UNITED ARAB EMIRATES

The United Arab Emirates (UAE) is a federation of seven traditional emirates established in 1971. Six of these states, from west to east Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Qaiwain, and Ras al-Khaimah, share the southern coast of the Persian Gulf from Qatar to Oman's Musandam Peninsula (Figure 49). The seventh, Fujairah, lies on the coast of the Gulf of Oman, separating the Musandam from the rest of Oman and itself divided from the other Emirates by the Hajar Mountains. Abu Dhabi is the only Emirate where nomadic Arabs were indigenous, and many remain today, their lives centered on the inland oases of al-Ain and Liwa.

Figure 49.
Map of the United Arab Emirates

The UAE is the wealthiest of the countries in the region (Table 88), and in terms of the information technologies is the most well-developed. Although the basis of the country's development was and continues to be oil wealth, the Emirates have become a major regional trading center and a hub for air and sea transport and telecommunications. Dubai's location on one of the rare deep (i.e., navigable) creeks in the region helped it become a major shipping center, a position on which it has capitalized with the establishment of the Jebel 'Ali Free Trade Zone. The UAE is also a major financial center, having actively courted and successfully acquired much of the business that left Beirut at the beginning of the Lebanese civil war in 1975.

Society in the Emirates is a mix of the conservative and modern more striking than in many of the other countries in the region, perhaps due in part to the extensive degree of development that has been achieved and the success of the Emirians in integrating modern technology into their society without significant disruptions. One manifestation of this is the openness with which the pros and cons of the Internet have been discussed and publicized in the UAE and the leadership the country has attempted to exert in organizing a regional consensus and approach to exploiting the Internet.

Table 88.
The United Arab Emirates in Statistics

Metric	Value[381]	Remarks
Population	2.38	millions, 1995
Population density	32	per km^2, 1995
GDP	36.2	US$billions, 1994
GDP per capita	16,247	US$, 1994
Telephones	672.3	thousands, 1995
Teledensity	28.28	per 100 inhabitants, 1995
Teledensity in largest city	42.51	per 100 inhabitants, 1995
Cellular subscribers	129.0	thousands, 1995
Cellular density	5.42	per 100 inhabitants, 1995
PCs	115	thousands, 1995
PC density	4.84	per 100 inhabitants, 1995
Television sets (receivers)	500	thousands, 1995 estimate
Television density	26.3	per 100 inhabitants, 1995 estimate
Literacy rate	79.2[382]	per 100 inhabitants older than 15 years, 1995
Infant mortality	20.4[383]	per 1000 inhabitants, 1996 estimate

Networks in the Emirates

Emirates Telecommunications Corporation (Etisalat), the state-owned monopoly telecommunications service provider, tendered

[381] Source: *World Telecommunication Development Report*, 3rd ed., 1996/97 (Geneva: International Telecommunications Union, March 1997), unless otherwise noted.
[382] *The World Factbook 1996*, <http://www.odci.gov/cia/publications/nsolo/factbook/tc.htm> (9 February 1998).
[383] *ibid.*

for a turn-key ISP site in early 1995, and awarded the contract to Sprint. Prior to the contract award, Etisalat reported that it had received 3,000 inquiries regarding Internet service, and Etisalat's chief engineer indicated that the service would be considered a success if only a third of that number signed up.[384] However, 1,500 subscribers had already signed up for service and paid their connection fee two months before the service became operational.[385] Sprint subcontracted the equipment installation and commissioning to Dimension Data, and the service was opened to the public on 6 August 1995. Emirates Internet (Emirnet, www.emirates.net.ae) had a total of 3,000 subscribers by the end of 1995,[386] which grew to 4,000 by May 1996, with 15 leased-line clients and 350 new customers signing up per month,[387] and to 9,669 by the end of the year, when subscriptions were being taken out at a rate of 1,000 per month.[388] Emirnet hit its stride in 1997, though, when subscriptions sky-rocketed to 45,150 by July and 88,552 by the end of the year (growth rates of 6,000 and more than 7,000 new users per month, respectively).[389] These phenomenal growth rates were most likely driven by the major increase in leased-line clients, each of which represents several to hundreds of users, over the past year. Based on the deep penetration of other value-added services, such as cellular telephony, the Internet user base could easily double within the next 12-18 months.

Etisalat is the *.ae* national TLD manager, and was the organization responsible for bringing the Internet to the Emirates. The company is eager to offer the latest and best services as part of the UAE's campaign to be the premier commercial and services center in the Gulf, and also by the need for revenue generation. The Internet was initially viewed as just another value-added service that could be established with minimal cost (e.g., the service would have been profitable with only 1,000 subscribers). The Emir is also said to be a strong proponent of modern technology (he is said to accept no hand-written memos, for instance). Many ministries and public companies initially signed up for Internet service because they were directed to do so by the Emir. Their enthusiasm increased, however, when they discovered how easy it was to use the Internet to search for and retrieve "important, useful information."[390] A Ministry of Information official described the Internet as a "blessing," a tool to be used.[391]

International links for Emirnet are maintained via two earth stations and international carriers, although both links terminate in the United States. A satellite link to an Internet port in the United States was part of the original package supplied by Sprint. This link is assumed to remain active, as the autonomous system (AS) numbers associated with Emirnet are registered to Sprint. However, Etisalat also leased a 128 Kbps satellite link from MCI, which also connects to the United

[384] "Etisalat lines up Sprint to put UAE on the Net," *CommsMEA* 5 (July 1995), p. 1.
[385] Pyramid Research, "UAE Launches Internet Service," *Africa/Middle East* 2 (28 August 1995), p. 11.
[386] Cooper, *op. cit.*; "In Brief… UAE," *Middle East Communications* 11 (January 1996), p. 7.
[387] "Gulf Intenet… ," *op. cit.*
[388] Pyramid Research, "Middle East Asks: … ," *op. cit.*; Reuter (20 January 1997).
[389] <www.nua.ie/surveys…>, *op. cit.*
[390] Bilal Habash, personal communication (26 May 1997). Mr. Habash was responsible for the Ministry of Information's decision to allow Internet connections and approved the technical requirements for the proxy servers.
[391] Ibrahim al-Abed, personal communication (26 May 1997). Dr. al-Abed is Advisor to the Minister of Information and Director of the Ministry's Department of External Information

States.[392] Al-Ain University has an independent link to the Internet which pre-dates Emirnet's service.

Etisalat is the only ISP in the Emirates, and no competition is officially contemplated (there are rumors, however),[393] nor is any re-selling of Emirnet access by dealers authorized. The country was the first to allow Cyber Cafés,[394] however, the only other country in the region besides Kuwait to allow this relatively unregulated and anonymous type of access. For example, the Cyber Café located in the Sahara Residence in downtown Abu Dhabi rents terminals connected to Etisalat via a 64 Kbps leased line by the hour. Clients that do not have their own username (i.e., Internet account) may use a generic Cyber Café account. Sandwiches, snacks, fruit juices, and sodas are also offered. A popular service is the lunch-time special: a sandwich, Cocoa Cola, and 1/2 hour of Internet access for AED 35 (US$9.50). The principal restriction on Cyber Café use is imposed by the Ministry of Information, which does not allow use of these terminals by people under 18 years of age. In addition to Internet access and food, Cyber Cafés in the Emirates offer basic computer and Internet training courses, which are said to be very popular. Topics covered in the Internet course include a description of the Internet and how it works, instructions on how to obtain an account, basic services (ftp, Web, e-mail, etc.), and Internet search strategies. Until May 1997, the Cyber Café leased lines, like all Emirnet leased lines, by-passed the proxy servers that Etisalat maintains to control the content of Internet communications to/from the UAE. However, Etisalat has since installed proxy servers at the customer ends of all leased-line circuits. The servers are owned and maintained by Etisalat, but physically located on subscribers' premises.

Internet Dimensions Table 89 summarizes and Figure 50 displays the Internet dimensions.

Pervasiveness After a late start, the Internet grew rapidly in the Emirates, where is has been accepted as an adjunct to other communications media that enable the international business that is the lifeblood of the cities. Almost four in every ten Emirians has an Internet account, and the penetration is likely to increase to more than 50 percent during 1998. The UAE is at Level 4 (Pervasive).

Geographic Dispersion The Internet is highly dispersed (Level 3) in the Emirates. There are access nodes in every major political division, although the interface between Emirnet and the global Internet is located in a single city. There are three international links to the Internet which are geographically dispersed although all are located in a single Emirate (Abu Dhabi). Nationwide access is available, although not every rural area has local service.

Sectoral Absorption Take-up of the Internet has been concentrated in the commercial sector. Although most public sector agencies and companies are connected, the Internet has not permeated their daily operations to the extent that is common in the business community. Those who can afford it have private Internet service as well as company- or agency-provided connections. All the country's universities have local area networks connected to the Internet; one of them has a separate international connection. Primary and secondary education institutions will be

[392] Pyramid Research, "Middle East Asks: … ," *op. cit.*

[393] Lemir el-Jazeiri, personal communication (26 May 1997). Mr. el-Jazeiri is a computer systems consultant and part-time manager of a Cyber Café in Abu Dhabi. The al-Maktoum Group in Dubai was mentioned as having raised the profile of the issue while campaigning for an ISP license.

[394] In addition to Cyber Cafés, there was an On-Line Shop in Dubai in May 1997.

connected in the future, but are currently not on-line. There is little participation by the health sector in the Internet. Overall, the UAE is rated at Level 2 (Moderate) for Sectoral Absorption.

Dimension	Level	Explanation
Pervasiveness	(4) *Pervasive*	Almost four in ten Emirians has an Internet account. The Internet has become a commonplace communications medium. Its absence in some areas is more noteworthy than its presence elsewhere in the country.
Geographic Dispersion	(3) *Highly Dispersed*	There are access nodes in every first-tier administrative division of the UAE and two commercial international links to the Internet.
Sectoral Absorption	(2) *Moderate*	The majority of businesses with more than 100 employees and almost all government agencies are connected to the Internet. All universities are also connected, but not lower education institutions. There is minimal participation by the health sector.
Connectivity Infrastructure	(1)	The aggregate bandwidth of the domestic backbone is less than T-3, while the aggregate international bandwidth is less than T-1. There is no open IX. Access is via modem and leased line.
Organizational Infrastructure	(1) *Single*	There is but a single ISP, which is the state telecommunications monopoly.
Sophistication of Use	(2) *Conventional*	Use of the Internet is currently conventional, as users become acquainted with the Internet and substitute Internet-based activities for current processes.

Table 89. Internet Dimensions for the United Arab Emirates

Connectivity Infrastructure The UAE is currently at Level 1 but approaching Level 2 in this dimension. There is a domestic IP backbone that runs over the national fiber optic network. Currently, less than 45 Mbps of traffic is being exchanged, but the traffic volume is growing rapidly. Since the country has a robust SDH backbone, no separate IP backbone is being considered. The country has multiple international links, but they do not aggregate to a T-1 (1.544 Mbps) link. As this is the single largest fixed, recurring cost of the Internet service, Etisalat is attempting to minimize bandwidth usage despite the rapid growth of Internet use. The use of proxy servers, intended principally as a means of censorship, contributes significantly to bandwidth savings by caching the most frequently-accessed information (generally Web pages) locally. There is no open Internet Exchange (IX) in the UAE, but there is a private IX at Etisalat, where the Sprint and MCI connections join Emirnet. Access to the Internet is currently via dial-up lines (including ISDN) and 64 Kbps leased lines. Etisalat recently announced that it was going to up-grade existing leased lines to 128 Kbps at no additional expense.[395]

Organizational Infrastructure Despite the fairly robust physical infrastructure and wide customer base, the UAE is rated at Level 1 (Single) for Organizational Infrastructure. Etisalat, 60

[395] Adnan al-Husseini, "ISP News… ," *op. cit.*

percent owned by the government, a public company, and the monopoly telecommunications service provider, is the sole ISP. There are rumors that Etisalat will be privatized or, alternatively that competition will be allowed in certain valued-added services, but no concrete plans have been announced or visible steps taken toward either of these ends.

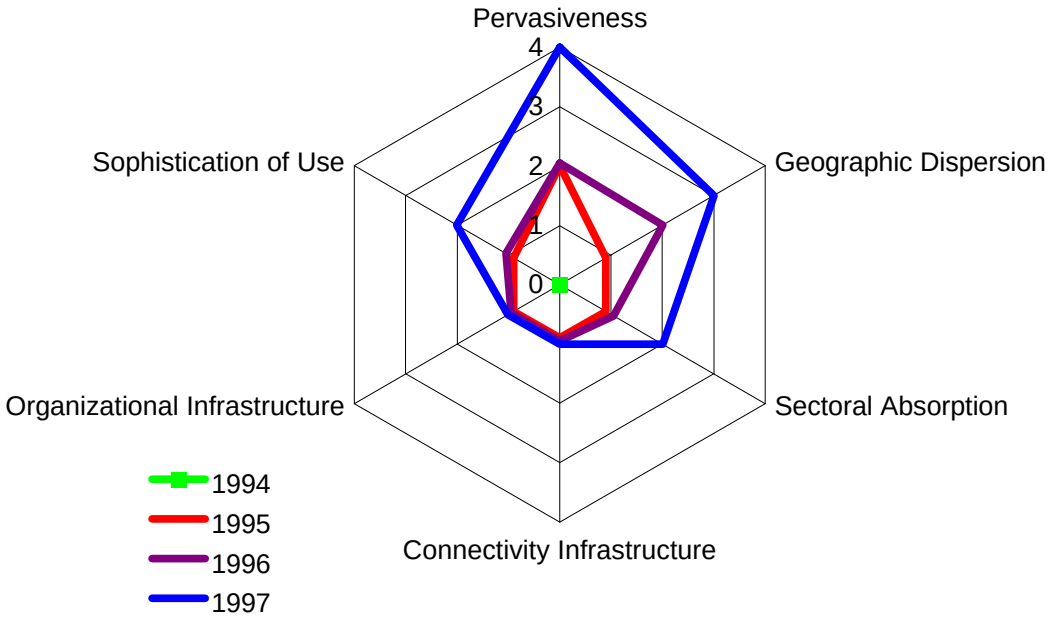

Figure 50. Internet Dimensions for the United Arab Emirates

Sophistication of Use is currently conventional (Level 2), but is increasing due to the high level of interest in and active use of the Internet. The "killer application" remains electronic mail, but both public and private organizations are becoming increasingly sophisticated at using the Web to promote Emirian products and services and conduct research worldwide.

Determinants

The UAE was the first country in the region to open a public discussion about the negative aspects of the Internet. (This and other factors affecting Internet development in the Emirates are summarized in Table 90.) When first opened, the service offered a direct link to the Internet, but public concerns were soon voiced about pornography and other inappropriate material. In January 1996, the UAE sponsored one of the first Internet conferences in the Middle East. Security officials there raised the possibility that terrorists would use the Internet for covert communications.[396] A committee was formed, comprising representatives from the Chief of Police of Dubai, the organizer of the Internet conference, Etisalat, the Ministry of Information, and several universities, to examine the possible hazards and recommend procedures to mitigate the risks.[397] Even the police chief, Major General Dhahi Kalfan Tamim, noted, however, that "the

[396] "UAE Authorities Warn of Possible Hazards From Internet," *COMPASS Newswire* (15 January 1997).
[397] Al-Abed, *op. cit.*; Habash, *op. cit.*

Table 90. Determinant Impact	
Determinant Quality	Affected Dimension
State monopolization of the telecommunications sector	Pervasiveness—May be limited due to the artificially high prices that result from the government's monopoly Geographic Dispersion—Enhanced by government's policy of distributing resources throughout the seven Emirates Organizational Infrastructure—Inhibited by lack of competition
Foreign policy emphasis on development of non-oil trade	Pervasiveness, Sectoral Absorption—Government encouragement may increase these dimensions Connectivity Infrastructure—May be increased by government to support foreign policy goals
Strong information content control policy	Pervasiveness—May be discouraged by restrictions on Internet access Sophistication of Use—Spurred development of sophisticated, ubiquitous access control system
Geographic dispersion of the country's constituent Emirates	Geographic Dispersion, Connectivity Infrastructure—Requirement to connect all seven Emirates enhances these dimensions
Extensive financial resources	Connectivity Infrastructure—The government can purchase whatever it needs, enhancing the physical infrastructure to meet demand Sophistication of Use—Expertise can be readily purchased
Excellent telecommunications infrastructure	Geographic Dispersion, Connectivity Infrastructure—Existing infrastructure provides a ready base for expansion
Extensive availability and flow of foreign information	Sophistication of Use—Openness of society and employment of foreign experts with a technology transfer mission will help develop a sophisticated user community
Strong constituent communities	Sectoral Absorption—Strong support from academic and business communities has increased the Internet's penetration; Emir's requirement for all government offices to be connected directly affected this dimension Organizational Infrastructure—Community concerns regarding the availability of undesirable information were responsible for the current proxy servers, which necessitate central control and support maintenance of a monopoly ISP.

nation needs to keep up with the emerging technology of the Internet."[398] By May 1996, the committee had completed its investigation and deliberations, and made its final report. The committee's recommendation to use a proxy server was approved and implemented over the next four months.[399] However, by June 1996, General Tamim was in the news again, now complaining about pornography on the Internet. In his capacity as head of the Parents-Teachers Association (PTA) of Dubai, Tamim had learned from outraged parents that high school children were discovering pornographic sites on the Internet and passing the URLs of the "good ones" around at school. The police chief's criticism was strong enough to cause Etisalat to withdraw their representative from the Internet oversight board, while the chief claimed that would-be Internet users should be licensed and monitored by the Ministry of Information and the police. "In all cases, the

[398] "UAE Authorities Warn… ," *op. cit.*
[399] Habash, *op. cit.*

information should be filtered, scanned, and then made available to users," he said.[400] Although restrictions were tightened on the proxy servers, the General still was not satisfied in January 1997, when he held a seminar on Internet monitoring. General Tamim said, "When told that putting water-tight restrictions on access to the Internet is impossible, we did not lose hope, especially since we came to know that Singapore has successfully done it."[401] Subsequently, Etisalat began installing remote proxy servers on leased lines, including the Cyber Cafés.

Today, Internet users in the UAE do not actually have direct access to the Internet. Etisalat has continued to add proxy servers as the number of subscribers has increased, so as to prevent a serious degradation of service. Thus, Internet users in the Emirates only access Web pages cached on the proxy servers. In addition to banning access to some URLs and IP numbers outright, incoming requests for information (e.g., searches, Web pages, ftp, newsgroups, etc.) are screened for "stop words," as is any information that is received from the Internet.[402] The General has apparently achieved his goal.

Problems and Prospects

Surprisingly, most of the public debate revolved around how to control the Internet, and there have been no adverse public reactions to the use of proxy servers or the restrictions imposed. Although UAE is not a hot-bed of civil libertarians, the society is open enough, and the press aggressive enough, that debate of these issues would have surfaced had there been any. For its part, Etisalat does not hide or disguise the existence of the proxy server system, but they do point out the advantages (speedier service through Web caching) and downplay the real reasons for the system. Thus far, the issue of possibly receiving out-dated information from a "stale" cached Web page has not been raised in the UAE.

Given that Internet use in the Emirates is likely to continue to grow, the country may become a "center of excellence" and teaching resource for other countries wishing to implement controls on Internet access. For the moment at least, the government appears to have found the balance between efficiently serving the legitimate needs of the subscribers (as defined by the authorities) and limiting the potential for mischief.

More is likely to be available on this score after February 1998, when the Internet World Middle East conference and exhibition will be held in Abu Dhabi.[403]

[400] Reuter (18 June 1996), quoting *Gulf News*.
[401] Reuter (21 January 1997).
[402] Adrian Hurel, "Dialling-in: Remote access in the region," *Middle East Communications* 12 (March 1997), p. 26.
[403] COMPASS Newswire (6 June 1997).