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PROFILE OF THE INFORMATION SOCIETY IN THE STATE OF KUWAIT

2003

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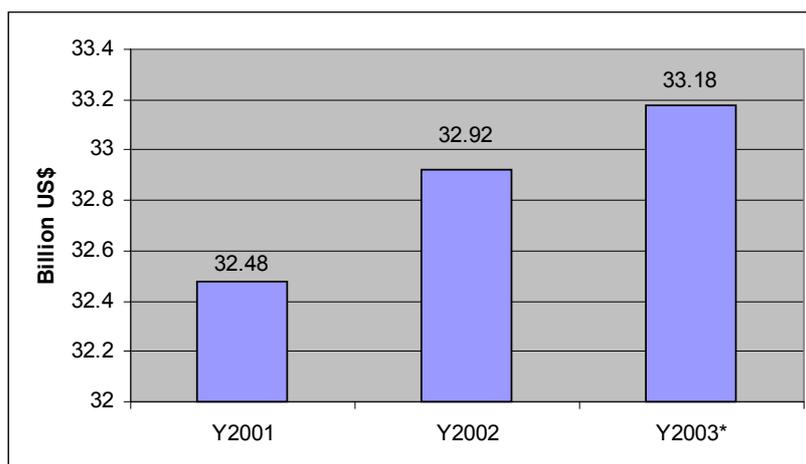
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INTRODUCTION

With the third Gulf War and the Iraqi threat behind it today, many believe that Kuwait, which holds approximately 10 percent of the world's oil reserves, will share in the windfall of re-building Iraq. Kuwait's already buoyant economy is the third largest in the Gulf Cooperation Council (GCC)¹ countries, after Saudi Arabia and the United Arab Emirates, with its real gross domestic product (GDP) standing at US\$32.92 billion in 2002. The state's GDP is projected to grow, at two percent, in 2003 to US\$33.18 billion. Kuwait's current and fiscal balances for the past two years have also been running surpluses close to a third of its GDP. Its GNI per capita of US\$18,720 in 2001 also places it among a handful of high-income states that include the United States, Australia and New Zealand.²

Figure 1. Kuwait's Gross Domestic Product



Source: Madar Research Group.

* Kuwait's 2003 GDP – forecast by Madar Research – is expected to rise partly due to the resolution of the Iraqi conflict.

Kuwait lacks a cohesive and detailed national information and communication technology (ICT) strategy similar to Jordan's REACH.³ It also lacks a comprehensive national IT plan. Its electronic government project, however, has clearly defined goals and far-reaching objectives in terms of delivering services to its citizens online. Progress, though, has been generally slow on this front.

The country's key industrial sectors – oil and gas, finance and telecommunications – also utilize the most advanced ICT systems including enterprise resource planning (ERP), relational database management systems (RDBMS) and customer relationship management (CRM) systems that clients, partners and employees could access through the public Internet or through private intranets.

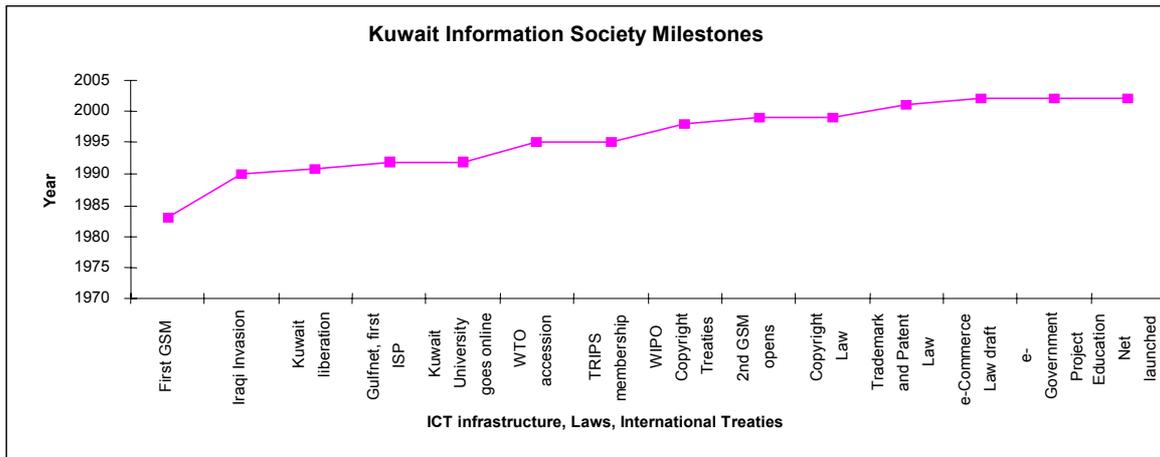
Automation in the public and private sectors is good by regional standards. PC penetration in Kuwait is over 12 percent – the third highest in the Arab world. Additionally, Kuwait is among the first Middle Eastern countries to have a local software industry. This is attested by the formation of the Kuwait Information Technology Society (KITS) as early as 1981. The organization has made significant contributions to the state's overall ICT awareness by organising conferences, lectures and seminars. KITS was instrumental in lobbying for policy changes such as those that led to the passing of the state's Copyright Law in 1999.

¹ The Arab Gulf Cooperation Council (GCC) comprises six countries: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Generally, the Arab Middle East comprises of the GCC, the Levant (Lebanon, Jordan, Syria, and Egypt) and the Maghreb countries (Algeria, Tunisia and Morocco).

² ITU (Internet host data: Network Wizards, RIPE) — World Telecommunication Development Report 2002: Reinventing Telecoms.

³ REACH is Jordan's ICT blueprint, which stands for regulatory framework, enabling environment (infrastructure), advancement programs, capital and human resource development. The framework includes a plan of action necessary to achieve the established goals in terms of FDIs, software exports, etc

Figure 2. Kuwait Information Society Milestones



Kuwait University, meanwhile, was the first learning institution in the Arab world to offer full Internet access to its students in 1992, when the Internet was introduced in Kuwait. Today the country has the third highest ICT Use Index (see Exhibit 4) in the Arab world, trailing United Arab Emirates (UAE) and Bahrain. The index gauges progress on tele-density and the use of PCs and the Internet, thus providing an indicator on the relative technology-adoption rate among Arab countries. Kuwait also has one of the highest Internet penetration rates in the Arab world and is one of the most aggressive adopters of broadband technology.

The introduction of economic reforms, however, has been slow. The road to a fully liberalised market in Kuwait, an essential prerequisite to its accession to the World Trade Organisation (WTO) in 1995, is still a good ways off. Issues like protectionism, monopolies and a host of regulations restricting trade and foreign investment have first to be fully resolved. Foreign banks, for instance, are not allowed to set up in Kuwait. Another example is Kuwait’s Ministry of Communication (MoC). It is the country’s only fixed line carrier, from where most of GSM operators and Internet service providers (ISPs) purchase bandwidth and network capacities.

However, Kuwait's overall performance against a set of economic criteria gauged by *Wall Street Journal* and the Heritage Foundation to test the level of economic liberalization in 161 countries, has been encouraging. *The Economic Freedom Index 2003*, released in November 2002, ranked Kuwait 40th most free economy worldwide (See Exhibit 3), after it scored 2.55 – on a scale of 1 (most free) to 5 (most repressed). Kuwait has improved by 0.20 over its 2002 score. It came in third position in the Arab world, following the UAE (24th world ranking) and Bahrain (16th).

Another roadblock to Kuwait’s economic and e-transformation are long-standing policy divisions within the government and parliament (National Assembly), which are hindering decision making and slowing down reforms. Even projects that are approved by the government often tend to pass their completion deadline due to bureaucracy or inadequate planning. Regardless of the pace at which economic, political or social reforms will be introduced in Kuwait, the end of the spectre of war that loomed for over 12 years will give impetus to a fresh cycle of investment and development which is bound to increase ICT adoption in both the public and private sectors.

Table 1. Kuwait's Performance on Index of Economic Freedom (2003)

Trade Policy	2
Government Intervention	3
Foreign Investment	4
Wages and Prices	3
Regulation	3
Fiscal Burden	2.5
Monetary Policy	1
Banking and Finance	2
Property Rights	3
Black Market	3
Score	2.55
World Rank	40

Source: The Heritage Foundation and Dow Jones & Co.

Notes: 1) The scoring system: 1= very low, 2 = low, 3 = moderate, 4 = high, 5 = very high; the lower the score, the higher the level of economic freedom as measured by the respective variable.

2) The overall score represents the average of all individual scores.

3) A negative change from the 2002 Index indicates an increase in the level of economic freedom.

Table 2. Arab Countries ranked by Madar ICT Use Index

Rank	Country	Population	PC Installed Base	Internet Users	Fixed Lines	Mobile Phones	ICT Use Index
1	United Arab Emirates	3,700,000	590,000	1,100,000	1,100,000	2,507,500	1.43
2	Bahrain	728,000	108,000	180,000	177,000	392,000	1.18
3	Kuwait	2,418,000	300,000	320,000	483,000	1,400,000	1.04
4	Qatar	805,000	108,000	75,000	178,000	280,000	0.8
5	Lebanon	4,387,000	275,000	505,000	760,000	840,000	0.54
6	Saudi Arabia	23,898,000	1,800,000	1,920,000	3,420,000	5,500,000	0.53
7	Jordan	5,332,000	233,000	342,000	805,000	1,240,000	0.49
8	Oman	2,760,000	97,000	165,000	234,500	484,500	0.36
9	Palestine	3,450,000	130,000	200,000	320,000	570,000	0.35
10	Morocco	31,430,000	510,000	600,000	1,250,000	6,436,000	0.28
11	Tunisia	10,000,000	328,000	524,000	1,163,000	700,000	0.27
12	Egypt	71,300,000	1,130,000	2,000,000	7,960,000	4,628,000	0.22
13	Syria	19,000,000	334,000	275,000	2,070,000	470,000	0.17
14	Libya	5,433,000	135,000	160,000	521,000	75,000	0.16
15	Algeria	32,549,000	310,000	610,000	1,904,000	595,000	0.11
16	Yemen	19,100,000	145,000	55,000	510,000	523,000	0.06
17	Iraq	24,340,000	200,000	45,000	700,000	22,000	0.04
18	Sudan	37,065,000	185,000	92,000	780,000	340,000	0.04
	Total	297,695,000	6,918,000	9,178,000	24,335,500	27,003,000	0.23

Source: Madar Research Journal, May 2003

I. POLICIES AND STRATEGIES

A. NATIONAL INFORMATION SOCIETY POLICIES AND STRATEGIES

While the government of Kuwait is actively engaged in allocating budgets to fund its ICT projects – whether within the framework of the e-government project, or as part of the ongoing process of modernization – there are either no plans or no documented plans that expressly set forth its national aspirations and goals in terms of:

- (a) Research and development output;
- (b) high technology exports;
- (c) ICT foreign direct investments (FDIs).

Furthermore, while a grand vision to make Kuwait a regional technology hub in the Middle East through a Technology Park and a government funded technology incubator was announced in 2000 (M. Mrayati and O. Bizri, 2000), these plans and projects are yet to be operational as of 2002.

Table 3. ICT Initiatives

ICT Strategy Clearly Spelled Out	ICT Implementation Plan Clearly Articulated	Plan of ICT-Dedicated Research Facilities	Operational ICT-Dedicated Research Facilities	Plan of Technopole Initiative	Operational Technopole Initiative	Planned Technology Incubator	Existence of Technology Incubator
Yes	No	Yes	Yes	Yes	No	Yes	No

Source: The Global Information Technology Report 2002-2003, The World Economic Forum

B. SECTORAL PLANS FOR BUILDING THE INFORMATION SOCIETY

1. Education

Students constitute around one fifth of the Kuwaiti population. About 456,783 students are enrolled in Kuwaiti schools – including special education, religious and regular schools – and colleges, which total about 838. In 2002, the Ministry of Education (MoE) embarked on a 25-year plan to revamp and modernize the education system, and core to this strategy is the electronic education initiative called Education Net. The initiative calls for every public school and library in Kuwait to be linked in a single network. This initiative is complemented by a project to automate all 620 public schools in Kuwait and to increase the use of personal computers (PCs) in the classroom.

By end 2002, the project had succeeded in furnishing all secondary and intermediary schools with PCs at the cost of \$24.6 million, 34 percent of which was covered by the Ministry of Education and the rest by the Kuwait Foundation for the Advancement of Science (KFAS). The project has been expanded in 2003 to cover elementary schools, and by 2006-2007 academic year, the target of ministry planners is to achieve a ratio of one PC for every eight students, which would require additional funding of \$100 million.

Distance learning is also high in the ministry's immediate agenda as it is now planning content and design of an Internet based learning program to be introduced during the next academic year to 24 secondary and intermediate schools, as part of a pilot project.

2. Government

Following the first E-government Conference in Kuwait in 2001, the *Central Technical Committee for the Implementation of E-Government* was formed in 2002. This committee is tasked to examine prospects and obtain feedback from all concerned government agencies on their current ICT infrastructure, and to

coordinate program of actions between the institutions to move forward in offering services using the Internet platform.

Compared to Dubai's straightforward implementation of e-government in neighbouring UAE, execution of Kuwait's e-government initiative has been relatively slow. Apart from the formation of the Central Technical Committee, which comprises of representatives from the Kuwait National Assembly, the Ministry of Planning, Kuwait University and the Kuwait Information Technology Society, the government has had to create the *Secretariat for the Central Technical System* to oversee the tendering process required in awarding the e-government contracts to the bidder(s) with the best solution.

While senior government executives have made references to the role of computerization in rooting out bureaucracy and corruption, there is yet to be an online government procurement initiative that will help reduce the cost of buying or selling supplies within Kuwait. The government's export revenues, mainly from oil, are estimated at US\$16.2 billion in 2001, whereas its import receipts reached US\$7.4 billion the same year.⁴

Interestingly, the World Markets Research Center's Global E-Government Survey published by Brown University in September 2002 gave Kuwait an overall score of 32 points out of 100 for online availability of government services. The same survey gave the United States 60 points and the UAE 38 points. Compared to 2001, when the survey was first conducted, the US score improved by eight points and the UAE by 12, while Kuwait gained only three points – confirming its slow progress.

3. *Industry and Commerce*

There is no single, overarching ICT strategy that governs Kuwait's industry sector, which is largely dominated by oil and oil-related industries that use sophisticated IT systems. Consumer-oriented and service industries show a high rate of ICT adoption. The level of overall ICT awareness within Kuwait is reflected by the availability and high adoption rates of Internet banking services, as well as new technologies such as multimedia messaging systems (MMS), short messaging services (SMS) systems and wireless application protocol (WAP) among its citizens.

Kuwaiti banks have been transitioning from mainframe to client-server or thin client environments in the past few years as they anticipate the need to make their back-end database systems accessible from a slew of consumer access devices such as PCs, PDAs and WAP phones. This move towards accessibility and platform interoperability has also required Kuwaiti banks to improve their security measures on all fronts.

Business-to-consumer (B2C) e-commerce is not a novelty to Kuwait's rather young population (52 percent of Kuwait's 2.418 million population is under 30 years of age). Business-to-business (B2B) e-commerce is also picking up in Kuwait, especially with the oil industry. Private exchanges, primarily those owned by multinationals to transact with their local partners and agents, are now in place.

4. *Healthcare*

In 2001 Kuwait's Ministry of Health (MoH) launched an electronic files project for its health clinics and hospitals, with the goal of replacing the traditional paper-based patient records system. The first half of 2002 saw the implementation of the system in all clinics, which comprises the project's first phase. The next phase will see the system deployed in general hospitals and, finally on the third phase, its implementation in Kuwait's specialised hospitals. The project will ultimately link all of Kuwait's health organisations to a central computer network to facilitate efficient diagnostic, medical and administrative services for each patient and to streamline government health services expenditure in the long run.

⁴ Central Intelligence Agency. The World Factbook 2002. United States, 2002 (www.cia.gov/cia/publications/factbook/geos/ku.html).

II. LEGAL AND REGULATORY FRAMEWORKS

Kuwait has signed a number of international trademarks, patent and intellectual property rights protection agreements, including the World Intellectual Property Organization (WIPO) Copyright Treaties (WCT) and the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).

The Kuwait National Assembly has also made significant strides towards enacting laws to promote the growth of its ICT industry since 1999, but is still far from having the complete set of core laws, let alone the sufficient enforcement of those that exist, to legitimise transactions conducted over the Internet, which are essential in the adoption of e-commerce and e-government services.

Table 4. Kuwait's Participation in Global Intellectual Property Bodies and Treaties

Entity/Treaty	Signatory
World Trade Organization (WTO)	Yes (1995)
World Intellectual Property Organization (WIPO)	Yes
Paris Convention	No
WIPO Copyright Treaties (WCT)	Yes (1998)
Patent Cooperation Treaty (PCT)	No
Madrid Agreement	No
Hague Agreement	No
Trademarks Law Treaty (TLT)	No
Patent Law Treaty	No
Nairobi Treaty	No
TRIPS	Yes (1995)

Source: INSEAD, 2002

Table 5. Electronic Laws in Kuwait

National Legislations	Year of Passage
Copyright Law	Yes (1999)
Trademark Law	Yes (2001)
Patent Law	Yes (2001)
E-signature Law	Draft
E-Government Law	No
Data Protection/Privacy Law	No
Freedom of Information Law	No
Cyber Crime and Computer Misuse Law	No

Source: Madar Research Group

A. INTELLECTUAL PROPERTY RIGHTS

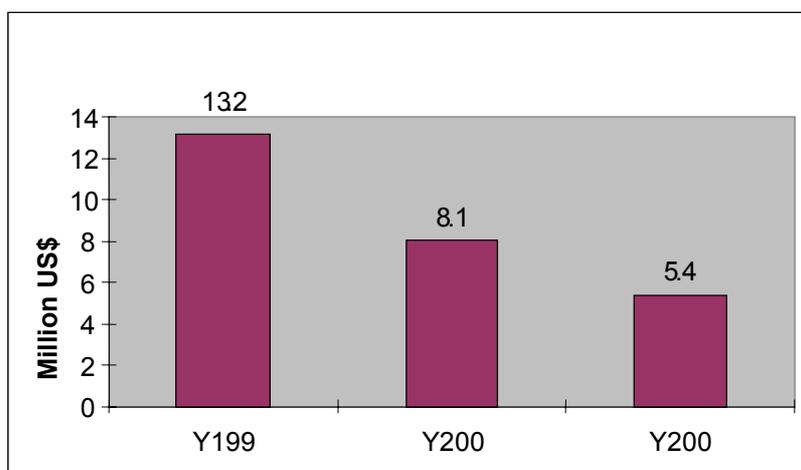
The first Kuwaiti Copyright Law was passed in December 1999, which extends protection to audio, video and computer software products published in countries that are members of the World Intellectual Property Organization (WIPO). The law was passed following Kuwait's accession to WIPO in 1998. Prior to the passage of the Copyright Law, Kuwait was largely a pirate market, with US copyright-based industries losing as much as US\$25.1 million to piracy in 1999. Of that figure US\$13.2 million accounted for pirated business software applications, according to the Business Software Alliance (BSA). While these losses were almost insignificant compared to over US\$10 billion lost to software piracy worldwide that year, what was alarming was the level of piracy in Kuwait, which was pegged at 81 percent in 1999 (see Figure 10).

The passage of the law in 1999 prompted the US Trade Representative (USTR) office to downgrade Kuwait from the Priority Watch List to the Special Watch List section. Slack enforcement of the law, however, has caused the International Intellectual Property Alliance (IIPA)⁵ in 2003 to recommend returning

⁵ The International Intellectual Property Alliance is a private sector coalition formed in 1984 to represent the US copyright-based industries in bilateral and multilateral efforts to improve international protection of copyrighted materials.

Kuwait to the Priority Watch List. Kuwait's software piracy rate of 76 percent as of 2001, which translated into losses exceeding US\$5.4 million, is still one of the highest in the world and in the GCC region.

Figure 3. Business Software Revenues Lost to Piracy



Source: Business Software Alliance

Table 6. World's Top IP Offenders

	2000	2001
Vietnam	97%	94%
China	94%	92%
Ukraine/Other CIS	89%	87%
Russia	88%	87%
Pakistan	83%	83%
Lebanon	83%	79%
Qatar	81%	78%
Nicaragua	78%	78%
Bolivia	81%	77%
Thailand	79%	77%
Bahrain	80%	77%
Oman	78%	77%
Kenya	67%	77%
Kuwait	80%	76%
Bulgaria	78%	75%
Romania	77%	75%
El Salvador	79%	73%
Guatemala	77%	73%
Paraguay	76%	72%
Nigeria	67%	71%
Malaysia	66%	70%
India	63%	70%
Zimbabwe	59%	68%
Honduras	68%	68%

Source: Business Software Alliance.

The IIPA's 2003 Special 301 Report quoted, "Copyright enforcement in Kuwait waxed and waned in 2002. After some positive reporting and promises made by the Kuwaiti government's recently formed Interministerial Task Force, enforcement nearly ceased until the end of 2002, when raiding activity picked up again. The raids, however, were only against small targets, and in several cases the illegal product was

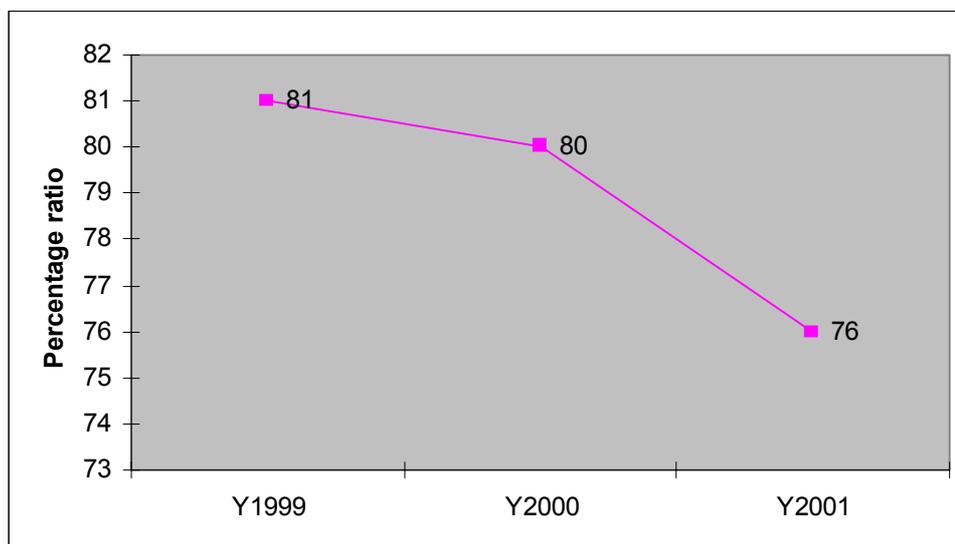
returned to the pirates. The leadership of Sheikha Rasha Naif Al-Sabah (Copyright Office in the Ministry of Information) demonstrates the will of the government, but results have been less than impressive.”

The IIPA further cites the Kuwaiti government’s own report from early 2002, which indicated that of the 79 piracy cases filed in early 2002, only 15 had been resolved, including four acquittals and four charged with "non-deterrent fines".

The IIPA has not withheld its criticism of Kuwait's Copyright Law indicating that the penalties provided for in the law, at approximately US\$1,650 plus one year imprisonment (doubled for recidivists), appear inadequate to effectively deter piracy.

Furthermore, while the Kuwait Copyright Law is generally compliant with TRIPS, the IIPA said there are remaining deficiencies in the law that must be fixed in the implementing regulations. It contends that a provision under the law for the copyright holder to be given the exclusive right to "exploit his writing financially" is an express violation of TRIPS Article 9.1. IIPA also cited that there is no express provision in the law for *inaudita altera partes* (without notice to the other party) procedures, as required by TRIPS Article 50. IIPA also recommends that a personal-use exception clause under the law should be re-examined in light of digital technologies.

Figure 4. Piracy rates in Kuwait show slower-than-desired decline



IIPA provided the following recommendation for Kuwait to avoid going back to the USTR Priority Watch List:

- (a) Make public declarations at the highest level of the Kuwaiti government that piracy will not be tolerated in Kuwait;
- (b) Run and support concerted and sustained raids against piracy of all copyrighted goods (including, in conjunction with police, against residences and warehouses being used as sources of piracy, and including raids against corporate end-users of pirated business software);
- (c) Publicize raids in order to achieve a deterrent effect;
- (d) Mete out administrative fines, and prosecute greater numbers of commercial infringers (including distributors, resellers, end-users, dealers in smart cards, and anyone producing illegal copies of copyrighted software), resulting in jail times actually served and severe fines;

- (e) Amend the copyright law to bring it into line with the TRIPS Agreement, establish an adequate legal framework for electronic commerce by protecting copyright in the digital environment, and join the WIPO “Internet” treaties.

Commercial inhibitors, which come in the form of a four-percent customs duty on business software and prohibitively high import fees on satellite receivers (US\$333), further compound the problem of weak implementation of copyright protection in the state.

B. TELECOM/INTERNET REGULATORY FRAMEWORK

Kuwait’s telecom sector has been engaged in a long transition period from monopoly to competition. Like many Gulf and Middle Eastern countries, Kuwait’s telecom industry is a traditional monopoly, with the Ministry of Communications (MoC) controlling the sole fixed line network in the country while serving as the country's telecommunications regulator.

A semblance of an open, competitive telecom market – a duopoly – was adopted in the late 1990s when the government opened its GSM market to a second player. This was followed by an ambitious five-year Privatisation Plan announced in July 2001, which was similar in essence to initiatives made by the government in the past.

The plan’s first year calls for privatising some gas station outlets and part or all of Kuwait Airways. Year two introduces privatisation to post office, telegraph and telecommunications services. Years three and four will complete the telecommunications privatisation and initiate the Ports Authority and Public Transport Company. The fifth and final year targets the power and water sectors, as well as Kuwait's Petrochemical Industries Company (PIC).

Also in June 2002, the MoC announced plans for legislation that would pave the way for the privatisation of the country's fixed line operations during the course of the year. This, however, did not materialize and is now expected to pass in 2003 instead.

Table 7. Kuwait’s Privatisation Plan (2001-2005)

Year 1	Gas Station Outlets and Kuwait Airways
Year 2	Post Office, Telegraph and Telecommunications Services
Years 3 and 4	Telecommunications, Ports Authority and Public Transport Company
Year 5	Power and Water Sectors and Kuwait Petrochemical Industries Company

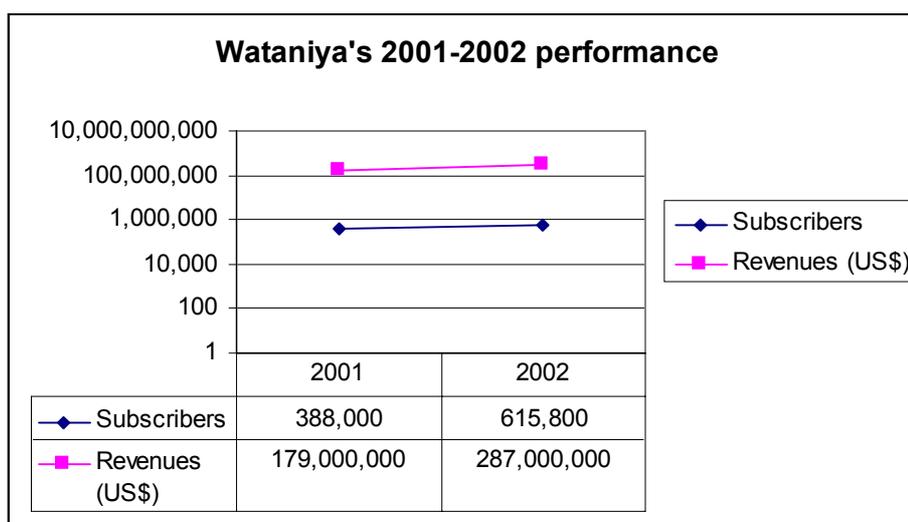
It is unclear whether these privatisation plans and schedules are running on course. However, if the privatisation of the telecom sector, particularly the fixed line service, is any indicator, then it is fair to conclude that the actual, strategic execution of the plans is significantly lagging behind schedule.

Kuwait’s GSM operators are Mobile Telecommunications Company (MTC) and Wataniya Telecommunications Company. The government of Kuwait maintains 25 percent equity in MTC, which was recently re-branded MTC-Vodafone as a result of the European operator's acquisition of MTC shares. MTC maintained monopoly of the GSM market from 1983 – when it was established – to 1999, when Wataniya was granted a license to operate a second GSM network in the country. The idea of issuing a third GSM license has been floating since 2002, but no license has been awarded as of the writing of this report.

The Internet services provider (ISP) sector in Kuwait is semi-competitive and remains closely monitored and regulated by the MoC. The three major ISPs and 13 sub-ISPs⁶ as well as the 150 plus Internet cafés in Kuwait are required to adhere to a series of regulations circulated by the MoC, otherwise they face the prospect of their licenses being revoked or cancelled.

⁶ A sub-ISP offers only pre-paid Internet subscription or Internet cards. An Internet prepaid card can cost from \$1.5 for a four-hour Internet access to \$118 for a three-month unlimited access.

Figure 5. Wataniya's 2001-2002 Performance



Data Source: Wataniya's Annual Report

Certain provisions under Article Three of *MoC's Ministerial Decision No. 70 of 2002* highlight the government's tough stand against pornography and other content considered immoral or in violation of religious and cultural beliefs and practices.

The whole text of Article Three reads:

- (a) Internet cafes shall not be permitted to provide clients with cabins regardless of the shape or nature of the same;
- (b) Computer monitors and screens shall be placed facing the entrance or open side to give easy access to Ministry inspectors to monitor and supervise Web site operations;
- (c) Internet Duly Authorized Representatives (DARs) shall install surveillance systems to guarantee blocking of pornographic Web sites or material, or those violating religion, traditions or security including Web pages, chat and e-mail sites, and shall abide by continuously upgrading the same. Such surveillance system shall form an integral part of the ISP surveillance systems. Efficiency of the same must be accredited by the MoC;
- (d) DARs shall register each client's basic data: the name, civil ID number, time of start and end of Internet surfing period and the same shall be stored for at least six months and presented to MoC inspectors upon request;
- (e) Providing any means of local and international communications or any related apparatus or equipment is prohibited;
- (f) Providing Internet access to clients under the age 18 is prohibited;
- (g) DARs shall undertake to install visual surveillance means at their own cost in a manner specified by the MoC;
- (h) MoC licenses issued to DARs must be easily visible and presented to MoC inspectors upon request;
- (i) Providing Internet services out of DAR premises is prohibited;
- (j) Internet access is prohibited unless provided by MoC licensed ISP.

Article Four of the same decree calls for ISPs to fully and promptly comply with regard to the installation of surveillance systems and to only provide services to DARs with a valid license.

Penalties for violation of the said provisions include a fine ranging from US\$6,600 and suspension of Internet services for two weeks to US\$33,000 and cancellation of license for DARs. More severe penalties may include a fine ranging from US\$33,000 and suspension of Internet services for two weeks to US\$166,700 and cancellation of license for ISPs.

C. E-COMMERCE

The Kuwaiti government is in the process of drafting an electronic signature law, which the National Assembly is expected to approve before the end of 2003. The draft law is based largely on the United Nations Commission on International Trade Law (UNCITRAL)'s Model Law on Electronic Commerce.

Moreover, the state has amended its Trademark and Patent Law in 2001, which effectively transfers the responsibility for patents from the Minister of Finance and Economy to the undersecretary for Trade and Industry. The amendment also extended the term of patents to twenty years from the filing date, with renewal fees being due every four years. Additionally new penalties for patent infringement have been adopted including the possibility of imprisonment for up to two years.

This new law also extends the period of protection for designs so that these will now be protected for an initial period of 10 years with the possibility of renewal for a further period of five years. Finally, the new law lays the basis for introduction of a system of protection for utility models for a period of seven years from filing and for the protection of integrated circuits as a type of design.

Overall, the socio-cultural-religious underpinnings in Kuwait, as in most Arab societies, translate into a reserved approach in enacting laws that allow the state to enjoy the benefits of new technologies such as the Internet while safeguarding its traditional values. The level of bureaucracy also hampers speedy regulatory changes required by the booming ICT industry and does not help promote a truly competitive environment despite pronouncements toward that direction by leading government figures.

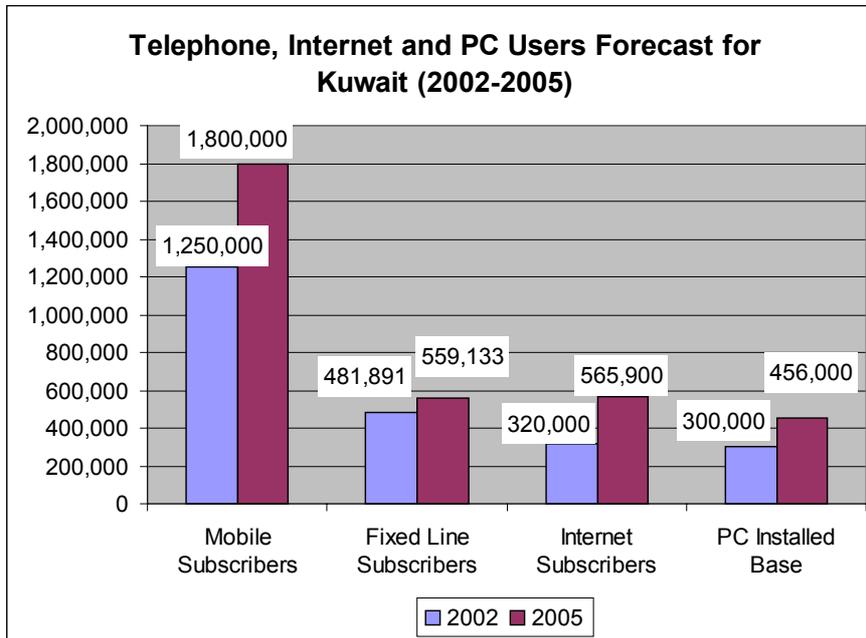
Another consideration unique to the GCC states' privatization and liberalization efforts is the need to protect their indigenous labor market, as they generally have a very high expatriate population. (Only some 842,000 of Kuwait's 2.418 million residents are Kuwaiti citizens) The government of Kuwait, for instance, employs 92 percent of Kuwaiti labor force; hence, any government intervention in any sector is strongly slanted to the benefit of Kuwaiti-citizens and Kuwait-owned firms.

Furthermore, the following academic observation on Arab states seems to apply to Kuwait: "While regulatory frameworks are being updated, personal liberty and consumer protection rights issues have not yet been fully addressed. Analysts question why Arab states maintain lax policies pertaining to encryption, while restricting and censoring the actual content available online, while the Arab consumer is highly constrained, consumer protection is largely absent from the regulatory environment in the Arab states." (Dutta and Coury, 2002)

A closer look into the laws governing the Internet offers insight into the priorities of the government. The fourth clause of Article Four of the Ministerial Decision mentioned earlier in section 3.2 of this report (that "*DARs shall register each client's basic data: the name, civil ID number, time of start and end of Internet surfing period and the same shall be stored for at least six months and presented to MoC inspectors upon request.*") clearly dispels any doubt that individual and consumer privacy as well as secrecy of communication (guaranteed under Article 39 of Kuwait's Constitution) is subordinated to the state's policy to censor the Internet for contents that are deemed inappropriate for public viewing, hence, the absence of a privacy or data protection law.

III. ICT INFRASTRUCTURE

Figure 6. Telephone, Internet and PC Users Forecast for Kuwait (2002-2005)

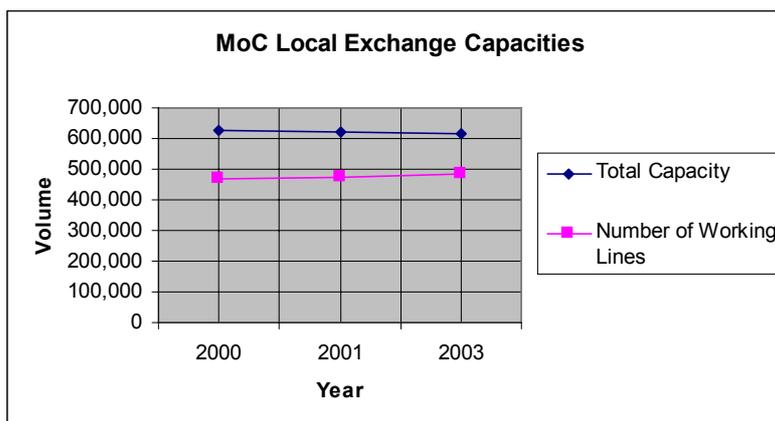


Source: Madar Research Group

A. TELEPHONE PENETRATION

There were 481,891 fixed line and 1.25 million mobile phone subscribers serving Kuwait's 2.418 million population as of end 2002 (see Exhibits 15, 16 and 17). This leads to penetration rates of 52 percent for mobile phones and 20 percent for fixed lines. A study by Madar Research forecasts subscription to fixed lines and mobile phones in Kuwait to grow by five percent and 12 percent respectively over 2002-2005. This will lead to almost 560,000 fixed lines in use and more than 1.75 million mobile phone lines in circulation.

Figure 7. MoC Local Exchange Capacities



Source: Kuwait's Ministry of Communication

Kuwait has virtually zero backlog for its fixed line services. This chart shows the total capacity of Kuwait's 36 local exchanges exceeding by a good margin the number of current working telephone lines in the state.

Factors that led to comparatively high penetration rates include pressure on the government in recent years to expand and upgrade the fixed line network as demand for capacity increases in its existing telephone

exchanges mounts. Credit for effecting phone network expansion goes largely to the ISPs, who were complaining about a lack of telephone lines to service the rising number of Internet users in the country. Fixed-line capacity can now easily meet forecast demand over the next two years.

Table 8. Kuwait Telephone Indicators

	2002	2005 f
Mobile phone subscriptions	1,250,000	1,756,160*
Mobile phone penetration (percent)	52	69
Fixed Line Subscriptions	481,891	559,133**
Fixed line penetration (percent)	20	22

Source: Madar Research Group

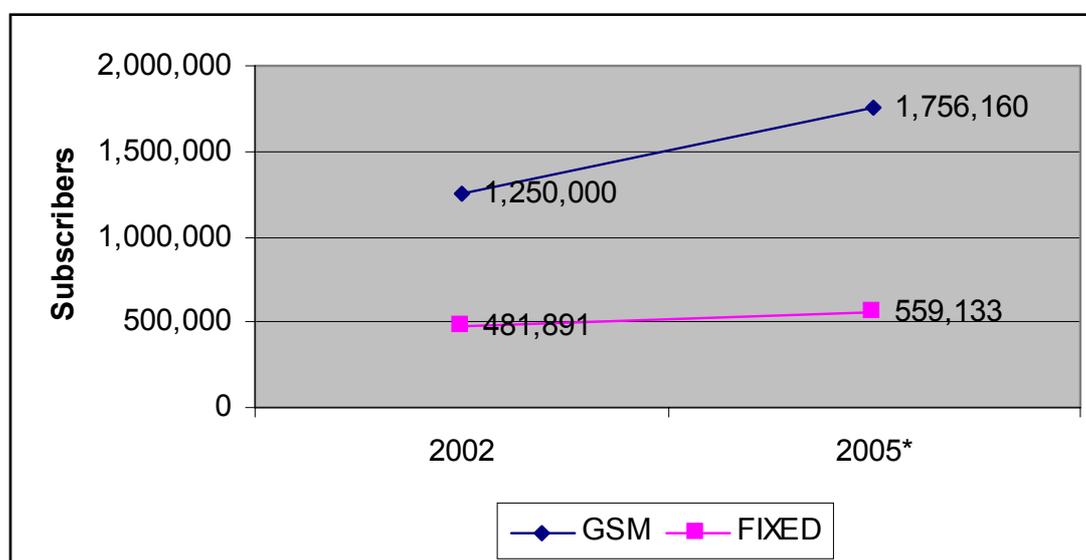
* Compound Average Growth Rate (CAGR) of 12 percent over 2002-2005

** Compound Average Growth Rate (CAGR) of 5 percent over 2002-2005

A semi-competitive environment in the mobile phone industry has also contributed in bringing the tariffs down. The tariff reduction, complemented by a rather affluent population, has further made the services hugely accessible.

Most recently, the availability of Thuraya⁷ satellite services through MTC-Vodafone has also enabled both mobile voice and data communications within and outside Kuwait, where fixed line and GSM networks are unavailable. Furthermore, MTC-Vodafone started piloting the first General Radio Packet Service (GPRS) network in Kuwait in September 2002, which marks Kuwait's 'forward looking' stance in terms of adopting latest telecom technologies.

Figure 8. Mobile and Fixed Line Subscribers 2002-2005

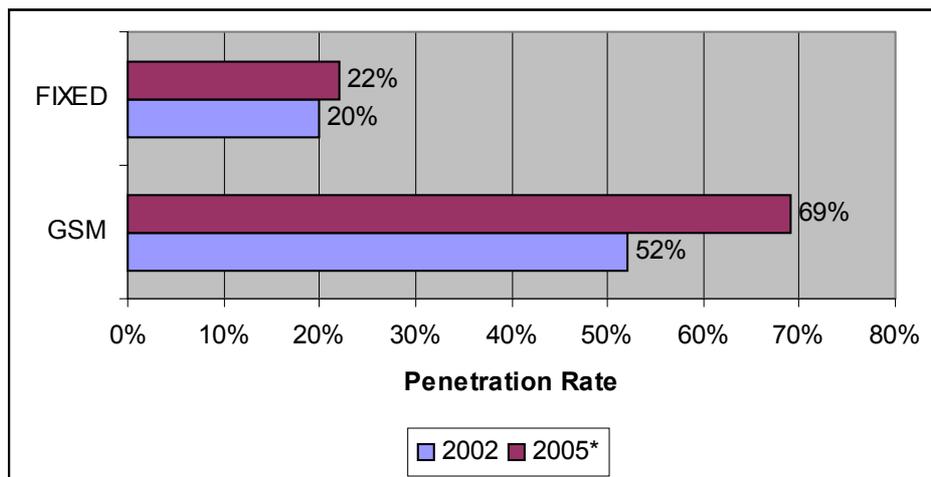


Source: Madar Research Group

* CAGR of 12 percent and five percent for mobile and fixed line subscribers, respectively.

⁷ Thuraya is a \$1 billion regional mobile telecommunications via satellite (GMPCS) system, owned by a consortium of Arab investors led by the Emirates Telecommunications Corporation of the UAE.

Figure 9. Fixed and Mobile Penetration Rates



Source: Madar Research Group.

* CAGR same as in Exhibit 15.

B. INTERNET BACKBONE

Kuwait is covered by submarine cable, fiber optic and terrestrial satellite networks but there are no Internet exchanges or a major Internet backbone within the state.

Kuwait is part of the GCC consortium that created the Fiber Optic Gulf (FOG) network, a 1,300-kilometer cable system jointly owned by the national telecom operators of Bahrain, Qatar, the UAE and Kuwait. FOG offers a 5 gbps capacity and is capable of carrying 180,000 telephone calls or equivalent data circuits between the four countries to other parts of the world simultaneously. The network, built at a cost of US\$283 million and inaugurated in 1998, provides gateway access into the Fiber Optic Link Around the Globe (FLAG), with a landing site in the UAE.

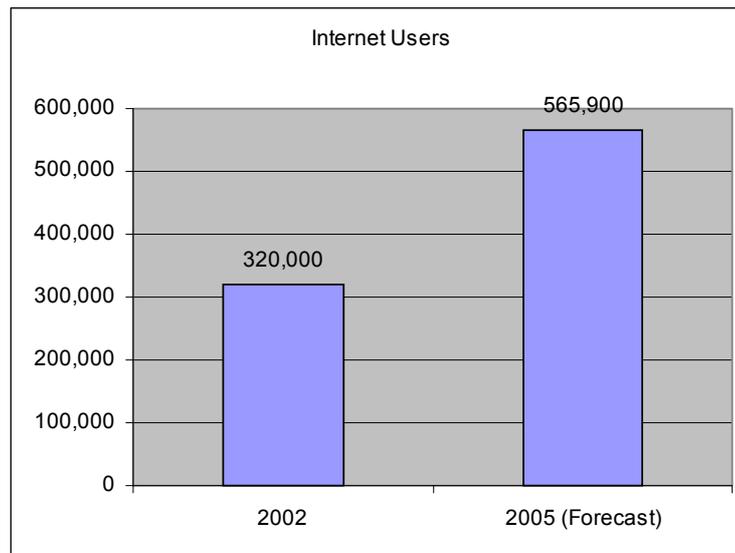
Kuwait also has connectivity links with Arabsat, Intelsat and Inmarsat to carry both voice and data traffic originating from Kuwait to the whole Middle East region. Local Internet access is available through dial-up, leased line, ISDN and DSL connections.

C. ISPS AND ASPS

By end 2002, Internet penetration in Kuwait stood at 13.2 percent (slightly above the 10 percent world average), with the country's 320,000 Internet users accessing the Internet through three major ISPs and 13 sub-ISPs. There is a very healthy demand for broadband Internet connections in Kuwait from businesses – and home users. Inquiries by Madar Research to major ISPs, show that over 11,000 subscribers access the Internet through DSL lines ((9,500 from home, 1,500 from work), while 650 use leased lines. Additionally, there are 150 ISDN subscriptions.

Competition in the ISP market has led to a fall in connection costs, both in terms of dial-up as well as broadband connections, which in turn has led to a considerable rise in the number of Internet users particularly in 2002. Monthly dial-up subscriptions have fallen to about \$33 while ADSL connections cost about \$60 per month. The market, however, had to pay the price of competition in an emerging free market, namely deterioration in the quality of services. To remedy this situation, a number of ISPs in Kuwait are now taking measures to offer quality services at more cost-effective prices.

Figure 10. Internet Users



Source: Madar Research Group

Table 9. Kuwait Internet Indicators

	2002	2005 f
Internet users	320,000	565,900*
Internet use penetration (percent)	13.2	23

Source: Madar Research Group

* Compounded Average Growth Rate (CAGR) of 35 percent over 2002-2005.

A closer look at the infrastructure of Kuwait's leading ISP, QualityNet, underscores Kuwait's level of sophistication in terms of its ICT infrastructure, as per the following excerpts taken from QualityNet website:

Qualitynet's asynchronous transfer mode (ATM)-based backbone network covers the whole Kuwait, backed by 24/7 customer support center ...The backbone network is based on fiber optic medium with a centralized ATM switch and many access nodes at strategic locations all around Kuwait. Access to the backbone network is primarily through frame relay, ADSL and ISDN technologies.

Furthermore, Qualitynet's network operation center is managed and maintained using a fully automated network management system, which is on par with those used by ISPs in Western Europe and North America.

Qualitynet commands about 70 percent of the whole ISP market in Kuwait. This share includes QualityNet clients and subscribers through its sub-ISPs. The sub-ISPs sell only prepaid Internet cards and resell access services from one of the three major ISPs. As a result, the numbers of pre-paid Internet card users are rising at an unprecedented rate.

Table 10. Individual dial-up access rates (US\$)

ISP	1 month	3 months	6 months	1 year
Gulfnet/KEMS	83			66 per month
Fast Telecommunications	33	93	179	340
Qualitynet	46	130	240	400

Source: ISPs Web sites

Table 11. Comparison between ADSL monthly subscription rates of Kuwait's main ISPs (US\$)

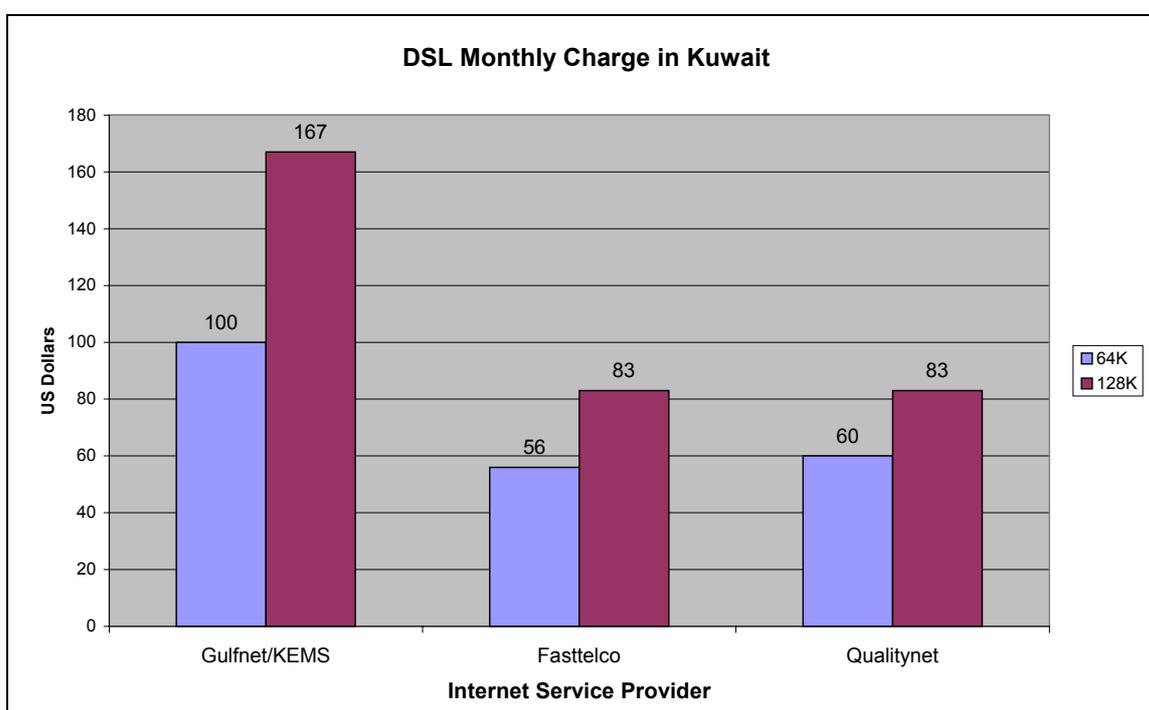
Speed (in Kbps)	Gulfnet/KEMS*	Fast Telecommunications	Qualitynet
64	100	56	60
128	167	83	83
256	n/a	133	133
512	n/a	233	217
1024	n/a	n/a	366

Source: ISPs' Websites

* Subscription price includes DSL service and DSL Unit and Dial Protection service

** n/a not available

Figure 11. DSL Monthly Charge in Kuwait



A semi-competitive ISP sector has helped reduce tariffs in Kuwait, but the connection cost is still higher compared to world average.

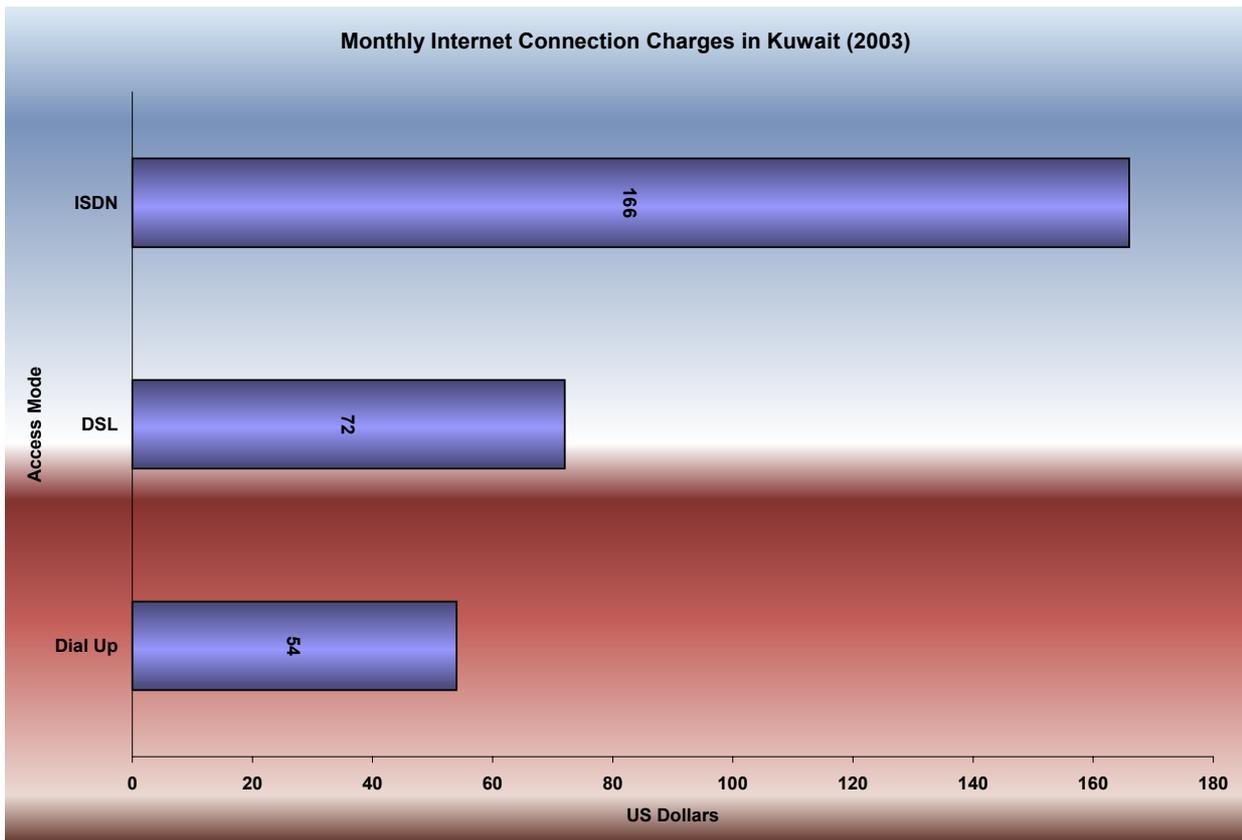
The breadth of services offered by Kuwait's major ISPs is quite impressive, extending broadband Internet connectivity to home and commercial users. Both KEMS and Qualitynet, for instance, offer satellite Internet through various access options including dial-up, leased line or DSL connection, with Shownet (sister company of satellite firm Showtime) providing downlink through its satellite network. Cable Internet, on the other hand, is yet to be introduced in Kuwait.

The exact number of application service providers (ASPs) operating in Kuwait is not known although one of the state's biggest enterprise solutions providers, Al-Faris Information Technologies, is ready to offer hosting and management applications to clients who are willing to shift. Al-Faris guarantees clients up to 99.5 percent uptime and its data centers observe the required five layers of security: physical security, operating system security, application security, data security and network security.

What is likely to make users cautious in shifting to an ASP, however, isn't the availability of bandwidth nor the reliability of Internet connection. It is changing their mindset from the traditional concept of purchasing software license from a vendor to leasing a software from a third party who basically determines when, how and where an application is used, against a monthly or yearly fee.

Dial up rate is for unlimited access per month. Pre-paid cards from the sub-ISPs, however, sell as low as \$1.7 for a four-hour Internet access.

Figure 12. Monthly Internet Connection Charge in Kuwait (2003)



D. PC DISSEMINATION

PC installed base in Kuwait stands at 300,000 – a penetration rate of 12.41 percent by end 2002. This rate places Kuwait among the top four Arab countries in terms of PC penetration and above the world average, which is 10 percent. The country's import taxes on computers, at four percent, are among the lowest in the Arab world. This, coupled with no sales taxes being levied on computers, further encourage high PC penetration rate in the country.

Given Kuwait's high spending on the computer equipment market – equal to about 40 percent of the country's total IT spending – PC sales in 2002 are estimated at 94,200 units. Of these, 80,000 (85%) were desktop PCs whereas 14,200 (15%) were notebook PCs. Branded PCs make up 62 percent of desktops sold in 2002, or 49,600 units. PC sales in 2003 are expected to register 103,866 units, valued at US\$101.82 million.

Demand for PCs is on the increase given the country's move towards the implementation of an e-government project. Demand is also driven by the continuous upgrade and development of the country's networking infrastructure following the second Gulf War, and most recently, the third Gulf War, as well as

the subsequent computerization of the country's governmental departments and branches. Internet use, among the country's large youth population, has also spurred PC purchases for home use.

Table 12. PC Use Indicators

	2002	2005*
PC Installed Base	300,000	456,000
PC Penetration Rates (percent)	12.41	18.8

Source: Madar Research Group.

* CAGR of 15 percent over a three-year period from 2002 to 2005.

IV. ICT CAPACITY-BUILDING

Part of Kuwait's 25-year plan to modernize its education system is updating the various curricula and exploring new media such as remote learning or distance education. Whereas specific details of this project remain undisclosed or not finalized, the expectation is that it will create a 21st century orientation, with computers playing a very key role in knowledge dissemination.

A. AWARENESS AND EDUCATION

The Kuwaiti Minister of Education in May 2002 issued a decree, which stipulates that obtaining the International Computer Driving License (ICDL) is a prerequisite for all teachers in Kuwait for job retention and promotion. According to the decree, any teacher who is not a holder of ICDL by academic year 2007/2008 will be disqualified from practicing their profession.

Plans are also underway to pilot UNESCO's TEAM educational framework in Kuwait. The framework includes strategic studies, network infrastructure, training and human resources development, and ultimately applications at the different levels of education, including Grades 7 to 12, higher education and life-long learning, focusing mainly on science and technology.

B. COMPUTERS IN SCHOOLS

The degree of computer usage as instructional tool and the degree by which students enrolled in pre-college education are able to use computers for research, programming or other creative purposes vary from school to school. While the government of Kuwait has been subsidizing projects to eventually achieve a ratio of one PC per eight students in government or public schools, PCs are pretty well entrenched in private learning institutions, especially those following the British and American curricula.

The American School of Kuwait for instance implements 25 units – or credits – as a prerequisite for high school graduation, and one of these units is on Computer Science. The new Omar Center at the Kuwait National English School, which has a 1:1 student-computer ratio, has a fully networked environment that allows students to conduct research for project work or pursue their extra-curricular interests.

A private organization designed to support efforts for modernization and scientific development within the country, the Kuwait Foundation for the Advancement of Science (KFAS), has also accelerated efforts to provide computers to schools and colleges starting from Kuwait's kindergarten schools. It awarded the MoE with US\$233,000 grant in 2001 for computer upgrades and another US\$16 million for the provision of PCs to 170 intermediate schools in Kuwait, a project that was to be finalized in school year 2002-2003.

An early initiative to expose teachers to the benefits of distance education was conducted in November 2002 through an online course conducted between MoE and the US State Department, in collaboration with the University of Oregon and the American English Institute. The first online course, attended by 40 Kuwaiti educators, was an introduction to Web based resources for English language teaching with a special emphasis on secondary school level.

Through the course, the teachers were able to learn more about computers and become more comfortable with them in a teaching environment, and participate in dynamic and insightful online discussions on a wide range of educational topics each week. The course also helped them gain knowledge about high quality Web-based instructional materials that are appropriate for the age, English language level and culture of their students, and adapt Web site materials in practical and pedagogically sound ways for in-class use alongside existing classroom texts and resources.

C. VOCATIONAL TRAINING

Vocational training in ICT is offered both by the Kuwait University Academic Support Services, through Al-Khwarizmi Center, and by private entities such as the New Horizons Computer Learning Center and Information Center Institute. Al-Khwarizmi effectively provides technology assistance to the university community, the government as well as private sectors, with classes ranging from basic children's courses to high-level consulting and training for corporate users.

Entities such as New Horizons offer certifications in various Microsoft, Oracle, Cisco, Sun and AutoDesk environments, among a slew of technical and end-user courses. Kuwait is also likely to benefit from pan-Gulf professional training centers such as Synergy Professional Services, which has remote training facilities headquartered in Dubai. Students who enroll at Synergy in Kuwait can remotely access and use the labs equipment located in Dubai, which makes for more effective and efficient training.

The Kuwait Institute for Scientific Research's (KISR) continuing education program is offering short-term IT courses at a nominal fee of US\$166 to US\$320. Courses include Introduction to AutoCAD, Introduction to Oracle RDBMS, Access, Microsoft Office modules, Visual Basic, Windows 2000 and Java.

Kuwait University is also a certified Cisco Regional Training Academy and IBM e-Business Academy, and it currently offers Microsoft Academic Programs and Oracle Job Track.

D. UNIVERSITY EDUCATION

Kuwait has two higher learning institutions, the Kuwait University and the Public Authority for Applied Education and Training. The Department of Mathematics and Computer Science in Kuwait University offers undergraduate and graduate programs in Pure Mathematics, Applied Mathematics and Computer Science. There are about 50 faculty members in the department whose research interests cover a wide spectrum in mathematics and computer science. The department maintains its own computer center, which is equipped with several Sun and SGI workstations, complementing Kuwait University's computer center that uses IBM mainframe and mini-computers (IBM9000 and VAX9000).

Students use these computer centers to develop, design and test applications on various platforms which range from Microsoft Windows, Linux and UNIX, using development tools such as ANSI, C++, Pascal, and Visual C++, amongst others.

Kuwait University's Computer Engineering Department has at least 27 professors, most of whom possess a doctorate degree and whose research interests cover computer networks and telecommunications, artificial intelligence, evolutionary computation and algorithms, fault testing of digital systems, database design and management, video on demand, parallel and distributed computing, grid computing, etc.

Various sources indicate that roughly 100, or five percent, of Kuwait University's annual graduates since 1997 have a degree related to ICT.

The Arab Open University

Kuwait is home to the Arab Open University (AOU), established in 2000 under the auspices of the Arab Gulf Program for United Nations Development Organizations (AGFUND) and in collaboration with the United Kingdom Open University (UKOU).

AOU exists as a private Arab institution of higher education of special status and has branches (hosts) in Lebanon, Jordan, Bahrain, Egypt and Saudi Arabia. AOU has all the nuances of a non-virtual institute for higher learning, including an administrative and academic staff for its various areas of specialization: Business Studies, Computer Studies, Education Studies and Language Studies. All undergraduate courses follow the standard prerequisites and admission requirements typical of any 'old world' university. There is also a designated rector or director in all of AOU's branches.

Tuition fees for the first year packages range from \$1,200 to \$1,500 although the "University is currently undertaking a careful assessment of fees and related study expenses such as the cost of course packages in order to agree on reasonable figures which would allow the largest possible number of learners to join the AOU."

The AOU open learning platform relies heavily on the tutoring process that aims at promoting a proactive environment of learning. To do this, course lectures are laid out in a programmed and progressive mode via well-prepared textbooks and supporting notes, besides other supporting forms of delivery media based on audio and video cassettes, CD-ROMs and websites.

AOU has also designated a number of learning centers in the subscribing countries, which will augment the facility offered by AOU's regional branches thereby offering an environment of true supported open learning.

With respect to assessment and evaluation of AOU students, assignments and term exams and/or quizzes are weighted and given 50 percent of the final score, which will include the mark of the final examination. The assignments may comprise different types of activities such as preparing reports for course related projects. Final exams will be prepared, and subsequently, graded under the control of the University Headquarters by qualified faculty members in accordance with strict measures of confidentiality and fairness.

E. RESEARCH AND DEVELOPMENT

A survey conducted by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1996, indicates that less than quarter of a percent (0.24 percent) of Kuwait's GDP is spent on research and development. This translates to a total of US\$67 million of the state's 1996 GDP of US\$ 27 billion. Ninety-seven percent (97.2 percent) of this R&D expenditure came from the Kuwait's government coffers, with the private sector accounting for the remaining 2.8 percent. More recent statistics are not available.

It is noteworthy that Kuwait's 1996 R&D spending vis-à-vis its GDP pales in comparison to the world average of 1.8 percent, let alone to the industrialized world average of 2.4 percent. It is, like most of its Arab neighbors, also significantly below the 0.90 percent threshold level for less developed countries.

National sources meanwhile indicate that Kuwait had spent a total of US\$735,000 for state-funded research on oil and the environment from 1982 to 1997, which is approximately US\$49,000 per year.

Hypothetically, if we were to apply the current average R&D expenditure as a percentage of GDP in the Arab countries – which is 0.5 percent – to Kuwait, then the state's total R&D spending in 2002 should be at least US\$162 million (*UNDP Arab Human Development Report 2002*). The view of Madar Research, however, is that Kuwait is spending much less than that.

It could not be determined how much of this amount is spent on ICT-related projects – if any at all – as there are no government-funded technology incubators⁸ that are known to exist in Kuwait today. What is certain is that the lion's share of Kuwait's R&D expenditures is still on oil exploration and production technologies.

⁸ Technology or business incubators are an economic development tool designed to accelerate the growth and success of entrepreneurial companies through an array of business support resources and services. A business incubator's main goal is to produce successful firms that will leave the program financially viable and freestanding. These incubator "graduates" create jobs, revitalize neighborhoods, commercialize critical new technologies and strengthen local and national economies.

The case with Kuwait, along with other rich Arab countries, is not only that R&D is extremely neglected, but that its R&D programs and scientists have weak connectivity with their counterparts within the region and the Arab world as a whole. There is a perception that Kuwait is among the technology rich countries in the Arab world that “have been parachuted in as 'black boxes' via international consulting and engineering development organizations (CEDOs).” The harsh reality, as the United Nations Development Program's *Arab Human Development Report 2002* cites, is that these installations are not linked to local or regional CEDOs and R&D organizations and until such connectivity is established, such installations cannot contribute to the scientific and technological development of the Arab world.

A major Kuwaiti scientific research think-tank, KISR, expressly states in its five-year strategic plan (2000 to 2005) its intent to optimise the utilization of information technology (IT), although its major focus remains to be petroleum and oil research, environment and urban development, food and water resources and techno-economics.

V. BUILDING THE ICT SECTOR

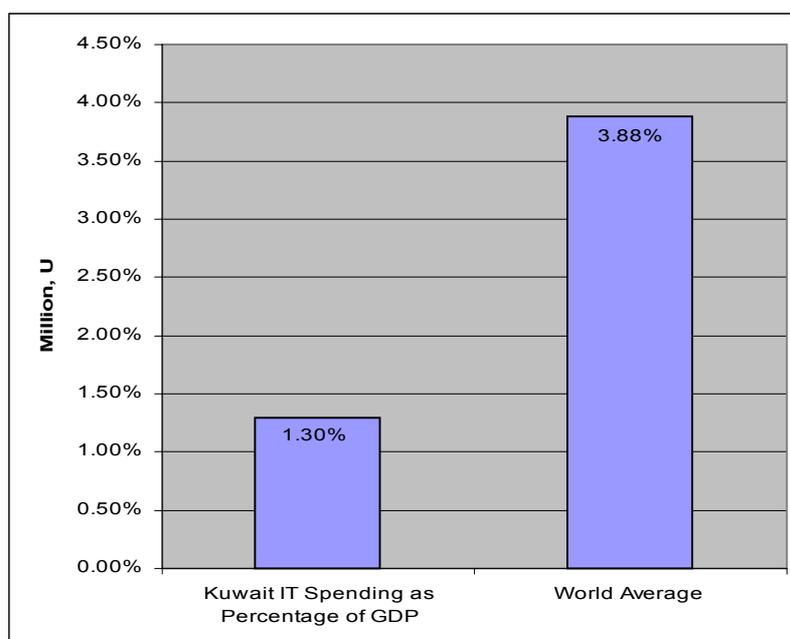
A. ICT FIRMS/MARKET POTENTIAL

Like most Arab countries, Kuwait is a net importer of technology, which explains why most companies listed under the "Computer" category of the Kuwait Chamber of Commerce and Industry's (KCCI) online directory are in reality hardware retail shops and service centers. The local IT market is valued at US\$410 million in 2002, according to Madar Research estimates. This market expected to rise to \$544 million in 2005, at a CAGR of 9.9 percent over the period 2002-2005. Despite the substantial size and growth of this market, no major local IT industry has yet emerged to claim a share.

The computer equipment market segment – which includes computer systems, peripherals, and add-on devices such as printers, scanners and external storage devices – was valued at US\$160 million in 2002, and is expected to register a 10 percent CAGR over the period 2002-2005.

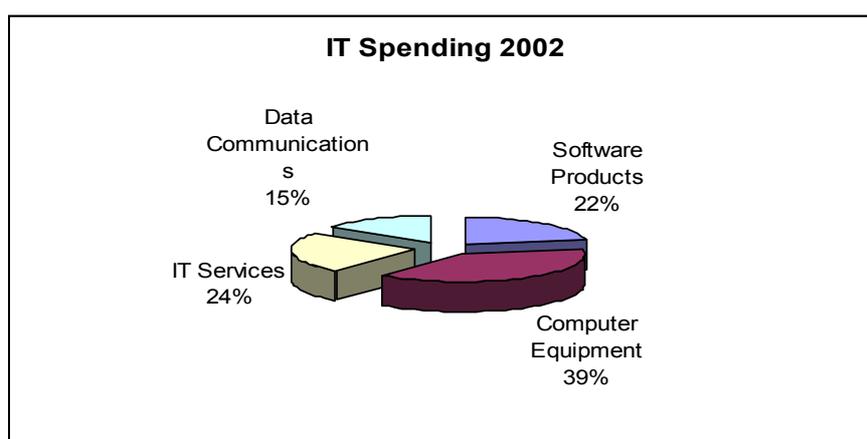
IT services – including IT consulting, implementation services, IT training and education, system design and integration, equipment services, IT support services, data communication services and programming services – are valued at \$100 million. This segment, according to Madar Research, will grow at a CAGR of 11 percent over the same period to be worth US\$136 million in 2005.

Figure 13. Kuwait IT Spending Per GDP vs. World Average (2002)



Source: Madar Research Group, Aberdeen (for world average)

Figure 14. IT Spending in Kuwait – Breakdown by IT Sector



Source: Madar Research Group

Software products, which include packaged software and ready-made software solutions, make up the third largest segment in the Kuwaiti IT market, with a value of US\$90 million. It is expected to rise to US\$113 million, at a CAGR (2002-2005) of eight percent.

Data communication makes nearly 15 percent of the IT market in Kuwait, and is the smallest segment, valued at US\$60 million. Data communication equipment includes WANs, LANs, terminal concentrators, modems and related equipment. This segment is expected to grow at a CAGR of 11 percent over the period 2002-2005, to a value of \$82 million.

Table 13. IT Opportunity Evaluation (2002-2005)

	2002 (Million, US\$)	2005 (Million, US\$)	CAGR (2002-2005)
Software Products	90	113	8 percent
Computer Equipment	160	213	10 percent
IT Services	100	136	11 percent
Data Communications	60	82	11 percent
Total	410	544	9.9 percent

Source: Madar Research Group

Table 14. Kuwait's Leading System Integrators

Company	Size (capital and/or turnover)	Partners	Activities/Products/ Services
Al-Faris Information Technologies (www.al-faris.com)		Art Technology Group (ATG), Communication Intelligence Group, ClearCommerce, Mercantec, Optika, PureEdge, BEA Systems, Oracle, Microsoft, Legato, Cisco, Javna, Novell, OpenText	Relationship management (system infrastructure, collaborative commerce, customer relationship management, enterprise application integration), B2B, B2C e-commerce, application hosting.
Arab Information Management Systems (www.aims-kw.com)	Annual turnover: US\$ 30 million	Oracle, Sybase, Microsoft, HP, 3M/Imation, Epson, HP, IBM, Verbatim, Panasonic, Curtis	Systems development and integration, HR consultancy services, feasibility studies, RFP preparation and consultancy, consumables.

Company	Size (capital and/or turnover)	Partners	Activities/Products/ Services
Fahad Al-Ghunaim and Partners General Trading (www.fapco.net)		Microsoft, BEA, RapidSite, Soffront	E-services (e-government, e-banking, e-commerce, e- enterprise, e-broadcasting, e- publishing, e-telephony), Web services (Web design, creation and marketing, Web hosting and DNS management, multimedia, security systems and solutions, network services and solutions, training and consultation).
International Turnkey Systems (www.itsq8.com)*	Capital: US\$28 million	London Bridge, 724 Solutions, Banqit, Verifone, Getronics, BroadVision, Telesoft, DiaVox, Cisco, Philips, SCT, Thales e- Security, Internet Security Systems, BEA, Oracle, Sybase, Compaq, Sun, HP, NTI, NCR	Enterprise solutions (HR, payroll, etc), telecommunications (customer care and billing, call center, mediation system), banking and finance, IT infrastructure and e- learning.
Khorafi Business Systems (www.gbm4ibm.com)	Employs 50 IT profession als	IBM	E-Business, networking, mainframes, AS/400, RS/6000, personal computers, IT consultancy, project management, education and training, skills outsourcing, systems management (systems and applications Integration).
Kuwait Computer Company/Hasibat (www.hasibat.com)*	Capital: US\$18.75 million	Oracle, Network Associates, Compaq, Hitachi, 3Com, Viztel, Ultimus, Kudos Development Group, Kingston, CrimsonLogic, Microsoft, Electronic Data Systems (EDS)	Financials, business intelligence, procurement systems, ATM/POS switching, e-Payment gateways, card management systems, enterprise portals for schools, e- government, health care systems, telco customer care and billing, fraud monitoring systems.
MIS Kuwait (www.mis- kuwait.com)		Oracle, BMC Software	IT consultancy, implementation of integrated software solutions, training, custom made software applications, networking and hardware solutions, portals, e- procurement.
Sakhr Software			Research and development on technologies to promote and use Arabic language in the new media including automatic speech recognition, machine translation and electronic publishing solutions.

Source: Systems integrators' Web sites

* Companies listed with the Kuwait Stock Exchange

B. INVESTMENT IN ICT

Most multinational ICT companies set up their regional headquarters in the UAE, particularly at the Dubai Internet City, which is a free zone utilizing state-of-the-art networking technology with generous bandwidth capacities. Notably the most forward looking ICT cluster in the Arab world, rivaling Saudi Arabia's King AbdulAziz City for Science and Technology (KACST), DIC based companies occasionally second personnel to a satellite office in Kuwait.

The norm, however, has been for the first-tier ICT vendors (e.g. IBM, Cisco, HP, Oracle) to work with Kuwaiti agents who own the relationship with the customer. These agents perform the entire sales and customer support cycle: pre-sales, project design, development, implementation, training and after-sales support. Big ticket turnkey projects normally require vendors to fly consultants from their European or regional offices to work with the local customer and partners primarily to transfer skills and knowledge.

Table 15. Top ICT deals in Kuwait in 2002

Customer	Vendor	Partner	Service/Product	Value (US\$)
Mobile Telecommunications Co.	Motorola	n/a	GPRS network infrastructure	4,600,000
Mobile Telecommunications Co.	Tecnomen	n/a	Replacement of old transmitters with HiQ transmitter product	658,000
Wataniya Telecom	Siemens		Expansion of telephony network	50,500,000
Mobile Telecommunications Co.	Logica	n/a	Upgrade of SMS infrastructure	
Kuwait Ministry of Public Works	Cimac Automation	n/a	SCADA	1,360,000
Al-Muzaini Exchange	IBM and Oracle	Al-Faris Information Technologies	E-infrastructure	1,500,000
Burgan Bank	ACI	n/a	ATM switching software	
Burgan Bank	3Com	n/a	Network infrastructure	
National Bank of Kuwait	Microsoft		Content Management Server and Commerce Server 2000	
Kuwait Finance House	n/a	International Turnkey Systems	Management of KFH computer operations and networks, backup services for system failures	2,800,000
Kuwait National Petroleum Co.	n/a	Al-Faris Information Technologies	eDirectory project	
Petrochemical Industries Company	Oracle	n/a	Oracle E-Business Suite	
Kuwait University	Oracle	MIS Kuwait	KU portals	
Kuwait University	n/a	Al-Faris Information Technologies	Infrastructure for Internet-enabled applications	
United Real Estate Company	N/a	KCC/Hasibat	Deployment of network infrastructure	

Source: Madar Research Journal, February 2003

C. GOVERNMENT FACILITATION

Investment, ownership and tax laws in Kuwait are consistently being eased to lower the barriers of entry for foreign investors.

A new Foreign Investment Law, passed by the National Assembly on March 11, 2001, authorizes foreign majority ownership in joint ventures and will – under yet to be established criteria – authorize 100 percent foreign ownership in certain industries. The law further exempts foreign-majority owned companies from requiring a local agent, authorizes ten-year tax holiday for new foreign investors, facilitates the entry of expatriate labor, and authorizes land grants and duty-free import of equipment, among a slew of incentives. Full benefit of these incentives, however, is linked to the percentage of Kuwaiti labor employed by the new venture.

Kuwaiti firms are not subject to corporate income tax, but those registered on the Kuwaiti Stock Exchange (KSE) are required to contribute 2.5 percent of their national earnings to the KFAS. The National Employment Law levies an additional 2.5 percent tax that will fund a program granting Kuwaitis working in the private sector the same social and family allowances provided to government workers. The Kuwait government levies no personal income tax.

The US Commercial Service views Kuwait's tax code as "often ambiguous, underdeveloped and often open to interpretation." Foreign corporate operations in Kuwait for example are liable to taxation on profits exceeding US\$17, 480 and the rates are on a progressive scale up to a maximum of 55 percent for taxable profits exceeding US\$1,237,500. US companies, however, generally report a favorable level of professionalism at the Kuwait Tax Department.

The licensing authority of the Ministry of Commerce and Industry screens all proposals for direct foreign investment in Kuwait. This authority has in the past encouraged high-tech industries over sectors viewed to be exceeding capacity, such as the hotel industry. The Foreign Capital Investment Committee (FIC), chaired by the Minister of Commerce and Industry with representatives from the private and public sectors, will authorize the investment incentives put forth under the new Foreign Investment Law on a case-by-case basis.

1. *GCC Customs Union*

Multinational vendors and importers of high technology goods could benefit from the implementation of the GCC Customs Union, in place since January 1, 2003. The GCC Customs Union agreement unified the common customs tariff at five percent on all foreign goods imported from outside the customs union, except for those exempted in accordance with the decision taken during the GCC's 20th session in 1999. This new policy granted industrial establishments in the GCC countries an exemption from customs duties on imports of production units, subject to specific controls. GCC countries agreed to a transition period of three years, after which all ports would have been compliant with the specific provisions of the unified customs system.

This policy is significant in that the GCC is predominantly a re-export economy. Goods that are shipped to UAE from Europe or the US may be re-exported to Kuwait or Saudi Arabia or even to a non-GCC country like Iran, in which case the vendors or their agents face the possibility of paying tariffs at every point of entry, inevitably increasing the cost of product handling, which is eventually passed on to consumers in the form of a higher product price.

D. IT EXPORTS

The KCCI could not provide statistics regarding the state's IT export. The World Bank *World Development Indicators 2003* also confirms Kuwait has zero high technology exports from 2000 to 2001.

VI. APPLICATIONS IN GOVERNMENT

A. COMPUTERIZATION OF PUBLIC ADMINISTRATIONS

An Internet-accessible database of Kuwait's 170,000 government employees, or civil servants, went live in 2002 at the Civil Service Commission. The service provides complete, up-to-date and instantly available employee records including salary and leave details. Civil servants are currently being trained on how to use the service and how to fill out and submit online forms before they receive their passwords to access their files and organize their work.

Meanwhile, the influential Ministry of Interior, which is responsible for delivering nearly 50 percent of government services in Kuwait including immigration and naturalization, police duties, elements of the judicial system, and documentation regarding civil registries, embarked on a \$45 million IT modernization program in 2001. The said project involve upgrading the ministry's backbone network, centralizing applications and offering secure payments and exchange of information through multiple devices such as public kiosks and PCs. The plan also involves the consolidation of a common data model, where all the ministry's databases – and eventually all government databases – are shared and centralized. Eventually a change in a user's details from one access point will automatically effect change across all government databases.

The ministry, in collaboration with Khorafi Business Machines, IBM's local agent, also created an overarching centralized architecture for the majority of the government's IT systems. Using this architecture the Interior Ministry's Information and Computer Systems Center (ICSC) has designed, developed and rolled out 13 applications relating to key areas such as immigration, residency and visa processing, driving license application and renewal, vehicle registration, border control and criminal records management, and an automated fingerprint identification system.

Meanwhile the Ministry of Water and Electricity is planning an electronic card payment system, which will be the forerunner for an Internet-based payment system. Consumers may purchase prepaid cards for the payment of their bills in one of 230 electronic stations to be installed in Kuwait.

B. DIGITIZATION OF INFORMATION

The vision for an e-government in Kuwait entails interconnecting the various government offices in a single wide area network (WAN), at the same time making sure that the internal systems (central databases, payroll and HR applications, etc) of the various government agencies are accessible via the Internet. However, there is no sufficient documentation as far as the pace of information digitization is happening in Kuwait.

What can be concluded is data capture into digital media isn't as complicated as those in countries that have to deal with hundred year-old documents. Kuwait, though one of the earliest societies to develop in the GCC, started a formal form of government only in the 1960s and its population of 2.418 million is small compared to other developing countries in the Arab world such as Egypt or Jordan.

C. E-GOVERNMENT PLANS

Kuwait's existing national identification system will eventually make the delivery of e-government services easier than those states in the region that have not yet adopted such system.

The government of Kuwait, in collaboration with Microsoft, launched in April 29, 2002, a national project to issue an e-mail facility to every citizen in Kuwait. The project will use the unique national identification card number of each citizen in issuing e-mail addresses for the entire population. The service, which will be free of charge for users, is an integral part of the Web-based facility that will enable residents to use government e-services and authenticate their correspondence with public departments, banks and other

organizations. Government departments and utility services such as the traffic department and water, electricity and telephone companies can also use the e-mail address to deliver traffic fines and utility bills.

Box 1. Stages of an e-Government Model

A review of the various government websites in Kuwait clearly indicates that the state is still on the initial stage of the generally accepted five-stage process to achieve the highest level of e-governance.

The United Kingdom's National Audit Office (NAO) Report on Government on the Web, cited by a paper presented by Dr. Nasser Saidi, first vice governor, Banque de Liban, distinguished the following five stages in the evolution of an e-Government model:

(a) A basic site holds electronic version of the agency's major print documents for public consumption (sometimes dismissively called brochure-ware). It gives basic information about the agency and hardly anything else. Contact with the agency is by phone or mail, not e-mail. Site users cannot download forms or accomplish anything substantial online. The site has few pages.

(b) Electronic publishing occurs when the agency develops its external website to be an important element of its overall communications strategy. The site becomes extensive, with many hundreds or thousands of pages, and the agency begins to put a substantial part of its information online, but in a linear, one-track fashion that has to be followed in the same way by all users. Citizens or firms can download forms to fill in and post back, but cannot do online submissions. The agency supports e-mail contacts but the external website still does not link in any significant way with the agency's back-office systems.

(c) Interactive e-publishing is reached when users can personalize in a useful way in which the site works for them through effective search tools. For instance users can specify their address or post code and see only relevant local information culled from the agency's databases. The agency's external website links extensively to at least some back-office systems. All the agency's forms are downloadable and some can be submitted online.

(d) A transactional website exists when users can accomplish specific dealings with the agency online. Users can authenticate themselves to the agency and register their identities reliably. They can then undertake a complete transaction with the agency online, for instance making secure payments for service, fee, fine or tax.

(e) Joined-up e-governance is achieved when public sector websites can facilitate "one-stop-shop" services online for citizens. Sites provide transparent access not just to the agency where people have logged on, but across central government agencies as a whole. Where necessary they also connect with other fields or tiers of government especially regional and local governments. Users can see their own files and accounts, and manage their relationship with the agency wholly via the Internet and by e-mail. Many agency processes use "zero touch technologies," where transactions do not require any active intervention by a human employee to be accomplished.

Unfortunately, a Madar Research evaluation on how the various Kuwaiti agencies are faring in terms of their online presence leaves a big room for improvement. Of the 36 government departments in Kuwait that are known to have an active website, 75 percent has no facility for feedback except for occasional e-mail contacts. Half of the Web sites do not offer Arabic content, which is a must for an Arab e-government Web site. The reverse is true as some websites offer only Arabic content, which makes it impossible for non-Arabic speaking researchers for instance to obtain information on the government agencies' basic services. Furthermore, only 25 percent of the Web sites have a search engine. None of the government Web sites to date offers transactional functions such as online payment of traffic fines or utility bills.

Two websites, www.e.gov.kw and www.kuwait.kw are being designed and proposed to dispense e-government services as a government portal, but no official announcement has been made as to which one – if either – will be the official e-government gateway. Both Web sites are in Arabic and neither offer online transactions at the moment.

Interestingly, among the options considered for the e-government project in Kuwait is the provision of services using an application service provision (ASP) model, which should further strengthen government and private sector cooperation.

D. E-PROCUREMENT APPLICATIONS

Whereas requests for purchases (RFPs) are now being published in most of the government-owned websites, online procurement of government supply still does not exist in Kuwait.

VII. APPLICATIONS IN EDUCATION

A. E-LEARNING/E-SCHOOL

The Kuwait University, with its 19,000 students and 1,297 staff, has five main campuses (Khefan, Khaldiya, Jabriya, Adaliya, and Shuwaik) with each campus approximately within five kilometers distance from another. The installation of a converged network has allowed the university to utilize distance learning, where a class can be held in different locations at the same time with the instructor at one campus and the student at their own home campus. This setup also helped address the issue of separate male and female campuses, and basically eliminated the need for instructors to duplicate their lectures – one for the female class, another for the male class.

The new classrooms at Kuwait University are also equipped with a jack for a camera so that classes can be recorded and stored in a digital library. The digital library provides students with a video on-demand facility where all the live lectures are recorded and backed up to an online library, which students can access whenever they need to.

Kuwait University's students are also now able to use the university portal to register for academic courses and receive information through the Internet. The service is available to university staff and faculty, with parent-focused services planned for a later phase of the project. In addition to online interaction with students, Kuwait University has integrated its back-end Oracle E-Business Suite financials, payroll and human resources solutions with the new Internet portal. The library component of the online project is expected to be available by mid 2003. Soon, students using the portal will be able to access all of their daily applications through the site, and customize their Web interface to get university news and calendar of events that interests them. University suppliers will be able to check new requests for proposals, track payments and in the near future submit online quotations.

In addition to the multiple Gigabit Ethernet network deployed around Kuwait University's campuses, wireless LANs are now located in various meeting areas and restaurants within the university. IP telephony is also available within the campuses, as the network platform – Cisco's AVVID – supports all forms of data transmission: voice, video, text.

Meanwhile, 24 public intermediate and secondary schools in Kuwait will serve as the pilot site for an e-learning module starting school year 2003-2004. Subjects covered include English, Mathematics and Science. The Ministry of Education hopes to roll out the project to all intermediate and secondary schools by school year 2006-2007.

VIII. APPLICATIONS IN COMMERCE AND BUSINESS

A. EXTENT AND MATURITY OF E-COMMERCE AND E-BUSINESS APPLICATIONS

Pending the passage of a Digital Signature Law that should make transactions conducted on the Internet legally binding, the Kuwaiti B2B and B2C e-commerce sector is gaining traction nevertheless, registering a total of US\$170 million in 2002. The bulk of the transactions were B2B in nature, valued at \$150 million, taking place between multinational companies and their local distributor and agents through private exchanges.

The country's oil and gas sector is expected to emerge as the major B2B player over the coming years. Kuwait Oil Company (KOC), for example, has recently implemented an online solution to automate all its internal tendering processes. The company, which procures several hundred million dollars every year in services and material, intends to move the entire tendering process online and eventually expand its processes to include a virtual marketplace for its suppliers and contractors.

Also in early 2003 KOC entered into a five-year agreement with global ICT player Schlumberger to build an enterprise-wide integrated information solution, with secure single point portal access. Under the agreement, KOC staff will have full access to GeoQuest exploration and production (E&P) software

covering the entire oil and gas lifecycle – from reservoir characterization and economic modeling to reservoir management, as well as on-site technical support and project consulting services.

Madar Research valued B2C e-commerce transactions in 2002 at \$20 million, which is driven by the large increase in Internet user numbers as well as the high penetration of credit and debit payment cards in Kuwait (55.83 percent), which is the highest in the Arab world (see Exhibit 31). The prevalence of advanced online banking solutions and practices in Kuwait further contribute to the spread and development of e-commerce in the country.

Growth projections by Madar Research and a separate study undertaken by Ernst & Young, commissioned by the Gulf Cooperation Council Secretariat General, indicate that the B2B e-commerce segment will be worth anywhere between US\$342 million and US\$496 million in 2005, while the B2C market will be worth US\$54 to US\$55 million in the same year.

Table 16. Value of B2B & B2C eCommerce in Kuwait

	2002		2005		CAGR 2002-2005 (Madar Research)
	Madar Research	Ernst & Young	Madar Research	Ernst & Young	
B2B eCommerce (Million, US\$)	150	not available	496	342	49%
B2C eCommerce (Million, US\$)	20	27	55	54	40%

Source: Madar Research

One of Kuwait's B2C sites, OurGulf.com, is a sophisticated site by any standards. Built using Microsoft and Baan platforms, OurGulf.com utilizes an electronic customer relationship management (e-CRM) system, which affords the site to offer a very high degree of personalized functions. Its online processes such as data transmission, security, privacy and business processes are also certified by bodies such as Checkpoint, Verisign, Truste and ISO 9001. The site offers a wide range of products including books, electronics, computers, office supplies and DVDs.

Table 17. Electronic Payment Indicators in Kuwait – End 2002

Population	Payment Cards	Density (per 100)	Merchant Locations	Density (per 1,000)	Banks	Density (per 100,000)	ATMs	Density (per 10,000)
2,418,000	1,350,000	55.8	5,500	2.3	12	0.5	270	1.1

Notes: (a) The population figures are Madar Research estimates based on official historical series on population levels and associated growth rates;

(b) The numbers on payment cards, merchant locations and ATMs are based on data gathered from various sources within the Kuwait banking and financial sector;

(c) The banks number comes from the website of the Union of Arab Banks.

Owing to a high rate of mobile phone penetration and a young subscriber base, telecommunication companies and banks in Kuwait are now using short messaging services (SMS) – and wireless application protocol (WAP)-based applications to present bills, broadcast promotions and let their subscribers communicate with one another in a more cost-effective fashion compared to making a voice call. In view of this demand, MTC-Vodafone recently upgraded its SMS infrastructure using Logica CMG solutions, at the same time launching a multimedia messaging service (MMS), MTC WOW, in association with German Materna and ISP Masiya Net.

B. AVAILABILITY AND QUALITY OF E-BANKING

Kuwait has the highest e-banking adoption rate among all Arab states, estimated by Madar Research at between 31 to 34 percent in 2002. Four of Kuwait's seven commercial banks now offer retail banking services through the Internet, while the other three banks are planning Internet banking. However, all the banks offer phone and ATM banking services. National Bank of Kuwait (NBK), Gulf Bank and Burgan Bank are the three leading institutions in Internet banking.

NBK, Kuwait's largest bank and by far the most aggressive in terms of online banking presence in the state, offers most of its services online. Its Watani Online Corporate (WOLC) services allow enquiries to all account types, current account check, overdraft facility, fund transfer to external accounts, all types of Letters of Credit and Letters of Guarantee, money market products and standing orders. Corporate users can also use the system to initiate financial and non-financial transactions such as book transfers, international and domestic telex transfers, demand draft request, salary processing and checkbook request.

Table 18. Internet Banking Services

Bank*	Online Retail Banking	Online Corporate Banking	Online Brokerage
Al-Ahli Bank of Kuwait	No	No	No
Bank of Kuwait and the Middle East	Yes	No	Yes
Burgan Bank	Yes	Yes	Yes
Commercial Bank of Kuwait	On beta	On beta	On beta
Gulf Bank	Yes	No	Yes
Kuwait Finance House	Yes	No	No
National Bank of Kuwait	Yes	Yes	Yes

Source: Madar Research Group

*All banks are listed with the Kuwait Stock Exchange.

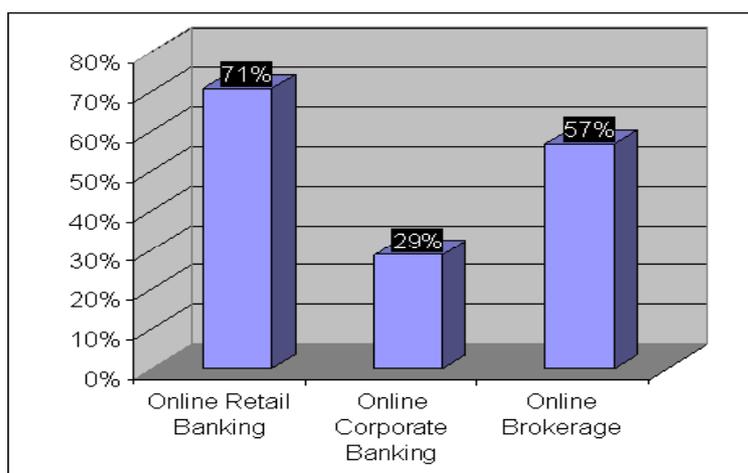
In terms of security, NBK employs the latest encryption and authentication technology like Public Key Infrastructure (PKI)⁹ and secured sockets layer (SSL).¹⁰ The system also provides corporate customers with an automated verification and approval process to control the initiation and processing of instructions from the customer side. An additional security feature used by WOLC is the transaction limit control, where every user is assigned a system transaction limit (per day and amount) that is consistently tracked and enforced.

The breadth of tasks available in online retail banking services in Kuwait varies. NBK and Burgan Bank for instance allow account balance inquiry, inter-account funds transfers as well as funds transfers to accounts in other banks in any part of the world. Users can also pay their bills to MTC, Wataniya or the MoC using NBK's online banking services. Meanwhile, customers of the Bank of Kuwait and Middle East can issue instructions using SMS and WAP for BKME to execute utility bills payment, transfer funds or send a statement of account to the concerned customer.

⁹ A PKI (public key infrastructure) enables users of a basically unsecure public network such as the Internet to securely and privately exchange data and money through the use of a public and a private cryptographic key pair that is obtained and shared through a trusted authority. The public key infrastructure provides for a digital certificate that can identify an individual or an organization and directory services that can store and, when necessary, revoke the certificates.

¹⁰ The Secure Sockets Layer (SSL) is a commonly used protocol for managing the security of a message transmission on the Internet. SSL uses a program layer located between the Internet's Hypertext Transfer Protocol (HTTP) and Transport Control Protocol (TCP) layers. SSL is included as part of both the Microsoft and Netscape browsers and most Web server products.

Figure 15. Percentage of Kuwaiti Commercial Banks Offering Online Services



Source: Madar Research Group

IX. APPLICATIONS IN HEALTHCARE

A. DATABASES FOR NATIONAL HEALTHCARE

The state-wide electronic files system espoused by Kuwait's Ministry of Health might as well be the forerunner for the state's clinics and hospitals to eventually link up in a single network and a central database for more efficient patient record management system, according to the ministry. Again, no timeframe is revealed for completion of such project.

B. TELEMEDICINE

The availability of broadband Internet has brought Kuwait one step closer to utilizing telemedicine. In the late 1990s, the Yale University estimated that Kuwait, together with Saudi Arabia and the UAE, spent an average of US\$60 to US\$100 million per year to receive treatment abroad. Indeed this cost can be significantly reduced with the availability of access to remote expert medical advice and practice provided by the more advanced medical institutions such as those in the US, especially that telemedicine has proved to be successful in many areas of healthcare.

In 2000, Kuwait's Al-Bader Group became the premier provider of Apollo Telemedicine to implement Apollo's eHealthStat Telediagnostic network in the Middle East and the Indian subcontinent. With Apollo's telemedicine technologies, Al-Bader-supported physicians and institutions can access on-line, real time and secure specialty consultations from the most prestigious hospitals in the United States and Europe without burdening patients with extensive and costly travel. Unfortunately there are no published documents as to how many hospitals or physicians in Kuwait are now using telemedicine applications – and to what extent – to further improve the administration of healthcare services in the state.

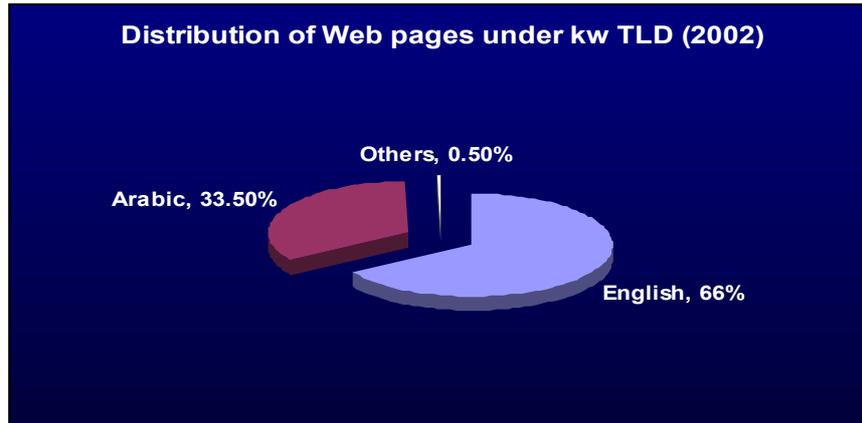
X. DIGITAL ARABIC CONTENT

A. ARABIC VERSUS ENGLISH CONTENT ON THE WEB

A survey of websites carrying the country code Top Level Domain (ccTLD) dot-kw, carried out by Madar Research for this report, reveals that 66 percent of available content are in English whereas 33.5 percent are in Arabic. Expectedly, generic TLDs such as dot-com, dot-net, dot-org, dot-gov and other country code TLDs have a significantly higher English content (approximately 70 to 80 percent of existing Web pages are in English) and significantly less Arabic content than those registered under the dot-kw domain. Kuwait's presence on the Net is established by 1,400 websites – whether carrying the 'kw' TLD or registered by Kuwaitis – according to the general manager of www.infozone.com.kw, a leading Web development company in Kuwait.

Statistics compiled by Global Reach indicates that Internet users in the Arab world, at 5.5 million, comprise only 0.9 percent of the worldwide Internet users of 619 million as of end 2002. A higher figure and more accurate statistic, however, is presented by Madar Research Group, which estimates that Arab world Internet users number 8.3 million in 2002. Chipping off non-Arabic speaking expatriates in the region, which represents around 15 percent or 1.2 million of the regional Internet users, brings the number of Arabic speaking Internet users to 7.05 million, or roughly 1.1 percent of the worldwide Internet population. Both research organizations did not consider the number of Arab speaking Internet users who are residing outside Arab countries.

Figure 16. Distribution of Web pages under kw TLD (2002)

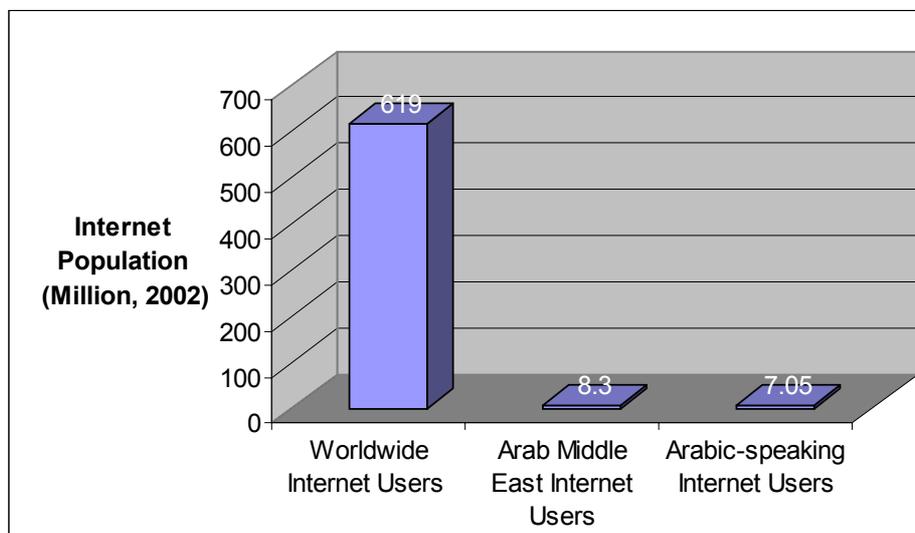


Source: Madar Research Group

Ironically, the Arabic language population constitutes 4.8 percent (300 million) of the total world population (6.2 billion). This disconnect illustrates that the number of users online who speak a particular language is of crucial importance to the amount of content available in that language. The more Arabic content there is online, the more reasons the Arabic speaking population will have to go online. Eventually some of these new users will produce their own content, thereby increasing the overall content available in Arabic.

Internet users from the Arab world represent only 1.3 percent of the world's total Internet user population. The number of Arabic speaking Internet users is lower, at 1.1 percent.

Figure 17. Arabic Speaking Internet Users



B. OBSTACLES FOR DEVELOPMENT

One of the impediments facing the use of Arabic on the Internet is the lack of unified standards, particularly in the field of character sets. Other obstacles include: weak telecom infrastructure, lack of Arabic content on the Internet, and lack of Arabic Internet access programs for the Web and e-mail.

The Arabic language differs tremendously in terms of its characters, morphology and diacritization from other languages. Besides its bidirectional orientation (Arabic text is written right-to-left, Arabic numbers are written left-to-right), the most striking difference between Arabic and other languages is that Arabic text is usually presented without vowels. Vowels, when used, are presented by diacritical marks, placed above or below the character. Diacritization defines the sense of each word, and how it will be pronounced. For example, the English words "some", "sum" and "same". Non-diacritized Arabic would reduce these words to "sm" leaving it to the individual reader to decipher the word and add its missing vowels depending on the context. For the average Arabic reader, this poses no problems but not so with a machine or a PC device.

This constraint has led a Kuwaiti-owned Egyptian company to design and develop a range of software solutions that integrates natural language processing (NLP), optical character recognizer, automatic diacritizer, summarizer, categorizer, corrector, speech recognizer and text to speech synthesizer. Sakhr, now with 300 employees and easily the biggest and most successful Arabic software company, has definitely helped promote the arabization of digital contents across the Arab world. Its products include end-to-end document and content management systems which ease the process of capturing, storing and managing Arabic content.

A good number of software companies, foremost among them Microsoft, are now keen to have an Arabic version or interface released the moment they release a new product to the market.

To further increase Arabic content and therefore motivate more Arabic language users to go online, Diab Hussein of the American University of Beirut recommends developing standards in the following areas:

- (a) Input of information: keyboard layout, character-set, phonemes set, etc;
- (b) Processing of information: compression standards of text and of speech, Natural Language processing (NLP) algorithms, control codes, etc;
- (c) Transfer of information over networks, such as the Internet: standard transfer protocols, standard Markup Languages, etc;
- (d) Output: displayed or printed character sets, page formatting, etc;
- (e) Application software standards: e-commerce, e-documentation, e-publishing, etc;
- (f) Terminology standards;
- (g) Standards for testing procedures to assure and control the quality of software;
- (h) Guides for unification of regulations for issuing conformity to standards certificates. Unification of procedures for accreditation/certification of testing.

Diab suggests that a closer collaboration between local and regional Arabic organizations such as the Arab Industrial Development and Mining Organisation (AIDMO) and international organizations such as the International Standardization Organization (ISO), International Electrotechnical Commission (IEC), the International Internet Engineering Task Force (IETF) and the European Telecommunications Standards Institute (ETSI) should be sought to overcome this lack of standards. This will also avert potential fragmentation within the 22 Arab speaking countries in terms of ICT use, adoption and commercial applications.

Madar Research Director, Abdul Kader Kamli has another opinion concerning the obstacles facing the development of Arabic content on the Web, and the drivers for such development:

"The current low Internet penetration in the Arab world is, of course, an important factor which is delaying the development of Arabic Web content. There are, however, other less known reasons, but as important. Paying for Internet content is not yet a part of the mindset of Arab Internet users, where information is traditionally expected to be received without a charge. This is a main reason why revenue models for Web content targeting mass users have financially failed in the region. This attitude is weakening investment in the development of Arabic content technologies. "

"As for governments, which do not seek profit, investment in developing Web content is gradually becoming a priority. Actually, the public sector is now leading the development of Arabic Web content, mainly because of e-government drives. Without government publications on the Net there cannot be e-government. As the Internet gains popularity with larger Arab masses, governments, which have been sponsoring traditional media, will give more attention to the Internet as a media tool to promote their ideals, strategies and political views, as well as to serve social purposes. "

"Outside the government domain, Arabic Web content will prove cost effective – or indirectly generating revenue – in the service industry, especially as the numbers of Internet users approach the critical mass. The role of Web content in supporting services and in marketing will encourage its development in Arabic."

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Annex I

INFORMATION SOCIETY INDICATORS FOR THE STATE OF KUWAIT

INDICATOR	Y2000	Y2001	Y2002
1. Basic Background Indicators			
1.1 Population	2,190,000	2,243,080	2,418,000
1.2 Area	17,820 sq. km	17,820 sq. km	17,820 sq. km
1.3 Density (per sq.km)	90	94	97
1.4 Urban population	1,919,000	Not available	Not available
1.5 Adult literacy	78.6	82	83.4
1.6 Poverty	0	0	0
1.7 GNI per capita	17,900	18,720	Not Available
1.8 GDP growth	3.9	-1	1.4
2. Telecom Infrastructure			
2.1 Fixed lines (total)	467,007	472,414	481,891
2.2 Domestic (lines per household)	Not available	Not available	Not available
2.3 Urban (%)	Not available	Not available	Not available
2.4 Waiting list (total number)	0	0*	0
2.5 Waiting time (average)	Not applicable	Not applicable	Not Applicable
2.6 Revenue per line (\$)	841	Not available	Not available
2.7 Cost of local call (\$ per 3 minutes)	Not available	Not available	Not available
2.8 Cost of call within region (\$ per 3 minutes)	Not available	Not available	1.11 (GCC)/ 2.4 (Rest of Arab world)
2.9 Cost of call to US (\$ per three minutes)	Not available	Not available	1.5
2.10 Number of fixed line operators	1	1	1
2.11 ISDN lines	Not available	Not available	150
2.11.1 Initial cost (\$)	Not available	Not available	100
2.11.2 Monthly charge (\$)	Not available	Not available	166
2.12 DSL lines	Not available	Not available	11000
2.12.1 Initial cost (\$)	Not available	Not available	198
2.12.2 Monthly charge (\$)	Not available	Not available	60
2.13 Leased lines	Not available	Not available	650
2.13.1 Initial cost (\$)	Not available	Not available	Not published
2.13.2 Monthly charge (\$)	Not available	Not available	Not published
2.14 Cable	Not available	Not Available	Not available
2.14.1 Initial cost (\$)	Not available	Not available	Not available
2.14.2 Monthly charge (\$)	Not available	Not available	Not available
2.15 Outgoing traffic (minutes per subscriber)	Not available	339.7	Not available
2.16 Incoming traffic (minutes per subscriber)	Not available	Not available	Not available
2.17 Mobile lines	476,000	878,000	1,250,000
2.18 Number of mobile operators	2	2	2
3. Media Infrastructure			
3.1 Radios	1,366,560	Not available	Not available
3.2 Television	930,000	950,000	Not available
3.3 Satellites	570,000	650,000	Not available
3.4 Daily newspapers	819,060	Not available	Not available

Annex I (continued)

4. Computers and the Internet			
4.1 Personal computers	250,000	272,000	300,000
4.2 Personal computers in education	Not available	Not available	22,500
4.3 Percentage of computers that are networked	Not available	Not available	Not available
4.4 Internet subscribers	40,000	55,000	80,000
4.5 Internet users	150,000	200,000	320,000
4.6 Internet hosts	3,360	3,437	3,261
4.7 ISPs (main)	2	2	3
4.8 ISP monthly charges (\$)	Not available	Not available	\$25
4.9 Telephone usage charges (\$)	Not applicable	Not applicable	Not applicable
4.10 Available national bandwidth	Not available	Not available	45Mbps
4.11 Hosting availability	Not available	Not available	Not available
4.12 Secure servers	Not available	Not available	Not available
5. ICT expenditure			
5.1 Telecom expenditure (million \$)	Not available	Not available	490
5.2 IT expenditure (million \$)	Not available	Not available	410
5.3 Percentage of GDP (%)	Not available	Not available	2.73%
5.4 ICT per capita (\$)	Not available	Not available	372
6. Capacity building			
6.1 Scientists and engineers in R&D	Not available	Not available	Not available
6.2 R&D expenditure (% of GNI)	Not available	Not available	Not available
6.3 ICT related graduates per year	Not available	Not available	Not available
7. ICT government and business environment			
7.1 e-readiness index	Not available	Not available	Not available
7.2 e-government index	Not available	2.12	Not available
7.3 IPR enforcement	Moderate	Moderate	Weak
7.4 Compliance with WTO	Yes	Yes	Yes
7.5 Basic telecom agreement	No	No	No
7.6 Reference paper	No	No	No
8. Laws and regulations			
8.1 Patent law	No	Yes	Yes
8.2 Trademark law	No	Yes	Yes
8.3 Copyright law	Yes	Yes	Yes
8.4 IT Agreement	No	No	No
8.5 e-Commerce law	No	No	No
8.6 e-Signature law	No	No	Draft
8.7 Piracy Rate	80%	76%	Not available
9. ICT policy			
9.1 ICT strategy	Outline	Outline	Outline
9.2 ICT Plan of action	Partial	Partial	Partial
9.3 National Initiatives	Yes	Yes	Yes

Sources: International Telecommunications Union, The World Bank, United Nations University World Institute for Development Economics Research (UNU-WIDER), World Information Technology and Services Alliance (WITSA) and local/national sources such as the Ministry of Planning and Ministry of Communications. Most of ICT indicators for 2002 are from Madar Research.

* The total capacity of Kuwait's local telephone exchanges generally exceeds the demand, but there is one location (Qurain/Um-Alhaiman) that is waitlisted in 2001. There are no recent reports that could verify if the exchange in that location has been expanded to accommodate the demand.

Annex II

LIST OF MAJOR STAKEHOLDERS

Government

Ministry of Communications

Ministry of Interior

Ministry of Education

Kuwait University

Kuwait National Petroleum Company

Non-Government

Kuwait Foundation for the Advancement of the Sciences

Kuwait Information Technology Society

Kuwait Institute for Scientific Research

Private/Semi-Private

MTC-Vodafone

Wataniya Telecom

Private

International Turnkey Systems

Arab Information Management Systems

FAPCO

Kuwait Computer Company

QualityNet

Fast Telecommunications

Annex III

GOVERNMENT AND QUASI GOVERNMENT WEBSITES

Name	URL	Site Language	Search Engine
National Assembly	http://www.alommah.gov.kw/	Bilingual	Yes (bilingual)
Ministry of Foreign Affairs	http://www.mofa.gov.kw	English	No
Ministry of Electricity and Water	http://www.mew.gov.kw	Arabic	No
Ministry of Communication - Kuwait Electronic Messaging Services	http://www.kems.net	English	Yes
Ministry of Finance	http://www.mof.gov.kw/	Arabic (select pages in English)	No
Ministry of Health	http://www.moh.gov.kw	Bilingual	No
Ministry of the Interior	http://www.moi.gov.kw	Arabic (Eng: u/c)*	No
Ministry of Information	http://www.moinfo.gov.kw/	English	(u/c)
Ministry of Justice	http://www.moj.gov.kw/	Arabic	No
Ministry of Planning	http://www.mop.gov.kw	Bilingual	No
Ministry of Education	http://www.moe.edu.kw	Arabic	Yes
Kuwait Municipality	http://www.baladia.gov.kw	Arabic	Yes
Legal Advice and Legislation - Council of Ministers	http://www.fatwa.gov.kw	Arabic	No
International Relations Department – Ministry of Justice	http://www.ird-kwt.com/	Arabic (Eng: u/c)*	No
Hawally Governorate	http://hawally.org/	English	No
Public Authority for Housing Welfare	http://www.housing.gov.kw	Arabic	No
Kuwait Investment Authority	http://www.kia.gov.kw/	English	No
Kuwait Institute for Scientific Research	http://www.kisr.edu.kw/	English	Yes
The Public Authority for Applied Education and Training	http://www.paaet.edu.kw/	English (select pages in Arabic)	Yes
Public Authority for Industry	http://www.pai.gov.kw/	Bilingual	Bilingual
Public Authority for Youth and Sports	http://www.pays.gov.kw	Arabic	No
National Committee For Missing & Prisoners Of War Affairs	http://www.pows.org.kw/	English	No
Kuwait National Petroleum Company	http://www.knpc.com.kw/	English	No

Annex III (continued)

Name	URL	Site Language	Search Engine
Central Bank of Kuwait	http://www.cbk.gov.kw/	English	No
Kuwait University	http://www.kuniv.edu.kw/	English (Arabic u/c)* Registration Dept. bilingual	No
Kuwait Institute for Medical Specialization	http://www.kims.org.kw	English	Yes
Kuwait Environment Public Authority	http://www.epa.org.kw/	English (select pages in Arabic)	No
Kuwait Chamber of Commerce and Industry	http://www.kcci.org.kw/	Bilingual	Yes
National Council for Culture, Art & Literature	http://www.kuwaitculture.org	Arabic	No
Zakat House	http://www.zakathouse.org.kw/index1.html	Arabic	No
Kuwait Fund for Arab Economic Development	http://www.kuwait-fund.org/frames.htm	English	Yes
Manuscripts & Islamic Libraries Dept.	http://www.mild-kw.net/	Arabic	No
State Audit Bureau	http://www.sabq8.org/	English	No
Public Authority for Assessment of Compensation for Damages Resulting from Iraqi Aggression	http://www.paac.org/	English	No
Civil Service Commission	http://www.csc.net.kw/	English	No
Kuwait International Airport	www.kuwait-airport.com.kw	English	No

(*) u/c: under construction