

Networked Information in Turkey

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Introduction

Computer networks have been in use for more than two decades. Yet, the proliferation and widespread use of networks is a relatively new phenomenon. For instance, the number of networks connected to the Internet, the major research and education network, is mushrooming. The usage of the Internet grew 95% all over the world in 1994. Some 160 nations are interconnected to each other through the Internet. Every 30 seconds, another network of computers joins the Internet. It interconnects almost five million computers (federal, national, regional, etc.) worldwide. The number of people that can be reached via the Internet is said to be around 30 million. Some 1.1 million school and university computers, more than 200.000 government computers, almost 100.000 organizations and businesses are accessible through the network. As these figures show, the Internet is no longer a network to support the military research only. Today, the Internet is an international network used for research, commerce, education, entertainment, and so on. It is an "information superhighway" to get access to rich information sources (archives and library catalogs, medical and police records, scientific data, etc.) in all forms (textual, graphic, multimedia).

A Brief History of Networking in Turkey

Parallel with the growing global interest in networking, the initial networking projects in Turkey have begun in the second half of 1980s. Undoubtedly, these earlier attempts were closely associated with the developments in telecommunication services in Turkey which has been progressed enormously in recent years. TÜVAKA (Turkish Universities and Research Institutions Network), the first Turkish network open to all universities and non-commercial research institutions without a fee, was set up in 1986 at the Aegean University to provide a Bitnet connection. The same year in October, TÜVAKA was connected to EARN (European Academic and Research Network) via Pisa in Italy. The TÜVAKA's EARN connection enabled Turkish universities to get access to similar networks around the world such as Bitnet and the Internet and to communicate with both European and American academic and research institutions.

In the beginning twelve universities including the major ones such as Istanbul, Ankara, the Middle East Technical (METU), and Bosphorus Universities, and TÜBİTAK (The Turkish Scientific and Technical Research Council) joined TÜVAKA.

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Aegean University was connected to TÜVAKA as an international node through which the EARN connection was provided. In addition to Aegean, Yıldız and Anatolia Universities also became the main nodes. These three nodes constitute, geographically, the back bone of the TÜVAKA network. All other participants are connected to the system via these three main nodes. Today, an overwhelming majority of universities are connected to TÜVAKA.

Networking facilities provided by TÜVAKA were rapidly exhausted. The fast-growing demand for networking among Turkish universities and research institutions made it a necessity to join the Internet. In 1991, in cooperation with METU and TÜBİTAK, TR-NET (Turkish Network) was set up to establish the Internet connection of Turkey and promote it within the country.

Turkey joined the Internet on April 12, 1993 through a link between the METU and the NSF (National Science Foundation) in the US. The second link has been realized in early 1994 between the Aegean University and the EBONE in Germany. The speed of both connections is slow (64Kbit/second), although the METU link is expected to be upgraded (to 128Kbit/second) soon. The Bitnet-Internet gateway in Turkey is through the Aegean University.

Although the national Internet structure has yet to be completed in Turkey, most universities have connected to METU, and thus to the Internet, via X25 or leased lines within the last two years. Bilkent, Gazi and Hacettepe Universities in Ankara, Bosphorus and Istanbul Technical Universities in Istanbul, Aegean University in Izmir and the University of Anatolia in Eskişehir can be given as examples. There are almost 40 domains belonging to the Turkish educational institutions (including some lycées). From the public sector, some 15 governmental bodies including the Central Bank of Turkey, the Ministry of Foreign Affairs and the State Institute of Statistics are on the Internet. Within the last couple of months, commercial companies have also shown great interest in joining the Internet. Currently more than 20 commercial Turkish companies and one non-profit organization (The Union of Chambers and Commodity Exchanges of Turkey) are accessible via the Internet. In addition, some organizations and professional associations (e.g., the Turkish Academy of Sciences, Informatics Association of Turkey and the Turkish Librarians' Association) offer gopher and Web services through the Bilkent University. Two service providers allow some 2000 individual users to get access to the Internet facilities (such as email, gopher, and the Web) via dial-up lines from their homes or workplaces.¹ It is estimated that currently some 25.000 Turkish users have access to the Internet.

Networked Information Services

Various network services are offered by the Turkish universities and research organizations through the Internet and TÜVAKA. For instance, network users are able to send and receive electronic mail messages and files over the network, get access to computer conferences through mail servers such as listserv and listproc, and query remote databases and library catalogs by telnet and email. These services are briefly explained below.

¹ A document listing all the domains in Turkey and the services they offer is available through the Bilkent University Archives (URL: <ftp://ftp.bilkent.edu.tr/pub/INFO/Turkce/css/inet-tr.css>).

Services Available Through Electronic Mail

Electronic mail (email) allows people to correspond with each other electronically over the network. From the very beginning, email facilities were made available to the TÜVAKA and, later, the Internet users. Yet email has yet to be the prevailing communication medium within the Turkish academic and scientific community. Somewhat limited access to computer resources and the general level of computer literacy prevented most users from becoming acquainted with email services in the beginning. The email traffic in Turkey has shown a tremendous increase in recent years, especially after joining the Internet in 1993. The infrastructure that allowed us to connect to the Internet had also taken away part of the email traffic that came through the TÜVAKA. Some of the email problems (i.e., slow delivery, lost messages) were alleviated to some extent.

Turkish network users have access to several email-based information services such as discussion lists and newsgroups which are accessible through two listservers (at Aegean and Istanbul Technical Universities) and three listproc programs (at METU, Bilkent and Bosphorus Universities). There are some 100 discussion lists on a wide variety of topics ranging from general science (dost@trearn.bitnet) to libraries (kutup-l@knidos.cc.metu.edu.tr), from the Internet (inet-tr@knidos.cc.metu.edu.tr) to Turkish stock exchange (borsa@trearn.bitnet), and from poetry (siir@trearn.bitnet) to natural language processing on the Turkish language (bildil@knidos.cc.metu.edu.tr).² Postings to conferences are usually in Turkish or English. Some conferences are more active than the others.

The General Directorate of the Press and Information of the Ministry of Foreign Affairs provides the daily political and economic news that appear in the Turkish press in three languages (Turkish, English, and German) through a mailing list (listproc@listserv.metu.edu.tr). Users can subscribe to this service (*haberler*) by sending an email message to the above address.

Some library catalogs and archives can also be consulted via email messages. For instance, library catalogs of Bilkent (blissnet@trbilun.bitnet), Anatolia (kybele@tranavm2.bitnet), Euphrates (firatlib@trfirat.bitnet), Mediterranean (aksea@trakden.bitnet) and Mimar Sinan (msulib@trmsu.bitnet) Universities and the Bilkent Archive (bilserv@trbilun.bitnet or bilserv@bilkent.edu.tr). In addition, Turkish network users can search the logs of discussion lists and transfer files by sending their queries as either email messages or files that contain structured search queries in the Bitnet environment (using the listserv and trickle programs).

Services Available Through Telnet and Ftp

Telnet is used for (remote) logging into other computers on the Internet. It is used to get access to lots of public services including library catalogs and other kinds of databases. Although several Turkish university libraries are in the process of automating their housekeeping activities, only a handful of library catalogs can be queried interactively. The following libraries and information services are accessible via telnet: Bilkent and Anatolia University Libraries (bliss.bilkent.edu.tr and vm.baum.anadolu.edu.tr, respectively), and the

²To subscribe to any of these computer conferences, send an email message to the relevant list server. I.e., to join kutup-l (Turkish Libraries Discussion List), send the following email message to listproc@knidos.cc.metu.edu.tr: *Subscribe Kutup-L First Name Last Name*.

TÜBİTAK Library (side.tetm.tubitak.gov.tr). The catalog of the Turkish National Library will soon be available interactively once the National Library becomes a host on the Internet. (Currently, its online catalog is accessible via a dial-up modem connection.) In addition, TÜBİTAK (kalkan.tetm.tubitak.gov.tr) has a few national bibliographic databases (journal articles) on the subjects of science and technology, medicine, and environmental science that are open to the network users. These information services can also be accessed through the gophers of each organization.

The Central Bank of Turkey (CBT) provides daily exchange rates and CBT's weekly, monthly and quarterly bulletins and some statistical data about money and credits in the form of time series. This service is available via telnet (tcmb580.tcmb.gov.tr).

The Legislative Information System of the Prime Ministry can also be accessed via telnet (edpnovell.basbib.gov.tr). It provides the full-text of the *Resmi Gazete* (Official Journal) as well as some other legislative documents for a fee.

File transfer protocol (ftp) is an Internet tool for transferring files back and forth from public archives over the network. Several Turkish universities and research institutions including METU, Bilkent, Bosphorus, Aegean Universities and TÜBİTAK have developed electronic archives open to anonymous ftp. From the very beginning, METU and Bilkent Universities have been collecting the source codes of some useful programs and documentation about the Internet services. METU (ftp.metu.edu.tr) also mirrors some of the well-known ftp archives in the world such as those of SimTel, Cica, Novell and Sun. The Bilkent University Archives (ftp.bilkent.edu.tr), on the other hand, collect documentation on the Internet both in Turkish and English and an excellent TeX archive, PC programs and source codes of Internet service programs which is searchable not only through telnet but also through the Internet Gopher, jughead and the Bilkent mail server (*bilserv*).³

Services Available Through the Internet Gopher, World-Wide Web and WAIS

The Internet Gopher is a distributed document search and retrieval system. Some thirty universities, government agencies and commercial companies have set up their own gopher servers. Among them are the Bilkent, METU, Istanbul Technical and Aegean Universities, TÜBİTAK, the Central Bank of Turkey and the State Institute of Statistics, and the Bilkom, Inc. Online phone books and directories are usually made available through gopher. The services of the METU, Bilkent and Anatolia Universities, the Central Bank and TÜBİTAK (library catalog, ftp archives, etc.) that we mentioned earlier can also be accessed through the Internet Gopher. The logs of discussion lists and the daily news summaries of the General Directorate of the Press and Information hosted by METU are also available via gopher as well as the Web. TÜBİTAK offers the full-texts of the back issues of some of its scientific journals (e.g., *Doğa Journal of Medical Sciences*) and bulletins (*Informatics Bulletin*) as well as the full-texts of RFCs (Request for Comments) about the Internet. The electronic copy of the *Türkiye Bilgi Merkezleri Rehberi* (Guide to Information Centers in Turkey), which lists the addresses and services offered by some 85 libraries and information centers, is also available online through the TÜBİTAK gopher. The State Institute of Statistics provides access through its gopher server to summary statistics about Turkey on its population, agriculture, industry, and construction sectors, imports and exports, wholesale and consumer price indexes, and the GNP.

The Wide Area Information Server (WAIS) and the World-Wide Web (WEB or WWW) are the newer information discovery and retrieval tools on the Internet. These tools are based

³ A document about the files and programs available in the Bilkent University Archives can be obtained from URL: <ftp://ftp.bilkent.edu.tr/pub/INFO/Turkey/Internet/bilkent-arsiv.xxx>.

on the hypertext model of information representation and allow users to get access to information services in a distributed environment. Many Turkish sites including universities, public and private companies set up their own Web home pages where they provide information about their services and products. However, very few information services are available through the Web and WAIS in Turkey. For instance, the Web home page prepared by the Ministry of Foreign Affairs contains much useful information about Turkey. Some daily newspapers including Sabah, the Turkish Daily News and Yeni Asır are also accessible through the Web. The Sabah Group made one of its printed magazines, *Aktüel*, available through the Web to all the Internet users (<http://www.sabah.boun.edu.tr>), which is one of the very first experiments in electronic publishing in Turkey. On the other hand, some organizations and professional associations (e.g., the Turkish Librarians' Association, the Turkish Mathematical Society, and the Association of Operational Research) designed their home pages using the Bilkent University computing facilities and included their membership lists and some of their publications in these pages.

The Bilkent University and the Marmara Institute of Research of TÜBİTAK are among some of the institutions that have Web and WAIS accounts that are open to all network users in Turkey. Such free access to the Web and WAIS accounts will increase the awareness of the Turkish users about the availability of a wide variety of information services in the world.

Conclusion

As our brief review shows, there have been a number of important developments with regard to networking in Turkey in recent years. The demand for network services is growing tremendously since Turkey joined the Internet in 1993. A large number of universities, governmental bodies and commercial companies have shown interest in making their information services available over the network. For example, the State Planning Organization, the Undersecretary of Treasury and Foreign Trade, and the Export Promotion Center are planning to set up their own information servers to make available some of the unique information sources that they own.

Turkey is often seen as a bridge between the East and the West. In view of the recent developments in the former U.S.S.R. and the establishment of sovereign nations, Turkey is likely to assume a more important role in the region and can become a networking hub among the Black Sea and Islamic countries with a sound telecommunication infrastructure. This would further facilitate the free flow of information between the East and the West.

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