

THE INFORMATION SOCIETY IN LEBANON: STATUS AND CHALLENGES

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Prepared by the
Office of the Minister of State for Administrative Reform (OMSAR)
and the
United Nations Development Programme (UNDP)
in Lebanon¹

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A. E-READINESS

1. THE STATE OF ICT FACILITIES AND INFRASTRUCTURE

Since the early 1990s, ICTs have greatly modified work and communication systems, leading to high productivity gains, decreasing costs, and exponentially growing networks that have re-organized socio-economic interaction. This has created an increasingly close-knit global community, with serious implications – positive and otherwise - for human development. How ready is Lebanon to become part of this global village? How technically able is the country to maximize ICT opportunities? How can Lebanon invest in ICT assets to enhance human development?

a. Telecommunications facilities

The public sector plays three main roles in supporting ICT development: as *facilitator*, it provides the infrastructure for development of the ICT sector; as *regulator*, the public sector enables ICT to develop within a sound legal and regulatory environment; and as a major *user*, the public sector is in a privileged position to boost demand for many ICT products.

As facilitator, the government has developed an extensive land-based telecommunications cable infrastructure that covers the entire country. The major use of this is currently for voice communications and Internet dial-up. The main fixed line-based network has a capacity of 1.4 million telephone lines, of which 740,000 were subscribed in 2000, a teledensity (number of telephone mainlines per 100 people) of around 21. The backbone of the network is 303 switching centres linked by high-speed fiber connections.

In the 1992-99 period, more than US\$1 billion was spent to rebuild and expand the public switch telephone system. By spring 2001, rehabilitation and expansion of the system was 95 percent complete, including installation of a modern fiber-optic network. International communications were improved with the installation of two submarine fiber optic cables, one linking Syria, Lebanon and Egypt, and the other connecting to Cyprus, Crete and France.

Payphones are gradually being installed in all Lebanese regions. Wireless local loop technology has been introduced in some rural areas where standard connection was prohibitive, with nearly half of the planned 40,000 lines completed by mid-2000.

Beyond voice communication, ISDN (integrated system digital network) data services will be offered pending a final review of tariffs by the Council of State. The Ministry of Telecommunications plans to provide state-of-the-art highband-width data services once the new telecom law is in place, and has deployed the first phase of a national network of metropolitan area networks (known as MANs) to interlink its operations and possibly those of the whole government. This might be the basis for the GovNet project (Box 2 below).

With respect to mobile telephone infrastructure, the Lebanese government awarded ten-year BOT (Build-Operate-Transfer) contracts to two operators in 1994, which mandate tariff structures and profit distribution between them and the state. The government had by 2003 to either take over the operation of the two companies or agree to a license buyout, but in June 2001 it terminated both operators' contracts and is now preparing an international bid for licenses. Because of the early launch of the mobile networks (up to five years ahead of the modern land-based fixed network), 700,000 mobile phone lines were in use in 2000, which represents a one-to-one ratio with the landlines. Per capita mobile telephone use is also widespread in the country compared to other Arab states (Table 1).

Table 1. Mobile phone use in selected Arab countries, 1999

Country	Number per 100 persons
UAE	33.3
Qatar	25.6
Lebanon	16.0
Kuwait	12.7
Bahrain	11.2
Oman	5.7

Source: *Executive magazine*, April 2000, Beirut

The Ministry of Telecommunications announced in 2000 a plan to privatize telecommunications and turn the ministry into a small regulatory authority to oversee the privatized operator, Liban Telecom, an independent company of which 25 percent will be sold in an initial public offering. Some estimates are that privatized fixed line and mobile services could net US\$ 5 billion within three to five years of full privatization.

Government plans for the development of ICT include establishment of a Telecommunications Management Unit that will involve integrating the network control equipment of the international suppliers and implementation of an Intelligent Network (IN) platform for the provision of various services, such as pre-paid calling cards and free phones.

b. Internet services

The Internet, one of the media enabling entry into the globalization era, is the quintessential ICT, with vast potential to transform how people work or otherwise interact, and participate in public life. Internet services started to develop in Lebanon in 1996. Thirty private Internet Service Providers (ISPs) were licensed, providing services mainly in the capital Beirut though some have points of presence in other main cities. ISPs that do not provide extra services are being pushed out of business; the number of ISPs decreased to 16 in 2000 (Table 2), and this figure is expected to fall further through mergers and acquisitions due to increased competition. Table 2 also provides comparative information on penetration and coverage for a selected number of Arab countries.

Table 2. Number of Internet service providers in Arab countries, 2000

Country	Number	ISP per million of population	Number of subscribers per ISP
Egypt	34	0.5	1,618
Saudi Arabia	25	1.2	4,000
Lebanon	16	4.6	4,063
Jordan	6	1.3	4,167
Morocco	6	0.2	2,500
Kuwait	5	2.7	8,000
Tunisia	3	0.3	7,333
UAE	1	0.4	160,000
Oman	1	0.4	20,000
Syria	1	0.1	4,000

Source: Raef el-Ghoury, *ISP: Characteristics of Internet Services and the cost of Services*, May 2000, [http:// www.iawmag.com](http://www.iawmag.com). Population from UNDP, *Human Development Report 2001*. Number of subscribers from Table 3 below.

The number of Internet users has increased rapidly in the past few years, doubling annually. Internet maturity expressed by the number of Internet subscribers ranges between 65,000 and 80,000, whereas the actual number of Internet users is 227,000-280,000, or about 3.5

users per subscription (Table 3). The majority of users are still in the private sector, mainly in business, followed by students at private universities. Efforts continue to widen Internet use through various distribution means such as Internet cafés. Table 3 provides comparative data for Arab countries on number of subscribers, total and per thousand population and number of users of the Internet; it also reveals the relative importance of subscribers and users in different Arab countries, as a percentage of total. The number of subscribers, both total and per thousand population, in Lebanon compared to other Arab countries is high, reflecting relative openness and sense for innovation.

Table 3. Internet use statistics in Arab countries, December 1998 and March 2000

Rank	Country	Number of Subscribers (December 1998)	Number of Subscribers (March 2000)	Number of subscribers (March 2000) per 1,000 population ^{1/}	Number of Users (March 2000)	Number of Users per Account	Subscribers Arab Countries (Percent)	Users Arab Countries (Percent)
1	Egypt	36,400	55,000	0.8	440,000	8	10	23
2	UAE	61,200	160,000	61.5	400,000	2.5	29	21
3	Saudi Arabia	18,700	100,000	5.1	300,000	3	18	16
4	Lebanon	30,700	65,000	19.1	227,500	3.5	12	12
5	Tunisia	4,700	22,000	2.3	110,000	5	4	6
6	Kuwait	22,000	40,000	22.2	100,000	2.5	7	5
7	Jordan	16,600	25,000	5.2	87,500	3.5	5	5
8	Morocco	11,200	15,000	0.5	52,500	3.5	3	3
9	Oman	12,700	20,000	8.0	50,000	2.5	4	3
10	Qatar	8,500	18,000	30.0	45,000	2.5	3	2
11	Bahrain	11,700	15,000	25.0	37,500	2.5	3	2
12	Syria	-	4,000	0.3	20,000	5	1	1
13	Yemen	2,200	3,000	0.2	12,000	4	1	1
14	Sudan	-	2,000	0.1	10,000	5	0	1
15	Libya	-	1,500	0.3	7,500	5	0	0
	Total	236,000	545,500		1,899,500	3.5	100	100

Source: Bin Daher Computer Group, <http://www.bdcinternet.com/News.htm>

^{1/} Population for the year 1999, UNDP, Human Development Report 2001

The number of private domain names was 4,729 in 2000, about double that of the previous year (according to figures compiled by the UN Economic and Social Commission for Western Asia). A global host count in Arab countries in early 2001 shows that Lebanon had 5,147 hosts and ranked third in the region (Table 4) though it was only 75th in the world.

Table 4. Internet host count statistics, 2001

Rank	Country	Individual hosts	Level 2 domains	Level 3 domains
1	Japan	3,413,281	111	84,829
2	US	2,251,445	89	3,727
3	United Kingdom	2,080,906	58	62,279
4	Germany	1,916,512	136,281	689,453
6	Canada	1,814,505	7,545	460,970
7	Italy	1,574,380	30,586	342,821
8	Australia	1,311,492	62	43,633
10	Netherlands	1,082,089	39,517	419,137

53	UAE	26,764	8	596
74	Egypt	5,422	7	269
75	Lebanon	5,147	7	280
76	Kuwait	4,594	7	1,509
82	Saudi Arabia	3,167	9	166
	Total	93,047,785	2,454,681	26,500,025

Source: RIPE, Region Host Count, 19 January 2001

A study on services provided by ISPs (*Lebanon Opportunities* magazine, April 2000) found that web hosting is most frequent (93 percent), followed by search engines (86 percent), leased lines (80 percent) and secure online transactions (73 percent). Providers also offer automated response (60 percent), microwave link and digital conversion (46 percent), video on demand (33 percent) and video conferencing (26 percent).

The monthly cost of Internet subscription in Lebanon was US\$ 10-20 in 2000, depending on the quality of service, down from US\$ 29-55 in 1998 and US\$ 11-25 in 1999. Present cost is comparable to the United States of America (US\$ 18), and is more attractive than in Egypt (US\$ 18-25). However, ISPs in the United Arab Emirates provide subscriptions for as low as US\$ 0.8 and only US\$ 0.5 during evenings. In Germany, Internet subscriptions are free for all schools.

2. NATIONAL ICT STRATEGY

a. Strategy development

A national ICT policy and strategy document was prepared by the Office of the Minister of state for Administrative Reform in November 1998 to provide the framework for national action on ICT for socio-economic development. The document draws on the experience of a number of other countries and has been adapted to particular local needs, to raise awareness, stimulate discussion on national goals and priorities, and encourage stakeholders to seize emerging opportunities.

The national ICT policy and strategy specifies the roles of the public sector, the private sector, and academia in supporting and promoting ICT interdependently. The government would be responsible for key regulatory functions (privacy, intellectual property rights, security, information content, etc.) with facilitation as its main role. The private sector would be the main driver in implementation. The potential benefits that could be gained by different sectors, such as industry, learning and education, communications, and culture are assessed. Contracting more public sector business to the private sector was proposed to promote the development of the ICT industry in the country, with norms and standards for ICT development and capacity building through human resources development also discussed in the document.

Since its publication, the national ICT policy and strategy document has been widely distributed in the public and private sectors and academia. The revised document of early 2001 provides an ICT business plan and a basis to encourage local and foreign investment in this key sector in Lebanon.

b. ICT laws and regulations

To protect the ownership of content in its various forms (text, images, voice, video, etc.) and the ownership of software, an intellectual property rights law was passed in 1999. Lebanon was the second Arab country, after the UAE, to pass such legislation. The law has encouraged several multinational corporations to establish a presence in Lebanon, though active enforcement has not begun and piracy is widespread. (Industry statistics indicate that software piracy fell slightly, from 93 percent in 1999 to 88 percent in mid-2000, a rate more than double that in the UAE.) The World Intellectual Property Organization (WIPO) recently

trained a number of government officials on enforcement procedures of intellectual property rights.

Successful enforcement of intellectual property rights is closely linked to public policies for more universal access. Some fear that tighter enforcement could block disadvantaged social groups from the knowledge sector, close existing opportunities and raise cost of access to new technologies. The enforcement of the intellectual property rights law would encourage the expansion of media and software development industries and creativity in content development.

Several public agencies, among which the Central Bank plays a leading role, are preparing draft laws for digital signatures, e-banking, e-payments, privacy protection, and certificate authentication in support of ICT development. Parliament approved in 1999 a law authorizing the Central Bank to reorganize the banking and finance sectors (Law no.133). An advanced e-payment system (complying with standards set by the Bank of International Settlements and the International Monetary Fund) is a key component of the country's strategy to become a centre for electronic banking and electronic commerce. Once enacted, these laws would provide the basis for a secure environment for online communications and transactions, thereby encouraging business use of the Internet and transcending national borders in dealings. The new customs law (April 2001) eliminated tariffs on information technology material.

c. Tax and labour incentives for ICT ventures and technology parks

To encourage creation of technology zones and parks, the government introduced in 2000 tax and labour incentives as part of the media and ICT free zone bill, which aims at supporting, expanding and promoting these sectors. The incentives target ICT enterprises that wish to be located in the free zone, and their employees. A tax-exempt period of up to fifteen years and support for setting up housing for employees are under consideration. Such incentives aim to attract international ICT companies and investment houses, and Lebanese expatriates who have become senior ICT experts and executives in leading global firms.

The Investment Development Authority of Lebanon (IDAL) launched in 2000 a feasibility study for the Beirut Emerging Technology Zone, funded by the US Trade and Development Agency. The study will consider how necessary facilities and incentives could best be provided for local and direct foreign investment in the ICT sector through start-ups; private enterprises can best synergize with university researchers; and, local content and media may be efficiently produced and provided for online Internet dissemination.

Lebanon faces competition from similar projects - such as Dubai Internet City, Smart Villages in Egypt, and a number of projects in Jordan - but has many advantages over these countries in general literacy, socio-cultural environment, and computer training levels. (A substantial proportion of ICT industry specialists and managers in the Gulf region are Lebanese expatriates.)

d. ICT partnerships and coordination

Synergy between the public and private sectors and the universities needs to develop with a view to supporting the progress of the ICT sector. Within this context, the government created a ministerial ICT committee in January 2001 to encourage increased use of ICT in the public sector. The committee promotes cooperation between the public and private sectors, including through peer-to-peer contacts or communities of practice. Supported by these, the ministerial ICT committee aims to:

- Establish a master plan for the use of ICT in line ministries and public agencies
- Set up integrated technical standards
- Determine procedures and means required for the different governmental bodies to share information and build remote handling capacity of administrative transactions and services

- Adopt the appropriate mechanism to avoid information overload and reduce costs through technical solutions and common technical standards and specifications
- Identify issues in managing information resources in government and recommend solutions that help modernize administration and enable it to keep pace with technological developments
- Draft the necessary decrees, laws, and regulations.

A good example of collaborative action among private business, the state, and the education sector, to be promoted on a national scale, is the UNESCO programme to channel and recycle ICT products from some users (such as the private and public sectors) to others (e.g. schools).

Another example is the collaboration of universities with industry and the public sector to create opportunities for young people and students through internship programmes and cooperative work experience. This could encourage job creation, reduce brain drain, and better match education and training programmes to actual needs of the local job market.

Partnerships of stakeholders can also make a useful contribution to forward planning, which is essential for the future development of ICT and its impact on human development in Lebanon. Among the issues to be considered are the roles of the public and private sectors, infrastructure and software financing, competition and privatization policies, investment in digital literacy, as well as launching, testing, and mainstreaming successful pilot projects.

B. E-GOVERNMENT

1. INSTITUTIONALIZING REFORMS

The Office of the Minister of State for Administrative Reform (OMSAR), has undertaken since 1992 a number of institutional development studies that address critical issues such as simplification of procedures, organizational restructuring, job descriptions and classifications, and decentralization and deconcentration. The implementation of the recommendations of these studies would mainstream ICT in government operations.

Automating outdated procedures and inefficient workflow processes does not by itself represent an effective use of ICT in government. It is only after the institutionalization of reform and introduction of modern work practices that e-government applications can be deployed on a large scale. Within this perspective, OMSAR has executed a number of integrated system solutions for the improvement of government services to the general public and business, including the medical and social compensation system for the Civil Servants' Cooperative, the commercial register system, document management for the National Archives, the Port of Beirut and customs, as well as citizen information offices in different public institutions. Such initiatives make government services more citizen-centered and foster closer ties with the general public (Box 1).

Box 1. Integrated system solutions in public agencies

Two examples of integrated system solutions in public agencies are:

Land Register and Cadastre: a project is underway to establish improved service delivery, enabled by automation, at the land register and cadastre. The objective is to offer a cheap, quick and customer-friendly service of digitized land registration, transfer and mapping, and of issuing related information and deeds. New services are also being added, namely online viewing of information for the public, controlled-view access to data, policy support in all land-related functions, and decision support for government land asset management. With respect to the cadastre, the capability has been created to produce digital cadastral maps; specialized stations have been installed, with computers and plotters, and a quality Global Positioning System is being provided.

Electricité du Liban (EDL) work is proceeding on a system to improve the collection of unpaid bills with a view to eliminating waste and corruption. The project consists of the establishment of a computerized customer database, which provides information on unpaid bills and allows their tracking. This will result in

improving performance of EDL, reducing inconvenience to customers and enhancing transparency.

2. E-GOVERNMENT APPLICATIONS

Integrated system solutions together with the development of an intra-governmental communication network or GovNet (Box 2) will enable the public to have access through a single point of entry or one-stop-shop to all information and services provided by the government. Successful achievement of an e-government vision will require continuous training and re-training of civil servants, and a population that is increasingly ICT-aware and digitally connected, which implies affordable and equitable telecommunications connectivity throughout the country. E-government poses major challenges, including how to make government services equally accessible to all citizens; thereby making the issue of an internal digital divide central to national concerns.

Box 2. GovNet: ICT and the development of public service

The objectives of the administrative reform managed by OMSAR are to modernize all administrative procedures, enable public administration to become connected to the network, and reach adequate levels of competitiveness and transparency, by easier access to public information and its diffusion through the Internet, fewer administrative procedures, and lower transaction costs.

GovNet aims at connecting all ministries and public agencies to facilitate their intra-services transactions as well as contacts with the citizens (information requests, application forms, general inquiries, etc.). It targets better productivity and responsibility for delivered services. The generalization of GovNet on a national scale, and the facilitation of online access to government services (e-government) will have both economic and democratic impacts, and constitute a significant step in the achievement of administrative reform. By reducing political patronage, it will also contribute to political reform.

Transcending national borders, ICT will help provide services to Lebanese emigrants, from within Lebanon and by embassies, consulates, and missions abroad. E-government can thus assume a global dimension by offering Lebanese in the country and abroad a range of government information and services online.

C. E-BUSINESS

1. ICT SOFTWARE INDUSTRY

The Lebanese ICT industry consists of about 500 computer-related companies with activities ranging from personal computer distribution and computer programming to training centres and turnkey integrated system solution providers. Of these, about 200 small to medium-sized computer software companies employ more than 3,000 people, and can play a major role in the development of an information-based national economy.

Initially, programming was done largely in-house in banks and private institutions. Around 150 large enterprises (mainly banks) have developed their own software system for internal use. Today, ISO-certified software companies are developing packages and customized systems for the national and international markets. The decrease of hardware prices and the simplification of software use have facilitated the spread of ICT and make it accessible to smaller firms. Development of quality Arabic software and Arabization of available software packages could be one of the main opportunities for Lebanon in this field, while information and knowledge need to be delivered in the mother tongue to help the economy to flourish and also to contribute to bridging the digital divide.

Development and sales of software are rather well spread, although quality varies and services are not always regularly provided. The 200 Lebanese professional software suppliers specialize in specific sectors: health, banking, insurance, industry, etc. Since the domestic market is limited, many enterprises have turned to exporting their products and knowledge regionally and globally. A dozen enterprises have become main players in this field, offering a wide variety of specialized software, computer graphics, audiovisual animation and content development.

2. E-ENTREPRENEURSHIP

As of early 1999, several investment houses such as Middle East Capital Group and Lebanon Invest began showing interest in backing ICT ventures. The Central Bank started to encourage banks to provide loans to technology SMEs; but a national capital market for ICT ventures has yet to develop, and even if a local ICT venture received seed capital, the initial public offering has still to be placed internationally.

ICT incubators were launched in late 2000. For example, Netakeoff established the first one dedicated to the development of Internet and technology firms through the provision of seed capital, office space, and know-how, in return for an equity stake.

An Entrepreneurship Network for capacity development was launched at AUB in December 2000, aimed at promotion of entrepreneurial competencies of students. The objective is to develop new niche market ideas (ICT and others) in the form of business plans for presentation to funding sources (seed funds, venture capital, investment houses, etc) in an effort to encourage start-ups.

A major initiative of the USJ in 1999 concerned BERYTECH, located at and initially supported by the *Ecole Supérieure des Ingénieurs de Beyrouth (ESIB)*. BERYTECH will operate as of October 2001 a regional and national technology centre, a start-up incubator, a network facilitator for firms, and an open space for high-tech enterprises. It also aims at supporting graduates entering the business world and improving links between the graduate training and the firm needs. BERYTECH also functions as a resource centre with a set of databases dealing with local, regional, and international issues.

Box 3. Call centres

The diversity in language skills in Lebanon provides a competitive advantage for the country to become a cross-continental and regional call centre hub. Arabic, English and French proficiency supported by the local and international telecommunications infrastructure and gateways would allow Lebanon to develop a large number of jobs for call centre operations. Call information or queries on products and services from consumers in Europe as well as the Middle East can be channeled through international toll-free provisions as well as over the Internet. The call centre industry is successful in Western and Far Eastern countries. Notwithstanding projects already operational in Morocco, Jordan and the UAE, there is an opportunity for Lebanon to establish such an industry to serve consumers in the Middle East and North Africa region. However, there are a number of important obstacles to be eliminated to enable the implementation of call centre projects, including passing the telecom law, establishing the possibility to subscribe to 800 numbers, changes in labour laws and ICT laws related to privacy, security, etc.

3. E-COMMERCE

In the new economy, there is an important potential for providing web-based e-business applications for *inter alia* human resources, finance, distribution and industry-specific solutions. Through the use of the Internet, which serves as a low-cost gateway to the global economy, SMEs and large businesses can benefit from much reduced transaction costs and access to national, regional and global markets. E-commerce has unleashed a revolution in entrepreneurship and innovation, providing a range of new services and products. Annual trade and telecom fairs that gather in Lebanon are giving more room to e-commerce, and organizers of E-Commerce Middle East 2001 expect e-commerce spending in the region to increase steeply from US\$ 250 million in 2001.

The Internet, which links millions of potential buyers and sellers around the world regardless of geographical and temporal boundaries, has transformed the traditional business model. Businesses now venture directly onto the worldwide market. The Internet has also enabled businesses, through global marketing and selling, to establish content-based websites relevant to their particular services and/or products.

Lebanese companies have begun to take profit from opportunities in e-commerce, but many establish a web presence without streamlining their internal business cycle to new

requirements. Awareness of the new business paradigm, knowledge of e-market products and services, availability of a secure, trusted, fast delivery backbone, and appropriate legislation are some of the elements still needed to promote e-commerce in Lebanon.

4. E-BANKING

Banks have begun to promote integration of ICT into their business, notably in retail banking and through electronic banking. New products and services are being developed, ranging from Internet services packages to insurance policies. However, banks are facing a number of challenges, namely in adapting themselves to rapid evolution of ICT and introducing related security measures; coping with the emergence of the Internet as an affordable medium of communication; and integrating small branches that yield little into their networks.

The establishment of online electronic banking able to deal with large transactions in a secure and low-cost manner, through the use of the Internet as the primary tool, is essential for the expansion of the sector. Banks have started to introduce and develop electronic technology and build networks to link headquarters to branches and branches to one another, with plans to establish online operations in the next couple of years.

D. E-EDUCATION

Effective educational use of ICT requires educators to move to resource-based teaching and learning strategies aligned with outcome-based education approaches. It is important to highlight the potential educational value of ICT through awareness, research and evaluation programmes. Use of Internet tools can enhance equal access to educational opportunities, providing alternatives to traditional/formal education, and enabling the development of more community-based learning facilities, but even if ICT systems are installed and accessible, people will have little access to networks without basic computer skills and digital literacy.

Distance learning brings critical knowledge to needy groups and their social institutions. However, one must ensure the availability of adequate human resources and course contents, and be careful about overlooking basic needs in favor of high-profile technologies.

1. GOVERNMENT PROGRAMMES

The government, realizing the importance of introducing ICT in education in its different stages, has taken on a number of initiatives. Two projects are currently underway.

- The SchoolNet pilot project was launched in 2000. It involves interconnecting 24 public schools (one PC in each school) in the six mohafazas via a central server located at the Ministry of National Education, which in turn is directly connected to the global Internet (Box 4). The goal is to increase availability of low-cost and appropriate connectivity options for schools, support the technical infrastructure subnationally, and co-ordinate connectivity initiatives for schools. The project highlights online education communication and collaboration by making use of audiovisual conferencing facilities and online multilingual references and encyclopedia. Distance learning, remote library access and customized courseware are among expected achievements of the project.

Box 4. SchoolNet: Connecting Lebanese public schools to the global world

The SchoolNet project, launched in June 2000, is a further step in the national information technology strategy promoted by the government. The project aims to enhance cooperation among sectors of the education system as well as among schools, teachers and students. SchoolNet's objectives are to:

- Provide students with educational information in an easy manner
- Disseminate educational information and provide channels of teaching/learning in a semi-virtual school
- Encourage educational and academic dialogue through provision of electronic fora to students and teachers
- Disseminate information knowledge among students, across geographic regions
- Bridge the gap between schools having access to adequate educational information and those that do not
- Encourage scientific competition among students by posting their output and achievements on the Internet
- Promote the participation of parents in the education of their children.

SchoolNet will also connect students and faculties to World Link, the World Bank's link, the Canadian SchoolNet, as well as the European SchoolNet, with the aim of encouraging international exchanges of information and expertise.

- Launched in late 2000 and fully operational in 2001, the Lebanese University Student Information System (SIS) and the Wide Area Network (WAN) – one of the first of its kind in Lebanon - aim to *inter alia* improve services to students, faculty members, and others by providing easy access to information and the ability to conduct administrative business electronically from anywhere, anytime; re-engineer processes to increase efficiency and modernize procedures; and improve and accelerate decision-making at all levels. The system provides the possibility of linking with financial and human resources, and library management systems in future. The two projects link newly established computer centres at remote campuses with the central computer system. The number of students that will benefit from the projects is estimated at 70,000.

2. OTHER PARTNERSHIPS PROJECTS

A UNESCO-supported programme entitled Upgrading Science and Engineering Education aims at assisting the Arab academic community in modernizing university teaching of basic sciences and engineering through the use of ICT. The Lebanese University hosted in 1998 a web-based systems simulation course to create an educational multimedia product to enable the assessment of the impact of new courseware on student learning.

Lebanon signed an agreement in February 1999 to benefit from the EUMEDIS (Euro-Mediterranean Information Society) regional programme financed by the EU. Its aim is to reduce the region's information and technology gap through regional pilot projects and encourage a network of Mediterranean Information Society Focal Points in five key sectors: ICT applied to education; e-commerce and economic cooperation; networks for health; multimedia access to cultural heritage and tourism; and ICT applied to industry and innovation. EUMEDIS funds the Internet-based interconnection between the European research network and Mediterranean research networks as well as pilot information society projects. The connectivity will boost the development of the Internet and also create a high-bandwidth ring around the Mediterranean to transport co-operative applications.

E. E-SOCIETY

Online communities, grouped around issues of politics, gender, society, ethnicity, religion, etc. are becoming a global trend. Using Internet networking, these e-communities engage in debates, are often able to rally instant responses and bring new lobbying power to previously weak voices. Network communication could also lead to the creation of local communities, providing information and strengthening social identity and ties. In this respect, through the

empowerment of excluded or socially marginalized groups, ICT facilities can offer major opportunities for human development.

1. THE USE OF ICT BY NGOs AND LOCAL PROFESSIONALS

A few online communities are being formed in Lebanon. Local websites (such as Naharnet.com, Thisiscyberia.com) are initiating political debates. Organized groups use e-mail to mobilize their members and supporters at key times. NGOs use electronic newsletters for networking and dissemination of information. ICT could give voices to NGOs, opening up new opportunities for small players in the civil sector (Box 5).

Box 5. Lebanese NGOs and ICT use for human development

The Centre for Research and Training on Development (CRTD) initiated in May 2001 an NGO Information and Resource Unit that edits a monthly bulletin disseminated by e-mail. This intends to fill a gap in specialized and alternative information on NGOs operating in Lebanon, and also monitors government programmes implemented in cooperation with NGOs. It comes in four sections: activities of Lebanese NGOs; current programmes and new grants; newly established NGOs; and library acquisitions.

The CRTD also uses information technology for another initiative, the Gender Linking and Information Project in the Mashreq and Maghreb (MACMAG GLIP). This is a regional forum for debate and exchange, providing opportunities, analysis, and exchanges on gender and development among local grassroots NGOs and networks at all levels to strengthen institutional capacity as well as regional collaboration and solidarity.

Source: www.macmag-qlip.org

ICT could also serve local academics and scientists through participation in Internet conferences, keeping up to date on developments in their fields.

Empowerment needs also to reach government agencies and ministries by giving staff access to the Internet and encouraging participation in discussion groups and by using the important possibilities of data mining, for instance.

Lebanese Internet sites are progressively reaching new constituencies and wider audiences, especially in the social and cultural spheres. An example of such new initiatives is given in the medical field (Box 6).

Box 6. Focus on innovations: doctors on the web

The first of its kind in Lebanon, toubibonline.com brings together professionals from the healthcare, software, and Internet industries to offer customized healthcare solutions to the consumer through a PC at home. This service strives to be comprehensive by offering the latest in medical news, and an up-to-date information database on all kinds of diseases. It is noteworthy that its services are offered in French, English and Arabic. A drug checker service is also available, allowing consumers to learn more about the drugs they are using. Additionally, toubibonline.com puts the consumer in contact with healthcare professionals located in their area and throughout Lebanon, while preserving anonymity. About 40,000 visitors a week access this service in early 2001, 60 percent of whom have Lebanese IP addresses.

Source: www.toubibonline.com

2. THE ISSUE OF CONTENT AND LANGUAGE

In the information-based society, it is essential to consider how ICT can serve national and local culture and development. The wide use of English, particularly on the Internet, appeals to young Lebanese as a symbol of modernity and development. This trend could have, however, a negative effect on the country's cultural and national identity. Pressing questions raised in this connection include *inter alia*: is the Internet becoming a medium for the hegemony of one culture over others? Is there a way in which the Internet can be used to further and promote Lebanese culture? Currently, only limited Lebanese creative contribution is made, by often-haphazard publishing of information on the World Wide Web. One possibility to be considered is for Lebanon to establish a portal to host digitized cultural

heritage databases and provide a gateway to the required information. In general, more innovative websites need to be created locally, adding Lebanese voices to the global conversation, and making content relevant to the diverse Lebanese communities.

Local content creation must become a major asset. There is a strong and urgent need to develop and promote original Lebanese web content in Arabic. Arabization availability and quality of the content would allow Lebanon to promote its culture in the region and worldwide, and to encourage exchanges and cultural tourism. Use of Arabic would not only encourage Internet use by the different social classes, but would also help create networks among Lebanese and Arab communities all over the world that want to maintain their cultural identity. Local content can also enhance community participation and institutional transparency. Attempts have been made to instantly Arabize or translate into Arabic original English content on the Internet (e.g. Tarjem.com), yet this remains an isolated and limited venture.

3. Electronic Publishing

The Internet is also the fastest growing medium for news, communication and entertainment. Combining all three previously existing types of media - print, audio, and video - seventy percent of the most visited sites on the Internet now contain audiovisual content.

The traditional print medium in Lebanon is one of the most productive and resourceful in the Arab world, as indicated in Chapter 2 above (accounting for more than 45 percent of all printed material produced in the region). The development of this sector was due to a relatively high degree of press freedom, a well-educated workforce, and the accumulation of modern resources in printing and publishing. Despite economic difficulties, publishing has continued to flourish. The number of publishing houses increased from 192 in 1985 to 620 in 1998, with a total of 52,000 published works. The number of printing houses is about 700, employing approximately 10,000 people in 2001. According to UNESCO statistics, more than 100 magazines are published in Lebanon, representing a quarter of all magazines published in the Arab world. General press titles published in Lebanon exceed 1,490, and political titles published are estimated at over 100 (though only a smaller number are actually published and distributed).

The printing and publishing sector is confronted with the challenge of digital printing and progressively making selected information available online. Lebanon already has seven online local newspapers and at least two radio stations that broadcast live over the Internet. Technology-driven media production and distribution, which relies primarily on innovation, creativity and freedom, can quickly become an important sector for Lebanon (Box 7).

Box 7. An Arabic Amazon.com: Neelwafurat.com

Since 1998, the Centre for Arabization and Programming, an affiliate of Lebanese Arab Scientific Publishers, has operated the largest Arabic library on the net. It offers a wide selection of 80,000 Arabic books at reduced prices. The search engines allow people to browse by subject, author, and title. The covers of the books are scanned and information about the content, the format, and the date of publication is available. The company delivers books within three to four working days, anywhere in the world. Online purchase is secured through credit card or bank transfer, following the SSL system. Fifty percent of the users of Neelwafurat.com are from Saudi Arabia.

Source: *An-Nahar, Mulhaq al-Internet, July 18, 2001, p.7, and www.neelwafurat.com*

F. E-EQUITY

ICT is bringing transformations faster than policymakers and others can comprehend, ethically, developmentally or otherwise. The increasing digital divide excludes many and their traditional systems of knowledge and ownership. Spreading ICT has tended to protect profits instead of people, and privilege interests instead of needs. At present, access to the

Internet runs along the fault lines of national societies, dividing the educated from the illiterate, men from women, rich from poor, young from old, urban from rural. ICT has created a new divide, accentuating the socio-economic one, separating the connected from the disconnected, and generating two parallel and very uneven communication systems.

1. UNEVEN ACCESS TO ICT

Lebanese statistics concerning the digital divide are very limited, and the issue itself has not yet been fully addressed by the authorities. In the absence of relevant social and regional data, discussing inequalities in accessing the network is bound to be incomplete. Available data mainly relate to the number of landline subscriptions by region (Table 5).

Recent estimates state that there were only 57 computers in Lebanon for every 1,000 inhabitants in 2000. The Internet has a stronger presence at workplaces than at home. ICT access is heavily concentrated in the Greater Beirut area. Half the population of Greater Beirut between the ages of 18 years and 48 years are individual Internet users. Seventy five percent of companies use ICT, among which 95 percent were located in the Greater Beirut area. ICT-related sales are also mainly concentrated in Greater Beirut (90 percent).

Table 5. Distribution of subscriptions to land-line services by region, 2000

Region	Number
Bekaa	45,000
South Lebanon	54,000
North Lebanon	83,000
Mount Lebanon	237,000
Greater Beirut	279,000
Total	698,000

Source: Ministry of Post and Telecommunications

Lebanese telecommunication fees are expensive. Subscription plans hinder growth of the sector and impede expansion in the number of users wishing to connect to the Internet. Land-based telephone dial-up fees are US\$ 1.60 per hour regardless of inter-area or intra-area code dialing, i.e. there is a flat rate for the entire country. Total fees amount to US\$ 1.78 per hour, including taxes, among the highest rates in the Arab countries (Table 6). At this rate, Internet access for 30 hours per month costs US\$ 53; and after adding the Internet dial-up rates (between US\$ 10 and US\$ 20), the total bill amounts to US\$ 63 to US\$ 73 per month. This represents more than 30 percent of the minimum wage, and up to 15 percent of a median salary, which is socially unfair. Fixed area code-based monthly subscriptions would attract more subscribers and in turn make connection to the Internet more equitable.

Table 6. Hourly telephone rates for Internet users, 2000

Country	At peak hour (US\$)
UAE	Free
Kuwait	Free
Egypt	0.58
Oman	Free
Bahrain	Free
Qatar	Free
Lebanon	1.78
Jordan	0.84
Saudi Arabia	1.2*

Syria	0.72**
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Source: Raef el-Ghoury, *ISP: Characteristics of Internet Services and the cost of Services, May 2000*, [http://: www.iawmag.com](http://www.iawmag.com)

* Special rate for Internet users, which is less than the normal dial-up rate

** Rate of Internet access is 120 Syrian Lira (2.4 US\$) per hour

Language can also be an obstacle for the even distribution of ICT and for Internet use. The predominant ICT language is English. Most of the web addresses available on the Internet are in English, including some of the Lebanese government addresses.

2. LOCAL AND NATIONAL INITIATIVES TO BRIDGE THE DIGITAL DIVIDE

In an attempt to quantify the digital divide in Lebanon, several initiatives are planned by the government. One relates to conducting a national ICT infrastructure and e-readiness assessment through a grant from the World Bank (Infodev). This will entail preparing a number of survey indicators to assess the level of readiness throughout the country so that the opportunities and challenges for making Lebanon a more e-connected society can be established and used to make the necessary decisions. Other initiatives target the rural community and aim at providing youth groups in the peripheral regions with access to the Internet by the provision of multipurpose telecentres (Box 8). These initiatives could benefit as well from other countries' experiences in their attempts to bridge the digital divide (Box 9).

Lebanese business associations are also showing increased interest in this field. In the summer of 2001, the Professional Computer Association (PCA) launched the PCA Internet Point of Presence Initiative (PiPOP), which intends to bridge the digital divide by establishing low-cost self-supporting Internet access centres in rural areas. This project is based on collaboration with universities, local communities, the government, the private sector, NGOs, and the media. The PiPOP project will initially launch five pilot projects in 2001.

Box 8. Technology access and multipurpose community telecentres

The Council for Development and Reconstruction, in partnership with UNDP and with the support of CISCO Systems (a UNDP strategic partner in the netaid.org initiative) and LibanCell, established a Technology Access Centre in Bint Jbeil (South Lebanon) in the spring of 2001. This centre trains residents to use ICT, both hardware and software, and provides access to the Internet.

The Office of the Minister of State for Administrative Reform plans to establish six multipurpose community telecentres in the six mohafazas. These telecentres will serve similar purposes technology access centres and in addition will make government information and services accessible to the local communities in each mohafaza. This could be a first step towards decentralizing some of the functions of the public administration.

Box 9. Mobile Internet Unit: the Malaysian model and the Lebanese SmartBus™

An inspiring model is presented by the Malaysian Mobile Internet Unit project that has trained 7,000 Malaysians on Internet and ICT use since July 1999. The Mobile Internet Unit is basically a self-contained coach, equipped with a number of ICT-literacy training modules, a set of project evaluation packs, local area networked computers, a content-rich server, modems, routers, LCD projectors, a pull down screen, LCDs, and other audio-visual aids in addition to a laser printer, fax machine, scanner, courseware, software, and reference books. The Mobile Internet Unit is intended to benefit rural and urban school communities.

In Lebanon, the SmartBus™ will be launched in September 2001. The SmartBus™ is a retrofitted school bus designed to reach rural communities and give ICT training. This bus accommodates eight trainees, and another twenty outside. It will be equipped with Internet access, and will use the latest hardware technologies from flat panel displays and wireless networking. The SmartBus™ is qualified as an international certified testing centre, as well as a certified training centre for several major software suppliers. The SmartBus™ is expected to train up to 4,800 people per year.