage.

On another hand, the Ministry of Telecom waives 40% of the fees for any public school who wishes to get direct Internet connectivity from the Ministry of Telecom.

- PC penetration in schools

Almost all private schools in Lebanon, totaling around 1,442²⁵, have computer laboratories for their students and the use of computers for administrative tasks. In July 2004, the Council for Development and Reconstruction (CDR) rehabilitated 1284 public schools. Based on the needs assessment conducted by the MEHE, the CDR executed a World Bank project that completed the supply and installation of 5000 computers and their peripherals to public schools and other bids for supplying the necessary equipment for the laboratories of 250 intermediate and secondary schools. In 2009, the World Bank supplied 1456 public schools with a School Information Systems together with two PCs per school.

In addition to the above, UNESCO Office in Beirut, through its "Bridging the Digital Divide"

²⁵ www.crdp.org (statistics for 2009-2010)

project, distributed more than 130 refurbished personal computers to 21 schools in Northern Lebanon, in cooperation with a local NGO. CISCO, through its School in a box project implemented in 2009, provided 50 PCs to public schools and devised and submitted to the MEHE material for ICT for education.

- Educational Portals

In the early 2000, a project under the name of SchoolNet was established. SchoolNet-Lebanon²⁶ as the first of its kind education portal, in Lebanon, that 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 provide 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 over direct communications connections.

- Higher education

- Virtual Universities

In Lebanon, the 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.

- E-learning systems and applications (management information systems, student information systems, etc...)

In 1999, through a project supervised by OMSAR, the Lebanese University was furnished with a Student Information System with its related underlying infrastructure. Due to different reasons, the system was not put in full use. On another hand, 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, the MEHE has been working on installing the SIS on all PCs that it is distributing on the public school administrations, to fasten the process.

- 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 the MEHE, to provide innovative teacher's portal for e-content development by the teachers and program to reach out to the subject-matter teachers assigned by the MEHE in 2008-2009.

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

Due to restrictive old rules and regulations, accreditation of distance learning or on-line learning programs is not granted by the MEHE. Some universities have engaged itself with 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).

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

D. E-health

- Availability and access to the world's medical knowledge and locally-relevant content resources

The MOPH has added new types of information on its site between 2010 and 2011. The site now provides, in addition to its previous content, awareness campaigns on Heart failure and asthma. The site

²⁶ <http://www.schoolnet.edu.lb>

also now includes an array of information concerning the health sector and hospitalization including the ranking and accreditation of hospitals, an updated drug price list and the list of recalled drugs, in addition to continuously updated statistics and publications.

- Telemedicine and medical use of teleconferencing for underserved areas and vulnerable populations

In 2009, Intel has provided a telemedicine system for the Saint Georges Hospital in Ashrafieh linked to a governmental hospital in kobeiat. The system allows a real-time video conferencing, and the ability to share data and diagnose patients from afar.

- Maturity and implementation of health care information systems

- patient care management

The MOPH runs a District Health Information System to empower the Health district manpower by improving the knowledge of ministry officials of health and health services in their areas of operation and their knowledge of other sectors with direct relevance to the health of the population such as education, environment, and NGO. The MOPH has also a Primary Health Care Information System that organizes and manages administrative and medical activities of primary health care centers in addition to the Interconnecting system allowing the MOPH and other public funds to share information about health coverage eligibility of patients. On another note, the MOPH has installed two further systems: the Visa Issuing system used to connect the central office of the MOPH and its regional visa centers to manage patients' admission to the contracted hospitals on the MOPH's expenses and the Billing System to control and properly manage incoming bills from the private hospitals.

- digital record keeping

The MOPH has extended its Transactions and Workflow Management System (TWFS) to allow Doctors and physicians to check online, on the ministry's site, their available funds with the MOPH through a secured login using a username and password.

- pharmaceutical management

As mentioned above, the ministry's site now includes in addition to other information an updated drug price list and the list of recalled drugs. The latter has started building a trusting bridge between the ministry and the citizens more and has helped the ministry in controlling the pharmaceutical market from fraud and scam that was exercised by some pharmaceutical agencies.

- Databases for national healthcare

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 the death certificate through the mobile phone application.

As a final note the MOPH is currently working with ESPISP II - The Second Emergency Social Protection Implementation Support Project, that is a part of the Trust Fund for Lebanon, with the aim to improve administrative affairs, service delivery, financial sustainability, and the establishment of a modern utilization management function to improve the efficiency of MOPH expenditures. The project also considers the adoption of modern hospital contracts based on key performance indicators (KPIs) in order to be able to provide an improved quality of services for citizens in the provision of health insurances

- Use of ICT based information systems to alert, monitor and control the spread of communicable diseases

The MOPH publishes on its web site 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 governates to secure a nationwide timely notification on any reported communicable disease.

E. E-employment

- 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. The NEO has received a grant from the Canadian International Development Agency (CIDA) end of 2009 serving till March 2011 to expand the services of the NEO (geographical distribution and service types). To ensure good management of the grant, the CIDA has joined hand with the ILO (International Labor Organization) to plan and supervise the management of the funds. The grant has allocated a good percentage of the secured fund towards upgrading the office's automated systems and its HW and infrastructure. Early 2011, the NEO launched through the ILO/CIDA a bid to buy new HW and extend and renew its infrastructure that dates back to 2002. The whole aim of the project is to better NEO's services to the public and stimulate its role as a main job hunting engine in the country.

- Employment Portal and national databases of résumés

In addition to all exiting local and international job search sites, new sites offering online employment opportunities have emerged. One particular site deserves to be highlighted on. Late 2009, a group of three young Lebanese men created Jomea.com to be the first free search engine for Job Opportunities in the Middle East and Africa linking all possible job search portals together. Job seekers can access all vacancies from the most reputable job boards, recruiting sites, company career pages, and classifieds in the Middle East and Africa through one place. Jomea scans the web for its users by gathering all job opportunities available in one simple step.

The portal targets job seekers as well as employers, recruiters and job boards, free of charge. They can also list their vacancies as links that redirect the job seekers to their site.

Jomea is not a recruiting site but a search engine that exposes the vacant positions to a large number of people and speeds-up the recruitment process.

- Teleworking

Teleworking using ICT means in Lebanon is mainly restricted to business-business or within government such as grants and contracts part-timers and consultancies or research assistants. From the organizations that use tele-working would be the European commission and the United Nations sub-organizations. 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

- Use of ICTs for the preservation of linguistic diversity and cultural heritage

Concerning cultural heritage there exists extensive work by the Ministry of Tourism especially through its new and enhanced website (www.destinationlebanon.gov.lb) to provide cultural information together with a map stating different religious and touristic attractions in the country. Furthermore, www.yamli.com converts Latin alphabets to Arabic for enhanced Arabic search and is powered by Google.

- Development of national digital archives and digitization of public, educational, scientific and cultural heritage information.

Many initiatives have been taking place since the early 2000s to digitize public information in the Lebanese Government. As previously mentioned the National Archives and OMSAR worked jointly on

the digitization and indexing of all historic documents available at the directorate in 2005. Furthermore, many government agencies' sites were initiated as information portals with Informs.gov.lb being a centralized nationwide government information portal.

- Use of social networking and social media/websites and the contribution of individuals.

The use of Facebook and twitter as a social media by the government is non-existent. However, some ministers have initiated personal accounts as an open forum of communication with the public. The first minister to do that was HE Ziad Baroud, Minister of Interior and Municipalities in 2010.

B. Local and national digital content development

- Digital content development (web-based, CDs, DVD)

In September 2010, entrepreneurs Elie-Grégoire Khoury and Elias Fadel Khoury developed innovative solutions in the field of digital imaging by creating ground-breaking mathematical algorithms that became an undisputed leader in panoramic imaging worldwide, Dermandar. Dermandar is a free webware that allows users to create panoramas. It has a stitching and blending tool and it offers a 3D panorama viewer. Panoramas can then be embedded into personal web pages and viewed using a Flash 3D viewer. The name Dermandar originates from a Lebanese slang name دِير مندار that means "all around"²⁷.

- Creation and distribution of software in local languages

As mentioned previously, the OMSAR is currently working on a Workflow, Document Management and Archiving System Enterprise project to be implemented for the Lebanese government. The WFS/DMS and Archiving System Enterprise Project will select a single product that will cater for the government workflow, document management and archiving automation needs in a systematic, standardized and cost effective approach. The project will Standardize WFS/DMS and Archiving Systems and common dictionary across the different government agencies and provide it in three different languages (Arabic, English and French) for the use by the public sector.

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

Promotion by governments, through public/private partnerships, of technologies and R&D programmes

The government's role in promoting research and development in the technology areas of translations, machine translation tools, electronic dictionaries, terminology and thesauri and even multi-lingual search engines and content referencing is very shy. Even through the public private partnerships, the current initiatives are still in the natal stage and still focusing on eliminating the digital divide and dispensing IT knowledge on the community as a whole.

D. Arabic domain names

Despite the fact that SEOUL, the private body that oversees the basic design of the Internet, voted end 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

- Diversity of media and ownership

Currently there are fifteen (15) TV stations, twenty-three (23) newspapers (18 daily and 6 non-daily) and forty six (46) independent radio stations operating in Lebanon²⁸. With the technology boom, almost all the Lebanese Media joined the Web revolution and made their appearance on the net. The Web media was accompanied by a new generation of press, the "Pure Web Media", represented by around seven (7)

²⁷ www.darmandar.com

²⁸ <http://www.pressreference.com/Ky-Ma/Lebanon.html>

news websites (elnashra.com, lebanonfiles.com, nowlebanon.com, naharnet.com, allprint.net, tayyar.org, and almustaqbal.org). The news sites are mostly bi or tri-lingual with the exception of Lebanonfiles.com that is published solely in Arabic.

Table ##: Newspapers, Radio and Television Ownership

Media outlets	Number	Language(s)	Ownership			
			Private	Mixed	Government	Foreign
News papers	23	Arabic, Armenian, English and French				
Electronic newspapers	6	Arabic and French				
Magazines	158	Arabic, Armenian, English and French				
News agency	7	Arabic, English and French				
Radios	6	Arabic, English and French				
Televisions	15	Arabic, Armenian, English and French	14		1	

Source: worldpress.org, www.lebweb.com

- Existence of Government support to media institutions and reporters

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.

- Legislations governing the media sector

With only one station of the 15 local TV stations being state-owned, Lebanon is thought to have a heaven of “Free” media. With the enactment of the Audiovisual Media law, many of the small operators of illegal stations at the time were closed and mostly influential politicians and corporate conglomerates were the ones to receive the bulk of the private licenses²⁹. 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 is always an indirect influence 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.

- The contribution of media sector to the freedom and plurality of information

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

- Gender portrayal in the media and percentage of female journalists.

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

²⁹ www.pressreference.com/Ky-Ma/Lebanon.html

presence has started to shine in the field.

B. The media and its role in the Information Society

- Role of the media: print, broadcast as well as new media in the Information Society.

The Lebanese media rarely covers information technology as a main program topic. For example Al Nahar newspaper has a dedicated section for ICT under the name “Computer and Internet” that is issued only once a week (every Sunday); however, the issues are addressed more as a social and cultural event rather than as a topic of discussion and debate. The other audio visual programs airing and correlated to ICT are phone, cameras and computer releases and prices rather than technological advancements in terms of innovative applications, networks or system. The problem may lay on the fact that the percentage of media listeners, readers and viewers for ICT topics do not represent a big enough stake of the media audience to encourage a dedication of a section or program on ICT. Nevertheless, pure technical sites have been emerging in the last couple of years, with www.techies.com being the first online magazine about latest computers, internet innovations, online games, tutorials, freeware and more.

- Use of traditional media in bridging the knowledge divide and facilitating the flow of knowledge, particularly in rural areas.

As mentioned in the point above, ICT has not yet made its appearance in the Media as a hot topic, and as such the Media’s role in facilitating, promoting and even dispensing the flow of knowledge on Information Technology in Lebanon has not yet occurred. However, with a new generation of technology fans, heads might be turned towards the importance of Information Technology in the Media and to make its entrance with E-legance.

C. Convergence between ICT and the media

With the lack of high-speed mobile networks, mobile users having Internet access on mobile handsets is limited to the availability of some WIFI areas and the slow Wireless Application Protocol (WAP) made available by the mobile operators. Lebanon falls behind so many neighboring and Arab countries in which the latest Arab Advisors Group’s research shows that 63% of Internet users in key markets such as Saudi Arabia access Internet through their mobile handsets (through a 3G connection or Wi-Fi), up from 47% in 2008.

With the wide availability of smartphone devices, content creators and application developers have been quick to capitalize on the opportunity these devices present. However, the weak infrastructure keeps on presenting the major block for Lebanon to make use of such available technologies. Research shows that by March 2011, there were more than 800 applications either created by Arab developers or available in Arabic on the three major platforms alone (Apple App Store, Blackberry App World and Android Market) and this number is rapidly increasing with new applications published every day. Yet Lebanese residents and visitors to the country lack this luxury. It is perceived, however, that with the planned 3G late introduction, matters will adjust to provide the Lebanese market with better mobile services.

10. International and regional cooperation

A. Financing of ICT networks and services

- Attraction of major private national and foreign investments

Unfortunately, Lebanon has some restrictions against foreign investment in several sectors, as well as unofficial barriers such as outdated legislation and a weak judicial system. However, Lebanon offers a variety of incentive packages, including tax incentives. Secured interests in property are enforced, but intellectual property rights enforcement is still weak. Political instability may be another deterrent from investment coupled with high corruption levels, as reflected in Lebanon's ranking of 102nd out of 180 countries in Transparency International's 2008 Corruption Perceptions Index (CPI), and 127th in 2010³⁰.

The European Commission delegation to Lebanon has provided since 2007 over 2 million euros (\$2.78 million) in technical assistance and equipment to reinforce the capacities of the Lebanese Telecom Regulatory Authority and allow it to fully develop its mandate according to the national law.

³⁰ DailyStar, 27 October 2010

The sources of financing of the ICT sector in Lebanon are mostly based on private initiative. The government does not provide much financial facilitations or funding for private ICT investment. Most of the foreign investment in ICT in Lebanon is from the Arab world.

- Improvements and innovations of financing mechanisms.

The Lebanese Government has embarked on major reformative action plans to modernize the regulatory framework and provide a suitable climate for investment in an efficient legislative environment. Across the years, and since the end of the war, new policies have been adopted, and modern laws have been promulgated such as:

- Foreign Acquisition of Property law that facilitates and streamlines the acquisition of real estate by foreigners;
- Customs Law that facilitates import and export procedures;
- Ambitious Privatization Programs in the vital sectors of the national economy such as Telecommunication, Water, Energy, and Transportation;
- Reduction of Customs Duties on almost all imports and especially raw material, equipment destined for industrial use, and IT-related products;
- Investment Promotion Law adopted by the Government and awaiting the Lebanese Parliament's approval.

In addition other reformative measures were undertaken:

- Increasing subsidies of interest rates on soft loans for vital sectors of the national economy (IT, Tourism, Industry, and Agriculture);
- Equalizing property registration fees for foreigners with Lebanese nationals and reducing them to 5 %;
- Reducing the Social Security Fund Contribution.

B. Infrastructure development projects

- Current implemented and future planned projects supported or financed by international or regional organizations.

The Lebanese Government is currently working on a couple of national projects through international and regional financing agreements, such as:

1. The automation of the Ministry of Justice's courts in Lebanon through a project financed by the European Union (EU); and
2. The e-government portal phase I that was launched for bidding in May 2011.

- Governmental efforts to market ICT projects and raising its national priority

In February 2011, the TRA signed a memorandum of understanding with the Turkish telecom regulatory authority for the strengthening of the bilateral relations between the two authorities, exchange of experience in several areas, including, consumer protection issues, traffic rights, ensure quality of service, IP, networks and information security protection and stimulating technical innovations in the field of electronic communications.

The two parties agreed to strengthen the cooperation through exchange of information and documentation, training of technicians and administrative bodies, organizing workshops and bilateral conferences, disseminating best practices in electronic communications planning, in addition to any other form of cooperation the parties might find appropriate.

C. WSIS Follow-up

- Survey of national action plans to support the fulfillment of the goals indicated in [WSIS declaration of principles](#)
Content not available.

- Regional projects for building the information society

Below is an updated list of recent initiatives on national and governmental projects:

- Policies and Procedures: preparation for One-Stop-Shops in 4 ministries (Ministry of Public Health, Ministry of Agriculture, Ministry of Tourism and Ministry of Education and Higher Education) has been initiated. It is perceived that the one-stop-shops will be operational and open for the public by next year (2012);
- ICT Strategy: mid-2010, an e-Government strategy roadmap was devised by the OMSAR translating the set strategies of 2002 and 2007 into actual action and time plan. The formulated roadmap draws a 5 year plan for the implementation of the set strategy;
- Telecommunications: The Ministry of Telecom (MOT) is currently working on the installation of a 3G infrastructure through the two local mobile companies. The MOT has also started the expansion of the fiber optics network project since March 2010 and initiated the IMEWE submarine cable project late 2010 as an ultra high capacity fiber optic submarine cable system which links India & Europe via Middle East.;
- 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;
- System Applications: the OMSAR is currently working on the launching of an enterprise WFS/DMS and Archiving system to serve all public institutions' need in transaction and document automation. The main purpose of this project is to unify and standardize the automation methodology and build a robust G2G infrastructure;
- Human resources: OMSAR's latest training project was launched in September 2010. The fifth government wide ICT training project for government employees includes 63 high end ICT courses and is expected to span over a period of one year and a half and expected to cover around 2500 training requests;

- Magnitude of the digital divide, in both its domestic and international dimensions.

Content not available

The OMSAR in close coordination with the Office of the Prime Minister has initiated different focus groups and stakeholders' joint meetings to agree on the country's key indicators and to set the measurement strategy to be adopted.

- Identify success stories:

- Availability of website on best practices and success stories (experience-sharing), based on a compilation of contributions from all stakeholders, in a concise, accessible and compelling format.

The OMSAR has also launched a "Government Website Standardization" project in November 2010 to standardize the general design, look and feel (site categories, navigation flow, links, etc.) of government sites, based on best practices, allowing web visitors to correlate government sites with specific standard layout to ease the public entities' site surfing. The project is expected to end November 2011. Once finalized, this project will be used as the basis for measuring government websites' compliance to the set best practices and conformity to the adopted measures.

- Availability of projects, which exchange knowledge, experiences and best practices on policies and tools designed to promote the Information Society at regional and sub-regional levels.

None available

D. Participation in Internet Governance activities

- Involvement in the Internet Governance Forum (IGF) process;
- Involvement in ICANN's policy making and public consultations.

Content not available

11. Building the ICT Sector

A. ICT Firms

Currently in Lebanon, there are around 559 ICT companies distributed among different types of ICT activities.

Companies have different activity types, combining hardware providers and software developers and ICT capacity building. It is worth noting that ICT companies have been growing in Lebanon with a service range reaching all neighboring and regional countries. Many Lebanese ICT companies rely heavily on the gulf market and recently have been targeting underdeveloped countries such as in Africa.

B. Government facilitation

Though from the government’s side not much has changed since 2009, International Organizations have had a more active role lately. Early 2010, World Bank’s investment arm IFC has announced a \$100 million equity investment in Lebanon’s Byblos Bank to help increase access to finance for small and medium enterprises and to expand the bank’s operations to frontier countries in the Middle East and Africa. The IFC aim is to build up confidence and encourage needed investment in the Lebanese financial sector, which in turn will increase access to finance for individuals and entrepreneurs.

C. Contribution of ICT sector in the national economy

Lebanon’s ICT market grew by 30 percent at the retail level over the past two years, but, like many other Arab countries, it is still lagging behind other countries due to low broadband³¹. However, Lebanon is blessed with skilled human resources, a sophisticated and multilingual human capital, a strategically geographic location and a competent and well-educated diaspora. This is a unique mix that gives the country a competitive advantage in the ICT sector, especially since Lebanon is heavily dependent on the services economy.

- ICT Revenues

In a session held in the framework of the EMERG conference at the Movenpick Hotel in Beirut to discuss the future of the ICT sector in the Middle East and North Africa Region (MENA) in April 2011, Mr. Hedi Larbi, country director of the Middle East department at the World Bank in the MENA region, stated that ICT revenues in 1994 in Lebanon reached \$517 billion, and 10 years later, the figure had topped \$1.2 trillion and is estimated to increase to \$2.4 trillion by the end of 2010.

On another hand, the Business Monitor International (BMI)³² of 2010 speculates that the ICT industry in Lebanon will reach 321 Million dollars by end of 2011 growing from 287 Million in 2010. This is mainly due to the general growth in the economy by 10%. BMI perceive that the ICT market will mainly benefit from the major infrastructure projects being undertaken by the MOT to build the broadband. Furthermore, Lebanon Weekly Monitor issued by Audi Group reported that there is a high potential for the growth of the ICT sector notably through provision of ICT technologies to vital economy service sectors such as the banking sector, real estate and telecom. However, the expected growth is dependable on the political stability of the country³³.

The Audi Group report also stated that computer hardware sales in Lebanon are expected to reach 164 million dollars by end 2011 rising from 147.5 million dollars in 2010. The speculation is that the computer hardware sector is expected to hit 11% growth between 2011 and 2015.

- ICT Expenditures

In 2008, IT expenditure in Lebanon was around \$350M, till end of 2010 a 20% growth has been reported bringing the expenditure level to \$420M.

Distribution of this spending is divided as 77.3% on equipment and supplies, 12.8% of the services sector, and 9.9% on software.

It is expected that IT spending in Lebanon in 2013 to reach more than \$500M.

- Export of ICT goods and services

Updated Customs’ Figures related to ICT goods

2009	2010	2011*	Years Total	Yearly Average
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³¹ Daily Star, October 2010

³² <http://www.businessmonitor.com>

³³ Annahar Newspaper, 18 February 2011

	2009	2010	2011*	Years Total	Yearly Average
Export Special	100,370	208,962	33,848	342,716	114,239
Import Special	516,491	507,751	80,383	1,104,625	368,208
Export General	133,392	244,170	33,414	277,717	92,572
Import General	103,085	217,371	23,150	343,604	114,534

Source: Directorate of Lebanese Customs³⁴

*Note: the 2011 figures represent the till June 2011 values

- Contribution to the GDP

According to the World Bank country director and in terms of economics, it is estimated that ICT contributed to between 0.6 percent and 1 percent growth of GDP for every 10 percent additional penetration. In terms of jobs, ICT contributed to between 3 percent and 5 percent of the employed labor force, while the cost per additional job is one of the lowest compared to other sectors.

It is believed that the only sector that would sustain in a way and overcome the global crisis today is the ICT sector and this is mainly due to the progress seen in the mobile-phone sector despite the lag in broadband.

- Employment in the ICT sector

In 2010, the number of ICT projects has risen up. The government has granted 5 licenses to International companies to build call centers for the country which has led to an increase and a boost to the employment level notably in the ICT sector. The employment opportunities created span on a period of at least 5 years (call center contract period). In addition, the government Broadband project is expected to attract 500 million dollars' worth of investments.

D. R&D and Investments in the ICT sector

- Research and development in the field of ICT, equipments, tools and services

Software output in Lebanon consists mainly of services, maintenance, and outside contracting. There is little or no active research or competitive of software development. The services consist mainly of company specific Database design/ Business management software that is tailored to the Lebanese Law and the needs of the different small to medium local companies. Most of the major consulting companies like PWC, Andersen and others, have offices in Beirut and also offer software development for specific business needs. There is no production of main stream software.

- Local and foreign investments in the ICT sector

ICT research facilities (existing or planned?)	None
ICT industrial clusters (existing or planned?)	None
ICT incubators (existing or planned?)	Exists (Berytech)

12. Millennium Development Goals – MDG

A. Progress toward achieving the MDG

In September 2010, eight LAU Model United Nation (MUN) students presented the MDGs, highlighting the current situation in Lebanon, the challenges faced, the strengths involved, and the recommendations that can ensure the successful implementation of the MDGs in Lebanon by 2015. The initiative reaffirmed the commitment of Lebanese youth to eradicating extreme poverty and hunger; achieving universal primary education; promoting gender equality and empowering women; reducing child mortality; improving maternal health; combating HIV/AIDS, malaria and other diseases; ensuring environmental sustainability; and creating a global partnership for development.

The students' recommendations regarding fighting extreme poverty and hunger included the

³⁴ <http://www.customs.gov.lb>

implementation of an integrated and comprehensive social development strategy, as well as the adoption of social safety net systems, pro-poor economic policies, and efficient mechanisms to measure poverty. To ensure that by 2015 children of both genders everywhere will be able to complete a full course of primary schooling, the students called for “offering children a friendly and accepting environment,” “creating a link between formal and non-formal education,” “developing a culture of quality among all those involved in education ensuring relevance of schooling,” “restructuring educational programs in a way that suits all social groups,” and promoting “the exchange of experience and knowledge between Arab countries.”³⁵

The Beirut Declaration for Woman and Child Health Rights was launched at the 35th Round of the Arab Health Ministers Council on March 2011.

It is a regional declaration that stresses on the importance of promoting female and child health and calls on Arab states to adopt specific protocols to improve medical access for women and children and decrease child mortality rates. The provisions found in the protocol aim at monitoring the health of children and stress the need to monitor children’s reproductive growth, especially in females to ensure safe pregnancy. The protocol affirms on the importance of monitoring women and children’s mental health by examining them for physical abuse. Provisions also attest to the need to test unmarried women for diseases such as HIV, and Hepatitis B. Neonatal care does exist and is implemented in Lebanon and would further develop in line with the protocol.

On another hand, the Ministry of Public Health is working to implement a national health care program for pregnant women, offering them medical services for low prices. The program is currently being implemented in its initial stage in remote areas in the north passing through the Bekaa and reaching the south.

- Efforts and stock taking initiatives

The reported new stock taking is in the maternal mortality rate that has dropped from 300/100,000 live births in 1990 to 86/100,000 in 2004 and 23/ 100,000 in 2008.

B. Use of ICT for achieving the MDGs

Many plans and projects are being prepared for the development of the ICT and to make it useful in catalyzing the development of processes to achieve global and national goals. The realization of the Standardization of Government Transaction forms project will allow citizens to have access to 100 government transaction forms over the web in a well organized and standardized look and feel and clear instructions on how and what to fill on the form. The project ensures transparency between the citizen and the government agencies as forms now will clearly state the requested supplementary documents for the respective government transaction and the due stamps to name few of the project’s benefits. On another hand, the launching of e-government portal will provide to the citizen easy access to government information and some e-services.

As for e-taxation that was launched in February 2011 by the MOF and the perceived e-payment implementation, the two projects will have measurable and direct impact on the development of Lebanese economy.

Given that most of the ICT projects that are considered as the main catalysts in the economic development, there is no current measurable impact till date. It is perceived that the coming couple of years will witness a remarkable improvement with clear impact on the economic development.

³⁵ www.lau.edu.net.lb

ANNEX 1:

Core ICT Indicators

Table 1 - Indicators on ICT infrastructure and access

Core indicator		Definitions and notes	2008	2009	2010
A1	Fixed telephone lines per 100 inhabitants	<p><i>Fixed telephone lines per 100 inhabitants</i> is calculated by dividing the number of fixed telephone lines by the population and then multiplying by 100.</p> <p><i>Fixed telephone lines</i> refer to telephone lines connecting a subscriber's terminal equipment to the public switched telephone network (PSTN) and which have a dedicated port on a telephone exchange. This term is synonymous with the terms "main station" and "Direct Exchange Line" (DEL) that are commonly used in telecommunication documents. It may not be the same as an access line or a subscriber. The number of ISDN channels and fixed wireless subscribers are included.</p>			
A2	Mobile cellular telephone subscribers per 100 inhabitants	<p><i>Mobile cellular telephone subscribers per 100 inhabitants</i> is obtained by dividing the number of mobile cellular subscribers by the population and then multiplying by 100.</p> <p><i>Mobile cellular telephone subscribers</i> refer to users of portable telephones subscribing to a public mobile telephone service using cellular technology, which provides access to the PSTN. This includes analogue and digital cellular systems, including IMT-2000 (Third Generation, 3G). Post-paid and prepaid subscribers are included. Prepaid subscribers are those that have used their account within a reasonable period of time. This period (e.g. 3 months) should be indicated in a note. Inactive users, which refers to owners of a prepaid card that have not made or received a call within the last 3 months, should be excluded.</p>			
A3	Fixed Internet subscribers per 100 inhabitants	<p><i>Fixed Internet subscribers per 100 inhabitants</i> is obtained by dividing the number of fixed Internet subscribers by the population and then multiplying by 100.</p> <p><i>Fixed Internet subscribers</i> refer to the total number of Internet subscribers with fixed access, which includes dial-up and total fixed broadband subscribers: cable modem, DSL Internet subscribers, other fixed broadband and leased line Internet subscribers.</p>			
A4	Fixed broadband Internet subscribers per 100 inhabitants	<p><i>Fixed broadband Internet subscribers per 100 inhabitants</i> is obtained by dividing the number of fixed broadband Internet subscribers by the population and then multiplying by 100.</p> <p><i>Fixed broadband Internet subscribers</i> refer to users of the Internet subscribing to paid high-speed access to the public Internet (a TCP/IP connection). High speed access is defined as being-at least 256 kbit/s, in one or both directions. Fixed broadband Internet includes cable modem, DSL, fibre and other fixed broadband technology (such as satellite broadband Internet, Ethernet LANs, fixed-wireless access, Wireless Local</p>			

		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	<p><i>Mobile broadband subscribers per 100 inhabitants</i> is obtained by dividing the number of mobile broadband subscribers by the population and then multiplying by 100.</p> <p><i>Mobile broadband subscribers</i> refer to subscribers to mobile cellular networks with access to data communications (e.g. the Internet) at broadband speeds (here defined as greater than or equal to 256 kbit/s in one or both directions) such as WCDMA, HSDPA, CDMA2000 1xEV-DO, CDMA 2000 1xEV-DV etc, irrespective of the device used to access the Internet (handheld computer, laptop or mobile cellular telephone etc). These services are typically referred to as 3G or 3.5G and include:</p> <ul style="list-style-type: none"> -Wideband CDMA (W-CDMA), an IMT-2000 3G mobile network technology, based on CDMA that presently delivers packet-switched data transmission speeds up to 384 kbit/s and up to 2 Mbit/s when fully implemented. It is known as <i>Universal Mobile Telecommunications System</i> (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)	<p><i>International Internet bandwidth per inhabitant</i> is obtained by dividing the amount of bandwidth (in bits/second) by the population.</p> <p><i>International Internet bandwidth</i> refers to the capacity which backbone operators provide to carry Internet traffic. It is measured in bits per second.</p>			
A7	Percentage of population covered by a mobile cellular telephone network	<p><i>Percentage of population covered by a mobile cellular telephone network</i> refers to the percentage of a country's inhabitants that live within areas served by a mobile cellular signal, irrespective of whether or not they choose to use it. Note that this measures the theoretical ability to use mobile cellular services if one has a cellular telephone and a subscription.</p>			
A8	Fixed broadband Internet access tariffs (per month), in US\$, and as a percentage of monthly <i>per capita</i> income	<p><i>Fixed broadband Internet access tariffs</i> are the lowest sampled cost in US\$ per 100 kbit/s per month and are calculated from two different broadband prices, low and high speed monthly ISP charges. <i>Low speed monthly charge</i> refers to a typical 'entry-level' broadband lower-speed connection (download speeds of 256 – 1,024 kbit/s). <i>High speed monthly charge</i> refers to a faster and typically more expensive offer. Monthly charges do not include installation fees nor modem rentals. The <i>lowest sampled cost in US\$ per 100 kbit/s</i> is the most cost-effective offer for a country based on the criterion, the 'lowest cost per 100 kbit/s'. The cost per 100 kbit/s is calculated by dividing the monthly subscription charge in US\$ by the theoretical download speed, and</p>			

		<p>then multiplying by 100.</p> <p><i>As a percentage of monthly per capital income</i> refers to the lowest sampled cost in US\$ per 100 kbit/s divided by the average monthly gross national income <i>per capita</i> (World Bank, Atlas method, current US\$) and expressed as a percentage.</p> <p>To ensure international comparability, this indicator is compiled by ITU.</p>			
A9	Mobile cellular prepaid tariffs, in US\$, and as a percentage of monthly <i>per capita</i> income	<p>Mobile cellular prepaid tariffs are based on the methodology of the <i>OECD monthly low-user basket</i>³⁶ (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.</p> <p><i>As a percentage of monthly per capita income</i> involves dividing the price of the-monthly low user basket by the average monthly gross national income <i>per capita</i> of the country.</p> <p>To ensure international comparability, this indicator is compiled by ITU.</p>			
A10	Percentage of localities with public Internet access centres (PIACs) by number of inhabitants	<p><i>Percentage of localities with public Internet access centres (PIACs)</i> is computed by dividing the number of localities with at least one PIAC by the total number of the country's localities and then multiplying by 100.</p> <p>A <i>public Internet access centre (PIAC)</i> is a site, location, or centre of instruction at which Internet access is made available to the public, on a full-time or part-time basis. PIACs include telecentres, digital community centres, Internet cafés, libraries, education centres and other similar establishments, whenever they offer Internet access to the general public. All such centres should have at least one public computer for Internet access. <i>Localities</i> can refer to a country's villages, towns, cities or enumeration areas used by the national statistics office for survey purposes.</p> <p>Note that this indicator is used to measure the WSIS target "<i>to connect villages with ICTs and establish community access points</i>" by 2015.</p>			

³⁶ For definition, see: <http://oberon.sourceoecd.org/vl=15177325/cl=12/nw=1/rpsv/sti2007/ge11-1.htm>.

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

Core indicator		Definitions and notes	2008	2009	2010
HH1	Proportion of households with a radio	The <i>proportion of households with a radio</i> is calculated by dividing the number of in-scope households with a radio by the total number of in-scope households. A <i>radio</i> is a device capable of receiving broadcast radio signals, using popular frequencies, such as FM, AM, LW and SW. It includes a radio set integrated in a car or an alarm clock but excludes radios integrated in a mobile phone, a digital audio player (MP3 player) or in a computer.			
HH2	Proportion of households with a TV	The <i>proportion of households with a TV</i> is calculated by dividing the number of in-scope households with a TV by the total number of in-scope households. A <i>TV</i> (television) is a stand-alone device capable of receiving broadcast television signals, using popular access means such as over-the-air, cable and satellite. It excludes TV functionality integrated into another device, such as a computer or a mobile phone.			
HH3	Proportion of households with telephone	The <i>proportion of households with a telephone</i> (fixed or mobile) is calculated by dividing the number of in-scope households with a telephone (fixed or mobile) by the total number of in-scope households.			
	Proportion of households with fixed telephone only	The <i>proportion of households with a fixed telephone only</i> is calculated by dividing the number of in-scope households with a fixed telephone only by the total number of in-scope households. A <i>fixed telephone line</i> refers to a telephone line connecting a customer's terminal equipment (e.g. telephone set, facsimile machine) to the public switched telephone network (PSTN) and which has a			
		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 cellular telephone only	The <i>proportion of households with a mobile cellular telephone only</i> is calculated by dividing the number of in-scope households with a mobile cellular telephone only by the total number of in-scope households. A <i>mobile cellular telephone</i> refers to a portable telephone subscribing to a public mobile telephone service using cellular technology, which provides access to the PSTN. This includes analogue and digital cellular systems, as well as IMT-2000 (3G). Users of both post-paid subscriptions and pre-paid accounts are included.			

Core indicator		Definitions and notes	2008	2009	2010
	Proportion of households with both fixed and a mobile cellular telephone				
HH4	Proportion of households with a computer	<p>The <i>proportion of households with a computer</i> is calculated by dividing the number of in-scope households with a computer by the total number of in-scope households.</p> <p>A <i>computer</i> refers to a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants or TV sets.</p>			
HH5	Proportion of individuals who used a computer (from any location) in the last 12 months	<p>The <i>proportion of individuals who used a computer</i> is calculated by dividing the total number of in-scope individuals who used a computer from any location in the last 12 months by the total number of in-scope individuals.</p> <p>A <i>computer</i> refers to a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants or TV sets.</p>			
HH6	Proportion of households with Internet access at home	<p>The <i>proportion of households with Internet access at home</i> is calculated by dividing the number of in-scope households with Internet access by the total number of in-scope households.</p> <p>The <i>Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer – it may also be by mobile phone, PDA, games machine, digital TV etc.). Access can be via a fixed or mobile network.</p>			
HH7	Proportion of individuals who used the Internet (from any location) in the last 12 months	<p>The <i>proportion of individuals who used the Internet</i> is calculated by dividing the total number of in-scope individuals who used the Internet (from any location) in the last 12 months by the total number of in-scope individuals.</p> <p>The <i>Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.). Access can be via a fixed or mobile network.</p>			

Core indicator		Definitions and notes	2008	2009	2010
HH8	Location of individual use of the Internet in the last 12 months	<p>The proportion of individuals who used the Internet at each location can be calculated as either: the proportion of in-scope individuals or the proportion of <u>Internet users</u>, using the Internet at each location.</p> <p>Access to the Internet is not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.</p> <p>Individuals should be asked about all locations of Internet use (that is, the survey question used by countries should specify multiple responses³⁷). 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.</p>			
	Home				
	Work	Where a person's workplace is located at his/her home, then he/she would answer yes to the home category only.			
	Place of education	For students. Teachers and others who work at a place of education, would report 'work' as the place of Internet use. Where a place of education is also made available as a location for general community Internet use, such use should be reported in the <i>Community Internet access facility</i> category.			
	Another person's home	The home of a friend, relative or neighbour.			
	Community Internet access facility	Internet use at community facilities such as public libraries, publicly provided Internet kiosks, non-commercial telecentres, digital community centres, post offices, other government agencies (such as schools); access is typically free and is available to the general public.			
	Commercial Internet access facility	Internet use at publicly available commercial facilities such as Internet or cyber cafés, hotels, airports etc, where access is typically paid (i.e. not free of charge).			

³⁷ 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	2008	2009	2010
	Any place via a mobile cellular telephone	Use of the Internet at any location via a mobile cellular telephone (including handheld devices with mobile phone functionality).			
	Any place via <i>other</i> mobile access devices	Use of the Internet at any location via other mobile access devices, e.g. a laptop computer or handheld device that uses wireless access (at a WiFi 'hotspot') or a laptop computer connected to a mobile phone network.			
HH9	Internet activities undertaken by individuals in the last 12 months (from any location)	<p>The proportion of individuals who undertook each activity can be calculated as either: the proportion of in-scope individuals or the proportion of <u>Internet users</u> who undertook each activity.</p> <p>Note that these activities are restricted to private purposes and therefore exclude activities such as purchasing over the Internet undertaken as part of a person's job.</p> <p>Individuals should be asked about all Internet activities (that is, the question used by countries should specify multiple responses. Activities are not mutually exclusive.</p> <p>Access to the Internet is not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.</p>			

Core indicator		Definitions and notes	2008	2009	2010
	Getting information about goods or services				
	Getting information related to health or health services	Includes information on injury, disease, nutrition and improving health generally.			
	Getting information from general government organizations	<i>General government organizations</i> should be consistent with the SNA93 (2008 revision) concept of general government. According to the SNA "... the principal functions of government are to assume responsibility for the provision of goods and services to the community or to individual households and to finance their provision out of taxation or other incomes; to redistribute income and wealth by means of transfers; and to engage in non-market production." (General) government organizations include central, state and local government units.			
	Interacting with general government organizations	Includes downloading/requesting forms, completing/lodging forms on line, making on-line payments and purchasing from government organizations. It-excludes getting information from government organizations. <i>General government organizations</i> should be consistent with the SNA93 (2008 revision) concept of general government. According to the SNA "... the principal functions of government are to assume responsibility for the provision of goods and services to the community or to individual households and to finance their provision out of taxation or other incomes; to redistribute income and wealth by means of transfers; and to engage in non-market production." (General) government organizations include central, state and local government units.			
	Sending or receiving e-mail				
	Telephoning over the Internet/VoIP	Using Skype, iTalk, etc. Includes video calls (via webcam)			
	Posting information or instant messaging	Posting messages or other information to chat sites, blogs, newsgroups, online discussion forums and similar; use of instant messaging.			
	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	2008	2009	2010
	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	<p>The <i>proportion of individuals with use of a mobile cellular telephone</i> is calculated by dividing the total number of in-scope individuals with use of a mobile cellular telephone by the total number of in-scope individuals.</p> <p>A <i>mobile cellular telephone</i> refers to a portable telephone subscribing to a public mobile telephone service using cellular technology, which provides access to the PSTN. This includes analogue and digital cellular systems, as well as IMT-2000 (3G). Users of both post-paid subscriptions and pre-paid accounts are included.</p> <p><i>Use of a mobile cellular telephone</i> does not mean that the telephone is owned or paid for by the person but should be reasonably available through work, a friend or family member, etc. It excludes occasional use, for instance, borrowing a mobile phone to make a call.</p>			
HH11	Proportion of households with access to the Internet by type of access (narrowband, broadband (fixed, mobile))	<p>This indicator should be calculated as the proportion of in-scope households with Internet access that use each type of access service, for instance, the proportion of households with Internet access that use a broadband service as their means of access.</p> <p>It is expected that countries will collect data at a finer level than 'narrowband' and 'broadband'. The categories chosen by countries should allow aggregation to total narrowband and total broadband, as well as fixed and mobile broadband, as defined below.</p> <p>As households can use more than one type of access service, multiple responses are possible.</p>			

Core indicator		Definitions and notes	2008	2009	2010
	Narrowband	<i>Narrowband</i> includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s. Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and <i>i-mode</i> .			
	Fixed broadband	<i>Fixed broadband</i> refers to technologies such DSL (Digital Subscriber Line) at speeds of at least 256kbit/s, cable modem, high speed leased lines, fibre-to-the-home, powerline, satellite, fixed wireless, Wireless Local Area Network and WiMAX.			
	Mobile broadband	Mobile broadband access services include <i>Wideband CDMA</i> (W-CDMA), known as <i>Universal Mobile Telecommunications System</i> (UMTS) in Europe; High-speed Downlink Packet Access (HSDPA), complemented by High-Speed Uplink Packet Access (HSUPA); CDMA2000 1xEV-DO and CDMA 2000 1xEV-DV. (See A5). Access can via any device (handheld computer, laptop or mobile cellular telephone etc.).			
HH12	Frequency of individual use of the Internet in the last 12 months (from any location)	The <i>frequency of individual use of the Internet</i> can be calculated as: either the proportion of in-scope individuals or the proportion of <u>Internet users, using</u> 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 - Indicators on use of ICT by businesses

Core indicator		Definitions and notes	2008	2009	2010
B1	Proportion of businesses using computers	<p>The <i>proportion of businesses using computers</i> is calculated by dividing the number of in-scope businesses using computers during the 12-month reference period by the total number of in-scope businesses.</p> <p>A <i>computer</i> refers to a desktop or a laptop computer. It does not include equipment with some embedded computing abilities such as mobile cellular phones, personal digital assistants or TV sets.</p>			
B2	Proportion of persons employed routinely using computers ³⁸	<p>The <i>proportion of persons employed routinely using computers</i> is calculated by dividing the number of <i>persons employed routinely using computers</i> (in all in-scope businesses) by the total number of <i>persons employed</i> (in all in-scope businesses).</p> <p><i>Persons employed</i> refer to all persons working for the business, not only those working in clerical jobs. They include short-term and casual employees, contributing family workers and self-employed persons, who may be paid or unpaid.</p>			
B3	Proportion of businesses using the Internet	<p>The <i>proportion of businesses using the Internet</i> is calculated by dividing the number of in-scope businesses using the Internet by the total number of in-scope businesses.</p> <p>The <i>Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.). Access can be via a fixed or mobile network.</p>			
B4	Proportion of persons employed routinely using a computer with access to the Internet ³⁹	<p>The <i>proportion of persons employed routinely using a computer with access to the Internet</i> is calculated by dividing the number of <i>persons employed routinely using a computer with access to the Internet</i> (in all in-scope businesses) by the total number of <i>persons employed</i> (in all in-scope businesses).</p>			
B5	Proportion of businesses with a web presence	<p>The <i>proportion of businesses with a web presence</i> is calculated by dividing the number of in-scope businesses with a web presence by the total number of in-scope businesses.</p> <p>A <i>web presence</i> includes a website, home page or presence on another entity's website (including a related business). It excludes inclusion in an on-line directory and any other web pages where the business does not have control over the content of the page.</p>			

³⁸ Note that this indicator is not equivalent to the employment weighted indicator 'proportion of persons employed working in businesses with a computer'.

³⁹ 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	2008	2009	2010
B6	Proportion of businesses with an intranet	<p>The <i>proportion of businesses with an intranet</i> is calculated by dividing the number of in-scope businesses with an intranet by the total number of in-scope businesses.</p> <p>An <i>intranet</i> refers to an internal communications network using Internet protocols and allowing communication within an organization (and to other authorized persons). It is typically set up behind a firewall to control access.</p>			
B7	Proportion of businesses receiving orders over the Internet	<p>For international comparability, the <i>proportion of businesses receiving orders over the Internet</i> is most simply calculated by dividing the number of in-scope businesses receiving orders over the Internet by the total number of in-scope businesses. Alternatively, output can be presented as the proportion of in-scope businesses using the Internet.</p> <p><i>Orders received</i> include orders received via the Internet whether or not payment was made on line. They include orders received via websites, specialized Internet marketplaces, extranets, EDI over the Internet, Internet-enabled mobile phones and email. They also include orders received on behalf of other organizations – and orders received by other organizations on behalf of the business.</p> <p><i>Orders received</i> exclude orders that were cancelled or not completed.</p>			
B8	Proportion of businesses placing orders over the Internet	<p>For international comparability, the <i>proportion of businesses placing orders over the Internet</i> is most simply calculated by dividing the number of in-scope businesses placing orders over the Internet by the total number of in-scope businesses. Alternatively, output can be presented as the proportion of in-scope businesses using the Internet.</p> <p><i>Orders placed</i> include orders placed via the Internet whether or not payment was made on line. They include orders placed via websites, specialized Internet marketplaces, extranets, EDI over the Internet, Internet-enabled mobile phones and email.</p> <p><i>Orders placed</i> exclude orders that were cancelled or not completed.</p>			
B9	Proportion of businesses using the Internet by type of access (narrowband, broadband (fixed, mobile))	<p>This indicator should be calculated as the proportion of in-scope Internet-using businesses that use each type of access service, for instance, the proportion of Internet-using businesses that use a broadband service as their means of access.</p> <p>It is expected that countries will collect data at a finer level than 'narrowband' and 'broadband'. The categories chosen by countries should allow aggregation to total narrowband and total broadband, as well as fixed and mobile broadband, as defined below.</p> <p>As businesses can use more than one type of access service, multiple responses are possible.</p>			
	Narrowband	<p><i>Narrowband</i> includes analogue modem (dial-up via standard phone line), ISDN (Integrated Services Digital Network), DSL at speeds below 256kbit/s, and mobile phone and other forms of access with an advertised download speed of less than 256 kbit/s.</p>			

Core indicator		Definitions and notes	2008	2009	2010
		Note that narrowband mobile phone access services include CDMA 1x (Release 0), GPRS, WAP and <i>i-mode</i> .			
	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.			
	Mobile broadband	Mobile broadband access services include <i>Wideband CDMA (W-CDMA)</i> , known as <i>Universal Mobile Telecommunications System (UMTS)</i> 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 <i>proportion of businesses with a LAN</i> is calculated by dividing the number of in-scope businesses with a LAN by the total number of in-scope businesses. <i>A local area network (LAN)</i> 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 <i>proportion of businesses with an extranet</i> is calculated by dividing the number of in-scope businesses with an extranet by the total number of in-scope businesses. <i>An extranet</i> is a closed network that uses Internet protocols to securely share a business' information with suppliers, vendors, customers or other businesses partners. It can take the form of a secure extension of an Intranet that allows external users to access some parts of the business' Intranet. It can also be a private part of the business' website, where business partners can navigate after being authenticated in a login page.			
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. <i>The Internet</i> is a world-wide public computer network. It provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files, irrespective of the device used (not assumed to be only via a computer – it may also be by mobile phone, games machine, digital TV etc.). Access can be via a fixed or mobile network. 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				

Core indicator		Definitions and notes	2008	2009	2010
	receiving e-mail				
	Telephoning over the Internet/VoIP, or using video conferencing	Using Skype, iTalk, etc. Includes video calls (via webcam)			
	Use of instant messaging, bulletin boards				
	Getting information about goods or services				
	Getting information from general government organizations	<i>General government organizations</i> should be consistent with the SNA93 (2008 revision) concept of general government. According to the SNA "... the principal functions of government are to assume responsibility for the provision of goods and services to the community or to individual households and to finance their provision out of taxation or other incomes; to redistribute income and wealth by means of transfers; and to engage in non-market production." (General) government organizations include central, state and local government units.			
	Interacting with general government organizations	Includes downloading/requesting forms, completing/lodging forms on line, making on-line payments and purchasing from, or selling to, government organizations. It excludes getting information from government organizations.			
	Internet banking	Includes electronic transactions with a bank for payment, transfers, etc. or for looking up account information.			
	Accessing other financial services	Includes electronic transactions via the Internet for other types of financial services such as share purchases, financial services and insurance.			
	Providing customer services	Customer services include providing on-line or emailed product catalogues or price lists, product specification or configuration on line, after sales support, and order tracking on line.			
	Delivering products on line	Delivering products on line refers to products delivered over the Internet in digitized form, e.g. reports, software, music, videos, computer games; and on-line services, such as computer-related services, information services, travel bookings or financial services.			
	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 - Indicators on the ICT (producing) sector

Core indicator		Definitions and notes	2008	2009	2010
ICT1	Proportion of total business sector workforce involved in the ICT sector (expressed as a percentage)	<p><i>ICT workforce</i> (or ICT employment) consists of those persons employed in businesses that are classified as belonging to the ICT sector. <i>Total business workforce</i> represents all persons engaged in domestic production in the business sector. In a national accounts framework, employment can be measured in terms of headcounts, jobs, full-time equivalents (FTE) or hours worked.</p> <p>For countries using ISIC Rev. 3/Rev 3.1 (or national equivalents), the ICT sector is defined per the OECD's 2002 definition. This can be found in Box 1 and is discussed in detail in OECD (2007).</p> <p>For countries using ISIC Rev. 4 (or national equivalents), the ICT sector is defined per the OECD's 2007 definition. This can be found in Box 2 and is discussed in detail in OECD (2007).</p> <p>The total business sector is defined on an activity (industry) basis per ISIC Rev. 3.1 as divisions 10–67 and 71–74. It therefore excludes: agriculture, hunting, forestry and fishing; real estate activities (because a significant proportion of the value added of the latter consists of imputed rent of owner-occupied dwellings); and, community, social and personal services (which consists mainly of non-market activities such as public administration, education and health services).</p> <p>For countries using ISIC Rev. 4, the total business sector is not so easily defined. It will most likely include the equivalent divisions 05 to 36, 41-66, 69-82 and 95. Discussions are ongoing on whether it should include some industries that were not included in the Rev. 3.1 definition of the total business sector (divisions 37-39, 90-93 and 96).⁴⁰</p>			
ICT2	ICT sector share of gross value added (expressed as a percentage of total business sector gross value added).	<p><i>Gross value added</i> for a particular industry represents its contribution to national GDP. It is sometimes referred to as GDP by industry and is not directly measured (but is estimated in a national accounts framework). In general, it is calculated as the difference between production (gross output) and intermediate inputs (the energy, materials and services required to produce final output). See also Table 7.</p> <p>Definitions of the ICT and total business sector are per ICT1.</p>			

⁴⁰ See draft ISIC Rev. 4: <http://unstats.un.org/unsd/cr/registry/regist.asp?CI=27>.

Table 5 – Indicators on international trade in ICT goods

Core indicator		Definitions and notes	2008	2009	2010
ICT3	ICT goods imports as a percentage of total imports	<p><i>ICT goods</i> are defined per the OECD's 2003 ICT goods classification, based on the 1996 and 2002 Harmonized System classification. It can be found in UNCTAD (2007).</p> <p>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).</p>			
ICT4	ICT goods exports as a percentage of total exports	<p><i>ICT goods</i> are defined per the OECD's 2003 ICT goods classification, based on the 1996 and 2002 Harmonized System classification. It can be found in UNCTAD (2007).</p> <p>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).</p>			

Table 6 - Indicators on ICT in education

Core indicator		Definitions and notes	2008	2009	2010
ED1	Proportion of schools with a radio used for educational purposes (by ISCED level 1 to 3)	Schools offering radio-based education as a percentage of the total number of schools in the country for each ISCED level (1-3).			
ED2	Proportion of schools with a TV used for educational purposes (by ISCED level 1 to 3)	Schools offering television-based education as a percentage of the total number of schools in the country for each ISCED level (1-3).			
ED3	Proportion of schools with a telephone communication facility (by ISCED level 1 to 3)	Schools with telephone communication facilities as a percentage of the total number of schools in the country for each ISCED level (1-3). Note that the facility should be directly associated with the school. For instance, a mobile phone which is owned by an individual working at the school would not constitute a school <i>telephone communication facility</i> .			
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 ⁴¹ by gender as a percentage of all students enrolled in educational			

⁴¹ 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.

Core indicator		Definitions and notes	2008	2009	2010
		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) ⁴²	Schools with electricity as a percentage of the total number of 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).

⁴² Since electricity is not specifically an ICT commodity, but an important prerequisite for using many ICTs, it is not included in the core list, but included as a reference indicator. International studies reviewed by UIS revealed that the lack of electricity is such a significant barrier in many developing economies that monitoring trends of its provision is as relevant as monitoring the supply and use of ICT.