YEMEN

Yemen is an out-lying country located on the southwestern corner of the Arabian Peninsula (Figure 51). Although proximity and history tie Yemen to the countries of the Persian Gulf, this once-better off trading nation neither physically nor demographically resembles the others (Table 91). Its history and culture have been influenced by neighboring Arab and African cultures and by extra-regional foreigners, since it is located on a major trading route. Its rough terrain in the north has allowed local tribes to maintain a high degree of independence, while its desert borders with Saudi Arabia and Oman have been a source of contention and occasionally war, since these regions contain the country's only oil wealth.

Figure 51. Map of the Republic of Yemen

The country's creation in 1990 from the former Yemen Arab Republic (North Yemen) and the Marxist People's Democratic Republic of Yemen (South Yemen) was followed in 1994 by a civil war in which the south attempted to break away.

Today, Yemen is attempting to overcome both its poverty and the legacies of the war. There is a strong feeling on the part of the leading members of the business community that exploitation of the information technologies, including and especially the proliferation and effective use of the Internet, are critical for economic development in Yemen. In May 1997, the Presidential Advisor on Science and Technology, Dr. Moustafa Bahran, in cooperation with the Sana'a office of the United Nations Development Program (UNDP), sponsored a conference on electronic commerce, "Establishing a National Dialog on Cyber-Economy." The conference is part of an initiative entitled "Arab Work Force for the Cyber-Economy," which is

Table 91.
Yemen in Statistics

Metric	Value[404]	Remarks
Population	15.13	millions, 1995
Population density	80	per km^2, 1995
GDP	18.4	US$billions, 1994
GDP per capita	1,262	US$, 1994
Telephones	187.0	thousands, 1995
Teledensity	1.24	per 100 inhabitants, 1995
Teledensity in largest city	7.12	per 100 inhabitants, 1995
Cellular subscribers	8.3	thousands, 1995
Cellular density	0.05	per 100 inhabitants, 1995
PCs	na	
PC density	na	
Television sets (receivers)	3,900	thousands, 1995
Television density	26.7	per 100 inhabitants, 1995
Literacy rate	38.0[405]	per 100 inhabitants older than 15 years, 1990
Infant mortality	71.5[406]	per 1000 inhabitants, 1996 estimate

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

characterized as an attempt to address the critical development issues of the "double challenge of globalization and information revolution."[407] Table 92 lists the speakers at this conference. The participation in this conference by such a cross-section of influential Yemenis attests to the degree of interest in information technology, although this interest has not been clearly translated into action, in large part due to the backwardness of the majority of the country's population and the need to attend to much more immediate problems, such as the provision of basic health and sanitation services.

Table 92.[408] Yemen Cyber-Economy Conference Speakers

Speaker	Position	Topic
Dr. Abdul-Kareem al-Eriani	Minister of Foreign Affairs; Deputy Prime Minister	(Moderator)
Eng. Ahmed al-Anessi	Minister of Communications	The Future of Telecommunication in Yemen
Dr. Dawood Othman	Dean, College of Commerce, Sana'a University	The Cyber Economy—Pros and Cons
Dr. Abdulaziz al-Saqqaf	Publisher, *Yemen Times*; Professor of Economics, Sana'a University	World Trade Organization—Yemen and the Cyber Economy
Dr. Raufa Hassen	Professor of Information; Director, Center for Women's Studies, Sana'a University	Socioeconomic and Gender Factors
Dr. Abdul-Kareem Amer		Industrialization and the Cyber Economy
Dr. Mutahar al-Saidi		R&D and the Cyber-Economy
Eng. Yahia al-Sharki		The Future of Information Technology
Nabil Hayel Saeed		The Private Sector in the Cyber-Economy

Although Yemen has Internet service, a country where obstacles to development include the poor quality of local access telephone lines which limits data speeds, the low numbers of computers and computer-literate people in the country, a low literacy rate in general and even poorer English literacy, and an unreliable electrical power generation and distribution system,[409] cannot be expected to be concentrating on such a novel addition to the telephone company's services.

Networks in Yemen

Computer networks of any type in Yemen are a novelty; indeed, even the availability of computers cannot be taken for granted. Then-North Yemen began to develop a telecommunications network only in the 1970s. The driving force behind that development was Ahmed al-Anessi, today the Minister of Communications of the unified Yemens. The resulting network, however, has failed to keep up with population growth, development, or the march of technology. With most of the existing telecommunications infrastructure beyond its useful life and significant war damage in the south, the country, again led by Engineer al-Anessi, is beginning to install a modern fiber optic backbone and new local infrastructure in the principal cities.

[407] Republic of Yemen, Presidential Office, Office of the Presidential Science and Technology Advisor, *Arab Work Force for the Cyber-Economy*, undated paper (obtained May 1997).

[408] Sources: Official list of conference speakers; "Evening on the Cyber Economy," *Yemen Times* (19 May 1997), p. 16.

[409] Abdulaziz al-Saqqaf, "In the Beginning Was THE WORD!," *Yemen Times*, 30 June 1997, <www.y.net.ye/yementimes/ iss26/vwpnt.htm> (15 August 1997).

There appears to be a great deal of interest in the Internet in the local business and academic communities, although the population in general is not nearly sophisticated enough to have any awareness of the issue, much less any interest.

Internet

In May 1996, TeleYemen, a joint venture of the Public Telecommunications Corporation (PTC) with UK's Cable & Wireless that operates the country's international communications, awarded a contract to Mercury Communications and Pipex, both British companies and the latter a subsidiary of UUNet Technologies, to provide an international connection to the Internet.[410] They set up a 64 Kbps digital satellite link between TeleYemen's Sana'a headquarters and a Mercury Communications earth station in Cambridge, England,[411] while Network Analysis Support Services (NASS) Yemen, the local Compaq computer dealer, installed an ISP site comprising three Compaq Proliant Prolinea (dual-166 MHz Pentium) servers, a Cisco 7513 router, five Cisco 2511 access servers, and 50 Motorola modems.[412] The Y-Net service (www.y.net.ye) opened for business in July 1996 with a Class C network (195.94.0), offering local dial-up numbers in Sana'a, Aden, and Taiz. According to NASS Yemen, firewall functions are implemented using TACX software in the router, which in May 1997 was set up to block access to about 15,000 Web sites.[413]

By April 1997, only 476 subscribers had signed up,[414] and as of the following month there still were no leased-line clients.[415] However, when asked if the service was profitable, the TeleYemen divisional manager in charge of the project responded, "You bet."[416] By October 1997, the service had only about 700 subscribers out of what TeleYemen estimated to be a total market of about 9,000 PC users.[417]

[410] "Yemen: In Brief," *Middle East Economic Digest* 40 (31 May 1996), p. 26; "In Brief… Yemen," *Middle East Communications* 11 (June 1996), p. 3.

[411] Pyramid Research, "TeleYemen Brings Internet Surfing to Yemen," *Africa/Middle East* 3 (9 July 1996), p. 11.

[412] Sam Behiry, personal communication (24 May 1997). Mr. Behiry is the Managing Director of NASS Yemen.

[413] Behiry, *ibid.*

[414] "Internet Subscribers Reaches 500," *Yemen Times* (7 April 1997), p. 2.

[415] NASS Yemen employee, personal communication (24 May 1997).

[416] "Internet Subscribers…," *op. cit.*

[417] "In Brief… Yemen," *Middle East Communications* 12 (October 1997), p. 8. The local Compaq dealer estimated that there were 70,000 computers in Yemen in early 1997, mostly used as terminals for mini-computers, such as the DEC PDP series, which are concentrated in the offices of major companies and industrial enterprises. The actual number of computers available to the population is unknown but estimated to be low. Behiry, *op. cit.*

The reason for the service's low take-up yet continued profitability is the high prices charged by TeleYemen, which puts the service well beyond the reach of even an above-average Yemeni.[418] A basic account costs YR 5,000 (US$40) to set up, and YR 3,500 (US$28) per month, while an IP account with 5 MB of disk storage costs YR 13,000 (US$105) per month. There is an additional connect charge of YR 12 (US$0.10) per minute. Although TeleYemen announced that it was going to set up toll-free access lines, in fact access is via normal telephone lines, for which the subscriber must pay an additional charge of YR 10 (US$0.08) for each three minutes of connection time. TeleYemen charges YR 32,000 (US$258) to register a domain name under the *.ye* national TLD, of which TeleYemen is the manager.

Due to the high cost of service, although Sana'a University has a domain name registered, it has no connection to the Internet. (There are also few LANs, perhaps as few as one, and relatively few computers on campus.) A private school in Sana'a, the University of Science and Technology, has two Internet accounts, but access there is restricted to the university's president, vice president, Computer Science Department chairman, and a single technician.[419]

One organization that clearly will benefit from the introduction of Internet service is the French oil company, Total, which is participating in the exploitation of Yemen's oil reserves. The company has placed an order for equipment to create an intranet at five sites in Yemen that are to be connected via 64 Kbps leased lines and have an Internet gateway. The project is delayed, however, due to the inability of the PTC to provide the leased lines.[420]

Alternatives to TeleYemen's Internet services are developing to meet the needs of what is apparently a market of more than 700 potential users. The United States Information Service office in Sana'a has an Internet account and provides a terminal for public use. This service is popular with university students.[421] A second access provider, although not an ISP, has started offering e-mail accounts in Sana'a and Aden for only US$15 per month. The company, Ylink, operates a bulletin board service that has an e-mail gateway with TeleYemen. Catering to the older computers typically found in a developing country, Ylink offers a DOS version of its e-mail client software.[422]

The current dimensions of the Internet in Yemen are listed in Table 93 and depicted in Figure 52.

GPC Network

The General People's Congress (GPC), the ruling political party, established its own private, nationwide computer network to support its candidates' election campaigns.

The project was started in 1993 to support the first national elections since unification. The Supreme Election Committee developed an Oracle-based voters list with personal information and demographic profile information, and distributed it to all the governorates on disk. The GPC used this as its initial database, to which it added detailed results of the election. During 1995 and 1996, the Foreign Ministry set up a network connecting 16 of the country's 19 governorates with

[418] The Dean of Science at Sana'a University estimated that even nominal Internet use would cost him approximately five times his monthly salary. Dr. Abdul-Kareem A.M. Nasher, personal communication (22 May 1997).

[419] Nasher, *ibid.*

[420] Behiry, *op. cit.*

[421] Nasher, *ibid.*

[422] Ylink brochure, undated (obtained May 1997).

an intranet and dial-up connections. The network is officially open to all political parties and government offices, but the bulk of the data is accessible only by registered GPC users. The welcoming screen for the network is dominated by the GPC logo, although the network belongs nominally to the Foreign Ministry. During the run-up to the 1997 election, the voters list was updated, and GPC staff used the new lists and the previous election results to predict the outcome of each local race, and target close contests for electioneering. Candidates that looked sure to lose were abandoned. Using this system, the GPC predicted that it would win at least 167 seats (of a total of 301) in the new Parliament; it in fact won 183, despite the fact that fewer than half the registered voters declared for the GPC. The party believes that weak constituencies were identified with 80 percent accuracy and that use of the network to mobilize and efficiently employ its campaign workers accounted for 40 percent of the votes it received. The network is now being adapted for connection to the Internet (www.gpc.org.ye).

Dimension	Level	Explanation
Pervasiveness	(1) *Experimental*	Less than one of every 10,000 Yemenis has Internet access. However, a large percentage of the few Yemenis with access are not computing professionals.
Geographic Dispersion	(1) *Single Location*	There is a single ISP node in the capital, and international satellite links serving the Internet terminate at one earth station.
Sectoral Absorption	(1) *Rare*	Take-up of Internet service has been rare in all sectors.
Connectivity Infrastructure	(1)	There is neither an IP backbone nor an Internet exchange, and only a single international link.
Organizational Infrastructure	(1) *Single*	TeleYemen is the only ISP, although the issue of ISP licensing has not been settled. Should ISPs be licensed, TeleYemen would provide the international access, probably making such ventures uneconomical.
Sophistication of Use	(1) *Minimal*	The exceptionally small user community struggles to use the Internet in any capacity. The sophistication of the GPC's intranet shows promise.

Table 93. Internet Dimensions for Yemen

Determinants

The reasons why the Internet appeared in Yemen so early (relative to its apparent needs, development level, and neighbors) are not completely clear. Nor are its prospects. The principal considerations are summarized in Table 94.

The business community claims that it was pressure from the commercial sector that compelled the government to direct one of its telecommunications companies to offer the service[423] (it fell to TeleYemen because that company has the international communications portfolio). Others say

[423] Abdulaziz al-Saqqaf, personal communication (23 May 1997). Dr. al-Saqqaf is Editor-in-Chief of *Yemen Times*.

that government ministries wanted access to the Internet,[424] and pressed the issue, while it may in fact have been pushed hardest by the prospective Internet equipment vendors themselves.[425] Prior to winning the contract to set up TeleYemen's Internet service, NASS Yemen was very active in extolling the virtues of the Internet, holding seminars, and providing free basic Internet training. Following the start-up of Y-Net, NASS is also one of the few companies that offers a turn-key subscriber's package (TeleYemen provides no support itself), including sign-up, software installation and customization, and training. What is clear, however, is that the process was driven either by commercial or government interests, or perhaps a critical mass of both, with no thought given to the academic community. Students and staff at the College of Medicine, for example, resort to visiting the Foreign Minister's house in order to use his account for research.[426]

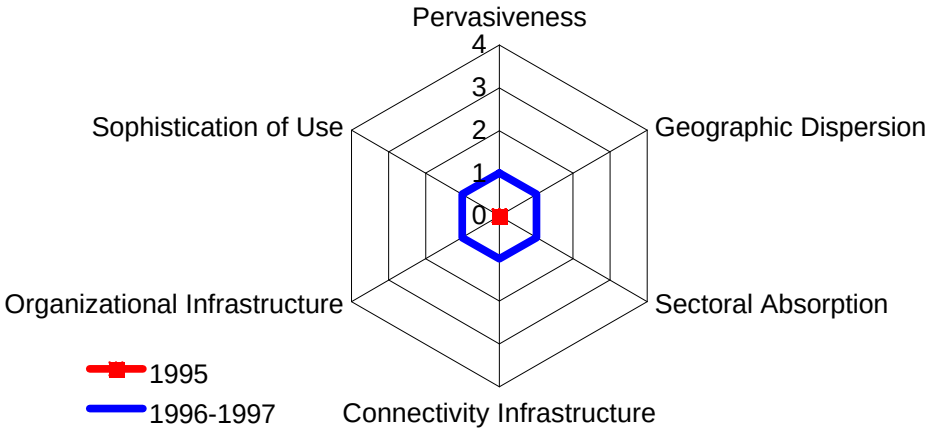

Figure 52. Internet Dimensions for Yemen

In addition to having no clear constituents, or perhaps an unusual number of supporters, the process by which the decision to offer Internet service was taken is unclear. One senior government official said that the government perceived that Yemen was far behind in information technology, so that a proposal prepared by TeleYemen with the assistance of Cable & Wireless was welcomed by the Cabinet. According to this version, a formal report was made to the Council of Ministers, which approved the project after deliberating it during two regular sessions. During these deliberations, the Internet was treated simply as a new communications medium, and there was no thought given to the potential for the medium to be used to introduce unwelcome or inappropriate information into the country.[427]

[424] Abdul-Kareem al-Eriani, personal communication (24 May 1997). Dr. al-Eriani is the Foreign Minister and Deputy Prime Minister of Yemen.

[425] Nasher, *op. cit.*

[426] Al-Eriani, *op. cit.*

[427] Abdulaziz Abdulghani, personal communication (24 May 1997). Dr. Abdulghani is the Chairman of the Consultative Council (i.e., head of the Senate) of Yemen. At the time of the reported Internet deliberations, he

Table 94. Determinant Impact	
Determinant Quality	Affected Dimension
Government monopolization of services	Pervasiveness—Artificially high prices keep the Internet out of the reach of the majority of the population Geographic Dispersion—Services are offered when and where the government cares to do so. Sectoral Absorption—While no sector is apparently either encouraged or discouraged from using the Internet, the lack of support for the academic and health sectors, coupled with the high cost, make the Internet unavailable to those sectors. Organizational Infrastructure—The government maintains the monopoly on international connections, and may constrain competition in commercial services offerings.
Lack of financial resources	Pervasiveness, Sectoral Absorption— The country is poor. Prospective users, especially those who most need the service (e.g., health sector), have been priced out of the market. Geographic Dispersion, Connectivity Infrastructure—There are insufficient funds to build out even a minimal national network.
Lack of interest in information control	Pervasiveness—The lack of government controls removes one potential obstacle to increased use of the Internet, but this potential obstacle is not on the critical path in Yemen.
Lack of strong constituency	Pervasiveness, Sectoral Absorption—Although popular among a few of the elite, there is no strong desire for Internet service, probably due mainly to a lack of awareness, in the mainstream of any sector.
Educational deficiencies	Sophistication of Use—Literacy in any language, preferably English or at least complemented by an adequate familiarity with basic English, is the *sine qua non* of using the Internet at any level of sophistication.

Another version, from an equally senior and informed official, maintained that there was no formal process to the introduction of the Internet. According to this version, the Minister of Communications became aware that there was a market, perhaps even a need, for this service, and asked for assistance from a few select Cabinet members. The issue was kept out of the formal Council of Ministers minutes, in part to keep the process "off the books" and thus out of the bureaucracy, but also to prevent the GPC's coalition government partner, the conservative Islamic Islah Party, from finding out about the project and raising objections on religious or moral grounds. Thus, with encouragement from a few powerful friends, the communications minister is said to have taken the decision on his own account and proceeded to establish an Internet service.[428]

Aside from the issue of the process that brought the Internet to Yemen, a larger question is what use can and will the Yemenis make of this medium. Those few elite with the money and education to use the Internet regularly are clearly grateful for the service, and it may in fact help them perform some functions that will advance Yemen's development. The Foreign Minister talks as glibly

was Prime Minister. Dr. Abdulghani noted that getting pornography via the Internet was difficult, and the results were not so different from what you could find on the newsstand.

[428] Al-Eriani, *op. cit.*

as any Western marketer about the benefits of electronic commerce and of information as a fungible commodity, but then he could afford to pay YR 300,000 (more than $2,400) in advance for ten months of Internet service. But for the great masses, the Internet is as unreachable as it is unknown. They have neither the funds nor the education to use the Internet, but may benefit indirectly should the business community be able to use this technology to reduce costs and improve services. There are some hopeful signs, but they are few and far between in this widely variegated nation of 21 million people.

Problems and Prospects

The principal bars to development of a robust Internet infrastructure in Yemen are the lack of a significant educated base of prospective users, the general poverty, and the poor infrastructure. The latter problem is being tackled, but the other two defy short-term solutions. At present, Yemenis have the enthusiasm but neither the capital nor expertise to effectively join the "information superhighway." A generation or more of development of the educational system is the most likely remedy to this situation, if educated Yemenis can be induced to remain at home in the interim.

It is most likely that the Internet service will limp along for the foreseeable future with a very few users paying a very high price, the marginal benefit of which will not be readily apparent. The Yemeni government and people, however, can reasonably be said to have many other issues more urgent than this one. Like that dog that talks, but only poorly, the marvel here is not that the Internet is used well or widely, but that it is used at all.