UNIVERSITÉ DU QUÉBEC À MONTRÉAL

THE E-READINESS ASSESSMENT OF LEBANON
CASE OF SOCIAL DIGITAL DIVIDE IN BEIRUT CITY

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PRÉSENTÉ
COMME EXIGENCE PARTIELLE
DE LA MAÎTRISE EN ADMINISTRATION DES AFFAIRES

PAR
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THESIS
PRESENTED
AS A PARTIAL REQUIREMENT
FOR THE MASTER IN BUSINESS ADMINISTRATION

BY
KHALED SAID HARB

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An abstract of the thesis

The main purpose of this thesis is to study the e-readiness of Lebanon; it answers the question: has Lebanon been able to take advantage of the opportunity presented by the revolution in information technology and the spread of globalization to establish a knowledge-based and technology-intensive economy? The study sheds light on the impediments that delay the progress towards E-Lebanon and recommends solutions where possible.

"The social digital divide with in Beirut city" is the case study in this research and is approached through an exploratory research based on a well designed questionnaire for primary data collection. Its primary objective is to study the trend of diffusion of the internet in Beirut city with respect to socio-economic factors of income, educational level, age, gender, and size of the household. The case study figures out the typical internet user in Lebanon and recommends solutions to bridge the available social digital divide.

Résumé du mémoire

L'objectif principal de ce mémoire est d'étudier la disponibilité électronique au Liban ; il répond a la question suivante : Le Liban pouvait-il prendre avantage de l'opportunité présentée par la révolution de la technologie de l'information et la diffusion de la globalisation afin d'établir une économie basée sur la connaissance et sur l'intensité de la technologie ?
L'étude éclaircit les obstacles qui retardent le progrès envers un Liban électronique et recommande des solutions s'il y a lieu.

« La division sociale selon les connaissances informatiques au sein de la cité de Beyrouth » est l'étude de cas dans cette recherche et est abordée suivant une recherche d'exploration basée sur un questionnaire bien conçu pour une collection de données primaires.

Son objectif fondamental est d'étudier la tendance de la diffusion de l'Internet dans la cite de Beyrouth tout en respectant les facteurs socio-économiques du revenu, du niveau pédagogique, de l'âge, du genre et de la taille des ménages.

L'étude de cas figure l'utilisateur d'Internet typique au Liban et recommande des solutions afin de relier les divisions sociales selon les connaissances informatiques.

Introduction

In the late sixties and the early seventies Lebanon enjoyed a regional leadership, because of certain services and infrastructures such as Beirut harbor and the airport, a solid banking sector, and a free press, relative to other countries in the region. These factors helped Beirut to become a regional hub for business banking, media, and press as well as tourism. Today the situation is totally different: the evolution of the internet as a pervasive phenomenon means that the traditional factors of production (capital and labor) are no longer the main determinants of Lebanon's economy power. In fact, the economic potential of the countries worldwide becomes more and more linked to their ability to control and manipulate information in the era of the internet. It is thus argued that the dynamics of a country's growth are changing with the internet; and the electronic readiness of a country defines the role it can play on both regional and international levels. Therefore, the governments' effort to promote the development of the electronic readiness in their countries is critical in order to preserve their good economic status in the new evolving economy.

CHAPTER I

ICT DIFFUSION IN The ARAB COUNTRIES

Lebanon is an Arabic country in the Middle East region that shares a set of common cultural beliefs and attitudes with its Arab neighbor countries. Therefore, it is critical to introduce the reader to the status and properties of ICT diffusion in the Arab countries and to the common impediments of ICT diffusion in the Arab world before studying Lebanon's e-readiness in Chapter two. The common impediments are the common elements in the social, cultural, business, economic, legal, and political environment that caused the poor diffusion of ICT in this region.

1.0 The New Age of Information and Technology

In our age of globalization, Information and Communication Technologies (ICT) are reshaping the working methods and ultimately the sectors in which they are used. They are transforming the economy and the way people work to the extent that few people would have imagined just a few years ago. They are also becoming a more integral part of the world economy than ever before, creating jobs and increasing productivity in companies across the economy.

The rapid progress of information and communication technology, and its impact on the global economy have intensified in recent years, leading to a new economic system that has attracted a great deal of interest. It has also raised debate on the economic opportunities and the challenges that ICT imposed on the world economy, particularly for the developing countries.

2.0 Definition of ICT

Few years ago, one referred only to IT (Information Technology), but now as the Internet has integrated into our daily lives and has become a reliable tool through which people can communicate, interact, and retrieve information; one can no longer refer to information technology only, but also to communication. These three major innovations have given impetus to an ongoing transformation of our economic and social environment.

Different definitions are available in the Literature Review of the term "Information and Communication Technology". Rodriguez and Wilson (2000) defined ICT with respect to its different activities and functions. They stated that ICT is a set of electronic activities that facilitate the processing, transmission, and display of information. The Economic and Social Commission for Asia and the Pacific (ESCAP, 2001) defined ICT with respect to the technology equipments used to process different ICT activities relevant to sharing, distributing, gathering information, and communicating through computers and computer networks. Some researchers also emphasized the complex nature and multiple applications of ICT. They viewed ICT as a combination of both applications and tools that facilitate the processing of information, in this respect Marcelle (2000) defined ICT as a set of goods, applications, and services used to process ICT activities.

3.0 The Status and Characteristics of ICT in the Arab World

The ICT diffusion in all of the Arab countries is compared to the ICT diffusion in different countries and regions worldwide to determine the progress of ICT in the Arab world with respect to other developed and developing countries. In addition, the diffusion of ICT is compared among the Arab countries themselves to find out if any gap exits in the diffusion of ICT between countries within the Arab region.

It is necessary first, to identify the countries of the Arab world before discussing the status and properties of ICT diffusion in the Arab region. The Arab countries include: Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates (UAE), Yemen.

3.1 Growing but Limited Market for ICT in the Arab Countries

In recent years, the diffusion of ICT in the Arab region has increased significantly. Table 1.1 shows an increase in the online population in the Middle East region from 2.4 millions in 2000 to 4.65 millions in 2002, but this increase is considered low if compared to others regions as Asia Pacific, Europe, USA and Canada. Although the results in table 1.1 include the figures for Arab countries plus those of 3 non Arab countries (Israel, Turkey, Iran) in the Middle East region, still, the relative percentage of online population in the Middle East region was only 1% of the total online population worldwide. This indicates that the market for ICT in the Middle East region is increasing at a low rate and is still considered limited.

Table 1.1

Growth of Online Population Worldwide, 2000-02

	World total	Africa	Asia/Pacific	Europe	Middle East	Canada & USA	Latin America
Year 2000							
Number online, millions	359.8	3.11	89.43	94.22	2.4	157.24	13.4
% of total	100	1	25	26	1	44	4
Year 2002							
Number online, millions	544.2	4.15	157.49	171.35	4.65	181.23	25.33
% of total	100	1	29	31	1	33	5
Growth rate, % (2000–02)	51.25	33.44	76.10	81.86	93.75	15.26	89.03

Source: Nua Internet Surveys (2000 and 2002).

Table 2.2 also shows the poor infrastructure and the limited ICT market in the Arab countries, where the average shares of the population having access to main telephone lines, mobile phones, or the Internet are 11.81 per cent, 6.99 per cent and 3.10 per cent, respectively, which are low in comparison to the USA, Japan, and Europe. Moreover, the average Arab countries' supply as indicated by the average number of Internet Service Providers (ISP) is very low versus that of the USA, Japan and Europe.

Table 2.2

Total Population with Access to Main Telephone Lines, Mobile Telephones, The Internet and ISP, 1996-2000

Country	% of population with access to main telephone lines	% of total population: With mobile telephones	% of total population: Using the Internet	Internet service providers (ISP)
United States	69.77	24.89	53.23	7,800
Japan	47.63	50.39	21.35	73
United Kingdom	58.47	21.79	32.64	245
The Netherlands	57.14	25.54	42.55	52
Average Arab countries	11.81	6.99	3.10	8.31

Source: CIA World Fact Book, 2001.

3.2 Unequal ICT Diffusion Among Arab Countries

A wide gap exists in between the Arab countries similar to the gap between the Arab countries and other regions worldwide. This gap is referred to in the Literature Review as "Digital Divide", according to Wenhong Chen and Barry Wellman (2003, p:2) the digital divide "refers to multi-dimensional inequalities in Internet access and use, ranging from the global level, to nation states, to communities, and to individuals".

United Nations Conference on Trade and Development (UNCTAD, 2003) formulated an ICT development index to evaluate countries' ICT capabilities. The ICT index for the Arab countries was withdrawn from the whole list of ICT diffusion ranking for 171 countries for which data were available. The results showed a wide gap between gulf countries represented by UAE (25th place), Bahrain (30th place), Kuwait (34th place), and Qatar (45th place), and other Arab countries ranging from Lebanon (63rd place) to Yemen (140th place) (Table, 1.3).

In a similar approach, the International Telecommunication Union (ITU, 2002) formulated the Digital Access Index (DAI), which combined eight variables covering five areas in order to provide an overall country score. The areas included availability of infrastructure, affordability of access, educational level, quality of ICT services, and Internet usage. The DAI contained only the factors that have an immediate impact on determining an individual's potential to access ICT. The results of the DAI index also proved the previous observed digital divide between Gulf Arab countries, and other Arab countries. Again, Gulf Arab countries including UAE, Bahrain, Qatar and Kuwait were classified in the upper access class, and all the other Arab countries were classified between the medium and low access classes.

Table 1.3

2001 Index of ICT Diffusion by ranking

RANKING	COUNTRY	2000 CONNEC	2000 ACCESS	2001-2002 POLICY	2000 ICT DIFFUSION
25	United Arab Emirates	0.3786	0.6247	0.2500	0.5017
30	Bahrain	0.2560	0.6660	0.0000	0.4610
34	Kuwait	0.1650	0.6555	0.1667	0.4203
45	Qatar	0.2315	0.4552	0.0000	0.3433
63	Lebanon	0.0479	0.4856	0.0000	0.2667
71	Saudi Arabia	0.1011	0.3953	0.5000	0.2482
81	Oman	0.0711	0.3930	0.0000	0.2321
86	Libya	0.0455	0.4027	0.0000	0.2241
88	Egypt	0.0433	0.3895	0.2500	0.2164
95	Jordan	0.0883	0.3335	0.2500	0.2109
111	Iran (Islamic Rep. of)	0.0701	0.2704	0.0000	0.1702
115	Tunisia	0.0512	0.2729	0.2500	0.1620
116	Syria	0.0402	0.2584	0.0000	0.1483
124	Algeria	0.0209	0.2248	0.0000	0.1228
134	Sudan	0.0063	0.1937	0.2500	0.1000
140	Yemen	0.0090	0.1575	0.2500	0.0832

Source: UNCTAD, 2003

A paper prepared by Samia Nour for the United Nations University and the World Institute for Development Economics Research (WIDER) Internship Program grouped statistical results from two different research units shown in table 1.4, and observed that "Gulf countries account for less than 12 per cent of the region's population, these countries account for 76-78.6 per cent, 62 per cent and 80.6 per cent of total percentage of the population with access to the Internet, main telephone lines and mobile telephones,

respectively. Moreover, both the share of the population accessing the Internet and the number of Internet users and subscribers indicates the Gulf countries account for 36.8 per cent of Internet services providers in the Arab world, On the other hand, the differential in the demand. Table 1.4, based on CIA global statistic data, illustrates that the United Arab Emirates (UAE), Bahrain, Kuwait, Lebanon and Qatar have a higher ratio of the population with access to the three ICT modes (telephone, mobile telephones and Internet). The gap between these countries and the other nations of the region, especially the poverty-stricken Yemen and Sudan, is very wide. These results are consistent with the findings of the (Ajeeb Research Unit, 2001a), which reports that within the Arab region, Internet penetration is highest in the UAE, where 24 per cent of the total population has access to the Internet. Bahrain, Qatar, Kuwait and Lebanon have the next highest level of Internet penetration with 16.67, 10.27, 8.25 and 6.56 per cent, respectively. All other Arab countries have less than 5 per cent of the population online. The gap between the UAE and the rest of the Arab world in terms of online penetration remains wide" Samia Nour (2002, p: 5).

Table 1.4

Access to Main Telephone Lines, Mobile Phones, the Internet, and ISP in the Arab Countries, 1996-2001

Country	Total population	Internet services providers (ISP) [a]	Percentage of population: With access to main telephone lines [a]	With mobile telephones [a]	Using the Internet [a]	Using the Internet [b]
UAE	2,407,460	1	38.02	41.54	16.62	24.44
Bahrain	569,202	1	23.55	9.07	5.81	16.67
Kuwait	1,930,132	3	20.18	10.28	4.90	8.25
Lebanon	3,627,774	22	19.30	15.99	6.27	6.56
Qatar	762,887	1	18.46	5.65	5.58	10.27
Saudi Arabia	22,757,092	42	13.62	4.39	1.76	2.59
Syria	16,728,808	1	7.85	na	0.12	0.18
Jordan	5,153,378	5	7.82	0.22	1.70	4.57
Oman	2,622,198	1	7.67	2.28	1.91	3.36
Libya	5,240,599	1	7.25	na	0.14	0.40
Algeria	31,736,053	1	7.25	0.11	0.06	0.60
Egypt	69,536,644	50	5.71	0.55	0.43	0.82
Tunisia	9,705,102	1	6.74	0.52	1.13	2.89
Iraq	23,331,985	1	2.89	na	na	0.06
Yemen	18,078,035	1	1.61	0.18	0.07	0.08
Sudan	36,080,373	1	1.11	0.06	0.03	0.08
Djibouti	442,972	na	na	na	na	na
Total Arab states	281,355,999	133	189.03	90.84	46.53	86.08
Total Gulf states	31,048,971	49	121.50	73.21	36.58	65.58
% of the Gulf states to total Arab	11.04	36.84	64.28	80.59	78.62	76

Sources: (a) CIA (2001); (b) Ajeeb Research Survey (2001a)

4.0 Impediments of ICT Diffusion in The Arab Countries

In the literature review, different researchers studied the causing factors of the unequal diffusion of ICT and confirmed that several factors in the cultural, economic, political, and

social environment shape and determine the extent of ICT adoption in a country and are themselves shaped by the extent of ICT adoption. According to Antón et al. (2003) Cultural adaptation, economic necessity, social demands, and resource availabilities are major determinants of the extent of technological adoption in each industry and society over the next 15 years. The extent of technology adoption could in turn have major effects on the economy, society, and politics of most countries. In the same manner, Hundley et al. (2003) postulated a set of causative and resultant factors to distinguish one nation's progress toward Information Revolution (IR) from the others. Causative factors were defined as the underlying factors shaping a nation information revolution posture. Whereas resultant factors resemble the effect of causative factors and characterize a nation's information revolution posture. (Table,1.5).

Table 1.5

Causative Factors Shaping a Nation's IR Posture

Technology Dimension	Social/Cultural Dimension	Political/ Governmental Dimension	Business/ Financial Dimension
Amount and quality of research in information science and technology	How the society deals with change • Reaction to change • Mechanisms for change	The nature of the legal regime Degree and nature of governmental control	Degree of risk-taking mentality and entrepreneurship Structure of capital markets
		Degree of financial and institutional support for IT research	
Status of underlying physical infrastructure and human capital			

Resultant Factors Characterizing a Nation's IR Posture

Technology Dimension	Business/ Financial Dimension	Political/ Governmental Dimension	Social/ Cultural Dimension
Degree and nature of IT penetration into society	Amount of information work and number of information workers	Presence (and number) of new political actors (e.g., NGOs)	Degree of societal tension created because of IR developments
Distribution of IT activity across technology, artifact, and service spectrum	Amount and nature of e-commerce	Degree to which the role and manner of governance has changed	
	Presence (and number) of IT business clusters		
Amount of "creative destruction"			
Movement of talented, IT-trained people (into and out of country)			

Source: Hundley et al. (2003)

In the same context, Grey E. Burkhart and Susan Older (2003) mentioned that the creation and usage of Information and Communication Technologies (ICTs) are critically dependent upon economic factors, nature of the government, and the government's role in ICT development.

As developing countries join the information and technology revolution age strategies are needed to establish the necessary infrastructure for technology creation and adoption, the reliable business and financial market, the favorable political regime and government policy, and the suitable social and cultural climate. The Arab countries, ranging between developing and least developing countries, must extend good efforts in the mentioned fields in order to avoid being lagged behind.

In what follows we will discuss the major factors in the previously mentioned dimensions of technology infrastructure, social and cultural environment, business and

economic environment and legal and policy environment, which impeded the diffusion of ICT in the Arab countries and caused a wide gap between Arab countries and other developed countries and within the Arab countries themselves mainly.

4.1 Technology Infrastructure

The absence of technology creation and the weak diffusion of new technologies are considered major impediments to the diffusion of Information and Communication Technology (ICT) in Arab countries. The Human Development Report (HDR, 2001) emphasized that all countries and especially the poorest, should settle policies that encourage innovation and access to new technologies. The report also mentioned that any country that fails to make effective use of technology, will fall behind and will be marginalized in the global economy.

The UNDP developed the Technology Achievement Index (TAI), which is the latest measurement approach to assess the technological achievements of a country. It also helps policy makers in identifying policy priorities. This index is a composite measure of the technological progress that ranks countries on a comparative global scale based on indicators in four dimensions which are: creation of technology, diffusion of recent innovations, diffusion of old innovations, and human skills. The TAI index classified countries into three groups, which are: leaders, potential leaders, and dynamic adopters or marginalized. The leaders are the countries that have high achievements in technology creation, diffusion and skills. Potential leaders are countries that have high levels of human skills and wide diffusion of old technologies but little innovations. Dynamic adopters are countries that have high levels of human skills and important high-technology industries, but still have low diffusion of old innovations. Marginalized group includes countries that lack old and new technology diffusion and human skills. Countries with

missing or with unsatisfactory data for one or more indicators were not ranked by the index. The results showed that four Arab countries were ranked as dynamic adopters by the TAI index (Tunisia, Syrian Arab Republic, Egypt, Algeria), and only one Arab country (Sudan) was ranked in the Marginalized group. No Arab countries were ranked due to the lack of data. We deduce from these results that Arab countries are adopters of technologies and not innovators. Also, they are mainly low adopters of old and new technologies and have low to high levels of human skills.

In another attempt to assess the extent of technology creation in the Arab countries we compile secondary data on the number of U.S. patents granted to the Arab countries. The U.S. Patent and Trademark Office is the only source that publishes a yearly report that shows the number of U.S. patents granted to U.S. and foreign residents distributed by state or country of origin. The origin of the patent is determined by the residence of the first name of the inventor. We draw the data relevant to Arab countries and Israel between the period starting from Jan.1, 1995 till Dec.31, 2001 as shown in table 1.6. Israel is included in our data for the sake of comparison, thus being a Middle East developed country. It is beneficial to include it in a comparison with its neighboring Arab countries. The results show a wide gap between the total patents granted to all the Arab countries that ranged from 18 patents in 1995 to 38 patents in 2001 and those granted to Israel that ranged from 432 in 1995 to 1031 in 2001, shown in figure 1.0. This proves that the Arab countries are non-innovators of technology and still have much to build in the field of technology.

Table 1.6

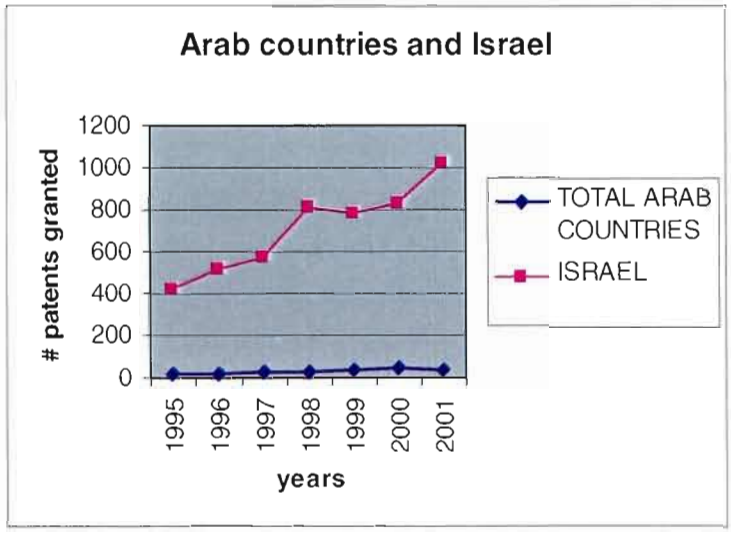
Patents granted to Arab countries

YEAR	1995	1996	1997	1998	1999	2000	2001
Algeria	0	0	0	1	0	0	1
UAE	1	1	0	1	3	2	6
Bahrain	0	0	1	0	2	1	0
Egypt	3	3	1	1	3	8	6
Iraq	0	0	0	0	0	0	0
Jordan	0	1	4	3	1	0	3
Kuwait	1	2	2	6	13	8	6
Lebanon	1	0	1	3	2	4	2
Morocco	2	1	0	2	2	2	1
Oman	0	0	0	0	0	0	0
Qatar	0	0	0	0	0	1	0
Saudi Arabia	10	12	14	14	13	19	12
Syria	0	0	0	0	1	4	1
Tunisia	0	0	1	0	0	0	0
Yemen	0	0	0	0	0	0	0
TOTAL ARAB COUNTRIES	18	20	24	31	40	49	38
ISRAEL	432	525	577	820	792	836	1031

Source: U.S. Patent and Trademark Office, 2001.

Figure 1.0

Comparison between Patents Granted to Arab Countries and those Granted to Israel

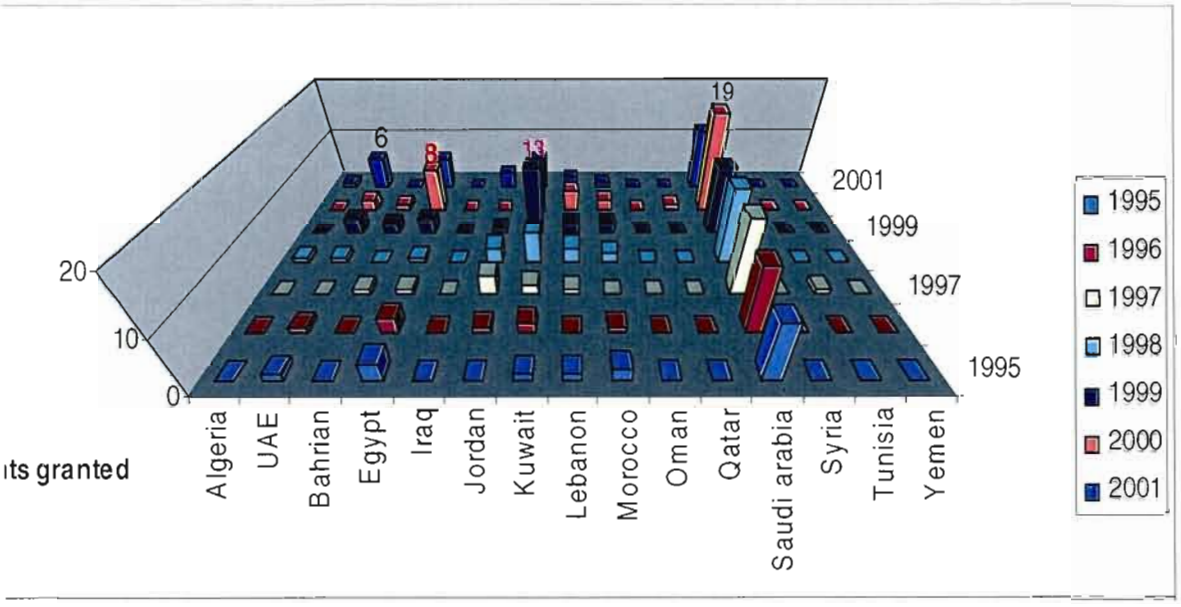


Source: Data compiled by the author, taken from U.S. Patent and Trademark Office, Technology Assessment and Forecast database (2001).

Figure 2.0, also shows the distribution of the granted patents by the U.S. Patent and Trademark Office among the Arab countries that also shows a wide gap, between Saudi Arabia, Kuwait, Egypt and UAE, respectively and the other Arab countries.

Figure 1.2

Distribution of Granted Patents between Arab Countries



Source: U.S. Patent and Trademark Office, 2001.

4.2 Social and Cultural Environment

In the social and cultural dimension, the Arab's specific cultural beliefs, their religion, and their discrimination against women are major impediments for the diffusion of ICT in their countries. This part will first discuss the Literature Review available on this context and then will move to study the role of each of the above-mentioned factors of major influence.

An enormous work is available in the literature review on the relation between the cultural environment and the transfer and usage of Information Technology. "Anthropologists, while studying the problematic nature of information transformation technology in developing countries like those in the Arab world, suggest that much of the technology designed and produced in developed countries is ethnocentric that is,

culturally-biased in favor of their own social and cultural systems; Consequently developing countries encounter cultural and social obstacles when attempting to transfer technology, created aboard, into practice at home" (Yavas et al., 1992, p: 80). Hill et al. (1998, p: 32) pointed out that "the culture of a country or region greatly affects the acceptance of technology through its beliefs and values about modernization and technological development". Hakken (1991) also stated that technology is determined by and at the same time becomes a determining factor of networks of interacting human, organizational, and artifactual entities or actors. In this part of our research, we will discuss the role of cultural and social factors in the Arab countries, whether they impede or help the transfer and usage of Information Technology in Arab countries.

4.2.1 Arab's Attitude Towards Time

Hill et al. (1998) studied the relation between the Arab's attitude towards time and the transfer of technology to Arab countries. The Arab's belief towards time was described as being not as fixed and rigidly segmented as it tends to be among Westerners, but as being more relaxed about the timing of events. The researchers prepared a model in which data were collected from three different focus groups and arrived at a significant correlation between Arab's belief towards time and the transfer of technology. Thus, they proved that Arab's attitude towards time is a significant impediment in the process of transfer of Information and Technology.

The Arabs also prefer face-to-face interactions in their personal relationships. This cultural belief also impedes the transfer and usage of the new technologies. Most Arabs do not prefer to communicate via computers, e-mail or fax, but instead they prefer direct human contact that in turn leads away from computer use.

4.2.2 Islamic Religion

Many Muslims feel that the West unrightfully and intentionally keeps attacking them and their religion. Western societies regard Islam as the religion of terrorists and fanatics. Since most of the technology is designed and produced in Western developed countries, Muslims consider that these technologies biased in favor of the Western countries and prefer not to adopt it.

Shai-lee (2000) studied the correlation between the diffusion of the Islam religion and the diffusion of the Internet in 156 countries around the world. He found a negative correlation between the two variables and concluded that the higher the percentage of Muslims in a country, the lower the Internet diffusion (in the 95% confidence). Arab countries having a high percentage of Muslims, and the internet being the leading source of information and technology. This means that Islam will impede the penetration and adoption of Information and Technology in Arab countries.

4.2.3 Discrimination against women

The Islamic culture in general and the Arab's culture in particular are characterized by the domination of man and the disempowerment of women in the social life. The Gender Empowerment Measure (GEM), established in the UN's 1995 Global Human Development Report, has ranked the participation of women as reflected by income per person, women's share of professional and technical positions, and women's share of parliamentary seats (UNDP, 2002). The Arab region had the lowest GEM ranking in the world running a close second to sub-Saharan Africa.

The United Nations' first Arab Human Development Report (AHDR, 2002) strongly criticizes the discrimination against women in the Arab world. The report highlights the negative impact of women's discrimination on technology development in the Arab countries. It clearly states that this act is depriving the Arab countries of the creativity and productivity of half of its citizens and leading to the marginalization and disempowerment of those countries in the new globalized world, in which the success of new economies rests heavily on the participation of the entire population.

4.3 Business and Economic Environment

In this session, we will discuss the characteristics of the business and economic environment of the Arab countries from a macro and micro economic perspective. We will also emphasize on two factors, the FDI (Foreign Direct Investment) and the openness to the global economy, which are considered effective channels to transfer Information and Technology to the developing countries and prosper the diffusion of ICT.

On the macroeconomic level, countries all over the world are coming together into groups with the idea of defending themselves economically against the incursions of other blocs into their areas. Europe adopted a single currency that will translate eventually into an entity functioning as a single economy. The Far East countries realized the seriousness of such a threat and made their own regional trade agreements and free trade zones. Asian countries have already adopted the necessary protective measures to protect themselves. Even the United States felt the need for a regional grouping and teamed up with Canada and Mexico to form North American Free trade Agreement (NAFTA). Against these trends of unity all over the world, the formation of an Arab Common Market becomes a most pressing imperative. Arab countries instead are not changing quickly enough

although some attempts had been made in the early 1990s to perform a unity but nothing was achieved more than plans yet to be materialized.

On the microeconomic level, although Arab countries vary between wealthy rich-oil countries and poor-oil countries, they are still considered weak in their economic development. According to Makdisi et al. (2002, p: 3), "the growth pattern in the MENA region is characterized by heavily relying on oil, weak economic base, high population growth and unemployment rates, dominance of the state in the economic sector, low level of integration with the world, underdeveloped financial and capital market, underdeveloped institutions, and low rates of returns on human and physical capital". In the same context, Grey E. Burkhart and Susan Older (2003, p:15) studied the effect of economic and business factors on information and technology revolution in Middle East and North Africa (MENA) countries and found that "the causative factors in MENA countries are not favorable to the information revolution. The societies are generally risk-averse and conservative. Business decisions take time... western-style entrepreneurship has been rare. Capital markets are nonexistent in some countries, such as Libya and Syria, and strongly state-dominated in most of the other countries... the most significant source of development financing in most of these countries comes from international and regional lenders/grantors, such as the World Bank or Arab Bank for Regional Economic Development".

4.3.1 Role of Foreign Direct Investment

The transfer of Information and Technology is considered one of the most important factors that lead governments to encourage FDI. Many researches confirm the important role of FDI in the transfer of information and technology. Damijan et al. (2003) emphasized the importance of FDI as a vehicle of technology transfer, especially for firms

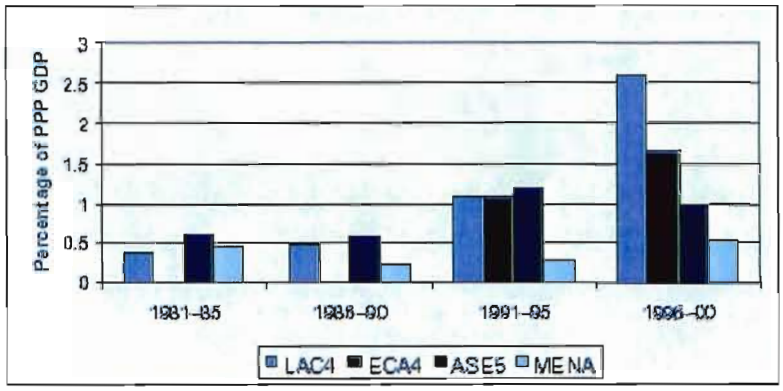
in transition economies due to the urgent need to restructure quickly. Similarly, Mansfield and Romeo (1980) mentioned that FDI might also be the cheapest means of technology transfer, as the recipient firm normally does not have to finance the acquisition of new technology. And it tends to transfer newer technology more quickly than licensing agreements and international trade.

Although all the above Literature Review emphasized on the effective role of FDI in the transfer of information and technology, still the evidence showed poor capital flows in the form of FDI to Arab countries. Figure 1.3, drawn from the reports of the World Bank 2003 showed the flow of the capital in the form of FDI to four regions in the world. Arab countries represented by the Middle East and North Africa countries showed the minimum capital flow.

The reason behind the wide gap in the distribution of FDI between Arab countries and other developed countries in the world is that those developed countries have started to liberalize their investment regulations, in order to increase the small level of FDI inflows, whereas the liberalization in the Arab region has been notably slower.

Figure 1.3

Net FDI flows to MENA and other regions



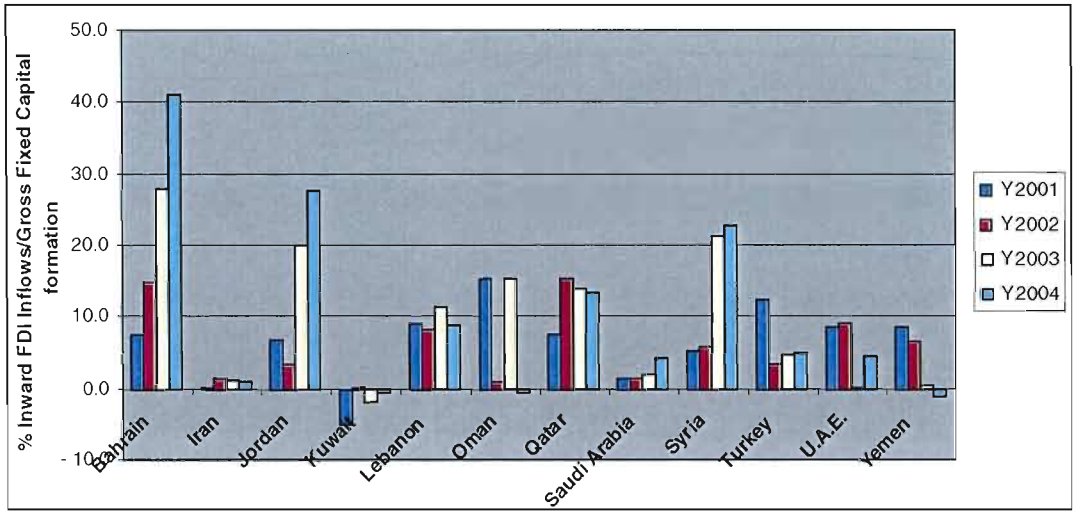
Notes: ECA4 are Czech Republic, Turkey, Poland, and Hungary. ASE5 are China, Indonesia, Republic of Korea, Malaysia, and Thailand. LAC4 are Argentina, Brazil, Chile, and Mexico. MENA are Middle East and North Africa countries.

Source: World Bank, 2003.

A wide gap exists in the distribution of FDI in between Arab countries. Figure 1.4 clearly shows that a minority of Arab countries including Bahrain, Jordan, and Syria have succeeded in increasing FDI inflows during the last four years, where as Lebanon figures are still moderate in comparison to other Arab countries.

Figure 1.4

Distribution of FDI in Between Arab Countries



Source: World Bank, 2004.

4.3.2 Openness to the Global Economy

Globalization or the degree of openness to the global economy is another important factor resulting in the flow of Information and Technology. Gallup et al. (1998) conclude that open economies are generally in a better position to import new technologies and new ideas from the rest of the world. The UN Secretary General Kofi Annan noted in the National Press Club of Australia in Canberra on 22nd of February 2000 that the main losers in today's very unequal world are not those who are exposed to globalization, but are those who have been left out. Similarly, the November 2001 World Trade Organization ministerial conference in Doha, Qatar, revealed that most developing countries want more globalization, not less. The challenge for the developing countries left out is to enhance their capacity to participate in and benefit from the opportunities of the global market.

Beginning in the mid-1980's Jordan, Algeria, Morocco, Tunisia, and Egypt implemented extensive economic policy reforms largely on a unilateral basis. Trade reform measures generally began by streamlining the tariff system and lowering the effective rate of protection in each Arab country, but Arab economic prosperity is a regional issue rather than a country specific one. As first recognized by Robert Z. Lawrence (1996), multilateral reform efforts such as that embodied in the World Trade Organization tend to most readily achieve liberalization of the transparent border barriers or 'shallow integration'. On a multilateral basis, the Arab region has the highest number of countries and the greatest part of any region in the world that does not yet belong to the WTO, most have large populations (Algeria, Iran, Iraq, and Saudi Arabia). This region also has a large number of countries affected by trade sanctions (Iraq, Iran, Libya, and Syria).

On a regional basis, eighteen Arab states approved on an executive program establishing the Arab Free Trade Area (FTA) in 1997 which will lead to the elimination of import duties and other barriers, to trade on goods of Arabic origin over a ten-year period. In March 1998, Bahrain, Kuwait, Egypt, Morocco and Tunisia reduced tariffs on trade among Arab countries. Libya removed all tariff and non-tariff barriers. The rest of the member states expressed an interest in the complete implementation, but are currently undergoing economic reforms.

Lebanon, which is well known as a country with a free and open trade regime, has recently increased its efforts to integrate with countries of the Arab regions and other countries worldwide. Lebanon signed a multilateral trade liberalization agreement with each of European Union (EU) in 2003 and GAFFA (Greater Arab Free Trade Agreement) in 1997. Lebanon has also signed bilateral free trade agreements with Syria (effective 1999), Egypt (effective 1999), Kuwait (effective 2000), U.A.E. (effective 2001), and Iraq (effective 2002).

4.4 Legal and Policy Environment

4.4.1 Legal Environment

A proper legal framework is essential for any developing country in order to cope with the age of globalization and Information Revolution. Without a proper legal framework providing stability and security for investors and shareholders, economic reforms such as the privatization of large state owned enterprises or projects requiring the injection of foreign capital will surely fail. A proper legal framework provides stability and security for investors and shareholders. In addition, it facilitates commerce and helps foster a favorable investment climate that provides a kind of transparency necessary to encourage investors to invest in the markets of developing countries.

The ESCWA press (2003), and while describing the status of the legal and regulatory framework in Arab countries, emphasized on the importance of the existence of a supportive and predictable legal framework to enhance trust in ICT and e-business, and to promote its development and dissemination. Although there is a consensus that the current legal infrastructure is generally applicable to electronic transactions, yet most national laws were developed in the absence of electronic systems. A review should be carried out of relevant legislation, where appropriate, with the aim of identifying and removing factors that prevent enterprises from using ICT, particularly in e-business. In this respect, the absence of a well-reviewed up to date legal system, together with an overworked and uninformed judiciary in many parts of the Arab world, stifle and stunt economic development and contribute to keeping Arab countries lagging behind other countries. One of the main problems in the legal process in Arab countries is the interference of unofficial relationships, such as family connections and personal ties in the legal system to replace the formal authority of the law. This is in contrast to developed nations where the legal system is free and independent.

Table 1.7, shows the integration of Arab countries in global intellectual property rights organizations. Nine of them are members of the WTO and eleven joined the Paris Convention for the Protection of Industrial Property, also four Arab countries have signed the Patent Cooperation Treaty (PCT) and three of them joined the Patent Law Treaty (PLT). In the mid-to-late 1990s a slight improvement occurred when eight of them joined the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) which is a joint WTO-WIPO framework. The below table shows that the legal framework in Lebanon and other Middle East and Gulf countries is less advanced than Arab North African countries including Egypt, Morocco, Algeria, and Tunisia. This is deemed to being lately colonized and for long time periods by advanced countries, France and Britain, which helped in creating more advanced legal framework compared to other countries in the region.

Table 1.7

Status of Arab States on Intellectual Property Rights

		WIPO Treaties								
	WTO Member	Paris Convention	WCT	PCT	Madrid Agreement	Hague Agreement	TLT	PLT	Nairobi Treaty	TRIPS
Gulf										
Kuwait	✓	×	✓ (1998)	×	×	×	×	×	×	✓ (1995)
Saudi Arabia	×	×	✓ (1982)	×	×	×	×	×	×	×
Bahrain	✓	✓ (1997)	×	×	×	×	×	×	×	✓ (1995)
Qatar	✓	✓ (2000)	✓ (1976)	×	×	×	×	×	✓ (1983)	×
U.A.E.	✓	✓ (1996)	✓ (1974)	✓ (1999)	×	×	×	✓ (1999)	×	✓ (1996)
Oman	✓	✓ (1999)	×	✓ (2001)	×	×	×	×	✓ (1986)	✓ (2000)
Levant										
Lebanon	×	✓ (1924)	✓ (1986)	×	✓ (1924)	×	×	✓ (2000)	×	×
Syrian AR	×	✓ (1924)	×	×	✓ (1924)	×	×	×	✓ (1984)	×
Jordan	✓	✓ (1972)	✓ (1972)	×	×	×	×	×	×	✓ (2000)
Egypt	✓	✓ (1951)	×	×	✓ (1952)	✓ (1975)	✓ (1999)	×	✓ (1982)	✓ (1995)
Maghreb										
Tunisia	✓	✓ (1984)	×	×	✓ (1982)	✓ (1930)	×	×	✓ (1983)	✓ (1995)
Algeria	×	✓ (1966)	✓ (1975)	✓ (2000)	✓ (1972)	×	×	✓ (2000)	✓ (1984)	×
Morocco	✓	✓ (1917)	✓ (1971)	✓ (1999)	✓ (1917)	✓ (1930)	×	×	✓ (1993)	✓ (1995)

Source: Soumitra Dutta, 2003

4.4.2 Political Environment

The governments of the Arab countries exercise a strong centralized control over commerce, finance, and politics. Many governments extend their control into the social sphere and people's private lives. None of these governments came to power as a result of a free and fair election. This fact made them much concerned about controlling the dissemination of information. One of the official reasons behind this tight control is the Islamic culture. The governments want to prevent "immoral" information (e.g. pornography) from entering the country. However, in some cases the religious reasons are only an excuse for other reasons such as the government's need to suppress opposition. Table 1.8 below shows the absence of a free society in Arab countries. This will grant real information revolution a little chance of occurring in any of these countries. Information revolution with its power to disseminate data more widely and efficiently and to create transparency in government and business operations is considered inimical to most of the ruling elites. Christopher Kedzie (1985) foresaw the future of information revolution in totalitarian societies and stated that those countries face a dilemma. They either try to stifle these information and communication technologies and become marginalized in the new industrial revolution, or else undertake this task and see their totalitarian control inevitably eroded, as it might lead and progress democratization inside their countries. In fact, they do not have a choice because they will never be able entirely to block the tide of technological advance.

Table 1.8

Freedom and the Information Revolution

Country	Political Rights	Civil Liberties	Freedom Rating	How Info - "Revolutionary"
Algeria	6	5	Not Free	Not At All
Bahrain	7	6	Not Free	Moderately
Egypt	6	5	Not Free	Trying
Iran	6	6	Not Free	Cautious
Iraq	7	7	Not Free	Not At All
Israel	1	2	Free	Very
Jordan	4	4	Partially Free	Trying
Kuwait	4	5	Partially Free	Moderately
Lebanon	6	5	Not Free	Moderately
Libya	7	7	Not Free	Not At All
Morocco	5	4	Partially Free	Trying
Oman	6	6	Not Free	Intending
Qatar	6	6	Not Free	Moderately
Saudi Arabia	7	7	Not Free	Very Cautious
Syria	7	7	Not Free	Desirous
Tunisia	6	5	Not Free	Trying
United Arab Emirates	6	5	Not Free	Trying
Yemen	5	6	Not Free	Not At All

Source: Freedom House Index, 2002

In the same context, Simon (2001) studied the diffusion of the internet in the Middle East and North Africa (MENA) region and classified it into three categories: with respect to the degree and nature of government control, which are driven countries, best of both countries and fearful countries (Table 1.9). Driven countries are those that allow the Internet to develop freely for the economic benefits it would bring. This group includes the most liberal countries in the region and all are driven by economic imperatives. The best of all countries include countries that tried to have it both ways by fostering "acceptable" activity while tightly controlling the rest. Fearful countries include those who are so fearful of potential adverse consequences of the dissemination of internet. Recently, even the most fearful countries start realizing the importance of ICT diffusion and became active in this field. Tatsuya Yamamoto (2005) stated two main reasons that lead Syria, one of the most fearful countries in MENA region, to allow the diffusion of ICT. The first is

the strong belief that ICT development is necessary to achieve sustainable economic growth, which is one of major tasks for the Syrian government, especially the growth of the private sector that should consider how to apply ICT in their business as it tends to carry out their business internationally. The second reason is the aim to stem the "digital divide" which pushes the Syrian government to provide incentives to create a basis for the ICT development.

Table 1.9

Wealth and Disposition Versus Development

Disposition Type	Country	Wealth	Internet Development
Driven	Bahrain	High	Rapid, extensive
	Egypt	Moderate	Moderate
	Israel	High	Rapid, extensive
	Jordan	Moderate	Slow
	Kuwait	Very high	Rapid
	Lebanon	Growing	Rapid
	Morocco	Moderate	Moderate
	Oman	Moderate	Slow
	Qatar	High	Rapid
	Yemen	Low	Very Slow
Fearful	Algeria	Low	Halted
	Iraq	Low	None
	Libya	Low-moderate	Recent, slow
	Syria	Moderate	Recent, slow
"Best of Both"	Iran	Moderate	Very slow
	Saudi Arabia	Very high	Recent, moderate
	Tunisia	Moderate	Moderate
	UAE	Very high	Rapid

Source: Simon, 2001

5.0 Conclusion

In brief, the constraints of ICT diffusion in the Arab region are largely related to the lack of an enabling environment that encourages the development of technology, some impeding policy frameworks that stifle the diffusion of information, an absence of a liberal trade regime, and the restrictions on the degree of openness and integration into the global economy.

Governments in the Arab Countries, through their policy-making mechanisms, hold the key to the development of a knowledge-driven society, through applying sound and forward-looking ICT policies and strategies that have the capacity to change the entire sector within short terms. On the other hand, over-protective and outdated policies, still adopted by many Arab countries, stifle competition and deprive those countries from much needed investment and expertise in the ICT field, hence affecting the countries over all development in this field. Governments' effective policies and legislations are much needed to liberalize trade regimes, increase FDI inflows as an effective means of technology transfer, support innovation and access to new technologies, develop a business environment that is conductive to entrepreneurship and private risk-taking, and empower Arab women and provide them with the needed support to build their capabilities and enable them to exercise those capabilities to the maximum degree.

CHAPTER II

LEBANON'S E-READINESS ASSESSMENT

In our electronic age, global economies are built on a new model based on the internet and electronic business that requires a well-developed telecommunication infrastructure and an instant access to information databases. According to Mc Connell International (2001), the electronic readiness of a country defines the role that it can play on the regional and international level. Harvard University (2000, p: 11) also defines the e-readiness as "the degree to which a community is prepared to participate in the Networked World". It is measured by assessing a community's relative advancement in the areas that are most critical for the ICT adoption. The objective of this chapter is to assess the e-readiness of Lebanon. This means: how much is Lebanon ready to join and yield benefits from the new electronic age of Information and Communication Technologies.

Many research units (Mosaic Group, McConnell International, Asian Pacific Economic Cooperation (APEC), Center for International Development at Harvard University (CID), and other research units) proposed models and schemes to assess the level of e-readiness in different countries all over the world. They grouped ICT indicators under broad categories to facilitate the evaluation of a country's ICT diffusion. The majority of these papers used the same ICT indicators, but it grouped them under different categories and classifications. In our approach to measure e-readiness in Lebanon, it is necessary to follow an e-readiness model that is applicable to developing countries since, Lebanon is a developing country. Mc Connell's model is adapted in our e-readiness assessment approach since it satisfies this need. Mc Connell's model was used to assess the e-readiness level in 53 developed and developing countries, in contrast with other models, which focused on ICT applications and ICT strategies together with a group of other ICT indicators that were more relevant to advanced countries than to developing ones.

Mc Connell International is a global technology policy and management-consulting firm that has helped its clients (governments and large firms) seize opportunities in the global economy. Mc Connell's assessment enables companies to realize the revenue potential and the possible threats when entering new markets. It is also useful for governments, as detailed national-level analysis creates an opening for business, government, and private organizations to work together to improve a nation's overall ability to participate in the digital economy (Mc Connell international, 2001). The company uses a sort of measure or index called "E-readiness" which gathers and evaluates both quantitative and qualitative data on five attributes, which constitutes the rating measure. The E-readiness attributes are the following:

- Connectivity: are networks easy and affordable to access and use?
- E-leadership: is E-readiness a national priority?
- Information security: can the processing and storage of networked information be trusted?
- Human capital: are the right people available to support E-business and to build a knowledge-based society?
- E-business climate: how easy is it to do E-business today?

In the following section of our e-readiness model, we will study several indicators relevant to the five attributes followed by Mc Connell International. Some of the data used were primary data collected from local telecommunication providers and ISPs, while other were secondary, collected from the International Telecommunication Union and various publications and web sites. Lebanon's position on several indicators was compared with that of regional developing and global developed countries in order to assess the current e-readiness status with respect to these indicators. At the end of each attribute, a special assessment section was added to determine the limitations and challenges to be addresses at each attribute.

1.0 Connectivity

According to Mc Connell International (2001), in order to participate in the networked economy there should be a reliable infrastructure for the exchange of information, goods, and services with the rest of the world. Key elements to assess connectivity include:

- Availability of wire-line and wireless communication services, community access centers, and networked computers in businesses, schools, and homes.

- Affordability and reliability of networked access, including the cost of service, downtime, and the prevalence of sharing access among individuals

- Underlying infrastructure, including the reliability of electrical supply for business-critical computer operations and the ease of importing and exporting goods and of transporting them within a country

1.1 Fixed Telephone Service

The fixed Line Network available in Lebanon is a Public Switched Telephone Network (PSTN), has a 2,000 km fiber-optic backbone with a capacity of 1.2 million landlines, which is operated and maintained by the" Organisme de Gestion et d'Exploitation de l'ex-société Radio Orient"(OGERO). The fixed line network is the most popular mode of access to the Internet providing users with dial up connections and leased lines services. The Government has the monopoly of this service.

1.1.1 Diffusion Rate of Fixed Telephones

Table 2.0 shows that the total fixed telephone subscribers are 681,066 subscribers. Given the total inhabitants in Lebanon are around 3.4 million, the number of telephone subscriptions per one hundred people or teledensity is 20%.

Table 2.0

Usage of Fixed Line Network (2002)

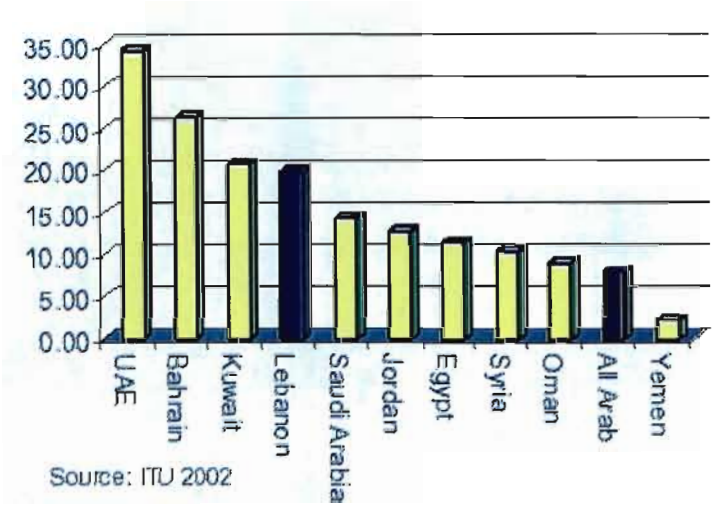
Residental Telephone Subscribers	564,143
Commercial Telephone Subscribers	116,923
Total Telephone Subscribers	681,066
Teledensity	20%

Source: OGERO, 2004.

The Lebanese civil war has weakened the fixed telephone network and deprived it from development. Just until 1995, the reconstruction of the telecommunication infrastructure started taking place, during which the wireless telephone connection was already being launched a year before and many subscribers replaced their wire-line connection with a wireless one. Lebanon's fixed telephone penetration rate of 20% could be classified in a moderate to good rank. Lebanon had the 4th highest teledensity after 3 rich Gulf countries with very high GDPs and very low populations (Figure, 2.0).

Figure 2.0

Teledensity in the Arab World



1.1.2 Reliability of Fixed Line Telecommunications

According to OGERO's maintenance department, the fixed line telecommunications network is reliable with a .0053% of faults on local calls, a customer service department is available 24 hours a day, 7 days a week, a 3-days new line installation period from the date of submitting an application, and a 24 to 48 hours maintenance period from the date of submitting a complaint.

On the other hand, the international lines seem less reliable than the local ones. According to the Arab Advisors Group (2001), which has studied the bandwidth issue in all Arab countries and has computed several indices to rank countries, the International Voice Circuits Utilization (IVCU) index was the lowest for Lebanon in 2002, it showed that the Lebanese people are the most likely to get busy signals when placing international

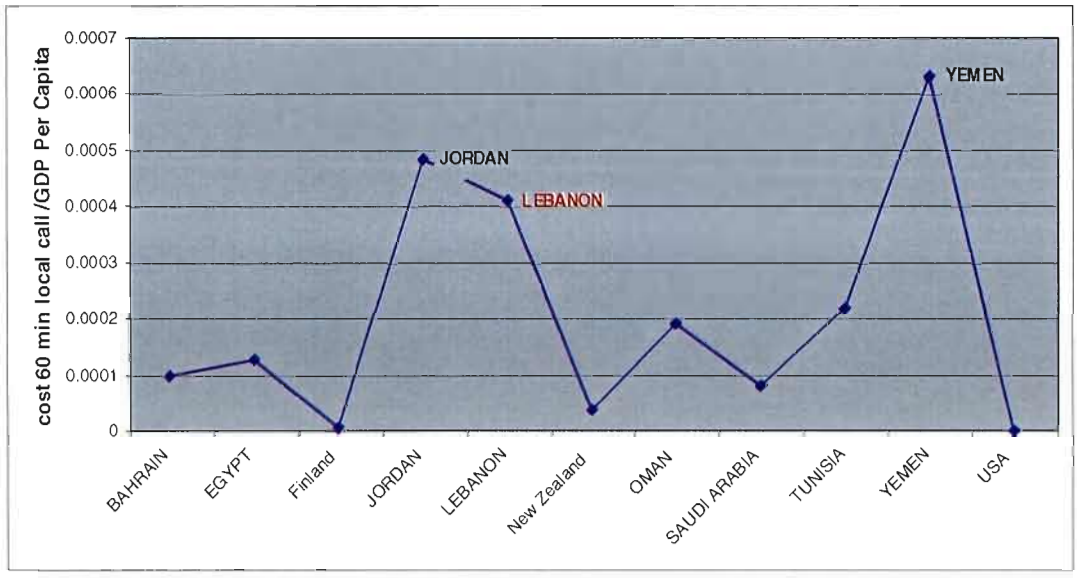
phone calls and that the percentage of successful international calls is only 60%, because of low international voice bandwidth.

1.1.3 Affordability of Fixed Telephone Service

The cost of the fixed telephone service in Lebanon is considered high relative to other Arab countries. Figure 2.1 shows that the affordability of the service, computed as the ratio of the cost of 60 minutes local call and the GDP per capita, comes in the 3rd highest place after Yemen and Jordan. A significant difference also appears between the Arab countries and other developing countries represented by Finland, USA and New Zealand. This shows that the cost of fixed telephone service in Lebanon is considered high with respect to the Arab developing countries and other developed countries.

Figure 2.1

Affordability Fixed Telephone Line



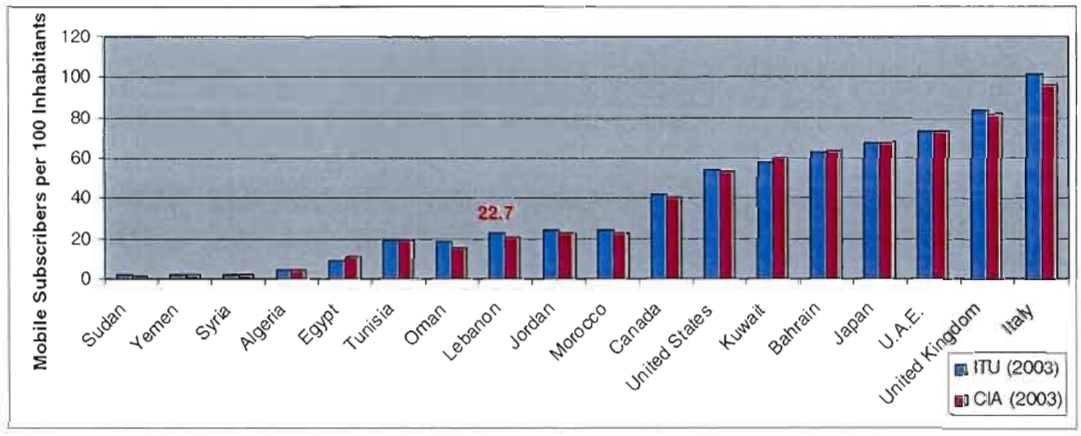
Source: ITU, 2001

1.2 Mobile Telephone Service

The mobile network was launched in Lebanon in 1994, a year before the reconstruction of the fixed telephone network took place. This helped its immediate diffusion in the early stages of its life cycle. The Lebanese have enjoyed the mobile service as a basic telecommunication tool that satisfied their need for a reliable communication mode and filled the gap in the fixed telephone network.

Two operators first managed the service: Cellis and Libancell, based on a BOT agreement (Build, Operate, and Transfer). In June 2001, the Lebanese government terminated the contracts with the two operators. In June 2004, two new mobile operators, Mobile Telecommunications Company (MTC) of Kuwait and Detecon a subsidiary of Deutch Telecom, took over the mobile network.

Figure 2.2
Cellular Mobile Subscribers



Source: ITU (2003) & CIA (2003).

Figure 2.2 shows that Lebanon enjoys a middle connectivity rate in the mobile network having a mobile density of 22.7 and lagging behind Gulf countries and other developed countries. This explains that Lebanon's Mobile connectivity is with unacceptable limits, but still much work need to be done to close the gap between Lebanon and rich Gulf countries, which surpassed other developing countries in its high mobile density. The high mobile density in Gulf countries is explained by the high purchasing power of its inhabitants, who purchased the mobile service as a luxury service more than a need.

1.2.1 Reliability of the Mobile Telephone Service

The mobile service in Lebanon is considered reliable with a minimum number of faults on mobile calls. It is a 24 hours customer service, and 24 hours maintenance period from the date of submitting a complaint. A full range of wireless applications is also available from WAP to MMS. Lebanon's mobile-phone companies, LibanCell and Cellis, have recently started offering wireless internet access through Wireless Access Protocol (WAP) services, using general Packet Radio Services (GPRS) technology to fill in the void in high-capacity dial-up services. Cellis is one of the first worldwide operators to launch this GPRS technology and the very first to do so in the Middle East.

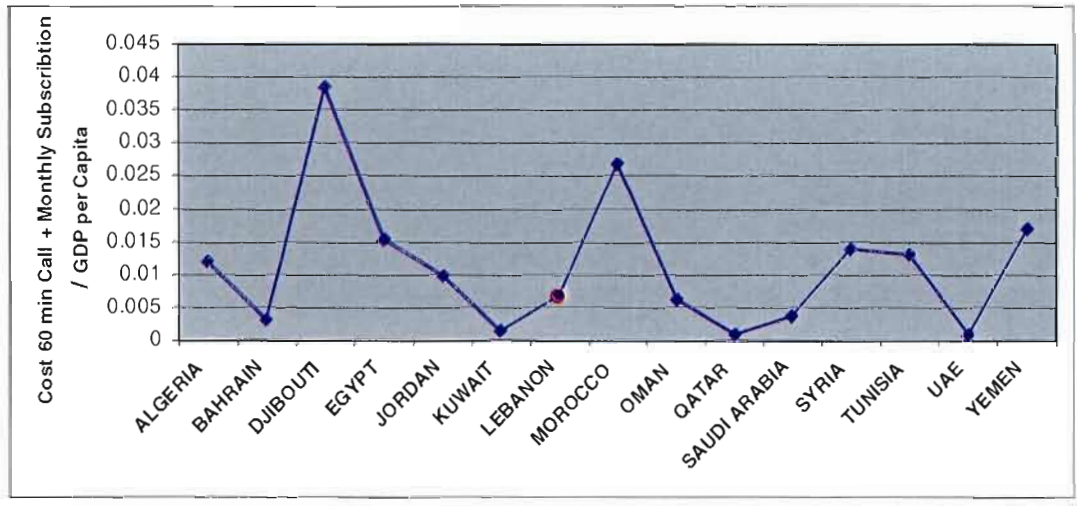
1.2.2 Affordability of the Mobile telephone service

The moderate position of Lebanon's mobile density is a result of the relatively moderate subscription fee and per minute charge of the mobile service which are computed as the ratio of the cost of a 60 minutes local mobile call, plus the monthly subscription cost over the GDP per capita (Fig. 2.3).In contrast, the high mobile density in the rich gulf countries is explained by the low subscription fee and per minute charge of

the service relative to the high GDP per capita. In an attempt to enhance the mobile connectivity in Lebanon and make the service affordable to more inhabitants, the government had already approved putting 100,000 new lines at the disposal of each of the two new operators at the end of 2004. This greater supply will reasonably lead to higher demand and lower prices.

Figure 2.3

Affordability mobile service Arab Countries



Source: ITU, 2003

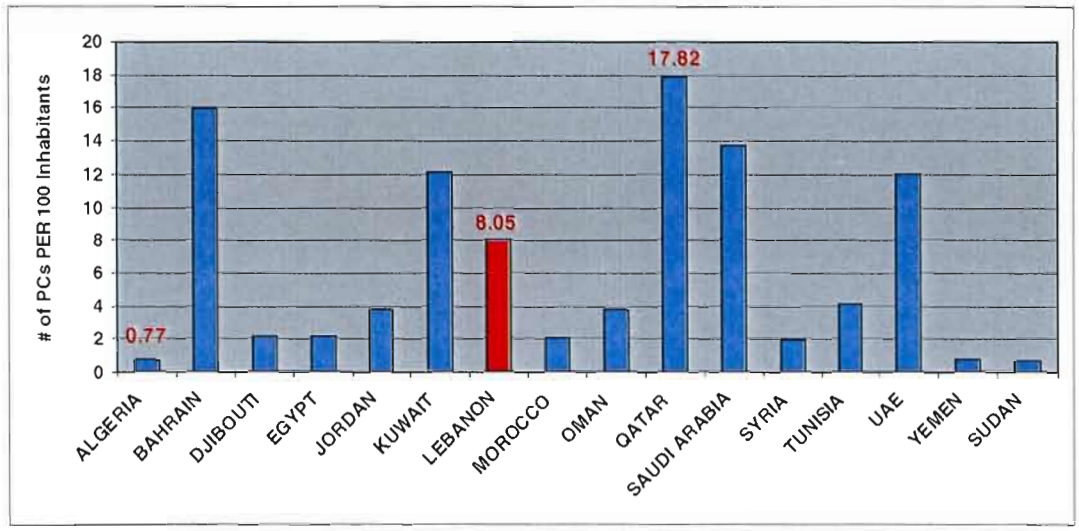
1.3 PC Penetration Rate

The penetration rate of PCs is still considered low in the whole Arab countries ranging from approximately 1% to 18%. According to the ITU, the density of personal computers in Lebanon in 2003 is 8.05%. This low penetration rate could not be accounted for the high customs rates only because at the beginning of 2001, the government reduced custom duties on hardware and software from a range of 6% to 30% to a flat 6%. Then starting from 2002 all ICT products were exempted from customs duties. However, during the

same year (2002) the VAT was applicable to ICT products. This did not lead to a significant reduction in end user prices.

Figure 2.4

PC Penetration per 100 inhabitants in the Arab World



Source: ITU, 2003

1.4 Internet Service

Lebanon was one of the first Arab countries to introduce the Internet in 1993. The American University of Beirut (AUB) had implemented and ran the first Internet node in 1991 and opened it to the public in 1993. AUB still hosts the Lebanon root name server.

Internet services had started to appear in Lebanon in 1996. This led to the licensing of 30 private Internet Service Providers (ISPs). These ISPs provide services mainly to the capital Beirut. Some have points of presence in the major cities throughout the country. In

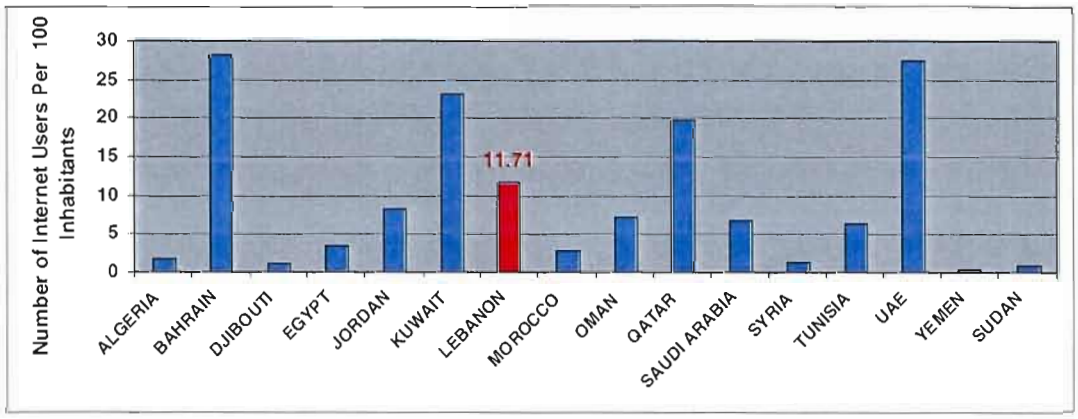
2000, the number of licensed ISPs decreased to 16 and in 2003, they rose up to 18. However, the number of active providers in Lebanon in 2003 was only five.

1.4.1 Internet Penetration

As shown in Figure 2.5, Lebanon is well positioned directly after rich Gulf countries with respect to the Internet penetration. Gulf countries represented by UAE, Bahrain, Kuwait, and Qatar are the only countries in the Arab region enjoying rates of penetration ranging between moderate to good rates, while all other non-Gulf countries leaded by Lebanon have relatively low rates of penetration and still have much to do to enhance the internet connectivity in their countries.

Figure 2.5

Internet Penetration per 100 inhabitants in the Arab World



Source: ITU, 2003.

1.4.2 Affordability of the Internet Service

Similar to other developed and developing countries, in Lebanon there are diverse modes of internet connection. Among them, we distinguish the dial up mode and the wireless access mode. We will discuss the affordability of the internet service relevant to each mode of connection.

1.4.2.1 Dial up Mode

The dial up mode is the most popular mode of access to the Internet in Lebanon. As shown in table 2.1, the data connection rates are charged per block of hours 25, 55, 100, 200 and 300 hours per month; above 300 the rates revert to the regular telephone connection rates after the 100 hours block the cost per hour of usage goes up. Although this mode is the most affordable mode of internet connection, still it is not considered reliable. Dial up modes offering per minute or hourly pricing are not much conductive for extensive internet usage, unlike flat rate pricing for unlimited access; in addition, the dial up mode can limit users' time online and therefore inhibit the use of the network for many activities, such as the electronic commerce (e-commerce). The speed of the dial up connection in Lebanon does not exceed 56 kbps and is considered very slow when compared with the latest launched DSL and ADSL technologies in developed countries, which provide a broadband bandwidth of 5MB or 10MB.

1.4.2.2 ISDN Access Mode

The ISDN service was launched in Lebanon by OGERO in 2001 and has provided a speed of 128 Kbps through two simultaneous connection channels of 64 Kbps each. The

ISDN service is more applicable for business use rather than residential use. Its charge is based on hours of access as well.

Table 2.1

Cost of Dial up and ISDN Access Modes

Dial up	33.6kbps	up to 15 US$	0 to 25 hours	12.6 US $	27.6 US $
			above 25 to 55 hours	26 US $	41 US $
			above 55 to 100 hours	32 US $	47 US $
			above 100 to 200 hours	102 US $	117 US $
			above 200 to 300 hours	264 US $	279 US $
			above 300 hours	1.8 US $ / hour	
Dial up	56kbps	up to 25 US$	0 to 25 hours	12.6 US $	37.6 US $
			above 25 to 55 hours	26 US $	51 US $
			above 55 to 100 hours	32 US $	57 US $
			above 100 to 200 hours	102 US $	127 US $
			above 200 to 300 hours	264 US $	289 US $
			above 300 hours	1.8 US $ / hour	

Source: OGERO, 2004.

1.4.2.3 Wireless Mobile Access Mode

Lebanon's two mobile phone operators, LibanCell and Cellis, have offered wireless internet access through mobile phones, using general packet radio services (GPRS) technology. This service covers most of Lebanon, but has not shown a high penetration mostly due to the lack of proper marketing, and the low speeds provided which are currently limited to only 24Kbps. The privilege of this service is that it allows a GSM phone to be always connected to the Internet to send and receive information (data) over a GSM network at an affordable price. This means that the customer pays only for the data he transmits over the network regardless of the duration he spends connected to the network.

Table 2.2

Cost of Wireless Internet Access

GPRS	Cellis	25 US $	40 MB per month**	37 US $	62 US $
GPRS	Cellis	25 US $	80 MB per month**	67 US $	92 US $
GPRS	Cellis	25 US $	120 MB per month**	96 US $	121 US $
GPRS	Libancell	25 US $	30 MB per month	20 US $	45 US $
GPRS	Libancell	25 US $	65 MB per month	40 US $	65 US $
GPRS	Libancell	25 US $	100 MB per month	60 US $	85 US $

Source: LibanCell (2003); Cellis (2003)

1.5 Power Supply

EDL (Electricite Du Liban) is the public authority in charge of generating, transmitting, and distributing power in Lebanon. It reports to the Ministry of Hydraulics and Electrical Resources. Since its foundation in 1954, EDL has been a monopoly, and it only offered two concessions: one to a small company in Zahle and another in Jbeil. The overall production of electricity in Lebanon is close to 1500 MW with the following repartition by type: 1030 thermal, 280 hydraulic, and the rest from gas turbines. EDL's supply of 1500 MW of electricity is enough to meet the country's demand and provide electricity 24 hours a day, but some regions of the country still do not enjoy that level of power supply due to failures in the distribution system. The Lebanese government is in the process of privatizing EDL. Power supply is not always reliable in Lebanon, even though EDL's supply is supposed to insure electricity 24 hours a day. The reasons behind the flows are mainly due to the inefficient management of EDL, who has loosed about USD 600 million in uncollected bills since 1992 and another USD 230 million due to illegal connections and technical problems. However, the improvement in EDL finances, resulting from improved bill collection in the first half of 2003, was eroded by the rise in the international price of oil derivatives. The country has experienced prolonged and disruptive power cuts in year 2004 owing to shortages in electrical power generating capacity. Indeed, without a

reliable, adequate, continuous, and price competitive supply of power, the hopes of development in the ICT sector are pipe dreams.

The rating is poor in terms of assessment on price and service of the electrical supply in Lebanon. Thus, the electrical power environment is not conducive to proper ICT operation without costly solutions, such as long life batteries in UPS units and electric power generators.

1.6 Transportation System

The availability of an efficient transportation system built on a well-developed physical transport infrastructure and logistic system minimizes the cost of the movement of goods within a country between the country, and other parts of the world. It is considered an essential non-ICT factor in enabling e-readiness.

The physical transport infrastructure is well developed in Lebanon through a network of roads and high ways linking the different districts of the country to each other. Also, the local distribution system is very efficient and reliable due to a strong competition between many local carriers, who are able to deliver goods to different regions in Lebanon within the required delivery timeliness and at reasonable prices.

Import and export of goods can be easily performed through Beirut International Airport, 12 ports, and harbors. Fees at Lebanese ports are notoriously high, but the forthcoming privatization is expected to attract strategic investors to develop the sector, set competitive prices, and enhance the quality of equipment and services. The availability of an advanced national cargo carrier, Trans Mediterranean Airline (TMA), supports the country's readiness and improves its openness to the world, especially after being ranked

by IATA among the top five airlines in the world in Cargo Load Factor. Small goods may also be sent or received to and from all countries worldwide through many International courier companies who have operations in Lebanon (FedEx, DHL, Aramex, UPS and Skynet) and the national Lebanese Courier Company, Liban Post. The market is also very competitive between those International couriers leading to an efficient and fast delivery system. The Lebanese customs also plays a vital role in supporting the country's readiness. New and modern customs law was implemented in 2001. It simplifies and expedites custom procedures, adopts international standards for the valuation of goods, applies modern and fair dispute settlement procedures, allows for electronic declaration of goods, and fosters the development of industrial and free zones. This new law has reduced delays and administrative burdens in clearing imported products through customs at the airport and ports. Furthermore, Customs have been very active in introducing online operations for its automated clearance system, whereby traders and custom brokers will be able to enter track customs declarations, and even start clearance while shipment is still in air, through the latest adopted Clear in Air (CIA) technology. In a later stage, users will be able to register, assess, and pay declarations from their bank accounts.

1.7 Assessment

In this part, we will review the term "connectivity' by identifying the challenges that Lebanon should surpass in order to be an active player in the digital economy.

The connectivity of Lebanon was moderate in terms of fixed and mobile telephones, and low with respect to the PCs and the internet. These penetration rates are not adequate for a country that wishes to yield benefits from the advantages of the new digital economy and bridge the digital divide both regionally and internationally. The connectivity phase is the first step in the electronic evolution of a country. A country should be well connected

in terms of ICT equipments and technologies to be able to perform several e-activities and live up to date with respect to the new evolving technologies. The figures mentioned above, showed a wide gap in the diffusion of several ICT technologies between Arab Gulf countries and other Arab countries. Rich Gulf countries were always ahead of other countries in the region. Some countries in the Arab region were aware of the evolution of a digital divide within the region itself, thus many of them had enacted new ICT strategies to enhance their position, and avoid being lagged behind, especially Jordan and Egypt. Gulf countries were also well investing their savings from oil revenues in new ICT technologies, and had succeeded to attain high connectivity rates comparable with those of advanced countries.

The affordability and reliability of the ICT services are key determinants of the rate of diffusion of these services. Many ICT services in Lebanon are marked by relatively high prices if compared to the moderate services they provide, especially the internet service and the power supply. The heavy hand of the government on different ICT sectors, ranging from a monopoly on the fixed telephone network and the power supply to a duopoly in the mobile network, frosted the improvement in those sectors. As a result, the international bandwidth of Lebanon is still unacceptably low and its reliability is also low, where the percentage of successful international calls is only 60%. On the data side, the total data bandwidth provisioned for Lebanon is shown above to be low; the responsiveness of the Government to rapid changes in technology and the demand for new technologies is also low. By the time that the ISDN service became available in 2001, the technology was already obsolete and the demand for it had sharply dropped. Today, DSL and ADSL services are demanded by the public to provide the badly needed broadband bandwidth of 5MB or 10MB. DSL should be offered as a service without delay because DSL is not a long term solution and will be certainly replaced by new technologies. The new technologies will result in major benefits, such as an increased traffic for ecommerce, a higher export of knowledge based products, and a more reliable access to knowledge and

information. The current situation of the ICT sectors in the Lebanese market calls for privatization for the urgent need to restructure quickly and promote the competition to enhance the quality and affordability of the service. However, the privatization has much been talked of in Lebanon since 1996, and still nothing is accomplished more than plans on paper. The vested interests of political parties have always been a major impediment in the privatization of any sector.

2.0 E-Leadership

This part of the E-readiness assessment discusses the role of the government as an encourager and adopter of ICT, and its efforts to promote the development of an E-society in Lebanon. This entails that the government understands the opportunities and risks of e-government and clearly demonstrates the commitment to implementing it for the benefit of its citizens.

According to Mc Connell international (2001), governments can increase the e-readiness of a country by providing an environment that encourages private sector action, while protecting consumers. Key elements to assess e-leadership include. For example:

1. Priority given by government to promoting the development of an e-society on a national level.

2. Extent of demonstrated progress on e-government, including efforts to automate governmental process, offer services to business and citizens electronically, and create national portals.

3. Quality of partnership between industry leaders and government to improve E-readiness.

4. Level of effort to promote access to all citizens.

2.1 Government's Vision to Promote E-Readiness

2.1.1 Absence of a National ICT Entity and Coordination across Ministries

In 2001, the government formed the Ministerial Information and Communication Technology Committee (MICTC) headed by the Minister of State for Administrative Reform, with the membership of each of the Minister of Telecommunications, and the Minister of Economy and Trade. The MICTC had a supporting Advisory Committee based in office of the Minister of State for Administrative Reform (OMSAR), whose members were from the public sector, private sector, and the academia sector. Both OMSAR and MICTC are still in charge of planning and executing ICT projects and strategies in Lebanon, in addition to other non-ICT duties relevant to administrative reforms in the public sector. This explains that there is no ministry for information and communication technology or a national ICT council dedicated towards the development of ICT, and involved in planning and supervising the implementation of ICT strategies and projects, coordinating ICT activities between ministries, public and private sectors, and helping the proliferation of ICT into the fabric of the society.

Although the Prime Minister issued two decrees requesting all Government entities to coordinate their ICT activities with OMSAR and MICTC, still many ministries perform their ICT projects without even consulting them. This shows the low level of coordination on ICT projects across ministries, which in most of the time leads to duplicated efforts or

efforts that are not aimed at the strategic aims of the Ministry or the Government. The case is totally different if compared to other Arab countries especially Jordan and Egypt who are well dedicated to bridge the digital divide regionally and internationally, and had improved their e-readiness lately by creating a Ministry for Information and Communication Technology with a firm national e-strategy to develop the ICT diffusion in the different sectors of the society.

2.1.2 Absence of a Coherent E-Strategy

Lebanon has a dynamic private sector eager to promote and implement e-Business, and a public sector, which is convinced of the importance of developing the needed legal and institutional framework. However, Lebanon still lacks a comprehensive e-Strategy capable of identifying clear goals, implementation plans, and timeframes. Lebanon is in need for a coherent e-strategy to reform the key enabling building blocks for an e-society including, ICT infrastructure, favorable e-business climate, legal, and regulatory framework conductive to e-business activities.

2.1.3 Low Government Expenditure on ICT

An estimate made by OMSAR (2003) of the ICT share in the 2001 government's budget, showed that the direct government expenditure on ICT was very limited and didn't exceed the sum of around USD 35 Million representing around 0.5% of the total budget. The low direct government expenditure on ICT explains that ICT was not given a high priority in the government's 2001/2002 plan.

Although the government's funding for ICT is low, YET the ICT projects receive considerable loans and grants from various donors. OMSAR'S portal (2004) listed the World Bank, the Arab Fund for Economic & Social Development and the European Union as the main donors that fund the Lebanese government with loans of large amounts, low interest rates, and long repayment due date. Similarly, the United Nations Development Program was listed as the sole donor that granted the amount of 2.4 million dollar to the Lebanese government for the implementation of the institutional development strategy for Lebanon.

2.1.4 Government Incentives for ICT

The government has issued many incentives to encourage ICT usage. In 2001, the government issued law number 360 which exempted information technology projects of all income taxes and taxes on project dividends for a ten year period.

The existence of free zones in Lebanon, such as that in the Beirut port, Tripoli port, Selaata free zone (north Lebanon), and a duty free shop at the Beirut international airport allow the import of goods, the transform of their package, and the re-export of goods, without paying any custom duties.

In 2002, all the incoming ICT products were exempted from customs duties. On February 2003, the ministry of post and telecommunications reduced Internet dial-up rates by 42% on average. The new dial-up rates are based on a usage cost matrix. In 2004, there is a strong demand from the private sectors to increase the planned international bandwidth and introduce high bandwidth telecommunication services (ADSL, XDSL) at affordable prices.

2.1.5 Government Awareness for ICT

The government's ICT promotion and public awareness are week on average and are limited to the few workshops conducted by OMSAR to expose the strategies of the government for the usage of ICT, and the efforts of the Ministry of Culture, which has lately established thirty public libraries for the public access to the internet. The ministry of culture is also planning to equip 15 public libraries with free internet access (OMSAR, 2003). The private sector remains more honored to the promotion of ICT than the government, through organizing a variety of ICT related events on yearly basis to enhance the public awareness of new ICT products and usages.

2.2 E-Government Progress

On Dec. 2002, the Ministerial ICT Committee approved an e-government strategy submitted by OMSAR. It provided a comprehensive vision and road-map of what needs to be achieved in a seven year period of time. The e-government strategy centered on the achievement of a number of strategic objectives backed with the required legal and institutional frameworks. All the assigned objectives focused mainly on the dissemination of public information and services to the citizens. In this respect, ICT was seen as a facilitator, i.e., a mean to the end and not the end itself.

Some of the key objectives listed in the e-government's strategy are as follows:

1. Increasing public administration efficiency through installing modern ICT infrastructures in a majority of ministries and public administrations.

2. Dissemination of all public sector information that a citizen is entitled to through various communication channels including, the Internet, hotlines, and government service centers or kiosks.

3. Simplifying governments' procedures and reducing the required information and supporting documents to a minimum through the creation of government information systems encompassing all the required information.

4. Attainment of all intra-government information exchanges reducing in the process the dependency on courier services and/or the diplomatic pouch for our embassies abroad.

2.2.1 Achievements

Some achieved e-government objectives and other pending projects are listed below:

A. The government has increased the proliferation of office technology products in the government sector by signing an agreement with Microsoft, to purchase ICT products at reduced prices. Relevant training had been also conducted by OMSAR.

B. All the ministries and Agencies have home pages to disseminate their services to the public, in which they define their structure, charter, and key services. Most of these sites are only a "one way" communication tool, and have no room for citizens to give any feedback; few of these sites are designed in a more sophisticated way to include an online tracking system

for students to track their applications and citizens to track the progress of the applications submitted to the municipality.

C. Numerous information system applications had been developed in the public administration, these applications included budget and payroll systems, taxation systems at the Ministry of Finance, medical and social compensation systems for the government employee Cooperative, commercial register system at the Ministry of Justice, legal decision support system at the Ministry of Foreign Affairs, national ID and passport processing systems at the Ministry of Interior, billing systems at several utilities agencies, and several document management and archiving systems at key ministries and agencies. All these government's application forms and their relevant information were digitized in to one central portal called INFORMS, designed and developed by OMSAR, this portal contained over 2000 forms and relevant information for citizens and establishments to access and download from; in addition a hotline call center facility accessible by dialing 1700 had been setup to address phone inquiries by citizens who do not have internet access. The government is now in the progress of designing a single point of notification for a citizen to use in informing the government of any change in personal or business information (Microsoft, 2002).

D. Most ministries and agencies have deployed local or premises networks (LAN setups) and some have wider intra-premises networks (WAN setup). The Work is now focused on a project designed to test a national digital secure network or intranet for the whole government to completely connect all key government ministries and agencies with their branch divisions through a wide area network. This project is expected to increase the intra-

government connectivity and to speed the supplied services for the benefit of the citizens (OGERO, 2001).

2.3 The Quality of Partnerships of the Government, Business Sector, and Civil Society

Public Private Partnerships are still isolated occurrences in Lebanon. The most important project to be mentioned, in this field, is the national public-private sector partnership involving international organizations, such as the UNDP and CISCO. This project has provided youth groups in the peripheral regions of the country with access to the Internet by the provision of multipurpose tele-centers as was done in the Southern city of Bint Jbeil. The center has also trained residents to use ICT, both hardware and software, and to use the Internet (OMSAR, 2003).

The private sector and especially the ICT professional associations have been active in playing their part of creating awareness in the Lebanese society. Moreover, Microsoft has offered training courses throughout Lebanon through certified training education centers; similarly Cisco systems established in partnership with USJ University the first Regional Academy for ICT training under the Cisco Networking Academy in the Arab world.

Public private partnerships are more common in the educational sector. On the other hand, various firms and associations from the local ICT industry are working with local universities to setup COOP and internship programs, to allow for a more seamless integration of the educationally prepared student body into the practical workforce. On the other hand universities are also collaborating with the private and the public sector to create opportunities for young people and students through internship programs and cooperative work experience. This will encourage job creation, reduce brain drain, and better match education and training programs to actual needs of the local job market. This

mutual relationship between the private/ public sector and the universities is leading many projects in the field of ICT to prosper. The most successful project recently launched was on February 2001 when the LibanCell launched a technology related initiative under the name of "Libancell Educational Support Program". The program focused on education and training as well as R&D in the telecommunication field, aimed at developing the talents and capabilities of Lebanese youth, and provided them with the background they require to excel in the field of communications technology. LibanCell decided to cooperate with the AUB by contributing an amount of US $ 200 000 during the year 2001 for providing scholarships to the distinguished and needy graduates of AUB and for building two laboratories for the engineering school (Issam Rahal, 2001).

2.4 Access for All Citizens

Lebanon has no legal or institutional restrictions that prevent any individual from accessing the internet. Any digital divide that exists among the Lebanese citizens is due to either financial or technical problems. On the financial side, the cost of phone calls in Lebanon is very high compared to other Arab countries, on the technical side some rural areas in Lebanon still do not have a reliable access to the telephone system. This supports the argument that Lebanon still has to deal with the basic ICT issues such as infrastructure and access costs before aspiring to become the hub of the information-based economy in the Arab world.

2.5 Assessment

The Lebanese government must increase its efforts and address the e-readiness issue on top priority basis, through establishing a national committee dedicated to build a national

e-government strategy supported by implementation plans and clear timeframes, and to synergize and coordinate the national ICT strategy with the concerned government references. The government must also, allocate sufficient financing budgets and appropriate financing channels to implement huge e-government projects. In addition, the government should get deeply involved in partnership projects with the private sector, academic sector, and international organizations that are much concerned with the enhancement of e-readiness in Lebanon, and are ready to increase their funding in promising ICT projects bearing in mind that the impact of the resulting economic growth on their revenues would greatly offset these funds.

3.0 Human Capital

In the new age of Information and Technology, governments are more requested to invest heavily in raising general public awareness and in promoting technological education. Such investments create increased interest and skills, and produce long-term economic growth. According to Mc Connell International (2001), the skilled human factor in technology is necessary for a country to participate in the new economy and is assessed as per the below elements:

1. Quantity of and participation levels in the education systems, with an emphasis on efforts to create and support a knowledge-based society

2. Penetration of ICT in schools and ability of educators to use and teach in accordance with the technologies

3. Culture of local creativity and information sharing within the society

4. Skills and efficiencies of workforce, and strength of efforts to retain skilled managers and technologists (Mc Connell International, 2001)

3.1 Technology and Creativity in Lebanon

The UNDP developed the TAI (Technology Achievement Index) which is the latest measurement approach to assess the technological achievements of a country and help policy makers in identifying policy priorities. It is a composite measure of the technological progress that ranks countries on a comparative global scale based on indicators in four dimensions which are: Creation of technology, Diffusion of recent innovations, Diffusion of old innovations, Human skills.
The TAI groups and ranks 72 countries of the world into the following classifications:

A. Leaders: High achievements in technology creation (Finland, US, Japan, Korea)

B. Potential leaders: High levels of human skills and diffusion but innovate little (Spain, Czech Rep).

C. Dynamic adopters: Dynamic in the use of technology, but tend to have lower skills than potential leaders (Brazil, China, India...).

D. Marginalized: Low achievements in all dimensions including spread of old technology

Lebanon was one of the countries which were not ranked in the TAI index, because of the missing or unsatisfactory data for one or more of the indicators. In the Arab Human

Development Report (2002), Lebanon was shown to have no technology creation patents. Also, it was shown that recent innovations in medium and high technology represented 6.8% of its exports as a percent of total exports. We deduce from these results that Lebanon is an adopter more than an innovator in the field of old and new technologies.

3.2 Emphasis on Technology and Creativity in the New Lebanese Curriculum

The science education standards that were proposed by the American Association for the Advancement of Science (1993) and the National Research Council (1996), placed less emphasis on memorizing decontextualized scientific facts and more emphasis on students practicing problem-solving activities. But the new Lebanese curriculum at the school level of education didn't emphasize so much on problem-solving. The general framework of problem-solving is a sequence of four actions: questioning, collecting data, analyzing findings, and explaining results (Singer; Marx; Krajcik & Chambers; 2000). The distribution of emphasis in the new Lebanese curriculum with respect to these four actions revealed that "analyzing data" and "explaining" received high emphasis, whereas questioning" and "collecting data" received little emphasis (Rola Beydoun, 2002).

Science and technology are closely linked in their processes and their products. Technology contributes to the advancement of science. Similarly, scientific knowledge facilitates technological innovations. Because the achievements of science and technology influence the society, and because the society either supports or limits the progress of science and technology, the science curriculum should be structured to develop awareness of interactions of science, technology, and society (Yager et al., 1995). In the new Lebanese curriculum the interaction between science, technology, and society is very slightly addressed. This means that the new curriculum is still limited to old technologies

and does not put the students on the track of new technologies to develop their sense of creativity (Rola Beydoun, 2002).

3.3 Strength and Limitation of Local Technology Incubators

Technology Incubators are defined by the Organization for Economic Cooperation and Development (OECD, 1997) as a property-based venture which provides tangible and intangible services to new technology-based- firms and entrepreneurs; in addition to counseling and support in marketing and management for start-ups. It also promotes interaction between academia and industry, encourage the development of knowledge-based industries and stimulate job creation

There are of activities technology awareness in Lebanon funded not only from the public budget, but also from cooperative sponsorship. The Lebanese government, the Investment Developing Authority of Lebanon (IDAL), the National Council for Scientific Research (CNRS), the American University of Beirut (AUB), the Saint Joseph University (USJ), and the entrepreneurship network of Lebanon, constitute an example of organizations effectively targeting the scientific research and education sectors. In what follows, we will briefly state the role of each incubator, together with the strength and limitation of its activities.

3.3.1 The Investment Development Authority of Lebanon (IDAL)

The investment development authority of Lebanon (IDAL) is a public investment promotion agency in charge of attracting private capital investments to Lebanon, and of supporting investors in the development and implementation of their projects. IDAL

covers sectors such as industry, agriculture, agro-industries, and tourism. Moreover, it deals with technology, information technology, telecommunication, and media. IDAL offers services to investors such as information gathering and assistance in the creation of companies. Also, it offers a quick issuance of permits and licenses demanded by the Lebanese authorities. Law number 360, article 6, specifies the role of IDAL as: Providing financial incentives or participating in the capital of joint-stock companies involved in the field of information and/or information technology, such as incubators established to support innovators in the fields of technology, information technology, communication and other sectors.

IDAL has been criticized for trying to draw a positive image of the local investment market in general and for ICT in particular. While it is fine to promote the country in such an affirmative manner, it should not deceive the foreign investor by the mere fact of introducing modern facilities and creating new laws: that the post-war Lebanon will be a safe heaven for his money (Sami Salame, 2003).

3.3.2 The National Council for Scientific Research (CNRS)

The Lebanese government's efforts are mainly reflected through the National Council for Scientific Research (CNRS). The CNRS was created in 1962 as a result of the mutual efforts of the public authorities and the scientific community, to prove their determination for combining science and research strategies with a sound national policy. The CNRS is a public institution in charge of formulating national science and technology policy and advising the government on all science and technology issues. It is also responsible for there are no consistent studies or publications edited by the CRNS; and it appears that most of its duties consist of administrative work and maintaining an official status. In short, the Lebanese user cannot rely on the CRNS to provide modern and up-to-date research.

3.3.3 The local Universities

While some local universities are working on research and technology in an acceptable manner (namely the American University of Beirut, the Saint-Joseph University, the Lebanese American University and the Lebanese University), most of the others are just limiting themselves to teaching without putting much effort in R&D. There should be a greater coordination between the previously mentioned top four universities as a first step, followed by a cooperation program between them and the other universities and technical institutes in the country. These institutes and universities may also regroup a number of individuals willing and able to do quality scientific research but are, unfortunately, lacking expertise and proper equipment.

3.3.4 The Entrepreneurship Network of Lebanon

The Entrepreneurship Network of Lebanon is a non-profit organization established by university professors and business professionals to help exceptional entrepreneurs turn pioneering ideas into tomorrow's leading firms. The network has two objectives:

First, to rally the support necessary ensuring that spark, the entrepreneurship competition, is successful and sustainable.

Second, to organize a monthly networking event (the Entrepreneurship Panel) a forum for successful entrepreneurs to share experiences with interested entrepreneur

In terms of Lebanon's economy, the Entrepreneurship network seeks to create employment opportunities in an economy whose main success factor is the human capital, and to slow down the brain drain.

3.3.5 The Lebanese Industrial Research Achievements (LIRA)

For building, an economy effective in the culture of productivity, with the aim of directly addressing the issue of making education more relevant to the job market, the National Council for Scientific Research, the Association of Lebanese Industrials, the Ministry of Industry, and the Universities in Lebanon with the cooperation of Friedrich Ebert Foundation and ESCWA have agreed in 1997 to initiate a yearly forum under the name of "The Conference and Exhibition on Lebanese Industrial Achievements". This event, which brought together innovative academic and manufacturing expertise, provided a unique opportunity for industry, academic, and research centers, both public and private, in order to meet and exchange their findings relating to the main theme of linking the outputs of scientific research to the needs of the industrial sector.

The exhibition showcases applied research that was accomplished in a collaborating effort between industry, academic and vocational schools. Furthermore, the exhibits were subject to scientific evaluation, whereby excellence in research was rewarded. This encouraged technological innovation for the purpose of upgrading production processes, creating jobs that are compatible with the ambitions and capabilities of Lebanese graduates, and incubating new ideas that may be turned into start-up businesses. In the last few years, this event led, on the one hand, to the upgrading of several production lines in the industry, introduction of new firms; and, on the other hand, to improved university standards, particularly Engineering and Science programs and curricula. As a result, new jobs were created. In addition to the design, execution, and use in the industry of machines, equipments, and software programs, some of which were exported aboard.

3.4 Participation Levels in the Education Systems

The Lebanese population is compared, very favorably, to neighboring countries in the level of education of the general population. School enrollment rates are the highest in the region. According to a study conducted by Choghig Kasparian (2001), the illiteracy rate for people aging 10 years and older is 8%. For people below 20 years of age the illiteracy rate is below 1%, which means that the illiteracy rate has been virtually eradicated. Illiteracy has been eliminated principally through increased school attendance. The same study compiles the following enrollment rates.

Table 2.3

School Enrollment Rates (2001)

Age	Enrollment Rate %
0 -- 4	30.30
5 -- 9	99.10
10 -- 14	96.90
15 -- 19	70.80
20 -- 24	29.70
25 +	0.80
Total	32.10

Source: Kasparian ,2001

According to the Ministry of National Education (1998) private schools, enrollment accounted for 56% of intermediate and secondary students and of 67% of primary enrollment. The high enrollment rates indicate that schools are the best place to develop the human capacity for the digital society.

3.5 Penetration of ICT in Schools and Universities

Exposure to IT is carried out through an educational curriculum that was introduced in the programs of public and private schools in 1998 at primary, elementary, and secondary levels. There are also suggestions for using ICT in subjects other than being a subject itself, such as Geography and Mathematics, where ICT will not be seen as a subject on its own, but one, which can be used as a tool within many subject areas (UNESCO, 2003).

The penetration of ICT tools in schools is still limited, especially in the public schools, because of the limited effort of the government in this field. Companies dealing with the computer and information technologies, under the sponsorship of the Professional Computer Association (PCA), sponsor many projects for the purpose of increasing the installation of computers in public schools and training instructors on their use. In a conference held under the name of "Towards e-Lebanon" (2003), several national priority recommendations were proposed to build a national e-strategy. The goal of reaching 1 PC to 15 students in 2004 and 1 PC to 5 students in 2006 together with a review of the ICT curriculum were identified as main goals in order to reach an e-Society. This shows the low student to computer ratio in Lebanon especially if compared to other Arab countries as Jordan which had an 8:1 student to computer ratio in 2002 according to Mc Connell (2002).

The situation at the university level seems fairly good. Nearly all universities (the public and the private) are well advanced in the teaching of information and computer technologies through courses pertaining to engineering, business, economies, and communication faculties. Most of the 40 Universities registered in Lebanon offer majors in computer sciences, business computers, and management information systems. ICT Masters Degrees are also offered in some of them. According to Professional Computer Association (2001), some 400-university students graduate every year in the IT field in

addition to 600 technicians. The new technologies, and especially the internet, are commonly used in these institutions. Some universities such as AUB, LAU and USJ are registering their students online and even start to publish on the net.

3.6 ICT Educational Initiatives

The Lebanese private sector is active in the field of new technologies and has initiated projects and activities to raise ICT awareness and promote its diffusion in the academic sector in Lebanon. Below are the main projects implemented or still under the implementation process:

A. SchoolNet and Schools Online are two ongoing projects implemented by the Ministry of Education in partnership with the private sector to connect Lebanese public schools to the Internet. Through the Schools Online project, computer labs were setup in various secondary schools throughout the country. More are being planned. Initially, SchoolNet provided some 24 PCs and peripherals to 24 schools around the country (Omsar, 2003).

B. A recent project financed by the Islamic Development Bank promised to provide 5000 PCs to around 400 public schools throughout Lebanon. The project was awarded in the spring of 2003 and was launched soon after. The project covered training on the support of the systems but not on the educational use of the PCs (Omsar, 2003).

C. According to Microsoft (2004), Microsoft Eastern Mediterranean signed an agreement with the Lebanese Government to introduce long-term ICT

education programs for students at grades 1 to 12 in all public schools in the country. The program will cover Information and Communication Technology (ICT) education for students along with upgrading teachers' skills, software, help desk, and other resources for schools. In the next four years, this project is expected to develop an ICT curriculum for schools in the country, establish seven IT Academy Centers around the country, and help more than 2,000 teachers, and half a million students in public school to develop much-needed technology skills. This will also provide training for teachers over four years, establish the Innovative Teacher Portal that will encourage teachers to get connected to the Innovative Teacher Community, share best practices, and adopt IT in their schools. The project will also provide free Windows Operating System for PCs that have been donated to schools together with a special help desk that will provide support services for schools.

D. Libancell, a mobile telecom provider, launched a technology-related initiative under the name of "Educational Support Program" in February 2001. The program focused on education and training as well as R&D in the telecommunication field and aimed at developing the talents and capabilities of Lebanese youth, providing them with the background they require to excel in the field of communication technology. Libancell decided to cooperate with AUB by contributing an amount of US $ 2000,000 during the year 2001 for providing scholarships to distinguished and needy graduates of AUB, and for building two laboratories for the engineering school (Issam Rahal, 2003).

3.7 The ICT Brain Drain

Lebanon has enough IT professionals and technologies to meet and even exceed the local demand of IT companies. According to the Professional Computer Association of Lebanon (2001), the IT sector in Lebanon includes around 5000 professionals with 400 university IT graduates and 600 technical school graduates per year. Lebanon's ICT sector suffers from a high brain drain, which greatly affects the ICT sector. This attributed to the incomparable employment wages and opportunities offered to ICT graduates between Lebanon and Gulf countries, Europe and North America. According Choghig Kasparian (2001), the migration rate in Lebanon was 13.4% and 23.8% for those aged 25 to 54 in 2001. It was also estimated that 70% of computer sciences graduates left Lebanon in 1999. The brain drain is increasing each year and the Lebanese Government is not playing any role to prevent those expatriate people from going abroad. Lebanon is deprived of the skills of the professional immigrants.

Table 2.4

Human Resource

IT Professionals in Lebanon	5000
University IT Graduates per Year	400
Tech. Schools Graduates per Year	600

Source: PCA, 2001

3.8 Assessment

The new curriculum at the school level must be more open to new technologies, and more involved in problem solving activities in order to explore the creativity of the students at this level. The government must extend its efforts and implement different

partnership projects with the private ICT sector. This will increase the coordination between the private ICT companies and will help the government to identify the weakness in some fields where its support is badly needed. Moreover, the government must also increase its funding to raise the penetration of ICT in primary and secondary schools and the ability of educators to use and teach in accordance with these technologies. The government is asked to display careful attention to ensure students are taught what the market demands. Stronger academia-private sector working relationships might help in this area. Finally, the government's effort must accelerate in offering employment opportunities with competitive wages for the purpose of slowing down the brain drain.

4.0 Information Security

According to Mc Connell international (2001), A vital aspect of e-readiness is the level of information security for several reasons. First, poor protection of intellectual property can inhibit the growth of the national software industry. Second, inadequate protection of personal data creates barriers to information exchange. Third, failure to recognize electronic signatures or to permit the use of encryption undercuts trust in the new ways of doing business. Key elements to assess information security are three:

1. Strength of legal protection and progress in protecting intellectual property rights, especially for software.

2. Extent of efforts to protect electronic privacy

3. Strength and effectiveness of the legal framework to address and prosecute computer crimes, authorize digital signatures, and enable public key infrastructures.

4.1 Efforts to Protect Electronic Privacy

A predictable regulatory environment is necessary to support secure technologies and to form the basis for building business and consumer trust in electronic transactions. Digital signatures, electronic signatures, and electronic representations, that link individuals and entities to operations in the electronic environment are less meaningful without the accompanying certification mechanism that independently verify information about transactions and transacting parties. Like the physical world, the electronic world needs means of its own for certifying information.

An advanced e-payment system, complying with the 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. Currently, there are no privacy and security laws that govern electronic transactions in Lebanon. However, 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. The Ministry of Economy and Trade (MOET) is also planning the legal framework for e-commerce as part of a two-year project valued at 1.7 Million EURO. This is expected to start in September 2003. It will study and recommend regulations for e-commerce, electronic contracts, e-Signature, and other issues (OMSAR, 2003). Once enacted, these laws will provide the basis for a secure environment for online communications and transactions.

As a matter of urgency, Lebanese government needs to clarify the legal definitions, practices, and structures that pertain to commercial activities in an electronic environment, and to seek multilateral agreements on critical legal matters, especially the laws regarding electronic transactions, control of databases, unauthorized use of databases, and data protection. Where appropriate, the government should adjust existing laws and regulations

so that they apply to "intangible" as well as "material" product environments. Moreover, It should ensure that all future actions regarding consumer protection laws and regulations are closely coordinated with developments in the electronic environment.

4.2 Intellectual Property Rights

Lebanon signed an intellectual property rights (IPR) law in 1999 to protect the ownership of content in its various forms (text, images, voice, video, etc.) and the ownership of software. Lebanon was the second country in the Arab region, after the UAE, to pass such legislation. The Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement was then introduced as a joint framework between World Trade Organization (WTO) and World Intellectual Property Organization (WIPO). TRIPS revisited the entire IPR protection system, standardizing intellectual property definitions, affirming and enforcing national treatment and most favored nation principles through a series of procedures, and providing for standard dispute treatment processes. Eight Arab countries joined the TRIPS agreement. Only Lebanon, Syria, Algeria, Saudi Arabia, and Qatar are yet to enact the agreement. Lebanon was not qualified to join the TRIPS agreement for several reasons. One of those reasons was due to clause 25 of the IPR law that allows teachers and students to make copies of software licenses. This law was considered a broad exception of the agreement. Although it was then clearly defined by the ministerial decision number 16/2002 limiting copying to educational and cultural software as well the permitted number of copies and the conditions of their use, still, it did not meet the standards and requirements of the Berne Convention or the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement.

With the introduction of the Intellectual Property Rights (IPR) law in 1999, the piracy rate for software dropped by 10% in the three years following the passage of the copyright bill in 2000 (table 2.5). However, cable piracy of movies and music still exist at high rates.

According to the International Intellectual Property Alliance (IIPA) Annual Special 301 Recommendations, Lebanon is still on the Priority Watch List because the market in Lebanon continues to be dominated by piracy. "Cable piracy destroys the local market for audiovisual materials, as over 1,000 pirate cable operators serve 60% of Lebanon's population. Retail piracy of optical discs (CDs, VCDs, DVDs, CD-ROMs, "burned" CD-Rs, etc.) of business and entertainment software, sound recordings, published materials, and movies remains blatant and open in Lebanon. Some discs are produced locally in one unregulated optical disc plant, while many more are imported from Asia, particularly Malaysia, and lesser quantities from Eastern Europe. Lebanon has become a producer of pirated materials and an exporter of piracy. One unregulated CD plant operating in Beirut has been producing over 150,000 discs per month, Book piracy remains a serious problem, as pirate photocopying and pirate publications are still the norm on college campuses" (IIPA, 2004, P:2).

Table 2.5

ESTIMATED TRADE LOSSES DUE TO PIRACY
(in millions of U.S. dollars)
and LEVELS OF PIRACY: 1999 – 2003[3]

INDUSTRY	2003		2002		2001		2000		1999	
	Loss	Level	Loss	Level	Loss	Level	Loss	Level	Loss	Level
Motion Pictures	10.0	80%	8.0	80%	8.0	80%	8.0	80%	8.0	80%
Records & Music[4]	2.5	70%	2.0	65%	2.0	65%	2.0	68%	2.0	60%
Business Software[5]	NA	NA	3.5	74%	1.1	79%	1.3	83%	1.6	86%
Entertainment Software	NA	80%	NA	NA	NA	NA	1.5	96%	0.5	70%
Books	2.0	NA	2.0	NA	2.0	NA	2.0	NA	2.5	NA
TOTALS[6]	NA		15.5		13.1		14.8		14.0	

SOURCE: IIPA ,2004.

Piracy is still widespread because of the absence of the active enforcement of the IPR law. The Lebanese government fears that tighter enforcement could block disadvantaged social groups from the knowledge sector, close existing opportunities, and raise cost of access to new technologies. In this respect, the government ignores that the enforcement of

the intellectual property rights law will encourage the expansion of media and software development industries and creativity in content development.

4.3 Strength, effectiveness, and Enforcement of Legal Framework

An internationally clarified legal environment must be supported by international agreement on policy and enforcement. Most rules and regulations for conducting business in Lebanon address a world of paper, physical products, and retailing within national borders. The new electronic transactions call for an evaluation and updating of the commercial codes that govern business transactions. At a minimum, it should address issues such as the legal recognition of electronic signatures. Acceptance of electronic documents for paper filing requirements. The formation, validity, and enforcement of contracts. Responsibilities need to be clarified across the chain of liability that extends from consumers to network access and service providers, software developers, and intermediaries such as certification authorities and e-payment providers.

The enforcement of the IPR laws in Lebanon is still week and the government lacks the will to reduce piracy rates. The government is also not serious in tackling this issue because by the time it increases custom's activities at the borders to intercept pirate products. Book piracy remains high including production for export of pirated scientific, medical, and technical materials to other countries in the Middle East and the Gulf. Although the government knows the sources of these pirated products, it has done nothing to shut down these illegal plants.

The situation in the courts also needs improvement. Cases proceeding to criminal court are marred by delays, procedural hurdles, and non-deterrent results. In some cases, no damages were awarded for harm done in the past and were only awarded if the pirate

engaged in repeat acts of infringement. According to IIPA (2004), in July 2003, 41 cable pirates were sentenced for cable piracy in the first such criminal convictions in the country's history. Unfortunately, the sentences included no jail time, and the fines ranged from a mere US$4,533 for some defendants to $9,335 for the most egregious defendants, hardly a deterrent.

4.4 Assessment

The information security system and the legal system are not favorable for conducting electronic transactions in Lebanon. Below are some recommendations to improve the current situation:

A. The government of Lebanon must work more seriously on the problem of piracy and must impose civil, administrative, and criminal penalties under the current laws against all unlicensed "community cable" television stations and illegal plants producing pirated products, and if necessary it must close down all those illegal sources.

B. The Lebanese government should establish a specialized IPR unit, in the police or elsewhere, containing well-trained personnel to deal with copyright infringements.

C. The situation in the courts needs improvement, through streamlining the IPR cases and establishing a specialized group of prosecutors, trained in copyright, to handle all copyright cases. In this way the government will guarantee an effective resolution of all cases to avoid delays and non-deterrent results.

D. The current commercial codes must be updated to govern and support electronic transactions. New laws must also be enacted to ensure the validity of electronic documents, e-signatures, and e-payments.

5.0 E-Business

According to Mc Connell International (2001), the e-business operates in a complex context of regulatory policies and institutional arrangements. Key elements to assess e-business climate include:

1. Existence of effective competition between communication and information services providers.

2. Transparency and predictability of the regulatory implementation, openness of government, rule of law, and general business risk (e.g. political stability, financial soundness).

3. Openness to financial and personal participation by foreign investors in ICT business

4. Ability of the financial system to support electronic business transactions

5. Sponsorships of science and technology parks as hubs of innovation and support for new enterprises (Mc Connell International, 2001)

5.1 Telecom Regulatory Framework in Lebanon

The Telecom market in Lebanon is still controlled by the heavy hand of the government on the fixed and mobile telephone networks. The government has developed an extensive land-based telecommunication cable infrastructure that covers the entire country. This fixed telephone network is solely operated and maintained by the Organisme de Gestion et d'Exploitation de l'ex-société Radio Orient (OGERO). The major use of this network is for voice communications and Internet dial-up. The mobile service is also characterized by limited competition. Since June 2004, this service has been managed by two new mobile operators, Mobile Telecommunications Company (MTC) of Kuwait and Detecom from Germany (a subsidiary of Deutch Telecom), based on a BOT (Build, Operate and Transfer) agreement. The two operators mandate tariff structures and profit distribution between them and the state. A strong competition exists in the data services between five active ISPs, but the competition is hampered by the monopoly of the government on the dial up service which is the most used mode of internet connection.

On the 22nd of July 2002 the Lebanese Parliament enacted a new telecommunication law number 431 which guided the drafting of a new telecommunication policy. On February 15, 2004, the ministry of telecommunications released a publication stating that the new telecommunication policy had been prepared and approved by the minister of telecommunications. The new policy is based on four pillars. The first is the liberalization of the sector and opening it to competition. The second is the establishment of a regulatory framework and an independent telecommunications regulatory authority (TRA) to promote competition and efficiency in the sector. The third is the opening of the sector to private participation through the partial privatization of the fixed public telecommunications operator that is to be established as a joint stock company, Liban Telecom, and by the auctioning of the two existing mobile networks together with associated 20-year licenses. The fourth pillar is the pursuit of social and public policy

objectives, such as ensuring access to telecommunications services in all the Lebanese territory, safeguarding consumer interests, encouraging the participation of Lebanese nationals in the ownership and control of telecommunications enterprises, and facilitating the use of telecommunications to protect the environment and the delivery of various social services (health, education, poverty, eradication, etc.)" (Ministry of Telecommunication, 2004).

The aim of the new telecommunication policy was to transform the telecommunication sector in Lebanon, from a state-owned fixed monopoly to a competitive market opened to private participation, through the establishment of an independent telecommunication regulatory authority (TRA) whose mission is to promote competition in the telecommunication sector and prevent anti-competitive behavior. Although the new enacted law provided for the establishment of the TRA as an independent entity separated from the ministry of telecommunication and is fully independent in terms of its financial and administrative status, still this issue is not yet resolved and the Council of Ministries is working to create the TRA as a fully independent sector regulator. This delay in the implementation of the new telecommunication regulatory framework is preventing the sector from any enhancement. The government is the only fixed telecommunication operator through the state owned company OGERO and the regulator of the sector through the ministry of telecommunications. The prices are also not determined by market conditions of supply and demand, but by the government sanction, regulation, or arbitrary intervention.

5.2 Government's Role in Encouraging Foreign Direct Investment

Lebanon's free market economy, the absence of controls on the movement of capital and foreign exchange, a highly educated labor force, and the quality of life encouraged a number of foreign companies to set up offices or regional offices in Lebanon in recent years. Foreign companies may either open a branch or a representative office. The Lebanese law provides a range of business entities available for both local and international investors. These are: partnership and sole proprietorship, joint-stock companies, limited liability companies, holding companies, and offshore companies.

According to statistics from the Ministry of Economy and Trade (2002) 38 foreign companies registered at the Ministry in 2002, encouraged to some degree by new legislation and measures taken by the Government of Lebanon in recent years, to attract foreign direct investment, create jobs, and stimulate economic growth.

Over the last two years the GOL passed several laws and decrees to encourage investment, such as the Investment Development Law of August 2001 and Cabinet's approval of the applicable decrees in January 2003. These laws granted the Investment Development Authority of Lebanon (IDAL), a public agency under the Prime Minister, the authority to award licenses and permits for new investments as well as to grant special incentives, exemptions, and facilities to large projects (referred to as the "Package Deal Contract"). In June 2003, IDAL granted its first package contract to Dubai-based Al Habtoor Group's Metropolitan City Center real estate project valued at USD 150 million. This package consisted of a ten-year tax exemption on income and profit, fee reductions on work and residency permits and other incentives. IDAL announced during 2003, that it would soon grant the Package Deal Contract to other projects worth USD 313 million, mainly in the tourism sector. In an attempt to attract foreign investments, IDAL had launched in 2003 the "Investors Matching Service" to facilitate the creation of strategic

international-local partnerships through joint venture, equity participation, acquisition, and others. It also adopted a new strategy based on one-on-one meetings with potential foreign investors, especially the Lebanese Diaspora. IDAL hosts several regional and international conferences each year to attract foreign direct investments.

There are no official statistics available on foreign direct investment. It is estimated that construction and real estate account for the largest part of foreign investment. In January 2002, UN-ESCWA granted Lebanon technical assistance to build an FDI database. According to a report released by the Inter-Arab Investment Guarantee Corporation (IAIGC,2002), Lebanon received the second largest share in Arab multilateral investments in 2002 attracting approximately USD 650 million, representing 22.3 percent of total inter-Arab investments in 2002. Lebanon's share nearly tripled from USD 225 million in 2001. Reportedly, 53.8 percent of Arab investments in Lebanon came from Saudi Arabia, followed by the U.A.E. (29.3 percent) and Kuwait (15.4 percent). According to IDAL's president, about 85 percent of Arab's direct investments in 2002 were in the hotel sector. Also, there were some Arab direct investments in real estate development projects, and through franchises in clothing and fast food industries.

5.3 Openness of the Government

Lebanon is, traditionally, a country with a free and open trade regime. Lebanon has signed trade liberalization agreements with each of European Union (EU), World Trade Organization (WTO), and the Arab world fronts. Lebanon's agreement with the European Union association came into effect in March 2003. The agreement provided for reciprocal free trade on the majority of industrial goods and liberalized trade on a large basket of agricultural and processed agricultural goods. The Euro-Med Partnership aims at establishing a free trade area in the Mediterranean region by the year 2010.

In an effort to integrate with the Arab region, Lebanon acceded to the Arab League's Greater Arab Free Trade Area agreement (GAFTA) in 1997. The GAFTA called for a ten percent annual mutual reduction in tariffs over ten years, effective 1998. Lebanon signed bilateral free trade agreements with Syria (effective 1999), Egypt (effective 1999), Kuwait (effective 2000), UAE (effective 2001), and Iraq (effective 2002). Free trade negotiations are ongoing with Jordan. The agreements called for a 25 percent annual mutual decrease in tariffs over four years.

5.4 Transparency of the Regulatory System

The Government of Lebanon encourages competition among companies bidding on Government contracts, and it does not discriminate among foreign suppliers. There is no one specific law regulating all aspects of Government procurement in Lebanon. The Government does not always establish "clear rules of the game" and the interpretation of laws remains flexible. Private sector companies should be wary when bidding for public projects. Transparency, clear regulations, and fair consideration of bids have never been the rule in Lebanon. Government administrations often award contracts by mutual agreement, without calling for a tender.

In early 2001, the United Nations' Economic and Social Council for West Asia (ESCWA) surveyed 50 foreign investors in Lebanon to identify major difficulties encountered by foreign investors in Lebanon. The study revealed that the main obstacles are: bureaucratic and administrative red tape, lack of transparency, corruption, slow customs procedures and the level of customs duties, work ethics, unexpected changes in economic policies, and infrastructure and tax regulations. The ESCWA survey has also revealed that contract enforcement and the unpredictable judiciary system were considered the most important risk factors. The recent disputes arising from the termination of two

mobile phone contracts in Lebanon between the government and the two mobile operators, Cellis and Libancell, are a clear example of the adverse effect of lack of transparent regulation.

Major problems faced by start-ups include complex administrative procedures for obtaining approvals and permits and difficulty accessing information. Some foreign companies left, or decided to move their regional offices to neighboring countries, or refrained from investing in Lebanon because of frustration resulting from red tape and corruption, arbitrary licensing decisions, archaic legislation, an ineffectual judicial system, high taxes and fees, and the lack of adequate protection of intellectual property.

5.5 Political Stability

Lebanon's location between two major regional states, Israel and Syria, directly affects the country's political and security environment. Israeli withdrawal in late May 2000 was expected to encourage investors to look for reconstruction and development opportunities in the South. However, continued violations of the U.N. Security Council Resolution 425 and regional instability have hindered foreign investment. Rehabilitation operations in South Lebanon achieved great progress during the year 2001 with $50 million in financing from the Government of the United Arab Emirates, and the training of the Lebanese Armed Forces. Stability in South Lebanon would improve Lebanon's security risk rating provided the government asserted its full authority in the region.

5.6 Corruption

Lebanon has laws and regulations to combat corruption, but historically these have not been enforced. Lebanon didn't sign the OECD Convention on Combating Bribery. According to the Lebanese research company "Information International", Lebanon wastes over USD 1 billion, each year because of corruption. It is widely believed that investors routinely pay bribes to win contracts and that government contracts are often awarded to companies close to powerful politicians. International companies are faced with an unpredictable and opaque operating environment and often encounter unanticipated obstacles or costs late in the process. Companies may also discover that to win a contract they must invest capital in a related project. The UN-ESCWA's early 2001 survey of 50 foreign investors operating in Lebanon revealed that 66 percent of them considered corruption a major obstacle along with "red tape" and lack of transparency. Passage of the Investment Development Law granting IDAL the authority to award licenses, permits, all the necessary Government formalities and is expected to curtail red tape for new investments.

USAID spent USD 2.6 million in 2000-2001 for anti-corruption campaigns in Lebanon. In March 2001 USAID launched a USD two million Transparency and Accountability Grants project. The project provided funds to civil society organizations and civic leaders to implement activities that address corruption and promote transparency, accountability, and good governance. To day, 55 grants were signed financing short-term and high impact activities in the public and private sector. The Transparency and Accountability Grants project had demonstrated that there is a committed Lebanese constituency willing to work hard and creatively to address corruption in all sectors.

5.7 Adoption of E-payment Technologies in Lebanon

The availability of e-payment technologies in Lebanon helps to conduct electronic transactions in an easy way. These technologies include ATM machines, credit cards including internet cards, and online banking systems.

Although the introduction of ATM machines was late in Lebanon, the number of ATMs grew to reach a healthy position. According to OMSAR (2003) report, the number of ATMs in the Greater Beirut and Suburb area reached 386 in December of 2002, 58% of the total number of machines located throughout the country. The credit cards are also well diffused in Lebanon. According to the Central Bank, there were 611,829 payment cards in circulation in Lebanon at the end of 2002, an increase of 33% over the previous year. The payment cards include credit and debit cards from VISA, MASTERCARD, Amex and Diners. The number of cards issued has been increasing steadily over the years. The total amount of purchases and cash disbursement using payment cards is also increasing. This is a good indicator for the readiness for cashless transactions (Nadine Zeidan, 2003). A new form of credit cards, Internet Cards, was lately introduced in Lebanon. These are debit cards with a limited ceiling designed to protect the eCommerce consumer in case of fraud. The number of internet cards is estimated to be around 2% of the total number of payment cards or around 12,000, which is relatively law. This is contributed to the absence of consumer trust in using credit cards and providing his card information over the net.

The online banking services have been recently adopted by different banks in Lebanon; out of the 61 banks members of the Association of Banks in Lebanon as of February 20th 2003, 31 of them have websites of which 4 are under construction, 17 are promotional for information only, and 10 have transactional websites offering on-line balances, check stopping, credit card settlement and inter-account transfer (Nadine Zeidan, 2003).

5.8 Financial System to Support ICT Projects

Lebanon can provide many services, particularly in ICT, for foreign companies who can use it as a cost center. For example, a foreign company may benefit from low costs in Lebanon and open a branch that solely concentrates on software development (or other knowledge based activities). Such companies are vulnerable. The Ministry of Finance does not recognize a company without revenues (a cost center) and would in most cases apply estimates forcing upon them taxes without incurring any revenues. From the Central Bank, software and specialized techniques enterprises can also benefit from the state subsidy to debit interests on their existing loans.

KAFALAT SAL is a joint-stock company with the Lebanese Agency for Guarantee of Deposits that operates under the Central Bank and some fifty banks operating in Lebanon as partners. It offers fast and easy to acquire investment loans up to USD 200,000 reimbursable within seven years. It also offers guarantees on some loans acquired directly from banks within special conditions.

The Investment Development Authority of Lebanon (IDAL), a public agency under the Prime Minister, operates within the legal framework defined in Law 360 on investment development in Lebanon, issued in August 2001. The law entrusts IDAL with "participating in the capital of joint-stock companies for the establishment and management of incubators to support innovators in the fields of technology, information technology, communication and other sectors ...". Furthermore, the law classifies information technology projects as Zone C, which means that they can benefit of a full exemption of income taxes and taxes on project dividends for a ten-year period. BETZ is promoted at the national and international level to attract foreign investment. However, there is no announced time plan for launching the technology park.

5.9 Technology Parks and Incubators

A key enabler to the promotion of ICT as a production sector is the setup of technology incubators. Technology incubators are firms that support new entrepreneurs to develop innovative technological ideas and set up businesses. These offer space, equipment, managerial advice and other technical assistance. In return, these take a certain percentage of the equity of the companies that succeed. The situation in Lebanon with regard to incubators and technology parks is still in its infancy.

From the private sector point of view, Berytech is the first Lebanese technology pole that aims at the creation and the development of companies by offering state-of-the-art hosting facilities, a team of highly experienced experts and a complete range of support services that create the appropriate environment to help the creation and the growth of businesses. Berytech engages in three activities:

First, the incubator identifies interesting projects and helps them evolve into sustainable companies by providing the adequate technical assistance. These include developing business plans and entrepreneurship culture, legal and intellectual property aspects, etc., as well as access to financial support.

Second, the business accelerator provides the supplementary services and links to financial means needed for a company to launch its commercial activities.

Third, business hosting welcomes well-established companies that need to benefit from the high-tech facilities provided by Berytech such as a video conference auditorium, training and meeting rooms, fast Internet access, etc. These companies would be looking for group synergy with other companies in Berytech to complement and broaden their activities to be open to both local and international markets.

5.10 Assessment

Lebanon has a free market economy that encourages private competition, a liberal banking regime that strictly enforce bank secrecy, a variety of financial services to allocate the required funds to establish ICT projects, and an advanced e-payment infrastructure. All these are favorable factors that help in speeding the process towards e-readiness, but still there are still many other factors that impede the e-readiness process and must be addressed in the nearest future. Some recommended actions to fix these deficiencies include the following points:

1. Government must liberalize electronic services through enforcing the Telecommunications Act of 2002, which calls for the establishment of Telecommunications Regulatory Authority (TRA), in order to push for the timely development of the appropriate telecommunications infrastructure and services. The delay in the implementation of these regulatory changes can provide new forms of protection to existing monopolies, and can be worse than preserving the status quo.

2. The Government should strictly enforce the existing laws and regulations to combat corruption.

3. Transparency of the regulatory system is one of the key indicators investors monitor. The Government should establish clear rules to avoid the flexible interpretation of laws that may serve the vested interests of political parties.

4. The government should also prevent the interference of political parties in the court system in an attempt to rebuild an effectual judicial system.

6.0 Conclusion

The results from the e-readiness assessment of Lebanon should act as the starting point in a participatory planning dialogue. A planning process should be undertaken as a true partnership among business, government and other members of the community. The process should encourage participation of the whole community and raise awareness among population.

The e-readiness Assessment study confirms that Lebanon is not well positioned when it comes to ICT diffusion and the possibility to benefit from the internet revolution. Hard, but fast work is required to become e-ready. But the country can be put back on the right track if it adopts eight steps:

1. The government needs to privatize and liberalize the telecommunication sector. In fact, public monopoly on telecommunication has to be a failure and privatization has proved to be a viable alternative provided it does not transfer the monopoly from the public to the private sector. The Lebanese privatization should eliminate monopolies, enhance competition, protect and guarantee the rights of operators to equal access, provide for economically reasonable tariffs, and insure service delivery at international standards and quality of services. The government should also expedite the building of the Telecommunications Regulatory Authority (TRA) to settle any dispute between operators and supervise the competition between them.

2. ICT services (internet access, WAP, data links, vo/ip, ect.) should be made available to every one, everywhere, and at highly reduced costs. It has to be note here that the cost reduction does not imply reduced revenues. In fact, revenues stand to increase in direct ways due to higher usage and higher traffic and indirect

ways due to new services and business opportunities that will create revenue streams that are currently non-existent.

3. Enhancing network Speeds in Lebanon by introducing high bandwidth telecommunication services (xDSL, DSL, ADSL, etc.), priced at marginal cost.

4. The government should implement modern legislation to regulate e-business, electronic signatures, internet banking, e-Commerce, e-Public procurement, and Cyber crimes, thus enhancing security, trust and non-repudiation. It should also formalize long-term licensing agreements to insure operational continuity and enforce legal frequency allocations to eliminate technical problems and interference. The government must review and implement the Intellectual Property Rights Law, with a special emphasis on more effective protection of Lebanese ICT product and content production.

5. The educational Curriculum must be redesigned to encourage the use of ICTs in the pursuit of problem solving, group learning and research. Students should be taught from the earliest age possible to use information and communication technologies to enhance and improve their learning experiences. Full integration of ICTs into the learning process is optimal, and collaborative, project-based learning can make up a solid pedagogical strategy for ICT-enhanced education. It should introduce Information technology training and education into all educational curricula.

6. The government should increase the awareness of the society on ICT usage, through creating incentives for ICT training companies, creating free information access points, encouraging international ICT exhibitions and fairs in Lebanon, and using the media to promote ICT usage.

7. Establishing a 'National e-Lebanon Committee' formed from the private sector, public sector and civil society to synergize a national ICT strategy and coordinate ICT activities between ministries, public and private sectors. The committee should also set up the implementation plan for the e-Lebanon strategy with well defined timeframes.

8. The current national e-government strategy is only limited to the dissemination of the public sector information to the citizens. This strategy must be enhanced in order to change governments' portals to a more effective two-way communication tool between the public administrations and the citizens. In such a way, their citizens can feedback the relevant public administrations with there comments, complaints, and any other changes in their personal information.

CHAPTER III

Social Digital Divide in Beirut City

1.0 Objective of the Survey

The primary objective of the survey is to study the trend of diffusion of the internet in Beirut city with respect to the socio-economic factors. This Thesis focuses only on Beirut city, because the internet service is not fully integrated in every district of Lebanon. Access in rural places is still very limited, and is more available to companies than to households. Previous studies showed that social disparities of income, education, gender, life stage, religion, and geographic location explained the diffusion of the internet even within developed countries. So, our survey tests if such factors are also critical in the diffusion of the internet in Beirut city. The secondary objective of the survey is to find out the reasons behind using or not using the internet service, plus the major problems that the respondents face in using the internet service in Beirut city. In this respect, a model will be drawn based on the data collected through a questionnaire, to study the relation between internet diffusion and other socio-economic and lifestyle indicators mentioned in the previous literature review. First, we will define the term "digital divide", and then we will move to discuss the previous literature review available on our subject of interest "social digital divide". Finally, we will discuss the methodology followed in our survey and analyze the results of our empirical data.

2.0 Definition of Digital Divide

Information and Technology are the main foundations of this new digital age, where know-how replaces land and capital as a basic building block of growth in the new

economy (G-8 Okinawa Charter, 2000). Technological opportunities are often unevenly distributed even within nations like Australia, the United States and Sweden at the forefront of the information society. A wide gap still exist in access and use of new information and technologies between rich, high educated urban societies and other poorer neighborhoods, working class households, or peripheral rural communities (Pipa Norris, 2000 Ch.1 p: 7). Bridges.org (2003), described the digital divide as "the wide division between those who have access to ICT [information and communications technologies] and are using it effectively and those who do not". The OECD (2001) also defined the term "digital divide" as the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities. The digital divide reflects various differences among and within countries.

From the very first definition of digital divide, it is clear that there is no one digital divide, there are many divides, and the nature of the digital divide varies at each level of analysis. Pipa Norris (2000) identifies three different types of digital divide: Pipa Norris (2000) identifies three different types of digital divide: The global divide refers to the difference of Internet access between industrialized and developing societies. The social divide refers to the gap between information rich and poor in each nation. Lastly, the democratic divide refers to the difference in the employment of ICT tools in public life.

In this research we are only concerned in studying the social digital divide in Beirut city. In the lines below, we will look at the previous Literature Review available on this subject.

3.0 Literature Review

3.1 Social Digital Divide

Many researchers agree that the social digital divide in the access to ICT occurs as a result of the disparities found in the different levels of income, gender, age, education, and geographic location within a country. Pew surveys (2000) confirmed a similar pattern of internet diffusion found in the American society, with sharp inequalities of Internet access by age, education, race, ethnicity, and little inequalities with respect to gender. Also, the latest data (NTIA, 2000) showed that notable divides in Internet penetration still exist between Americans with different levels of income and education, different racial and ethnic groups, old and young, single and dual-parent families, and those with and without disabilities. In UK, similar to USA, Paul Foley et al. (2003) studied the pattern of social stratification in ICT diffusion in the U.K. and found that geography and socio-economic factors are key determinants of the digital divide in Britain, thus the adoption and use of ICTs are strongly related to the level of the household income, level of education, and other life characteristics factors such as age, gender, disability, and ethnicity. The OECD (2000), found similar patterns of stratification among the Internet population in Canada, Australia, and Finland.

The UNDP (1999) had identified the characteristics of a typical internet user, as an English-speaking male, under 35 years old, urban-based, and with a college education and high income. Pipa Norris (2000) also stated that education, literacy, and social status are main factors that provide the required financial and information base to adapt flexibly to innovative technologies.

3.2 Indicators of Social Digital Divide

The indicators of social digital divide used in our survey are drawn from the previous literature review discussed above. In what follows, we will separately discuss the available literature review on the effect of each of these indicators on the diffusion of the internet, and other ICT applications in different countries.

3.2.1 Income

The income and the level of education are the most significant factors of effect on the diffusion of the internet in different studies conducted in different countries. The research of the NTIA (1999) emphasized that household's income was one of the strongest predictors of Internet access in America. Similarly the OECD (2001) mentioned that the extent of internet access and presence of PCs in homes is highly determined by the household or individual income. In France, 74% PC penetration in 2000 were acquired by the groups with high incomes. Whereas, those with low incomes acquired only 11%. The U.S. Census data showed that PCs in households quadrupled in the period from 1984 to 1997, which was characterized by growing disparities in ownership among social strata based on household income, race and education (Kominski; Newburger, 1999). In Europe, similar to the U.S., Pipa Norris (2000) had mentioned that the richest European households were three times more likely to be online than the poorest ones. Overall 37% of those living in the most affluent households were online, compared with only 14% of those in the poorest homes. There was a consistent and significant association between household income and levels of Internet access across all EU countries, with the single exception of Greece.

The income included in our survey is the income of the household in which the respondent lives, not the respondent's individual income, since a majority of the respondents aged

between 12 and 25 years old are still students, who are not employed yet, and at the same time, are heavy users of the internet in their daily life.

3.2.2 Education Level

The internet use does not require high levels of education, but one must, at least, require basic literacy skills such as reading and writing. Pipa Norris (2000, ch:4, p:8) stated that "Education can be expected to improve the general capacity for analytical reasoning and information filtering, which helps cope with the flow of information available online, as well as strengthening numeric, literacy, English-language and keyboard skills". Similarly, Anthony G. Wilhelm (2000) concluded that education was a stronger determinant of connectivity in America than any other demographic or social variable.

3.2.3 Age

Young people at low life stages have been classified as heavier internet users than others at higher life stages in different countries. The highest number of internet users in many countries is in the 35-45 age groups, but some countries, such as Australia have more users in lower age groups. According to the NUA (2001), 85% of those aged 16-24 have Internet access in the United Kingdom compared to just 15% aged 65-74 and 6% over the age of 75, also in Spain 1% of Internet users are over 60 ,and in Sweden only 8% of those online are 65-74. These numbers proved the findings of the OECD (2001) which stated that PC penetration and Internet access are negatively correlated to age and generally grow faster in younger age groups than older age groups.

3.2.4 Gender

Some statistics drawn from NUA (2001) Internet Surveys showed that the United States have succeeded in closing the digital divide in the internet access among different genders. Thus, there is nearly an equal percentage of men and women internet users. In Western Europe it is totally different, in France only 40.5% of the Internet users are female; in Italy there are 2.6 Italian men online for every one Italian woman online; In Spain only 33.5% of the Spanish internet users are females and only 36% of the German internet users are females.

3.2.5 Size of the House Hold

This factor has a strong effect on the diffusion of the internet in Lebanon. The Lebanese in their culture emphasize on the family as a primary unit of the social organization; in contrast to the Western societies who emphasize on the individual. The disposable income of each member of the family is greatly affected by the size of the household. In this respect, members of households with high monthly income and low household size are heavier internet users than others with low monthly income and high household size, simply because the disposal income of the members of the first household is greater than the disposable income of the members of the second.

3.2.6 Foreign Spoken Languages

The little Arabic language content available on the net gives the Arabic language users a little chance to browse their subjects of interest. The vast content available on the net is in foreign (non-Arabic) languages, especially English language, which makes the net more

compatible to foreign language users than Arabic language users. According to NUA survey (2002) non-English speaking zones account for 59.8 percent of the world online population, whereas, the English speaking zones account for 40.2 percent; in particular, 33.9 percent of the world online population are speakers of European languages (excluding English). On the other side the percentage of Arab language internet users is very low compared to the total Asian language Internet users, the total non-English Internet users, and the total world Internet users. According to ESCWA (2003) the Arabic language Internet users account for 0.8 percent of the total world Internet users, 2.7 percent of the total Asian language Internet users, and 1.3 percent of the total non-English Internet users.

3.2.7 Religion

This indicator is not included in our survey due to the unavailability of the data relevant to this factor, both in the data source from where the sample was drawn, and from most of the respondents in our sample who refused to respond to this question.

3.2.8 Social Races

This factor is not included in our survey due to the inexistence of social races within the Lebanese society.

4.0 Methodology

The data used in our research is a primary data collected by means of a survey. A questionnaire is used to collect data on the telephone or face-to face. In what follows, we will discuss the data collection method, the sampling method, and the questionnaire used in this survey.

4.1 Sampling Method

Sampling unit: The definition of the unit of analysis differs from one study to another. Some studies use an individual other use a household as a unit of analysis. The later may hinder the comparability and the pattern of internet usage within households. In our survey the sampling unit is any individual residing in Beirut above the age of 12. We included adults at the age of 12 years in our survey, since adults at this stage are considered effective internet users.

Size of the Sample: a sample of 100 respondents will be approached for data collection, although this sample is small, still, it is considered sufficient if a good sampling procedure and data collection method are applied.

Sampling Method: Our main objective in this phase is to choose a sample which represents the majority of the sampled population. Considering the population normally distributed in Beirut, the best sampling method to achieve this objective is the random sampling method. A sample of 100 people, 12 years old and above, will be randomly chosen from the directory of the residence of the municipality of Beirut city found at the

Ministry of Interior. This directory is annually updated to include all newborn and exclude dead people.

4.2 Method of Data Collection

The personnel interview is the most suitable data collection method in Lebanon, although it is costly both in time and money, yet it has many advantages. The interviewer can have the opportunity for feedback in clarifying issues to respondents, probe complex answers or ask for clearer ones, benefit from an extended interview, and ensure that all items on the questionnaire will be answered and that a high participation rate will be guaranteed. We have to keep in mind that a good questionnaire design is a key for obtaining good survey results and therefore, questionnaires should be relevant and accurate (Zikmund, 2000).

Other methods of data collection, such as mail surveys have low respond rate in Lebanon and are considered unreliable. The telephone survey cannot be used in our case, because the telephone itself is an ICT tool that preceded the diffusion of the internet, and has also been unequally distributed in Lebanon similar to other developed and developing countries worldwide. Using the telephone as a data collection mode will include a bias in our collected data, since the sample will be limited only to those having a telephone. The telephone was used only when a phone number was available for the respondent in the directory from which the sample was drawn. 71 respondents were approached via telephone and others were interviewed. 30 respondents out of the 100 who did not respond to the questionnaire, 10 during a personnel interview attempt and 20 during a telephone attempt, were replaced by another sample of 30 respondents using the same sampling method. The head of the household was approached for data collection in most cases, especially for immature respondents.

4.3 The Questionnaire

In the first part of the questionnaire (Appendix A), questions ranging from A to Q address the concept of the social digital divide and aim at identifying the socio-economic characteristics of the typical internet users in Beirut city through collecting data relevant to the indicators of social digital divide. The parts (R and T) aim to identify the reasons for using or not using the internet. Finally, part (S) lists the major problems in using the internet service in Beirut city, those problems are derived from the e-readiness assessment study in Part II of our research.

5.0 Data Analysis

Qualitative data were also coded into categories when possible. Data was then transformed into meaningful descriptive analysis. This was accomplished by summarizing and categorizing data, as well as cross-tabulating variables, also by graphing and charting data. Tabulating data is useful for indicating percentages and frequency distribution. Cross-tabulation shows how one variable relates to another variable, in order reveal differences between groups (Zikmund, 2000). Correlation and regression models were also used in our survey to study the strength and significance of the relation between dependent and independent variables.

5.1 Gender

Table 3.0 shows a significant relation between the use of the internet and the gender; the internet is more diffused among males than females, having 33 male users out of 45 total male respondents and 26 female users out of 55 total female respondents.

In Table 3.1 we studied the difference in the hours spent on the internet between males and females using the independent sample t-test. Although the results showed a considerable difference between the means of hours spent on the internet among the two groups (4.63 hrs versus 6.97 hrs), yet it was insignificant. We repeated the same test between single females and single males and found a slight difference between the means of hours spent on the internet among the two groups (7.53 hrs versus 7.93 hrs), and was also insignificant (Appendix M). On the other hand, we found a great difference between hours spent on the internet among married females and married males (3.68 hrs versus 8.80 hrs) and was significant (Appendix N). This proves that single males don't spend more hours on the internet than single females, yet married males do spend more hours on the internet than married females.

Table 3.0

Internet Diffusion among different Genders

		Use of the internet		
		don't use the internet	use the internet	Total
Gender of the sampled respondent	FEMALE	29	26	55
	MALE	12	33	45
Total		41	59	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.949[b]	1	.008		
Continuity Correction [a]	5.913	1	.015		
Likelihood Ratio	7.097	1	.008		
Fisher's Exact Test				.014	.007
Linear-by-Linear Association	6.879	1	.009		
N of Valid Cases	100				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18. 45.

Source: Compiled by the author.

Table 3.1

Difference in Hours Spent on Internet among Males and Females

	Gender of the sampled respondent	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet	FEMALE	55	4.6364	11.21567	1.51232
	MALE	45	6.9778	9.71758	1.44861

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet	Equal variances assumed	.268	.606	-1.102	98	.273	-2.34141	2.12452	-6.5574	1.874
	Equal variances not assumed			-1.118	97.656	.266	-2.34141	2.09418	-6.4974	1.814

Source: Compiled by the author.

5.2 Marital Status

In our sample, the internet is more diffused among singles than married. Table 3.2 shows a significant relation at the 0.05 level of significance between the use of the internet

and the marital status, 40 out of 55 single respondents are internet users, while only 19 out of 45 married respondents are internet users.

Table 3.2

Internet Diffusion with respect to Marital Status

		Marital status of the sampled respondent		Total
		single	married	
use of internet	don't use internet	15	26	41
	use internet	40	19	59
Total		55	45	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9.521[b]	1	.002		
Continuity Correction[a]	8.302	1	.004		
Likelihood Ratio	9.627	1	.002		
Fisher's Exact Test				.002	.002
Linear-by-Linear Association	9.426	1	.002		
N of Valid Cases	100				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 18. 45.

Source: Compiled by the author.

Table 3.3 proves that the difference between the mean values of hours spent on the internet among single and married groups is positive and significant at the 0.05 level of significance. This means that single people in Lebanon use the internet more than married people.

Table 3.3

Difference in Hours Spent on Internet among Married and Singles

	Marital status of the sampled respondent	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	single	55	7.7455	12.84987	1.73268
	married	45	3.1778	6.12480	.91303

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet per week	Equal variances assumed	8.079	.005	2.188	98	.031	4.56768	2.08725	.42559	8.709
	Equal variances not assumed			2.332	80.53	.022	4.56768	1.95852	.67050	8.464

Source: Compiled by the author.

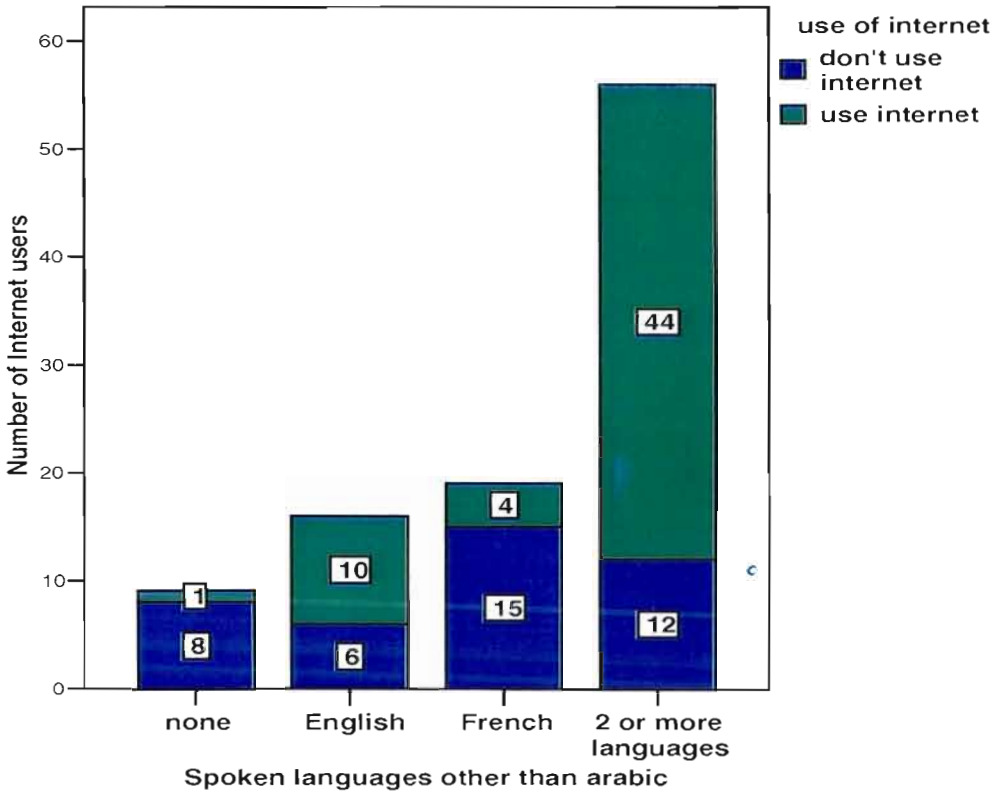
5.3 Foreign Languages

Figure 3.0 shows that 56% of the people in our sample speak two foreign languages other than Arabic, which are mainly English, and French, 19% speak only French as a Foreign language and 16% speaks only English as a foreign language, while 9% do not speak any foreign language other than Arabic. Figure 1 also shows that speakers of two or

more foreign languages have more opportunity to access the internet than others with only one foreign language. Also, English educated people are more internet users than French educated people.

Figure 3.0

Internet Diffusion with respect to Foreign Spoken Languages



Source: Compiled by the author.

Table 3.4

T-test for Equality of Means of French and 2 or more foreign language Speakers

	Spoken Languages other than Arabic	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	French	19	.4737	1.21876	.27960
	2 or more Foreign languages	56	8.5357	12.88264	1.72151

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Internet hours per week	Equal variances assumed	13.54	.000	-2.712	73	.008	-8.06203	2.97317	-13.987	-2.1365
	Equal variances not assumed			-4.623	57.8	.000	-8.06203	1.74407	-11.553	-4.57065

Source: Compiled by the author.

Table 3.4 shows the big difference that exists between the mean values of the hours spent on the internet among French language speakers and two or more foreign language speakers, which is strongly significant at the 0.05 level of significance. People speaking two or more foreign non-Arabic languages, mainly English and French, spend more internet hours in average than those who speak only French as a foreign language. The same t-test is also conducted between English language speakers and two or more foreign language speakers (Appendix B). The test shows an insignificant difference in the mean

values of the hours spent on the internet among both groups. The t-test is also conducted between English language speakers and French language speakers (Appendix C). The difference between the mean values of the hours spent on the internet among both groups is huge and significant at the 0.05 level of significance. It proves that English speakers are more users of the internet than the French ones. If we compare the results of the three t-tests we would find out that Lebanese English language speakers are more internet users than speakers of other foreign languages. The results of our survey support the findings of the previous literature review that the net is more compatible to users who access the internet in more foreign (non-Arabic) languages, especially English due to the huge content available on the net in English language.

5.4 AGE

According to Table 3.5, a negative significant correlation at the 0.05 level of significance exists between the hours spent on the internet, which is an indicator of the extent of usage of the internet, and the age of the sampled respondent. This result explains that an increase in the age negatively affects the usage of the internet, this agrees with the findings in the previous Literature Review in which young respondents were shown to be more effective internet users than the old respondents.

Table 3.5

Correlations of Social Digital Divide Indicators

		Age of the sampled respondent	The family size of the household	Number of years of schooling of the sampled respondent	hours spend on the internet per week	Income of the household
Age of the sampled respondent	Pearson Correlation	1	-.222*	-.166	-.204*	.137
	Sig. (2-tailed)	.	.026	.099	.042	.174
	N	100	100	100	100	100
The family size of the household	Pearson Correlation	-.222*	1	.020	-.090	-.046
	Sig. (2-tailed)	.026	.	.841	.374	.646
	N	100	100	100	100	100
Number of years of schooling of the sampled respondent	Pearson Correlation	-.166	.020	1	.217*	.166
	Sig. (2-tailed)	.099	.841	.	.030	.099
	N	100	100	100	100	100
hours spend on the internet per week	Pearson Correlation	-.204*	-.090	.217*	1	.314**
	Sig. (2-tailed)	.042	.374	.030	.	.001
	N	100	100	100	100	100
Income of the household	Pearson Correlation	.137	-.046	.166	.314**	1
	Sig. (2-tailed)	.174	.646	.099	.001	.
	N	100	100	100	100	100

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Compiled by the author.

We tried to compare the means of the hours spent on the internet between respondents aged below 20 years and respondents aged between 20 and 30 years; the results (Appendix D) show a small insignificant difference between the two means. At the same time, we

tried to compare the means of the hours spent on the internet among respondents between 20 and 30 years and respondents between 30 and 40 years; the results (Appendix E) show a big difference between the means of the two groups and are significant at the 0.01 level of significance. If we compare the results of the last two t-tests than we can easily deduce that respondents aged less than or around 30 years old are the most internet users in Lebanon.

5.5 Family Size of the Household

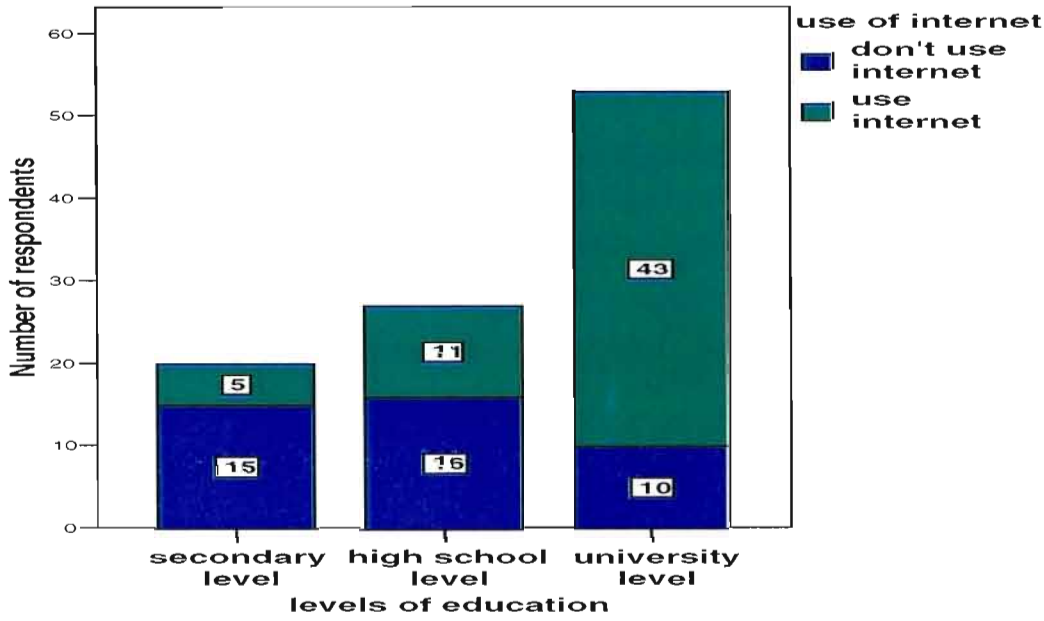
This indicator has a negative insignificant correlation with the hours spent on the internet. Although the result is insignificant, but we can find out a negative significant relation between number of children, and the hours spent on the internet, which is logical and supports the findings in the previous Literature Review. The large size of the household and the number of children the smaller the disposable income of each family member, which makes the service nearly unaffordable.

5.6 Number of Years of Schooling

The number of years of schooling is positively correlated with the number of working hours and the correlation is significant at the 0.05 level of significance (Table 3.5). High educated people are more qualified to cope with the information available online than less educated people. Figure 3.1 shows that there are more internet users in the respondents having a university or a higher degree than respondents who have a high school degree or secondary degree.

Figure 3.1

Internet Users per Education Levels



Source: Compiled by the author.

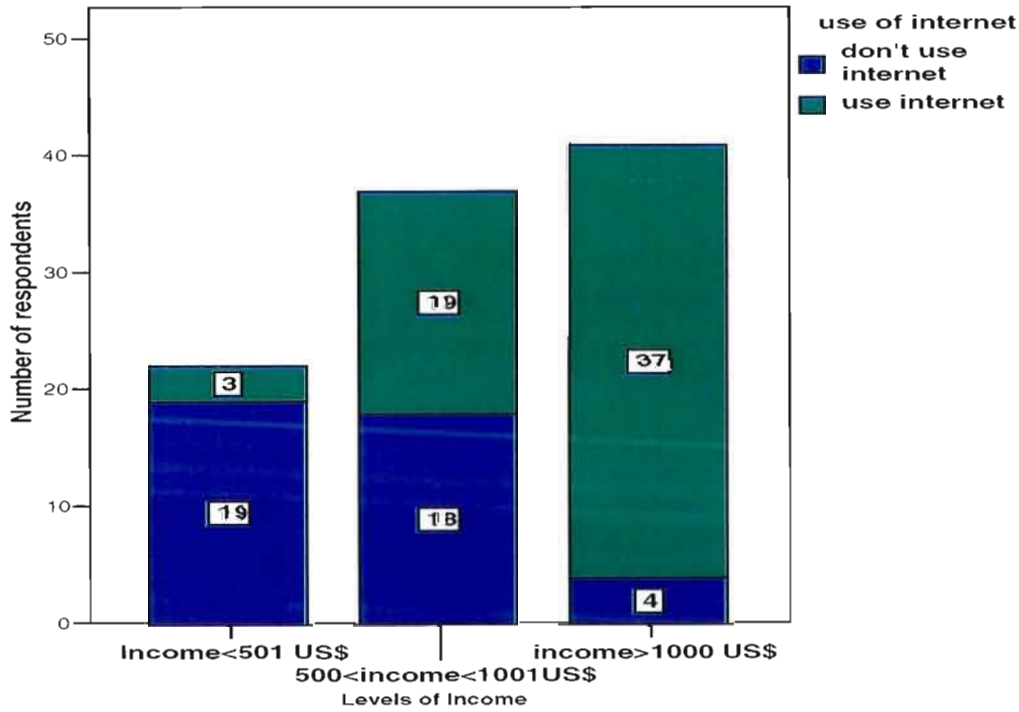
An independent sample t-test is drawn to check the significance of the difference of the means of hours spent on the internet between respondents at or below high school level and respondents at or above university level. The results (Appendix F) show a strong difference between the two means and are also, significant at the 0.05 level of significance. This proves that the Lebanese people at the university or higher a level of education use the internet more than others.

5.7 Household's Income

The level of income has a strong positive correlation with the hours spent on the internet significant at the 0.01 level of significance (Table 3.5). In Figure 3.2, the income levels of the sampled respondents are divided into three classes. The results show that the majority of respondents with an income less than 1000 USD are not internet users, while most of the respondents with an income more than 1000 are internet users.

Figure 3.2

Internet Usage per Household Income



Source: Compiled by the author

A comparison of the means of hours spent on the internet is drawn using the independent sample t-test between households with a monthly income below 500 USD and others of an income between 500 and 1000 USD. The results in (Appendix G) show a small insignificant difference in the means of the two groups. The same t-test is drawn between the means of hours spent on the internet (Appendix H) among households with a monthly income between 500 and 1000 USD, and others of monthly income between 1000 and 1500 USD. The results show a huge difference in the means of the two groups, which is also significant at the 0.01 level of significance. From the last two t-tests, we conclude that most internet users in Lebanon have an income of around 1000 USD or more, while most of those who have a lower income are still not using the internet service.

6.0 Regression Model

A regression model is drawn between the social digital divide indicators as independent variables and hours spent on the internet as dependent variable (table 3.6). The R square, the coefficient of determination of the model, equals 0.193. This explains that 19.3% of the variation in the hours spent on the internet is explained by the social digital divide indicators. The significance value of F is even less than 0.01, which means that the variation explained by the model is strongly significant at the 0.01 level of significance and is not due to chance. Although the R square of the model is low, yet, it is considered good, because the diffusion of the internet is explained by multiple variables other than socio-economic variables. These variables are out of the scope of our survey, the social digital divide.

Table 3.6

Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.439	.193	.159	9.70258

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2140.094	4	535.023	5.683	.000
	Residual	8943.296	95	94.140		
	Total	11083.390	99			

Predictors: (Constant), Income of the household, the family size of the household, Number of years of schooling of the sampled respondent, Age of the sampled respondent

Dependent Variable: hours spend on the internet.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.284	5.381		1.725	.088
	The family size of the household	-.921	.646	-.135	-1.425	.158
	Age of the sampled respondent	-.175	.066	-.258	-2.652	.009
	Number of years of schooling of the sampled respondent	.291	.224	.124	1.298	.197
	Income of the household	.000	.000	.323	3.406	.001

a. Dependent Variable: hours spend on the internet per week

Separate regression models were drawn between the hours spent on the internet and each of the independent variables, income, number of years of schooling, age, and the size of the household. The income of the household had the highest R square value of 0.099, significant at the 0.01 level of significance (Appendix I). It is followed by the number of

years of schooling having an R square value of 0.047 significant at the 0.05 level of significance (Appendix J), and the age of the sampled respondent having an R square value of 0.042 significant at 0.05 level (Appendix K). The R square of the size of the household was insignificant (Appendix L). These results prove that the income of the household explains most of the variation in the internet usage, followed by the number of years of schooling and the age of the respondent.

7.0 Reason for Using or Not Using the Internet

Table 3.7 lists the main reasons for using the internet in Lebanon. Most of the internet users in our sample use the internet to access their emails, chat online, and surf for information.A minority of the sample uses the internet for e-commerce transactions due to their lack of confidence in the security of internet transactions. Also, few of the respondents pay their bills over the net either for security reasons or due to the lack of local portals ready to process invoice payment online.

Table 3.7

Reason for using Internet

Dichotomy label	Count	Pct of Responses	Pct of Cases
Surfing for information	48	36.1	82.8
Recreation and entertainment services	29	21.8	50.0
Electronic delivery	49	36.8	84.5
Buying or selling products or services	5	3.8	8.6
Paying my bills	2	1.5	3.4
Total responses	133	100.0	229.3

According to table 3.8, the main reasons for not using the internet are lack of skills and unaffordable prices. The former is due to the lack of government awareness to introduce the society to the benefits of the internet, and to the lack of ICT applications in the country to facilitate people's daily demands, and encourage them to effectively use the different electronic applications. The latter is also due to the absence of the government's initiative to supply affordable prices and to promote the internet usage.

Table 3.8

Reason for not using Internet

Dichotomy label	Count	Pct of Responses	Pct of Cases
Can't afford it	13	21.7	31.0
No time to use the internet	7	11.7	16.7
Lack of skills	17	28.3	40.5
Not interested in using internet	8	13.3	19.0
Lack of confidence	3	5.0	7.1
No need to use internet	12	20.0	28.6
Total responses	60	100.0	142.9

Source: Compiled by the author.

8.0 Internet Problems in Lebanon

The most affordable internet access mode available in Lebanon is the dial up mode, with a speed ranging from 33.5 to 56 Kbps. The ISDN and the leased line access modes are not affordable for the majority of people. Moreover, the latest the latest DSL and ADSL technologies are still not launched in Lebanon. In this respect, most of the respondents were suffering from the same problems of high connectivity charges and

unreliable internet service. Few respondents found the uncontrolled content over the internet, such as pornography sites, which are very harmful for their children. While others suffer from the overwhelming viruses that limit their access to new information disseminated on the net.

Table 3.9

Problems of using the Internet

Dichotomy label	Count	Pct of Responses	Pct of Cases
High connectivity charges	30	35.7	57.7
Lack of security and overwhelming viruses	10	11.9	19.2
Unreliable internet service	36	42.9	69.2
Uncontrolled content over internet	8	9.5	15.4
Total responses	84	100.0	161.5

Source: Compiled by the author.

9.0 Conclusion and Recommendations

This survey shows the strength of the social digital divide in the diffusion of the internet in Beirut city which runs across the following lines: Rich / poor, Young / old, Educated / Uneducated, Native/Foreign language. It also introduces us to the socio-economic characteristics of the typical internet users in Beirut city, which are mainly single males or females, under or around the age of 30 years, (English-speaking), with a university or higher level of education, having a minimum household income around 1000 USD.

The survey also shows that problems of high connectivity charges and unreliable internet service, due to low speed, are major problems preventing the effective use of the internet. These problems resulted from the government's monopoly on the dial up internet service, which is the most used mode of internet connection. This calls for government's immediate action to reform the current Telecom and data services' regulatory framework and authorize new Internet service providers to operate in this sector, there by activating competition which lowers the price, enhances the service level, and introduces new services (DSL, ADSL). In addition, the government should also disseminate the use of information technology through providing free or reduced cost ICT access points that will help to live up to date with the new evolving technologies and yield the benefits they would provide.

The survey also revealed that the lack of skills and especially at low income and old groups is a major reason for not using the internet. The government should also work to fill this gap through launching national ICT professional associations and creating incentives for ICT training companies, to provide ICT skills training to the old, poor, uneducated, and those deprived of ICT exposure at their workplace.

The results of the survey also show a lack in using the internet for e-commerce activities and instead using it as a source of information, and a tool for communication and recreation activities. The government should also act to promote the proper usage of the internet through the available media tools, and to launch an ICT enabling legal framework that provides the required information security to encourage using the internet for more complex transactions, especially e-commerce. The government can also enhance the usage of e-commerce activities through changing its current portals to include complex e-commerce functions through which citizens can pay their bills online.

CHAPTER IV

CONCLUSION

1.0 Results of the research

This research focused on e-readiness as an indicator of the future role that a country will play in the new age of information, communication, and technology, and as a base upon which other ICT applications will be developed. The research specified through a detailed method of discussion the position of Lebanon in terms of e-readiness. The method of discussion of the e-readiness issue has added value to the whole research. Each attribute of the e-readiness assessment model was studied separately. Thus, detailed problems were identified at each phase and relevant solutions were recommended. This detailed approach helped to cover the major and minor aspects in the e-readiness assessment model. The general e-readiness assessment at the end of chapter two figured out some recommendations for major problems that call for government immediate action. Although most of the recommendations were addressed for government's action, since the government is the major user, promoter, and governor of the ICT applications, yet some addressed the private and educational sector through public private partnership projects to be performed with respect to a unified national e-strategy.

The case study in our research proved the existence of the social digital divide in the diffusion of the internet in Beirut city, and found solutions to bridge this gap. The first step in this approach identified the scope of diffusion of the internet with respect to socio-economic factors; as a result the research specified the socio-economic characteristics of the typical internet user and of the users and nonusers of the internet in general. The second step identified reasons for not using the internet and the problems in using the

internet. Those findings helped to figure out some recommendations to solve these problems and bridge the existing social gap in the access to the internet.

As a recap for the whole research, we believe that the government should realize the existence of a social digital divide and should also realize the current position of Lebanon in terms of e-readiness and must establish a "National e-Lebanon Committee" formed from the private sector, public sector, and civil society with a coherent e-strategy to reform the key enabling building blocks for an e-society including ICT infrastructure, favorable e-business climate, and legal and regulatory framework conductive to e-business activities. It is also recommended to create a Ministry for Information and Communication Technology with a firm national e-strategy to develop the ICT diffusion in the different sectors of the society, similar to what Jordan and Egypt have recently done to bridge the digital divide both regionally and internationally.

2.0 Future research

Our research covered all the essentials of e-readiness, which represent the basic foundations upon which a well advanced e-society is build and are essential to fully deliver the benefits of the information society to all the citizens regardless of social classes. ICT has great benefits to be gained through applying the different ICT applications in the Information Society. Future researches should emphasize on raising the awareness of the potential of ICT and should focus on government's effort and in particular on government's ministries to facilitate the implementation of ICT applications. ICT applications are the tools that allow citizens to derive the benefit from the information infrastructure. ICT applications can be applied in the different industries of an economy; for example, e-learning can be applied in the education sector to enhance the education system, e-health can greatly enhance health care delivery systems, e-government can

ensure a better service to be delivered to the citizens, and other ICT applications that can play an important role in advancing general economic development and living standards.

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Appendix A

QUESTIONNAIRE

1. Date:
2. Name:
3. GENDER: Male ☐ Female ☐
4. Age
5. MARITAL STATUS: Married ☐ Single ☐ Divorced ☐ Widow ☐
6. Do you have any children? Yes ☐ No ☐
7. How many children do you have?
8. What are the ages of your children?
9. How many hours do your children spend on the internet weekly?
10. What is the total size of the household you are living in?
11. How many languages do you master? English ☐ French ☐ Two / more ☐
12. What is your number of years of schooling?
13. What is your household monthly income in US dollars?
14. Do you have access to personnel computers? Yes ☐ No ☐
15. Do you have access to the internet? Yes ☐ No ☐
16. How many hours do you spend on the internet each week?

17. Why do you use the internet?

A- Surfing for information
B- Recreation and entertainment services
C- Electronic delivery
D- Buying or selling products or services
E- Paying my bills

18. What do you think is/are the major problem(s) in the internet service in Lebanon?

A- High connectivity charges
B- Lack of security and overwhelming viruses
C- Unreliable internet service
D- Uncontrolled content over the internet
E- Absence of Legal and regulatory framework

19. What is the main reason for not using the Internet?

A- Do not have access to a computer
B- cannot afford it
C- Do not have Internet access
D- No time to use the Internet
E- Lack of skills
F- Not interested
G- Lack of confidence
H- No need to use it

Appendix B

T-test for Equality of Means of English Speakers and 2 or more Foreign Language Speakers

	Spoken languages other than Arabic	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	English	16	5.0000	6.72309	1.68077
	2 or more languages	56	8.5357	12.88264	1.72151

		Statistics								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet per week	Equal variances assumed	2.216	.141	-1.054	70	.296	-3.535	3.35512	-10.22	3.15
	Equal variances not assumed			-1.470	48.4	.148	-3.535	2.40595	-8.37	1.30

Appendix C

T-test for Equality of Means of English Speakers and French Language Speakers

	Spoken languages other than Arabic	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	English	16	5.0000	6.72309	1.68077
	French	19	.4737	1.21876	.27960

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet per week	Equal variances assumed	20.05	.000	2.887	33	.007	4.52632	1.56803	1.336	7.7164
	Equal variances not assumed			2.656	15.83	.017	4.52632	1.70387	.9111	8.1414

Appendix D

T-test for Equality of Means with respect to ages below 20 and ages between 20 and 30 years old.

	new age	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	age less than 20	25	6.9600	9.96025	1.99205
	age between 20&30	32	8.9688	14.45680	2.55562

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet per week	Equal variances assumed	1.370	.247	-.593	55	.556	-2.00875	3.38787	-8.7981	4.7806
	Equal variances not assumed			-.620	54.24	.538	-2.00875	3.24029	-8.5044	4.4869

Appendix E

T-test for Equality of Means with respect to Ages Between 20 and 30 Years and Ages Between 30 and 40 Years Old.

	new age	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	age between 20&30	32	8.9688	14.45680	2.55562
	age between 30&40	19	2.0000	2.88675	.66227

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet per week	Equal variances assumed	9.316	.004	2.069	49	.044	6.96875	3.36867	.19916	13.73
	Equal variances not assumed			2.640	35.03	.012	6.96875	2.64004	1.6093	12.32

Appendix F

T-test for Equality of Means with respect to Level of Education.

	new school	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	high school level or below	47	2.6596	5.93910	.86631
	university level or above	53	8.3774	12.89488	1.77125

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet per week	Equal variances assumed	10.517	.002	-2.788	98	.006	-5.71778	2.05099	-9.787	-1.647
	Equal variances not assumed			-2.900	75.0	.005	-5.71778	1.97175	-9.645	-1.789

Appendix G

T-test for Equality of Means Between income groups (below 500 USD and between 500 and 1000 USD).

	New income	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet	Below 500 USD	22	.7273	2.05129	.43734
	between 500 & 1000 USD	37	1.9459	3.12646	.51399

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet	Equal variances assumed	2.632	.110	-1.629	57	.109	-1.21867	.74822	-2.71696	.2796
	Equal variances not assumed			-1.806	56.357	.076	-1.21867	.67487	-2.57041	.1330

Appendix H

T-test for Equality of Means Between income groups (below 500 USD and between 1000 and 1500 USD).

	New income	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet	between 500 & 1000 USD	37	1.9459	3.12646	.51399
	between 1000 & 1500 USD	16	11.6250	11.42439	2.85610

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
hours spend on the internet	Equal variances assumed	32.53	.000	-4.807	51	.000	-9.67905	2.01356	-13.72	-5.636
	Equal variances not assumed			-3.335	15.9	.004	-9.67905	2.90198	-15.83	-3.526

Appendix I

Regression Model of the Income and the Number of Internet Hours

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.314[a]	.099	.090	10.09518

a. Predictors: (Constant), Income of the household

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1095.959	1	1095.959	10.754	.001[a]
	Residual	9987.431	98	101.913		
	Total	11083.390	99			

a. Predictors: (Constant), Income of the household

b. Dependent Variable: hours spend on the internet per week

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.778	1.047		4.563	.000
	Income of the household	.000	.000	.314	3.279	.001

a. Dependent Variable: hours spend on the internet per week

Appendix J

Regression Model of the Number of years of Schooling and the Number of Internet Hours

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.217	.047	.037	10.38072

A Predictors: (Constant), Number of years of schooling of the sampled respondent

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	522.973	1	522.973	4.853	.030
	Residual	10560.417	98	107.759		
	Total	11083.390	99			

A Predictors: (Constant), Number of years of schooling of the sampled respondent

B Dependent Variable: hours spend on the internet

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.394	3.814		-.628	.532
	Number of years of schooling of the sampled respondent	.511	.232	.217	2.203	.030

a. Dependent Variable: hours spend on the internet per week

Appendix K

Regression Model of the Age and the Number of internet hours

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.204	.042	.032	10.41117

A Predictors: (Constant), Age of the sampled respondent

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	460.938	1	460.938	4.252	.042
	Residual	10622.452	98	108.392		
	Total	11083.390	99			

A Predictors: (Constant), Age of the sampled respondent

B Dependent Variable: hours spend on the internet

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.164	2.407		4.224	.000
	Age of the sampled respondent	-.139	.067	-.204	-2.062	.042

a. Dependent Variable: hours spend on the internet per week

Appendix L

Regression Model of the family size of the household and the Number of internet hours

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.090(a)	.008	-.002	10.59155

A Predictors: (Constant), the family size of the household

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	89.659	1	89.659	.799	.374(a)
	Residual	10993.731	98	112.181		
	Total	11083.390	99			

A Predictors: (Constant), the family size of the household

B Dependent Variable: hours spend on the internet

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.014	2.807		2.855	.005
	The family size of the household	-.615	.688	-.090	-.894	.374

a. Dependent Variable: hours spend on the internet per week

Appendix M

Difference in Hours Spent on Internet among Single Males and Single Females

Group Statistics

	Gender of Singles	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	Single Male	29	7.9310	10.20830	1.89563
	Single Female	26	7.5385	15.48736	3.03732

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
hours spend on tl internet per week	Equal variances assumed	.962	.331	.112	53	.911	.39257	3.50269	6.63294	7.41808
	Equal variances not assumed			.110	42.510	.913	.39257	3.58033	6.83025	7.61540

Appendix N

Difference in Hours Spent on Internet among Married Males and Married Females

Group Statistics

	Gender of Maried	N	Mean	Std. Deviation	Std. Error Mean
hours spend on the internet per week	Female Married	29	2.0345	3.68862	.68496
	Male Married	16	5.2500	8.80530	2.20133

Independent Samples Test

		Levene's Test for quality of Variance		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	ig. (2-tailed	Mean Difference	Std. Error Difference	Lower	Upper
hours spend o internet per we	Equal varian assumed	7.784	.008	-1.723	43	.092	-3.21552	1.86609	-6.97884	.54781
	Equal varian not assumed			-1.395	17.955	.180	-3.21552	2.30543	-8.05991	1.62888