ICT in Afghanistan

(two-way communication only)

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Summary

Two years after Taliban left Kabul, there is about 172 000 telephones in Afghanistan in a country of assumed 25 mill inhabitants.

The MoC has set up a three tier model for phone coverage, where the finishing of tier one and the start of tier two are under implementation. Today Kabul, Herat, Mazar-i-Sharif, Kandahar, Jalalabad, Kunduz has some access to phones, but not enough to supply the demand. Today there are concrete plans for extension to Khost, Pulekhomri, Sheberghan, Ghazni, Faizabad, Lashkergha, Taloqan, Parwan and Baglas. Beside the MoCs terrestrial network, two GSM vendors (AWCC and Roshan) have license to operate.

The GoA has a radio network that reaches out to all provinces.

10 ISPs are registered. The .af domain was revitalized about a year ago, now 138 domains are registered under .af.

Public Internet cafes exists in Kabul (est. 50), Mazar-i-Sharif (est. 10), Kandahar (est. 10) and Herat (est. 10), but NGOs has set up VSATs also in other cities. The MoC has plans for a fiber ring, but while the fiber ring may take some time, VSAT technology are utilized.

Kabul University is likely offering the best higher education in the country. Here bachelor degrees in Computer Science are offered. Cisco has established a training centre in the same building offering a two year education in networking. The Islamic University of Science and Technology in Jalalabad and Herat, Kandahar University and Khost University/Afghan university also offers computer science education.

Computer education is popular, so a number of private computers and English training centres have grown up in the larger cities. They are mostly offering basic computer training for Windows, MS Office and Internet along with English. Several NGOs have established similar centres. GoA employees and partners have their own labs for computer education and networking.

Women are offered separate or integrated basic computer training at the NGO's centres. There are women being educated at Kabul University, at NGOs and in the Cisco lab. At least one Internet cafe in Kabul has a female owner.

A handful of commercial companies are offering software development or related activities. In addition there exist quite a few companies offering basic computer hardware, software and installation.

There is a small computer interest group called Afghan Computer Science Association (ACSA) was initiated in 1999. ACSA publishes a bimonthly magazine *The Computer Science* in Pashto and Dari.

Books are imported from Iran and Pakistan, in addition some 10-15 basic computer books is even available in Dari and Pashto.

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Preface

This report aims at looking into existing information and communication technology (ICT) infrastructure and plans for Afghanistan in the nearest future. It is based on Internet information and received information through e-mail with stakeholders. Also, information was collected by the first author from a three week trip to Kabul in August 2003 and by means of the extensive knowledge of the second writer. The purpose of writing the report has been to collect information on ICT status in Afghanistan to see if telemedicine could be implemented. Thus, the report focuses on two-way communication ICT initiatives related to education, media, government/state, health, women, and public services in general. One-way ICT solutions have been left out, although radio and TV is likely the most efficient tool for reaching out to people with basic health care information. Several initiatives are likely missing and some information can be outdated or even incorrect. This is partly due to the many existing initiatives which is differently announced, and partly due to lack of available information channels in Afghanistan.

The Norwegian Centre for Telemedicine financed the pre-study.

The Islamic calendar (currently at year 1382 lasting until 20. March 2004) is used in some GoA documents. Referring to these documents we have chosen to use Gregorian dates, with the Islamic year in brackets since many western readers are unfamiliar with the Islamic calendar, while most Afghans reading English also knows about the Gregorian calendar.

4. February 2004

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Abbreviations

AACA	Afghan Assistance Coordination Authority
ABM	Afghan Business Machine
ACC	Afghan Computer Center
ACSA	Afghan Computer Science Association
AFGNIC	Afghan Network Information Center
AKFED	Aga Khan Fund for Economic Development
APDIP	Asia-Pacific Development Information Program (UNDP)
ASDHA	Associació pels Drets Humans a l'Afganistan
AWCC	Afghan Wireless Communication Company
AWRC	Afghan Women's Resource Centre
AWWD	Afghan Women's Welfare Department
BSS	Base Station Subsystem
ccTLD	Country Code Top Level Domain
C-band	Frequency ranges from 3700 MHz to 4200 MHz
CD-ROM	Compact Disk, Read Only Memory
CDMA WLL	Code Division Multiple Access, Wireless Local Loop
CIA	Central Intelligence Agency
DTP	Desktop Publishing
DTRS	Digital Trunk Radio Services
E1	Int standard wide area network standard working at 2048 kbps
EDP	Electronic Data Processing
ET	Enabling Technologies Limited
FM	Frequency Modulation
GoA	Government of Afghanistan
GCN	Government Communication Network
GSM	Global System for Mobile Communications
HAWCA	Humanitarian Assistance for the Women and Children of Afghanistan
IANA	Internet Assigned Numbers Authority
ICT	Information and Communication Technologies
IDC-G	The International Day of Charity – Golf
IEEE	Institute of Electrical and Electronics Engineers Inc.
IGA-FS	International Golf Associates Franco-Suisse Chapter
ISO	International Organization for Standardization
IP	Internet Protocol
IT	Information Technology
ILO	International Labour Organisation
ISM	Industrial, Scientific and Medical
ISP	Internet Service Provider
ITCK	IT Center in Kabul University
ITU	International Telecommunications Union
IUST	Islamic University of Science and Technology
KU-band	Frequency ranges from 10.7 GHz to 12.75 GHz
LAN	Local Area Network
MCT	Multipurpose Community Telecentres
MoC	Ministry of Communication
MoWA	Ministry of Women's Affairs

MS	Microsoft
MSC	Mobile Switching Center
MTI	Monaco Telecom International
MW	Medium Wave
NGO	Non-governmental Organization
NITA	National Information Technology Agenda
NITCA	National Information and Technology Council of Afghanistan
NSS	Network Sub System
PABX	Private Access Branch Exchange
RF	Radio Frequency
RINSCA	Regional Informatics Network for South and Central Asia
SMS-C	Short Message Service Center
TDCA	Telecom Development Company Afghanistan
TDF	Telecommunications Development Fund
TRAA	Telecommunications Regulatory Authority of Afghanistan
TSI	Telephone Systems International Inc
TTC	Telecom Training Centre
UNESCAP	United Nations Economic and Social Commission for Asia and the
	Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
UNIFEM	United Nations Development Fund for Women
USAID	U.S. Agency for International Development
USB	Universal Serial Bus
USTDA	U.S. Trade and Development Agency
UN	United Nations
UNDP	United Nations Development Programme
VMS	Voice Mail Service
VSAT	Very Small Aperture Terminal

Introduction

By December 2003 Afghanistan had one of the weakest telecommunications systems in the world with ca 172 000 telephones (140 000 GSM phones, 32 000 terrestrial phones). Assuming that Afghanistan has 25 million inhabitants, only one out of every 145 Afghans have access to telephone services. This level is below the developing country average of 38,5 persons per phone. On the other hand, there has been a great increase during the last year when the figure was one phone per 550 Afghans¹.

In the late nineties, the number of telephones in use according to CIA was assumed to be around 29,000 (1998). In 1997 telecommunication links had been established between Mazar-e-Sharif, Herat, Kandahar, Jalalabad and Kabul through satellite and microwave systems. To reach international destinations one Intelsat (Indian Ocean) connection was linked only to Iran and one Intersputnic (Atlantic Ocean region) reached abroad otherwise. There was a commercial satellite telephone center in Ghazni².

National policies, strategies and authorities

Papers on policy and strategy

In October 2002 the Ministry of Communication (MoC) created a Telecommunications Development Strategy³ and also made available a National Telecommunication Policy Paper and a draft Information and Communication Technologies (ICT) Policy Paper⁴. The drafts came after a workshop organized and hosted by Asia-Pacific Development Information Program (APDIP) UNDP. A delegation of high officials from the government and ICT professionals took part in the workshop.

3. July 2003 the MoC finished an updated version of the policy document by the Telecommunications and Internet Policy Final Working Draft⁵ and Information and Communication Technologies (ICTs) Policy (draft)⁶.

Telecommunications Regulatory Authority of Afghanistan (TRAA)

The Telecommunications and Internet Policy Final Working Draft⁵ includes planned actions to establish an independent Telecommunications Regulatory Authority of Afghanistan (TRAA) before 20. March 2004 (end of Islamic year 1382), to ensure regulatory transparency and fair treatment for all market participants. TRAA will be authorized as an independent agency reporting to the Ministry of Communications. Areas of responsibility includes implementation of a national policy of competition and market liberalization together with issuance of licenses for provision of mobile, fixed and other network services and for Internet Service Providers (ISP) among several other tasks.

MoC's Spectrum Management Office

At their homepages ITU announced in December 2002 that ITU will help establish an equipped and operational Frequency Management Unit within the MoC and will prepare a table of frequency allocations; update the national administrative regulation; assess present and future spectrum requirements; work out a country-wide coverage map for MW, FM and TV broadcasting; elaborate a guide for spectrum monitoring and station inspection; establish a computerized frequency management system and training for local staff in frequency spectrum planning and management activities. Afghanistan's Ministry of Culture and Information, which is responsible for frequency assignment for broadcasting use, will also be a beneficiary of this project⁷.

In the Telecommuncations and Internet Policy Final Working Draft it is stated that no entity is permitted to utilize licensed radio spectrum without first obtaining a Spectrum License from the Spectrum Management Office, with exception for the use of Unlicensed Radio Spectrum as specifically defined in the policy and by regulations adopted by the TRAA.

Furthermore, it is stated that the MoC's Spectrum Management Office will work closely with other government agencies and the TRAA⁵.

National Information and Technology Council of Afghanistan (NITCA)

According to the Information and Communication Technologies (ICTs) Policy a National Information and Technology Council of Afghanistan (NITCA) will be established before 20. March 2004 (end of Islamic year 1382). The Council's mandate will be to provide advisory services to the Government in all matters related to ICT and to act as a coordinating focal point. The Council will initially be hosted and chaired by the MoC and the MoC will publish guidelines for the efficient, transparent and open operation of the Council before opening date. The initial task of the Council will be the formulation of a National Information Technology Agenda (NITA), which will chart a path for the development of the country's ICT sector⁶.

The NITCA will in ICT matters present the state of Afghanistan internationally at trade shows and conferences with a well-articulated, focused and comprehensive strategy and publish investment information through a specialized web site⁶.

Telecommunication Development Fund (TDF)

A Telecommunications Development Fund (TDF) administered by the MoC has been established to which all licensed network service providers must contribute. The fund will be used only for re-investment in telecommunications infrastructure projects of strategic importance, including for public safety, or to provide basic access services in communities not adequately addressed by licensed operators. The MoC will develop criteria for such investment⁵.

The amounts and uses of the fund will be made public, and subject to terms established by TRAA. The mobile and fixed service providers in Afghanistan will contribute 2.5% of gross revenues to the TDF. Any licensed operator may apply to the MoC to receive funds to support specific infrastructure expansion projects⁵.

ICT Technology Park

According to the MoC's ICTs Policy an ICT Technology Park will be established based in Kabul in order to spur investment and growth of the sector. The park will host ICTs operators and companies engaged in the sector. The MoC will develop a detailed plan for establishment and operation of the Technology Park. It is envisioned that the Technology Park will, among other things, serve as a local business incubator providing facilities, access to management and operational expertise, and act as a conduit for venture capital funds. Furthermore, "virtual ICTs Technology Parks" located in regions of Afghanistan with similar benefits and tax incentives as described above will be promoted to give impetus to private investment in the ICT sector on the local and regional level⁶.

Networking infrastructure



Figure 1. Ministry of Communcation building, Kabul. Photo: Torill Iversen.

Providers and infrastructure

Ministry of Communication (MoC)

City capacity

In October 2002 the city telephone switching capacity was the following³:

City	Capasity	Active
Kabul	27,000	20,150
Herat	7,800	7,000
Kandahar	5,000	n/a
Mazar-e-Sharif	3,500	3,500
Kunduz	1,000	1,000
Jalalabad	1,400	1,400

Table 1. City telephone switching capacity.

Many of the analogue lines in service are more than 45 years old, installed at that time by Siemens⁸. In Kabul, the MoC has 8,000 analogue lines out of a switch capacity of 15,000. About 45% of the existing fixed network in Kabul city has been restored. There is also a fixed line digital switch of capacity 12,000 where 7,000 lines are active. There is no dynamical interconnection between the analogue and the digital network, but there is an ongoing project to

decommission analogue exchanges and transfer the lines to the digital exchanges in Kabul. This will allow communication between GSM and the older analogue system³. Public phone boots exists in the bazaar of Kabul.

Only Herat has a modern functioning landline telephone network, complete with public call booths⁹. This network has a 7500 fixed line digital system where most of the lines are active³.

In October 2002 a 5000-line digital switch was commissioned for Kandahar³.

MoC plans to expand the different cities today to the following number of lines³: *Tier 1:*

City	Expansion
Kabul	38000
Herat	5000
Kandahar	5000
Mazar-e-Sharif	10000
Kunduz	2500
Jalalabad	5000

Table 2. Telephone expansion plans as of October 2002.

Tier 2: Pulekhomri, Parwan, Juzjan, Khost, Ghazni, Faryab, Takhar, Helmand, Badakhshan, Paktikya, Farah. Minimum upgrade is with 1000 lines each.

Tier 3: Rural areas

In addition to shortage of basic telephone switching capacity, the local transmission network delivering last mile services, presents an even more difficult bottleneck. The cabeling conduit, trunk cables and copper wires are destroyed or in poor condition³.

In July 2003 the MoC announced its intention to invite bids for a project to implement CDMA WLL for 35000 lines in four major cities of Afghanistan to solve some of the shortage¹⁰:

- 20000 lines for Kabul
- 5000 lines for Khost
- 5000 lines for Kunduz
- 5000 lines for Jalalabad

21. August 2003 the MoC signed a contract with Huwei and ZTE for total of 100 thousand telephone lines. The digital switching equipment is part of the MoC's development plan for 2003/2004 (Islamic year 1382) and will cover the cities of Kabul, Mazar-e-Sharif, Kandahar, Jalalabad, Khost, Kunduz, Pulekhomri, Sheberghan, Ghazni, Faizabad, Lashkergha and Taloqan^{11,12}.

14. January 2004 the MoC invite bids for procurement of goods and associated services: replacing the satellite dish, upgrading the power supply and other equipment; and installation and maintenance of the earth station in Kabul¹³.

USAID has provided the Ministry with a computerized accounting and billing system. The project included computer equipment, a billing system, and training for those who are responsible for operating the system¹⁴.



Figure 2. National backbone and international connections plans, MoC (Oct 2002)³. On the picture map, the red line depicts the proposed fibre-optic network following the country's ring road. The blue line in the north reflects the Trans-Europe-Asia fibre cable. The green lines depict proposed international links negotiated as bilateral agreements with Afghanistan's neighboring countries. This provides alternative routing as traffic demands increase, reducing the need for satellite communications.

Backbone and international connections

As of October 2002 there is long distance communication by VSAT between Kabul, Mazar-e-Sharif, Herat and Kandahar. Jalalabad has a VSAT but no switch to connect, while Kunduz has no VSAT terminal³. Instanet installed a 5 V-sats in the main cities to give the backbone transmission to connect its digital lines¹⁵. In October 2002 there was no national, publicly owned international gateway³. Afghan Wireless Communication Company (AWCC, see below) owns the primary international gateway routed via satellite through Guam.

Some of the existing microwave links have been upgraded by replacing damaged towers and repeaters to enable a 2 Mbps international line connection through Pakistan from Kabul ³.

11. January 2004 the MoC invited bids for procurement of goods and associated services to build a SDH Microwave Network between Kabul and the Eastern provinces including Jalalabad, Nuristan, Kunar, Laghman, and terminating in Peshawar (Pakistan).¹⁶

According to MoC's Telecommunications Development Strategy, a national fiber ring on a ring road is under construction (figure 2). As the ring road begins to complete, cities will convert from

a dependency on VSATs for their national and international communications. The top cities will become the centres of the primary exchanges and depending on the topology and demand of the remaining cities, there will grow a gradual network of secondary and local exchanges linking all the main provincial cities of the country³.

In March 2003 the U.S. Trade and Development Agency (USTDA) awarded a \$280,081 grant to the MoC to fund a feasibility study on the proposed 3300 km telecommunications backbone ring. The USTDA-funded study has assessed the technical and financial feasibility of the MoC telecommunications backbone project and has also recommend options for its implementation¹⁷. This feasibility study has now been completed¹².

Afghan Telecom

According to the Telecommunications and Internet Policy Final Working Draft, MoC will separate the Telecommunications Department of the MoC, including authorizing the transfer of related assets, to a newly established state owned enterprise, Afghan Telecom. At the time of the establishment, Afghan Telecom shall be a public corporation owned by the Government and administered by the MoC. However, Afghan Telecom is encouraged to engage operating and investment partners to become a market-oriented and commercial enterprise.

Afghan Telecom's charter to provide domestic and international telecommunications services in Afghanistan will be normalized with forthcoming licensing requirements that will be published by TRAA⁵.

National licenses for fixed lines

The MoC will issue two new national licenses for fixed service providers through a competitive selection procedure. To develop public access networks as fast as possible, initial obligations will be divided into two geographic regions with Kabul being common to both. Tenders will be issued to invite companies to engage in the provision of voice, data and Internet services. Either operator fulfilling its licence obligations early will be free to enter the other region. Fixed service providers will be free to carry their own long distance traffic. Companies licensed to operate public telecommunications services will be obligated to provide interconnection for purposes of transmitting traffic between different networks⁵.

Afghan Wireless Communication Company (AWCC)

Only one month after the Bonn agreement in November 2001, the Afghan-American entrepreneur Ehsan Bayat initiated Afghan Wireless Communication Company (AWCC). Before he had started an American telephone company called Telephone Systems International Inc (TSI). AWCC was initiated as a joint venture by the MoC and TSI, where the MoC holds 20% of the stakes¹⁸. AWCC became a member of the GSM Association at the April 2002 plenary meeting held in Rome, Italy¹⁹.

In April 2002 the first GSM service was launched in Kabul with four base stations. Afghanistan's interim leader, Chairman Hamid Karzai, launched the GSM network by placing the first call to an Afghan émigré in Germany. In November the network was upgraded to 13 base stations, focusing on the area around the Ministries building and the Bazaar. In August 2002 Herat was connected with GSM, in September Mazar-e-Sharif and in November Kandahar¹⁸.

In November 2002, AWCC donated 30 phones to the Ministry of the Interior for use by Kabul police and fire units¹⁸.

Since 2002 Kabul's GSM network offered irregular service and its capacity has been insufficient for its 12,000 customers. The Minister of Communication, Mohammad Massom Stanekzai, ordered AWCC to stop taking new subscribers until it could handle its current customer base¹⁸. In May 2003, the network was heavy loaded with traffic at least for placing international calls. International phone calls thus were often disconnected when a period was finished. In August 2003 AWCC informed that their drop call rates again were no larger than other phone companies²⁰.

In January 2003 AWCC network was hosting more than 25,000 subscribers handling 30,000 call during peak hours. The city switch was upgraded to handle 35,000 simultaneous phone calls²⁰.

In November 2003 AWCC finished the installation of a new 100,000-line Siemens mobile switch, which will significantly upgrade network capabilities as well as add capacity to Afghanistan's capital city network. This switch will also enable AWCC to extend service to Jalalabad. Afghan Wireless will redeploy existing equipment to Jalalabad and other cities where service has not yet been initiated. AWCC has invested more than \$14 million on Siemens equipment, among them all of AWCC's cell sites. Parwan, Kunduz and Baglas are now mentioned in AWCC's latest expansion plans²⁰.

Along with the network upgrade there will also be an improved billing and customer care system from Argent Networks Ltd, which will enable AWCC to provide new products such as international roaming²⁰.

AWCC has the primary international gateway in the country today, operated via satellite from an international carrier located in Guam. Global outbound calling goes to Guam and there enters the international networks. Global inbound calling to the +93 country code for Afghanistan from Europe and the Middle East is routed mainly to USA and from there to the Guam station³. In Afghanistan, AWCC operates the one satellite station with a capacity of about 250 lines.

AWCC currently operates a digital wired service in Kabul connecting some of the Ministries and public telephone booths to its international satellite switch. There are similar operations in Herat and Mazar-e-Sharif with lower numbers whilst Kandahar is estimated to have 750 active lines (per December 2002)³.

AWCC mobile network operates at GSM 900 MHz, which is also common in Europe and Asia²¹.

In August 2003 there was connection between the two GSM providers AWCC and Roshan. In January 2004 AWCC served around 70.000 subscribersⁱ.



Figure 3. A Roshan poster advertisement in the streets of Kabul.

Roshan

Telecom Development Company Afghanistan (TDCA), trading as Roshan, was awarded Afghanistan's second GSM license 5. October 2002. Roshan consists of an international consortium led by the Aga Khan Fund for Economic Development (AKFED) and comprising Monaco Telecom International (MTI), U.S.-based MCT Corp. and Alcatel²². AKFED controls 51% of the equity in the operating company, MTI 35% and MCT 9%. Alcatel controls 5% and also provides financing for technical equipment.

Roshan was per January 2004 established in Kabul, Herat, Mazar-e-Sharif, Jalalabad and Kunduz. Kandahar will be connected during Ferbruaryⁱ. The phased initiative is expected to expand its network to other cities over the next four to five years. Services at least planned are telephony, fax, data transfer, conference calling and voice mail²². Is December 2003 Roshan had coverage and was represented with quite a few sales stores in Kabul. In January 2004, Roshan had about 70 000 subscribersⁱ.

Alcatel is supplying Roshan with a radio base station subsystem (BSS) and a core network sub system (NSS), including a mobile switching center (MSC). The network includes an Intelligent Network platform for value-added services such as voice mail service (VMS) and a short message service center (SMS-C) supplied by Alcatelⁱ. To carry high-capacity traffic, the network is also deploying Alcatel microwave radio and carrier-class transmission solutions, both managed by Alcatel's integrated transport network management platform.

The network will also encompass Alcatel VSAT connections for both domestic and international communications²².

Roshan's mobile network operates at GSM 900 MHz²¹.

ⁱ E-mail connunication with Samir Satchu, Roshan, 28. January 2004.

Radio frequency network

In some rural areas, especially those with large refugee populations, have received push-to-talk access over radio frequency (RF) systems operated or donated by the UN, USAID and other relief organizations³.

According to the Telecommunications and Internet Policy Final Working Draft, networks like digital trunk radio services (DTRS) and analog trunk mobile radio systems are allowed for private use. A spectrum license is however required and the assignment of radio frequency shall be made via competitive tender. Trunk mobile radio systems will not be permitted to establish interconnection to other licensed operators or international gateway services⁵.

Satellite

VSAT technology is a relatively inexpensive technology for Internet to permanent locations. One example: Internews has provided their Kabul news station with Internet connectivity using the Star-Trio system, bought readily available from Horizon communications in Spain²³. The package cost was about \$ 8500 for one year availability of a 512 kbps downlink (maximum 2 mbps is available) including service and shipping to Kabulⁱⁱ. Geostationary satellites like Thuraya²⁴, Intelsat²⁵, Inmarsat²⁶, Eutelsat²⁷, Thaicom²⁸ and possibly also Thor²⁹ are all able to access Afghanistan. In addition both the low-orbit satellite systems Iridium³⁰ and Globalstar³¹ may be utilized.

In the MoC's Telecommunications and Internet Policy the use of VSAT to access domestic or international satellite systems is allowed for private use, but requires registration of equipment. Furthermore are owners of private VSAT systems not permitted to transit or interconnect international traffic to licensed operator's network⁵.

For mobile services, there are satellite phones, but these services are usually priced \$6-8 pr minute for 64 kbps and thus do not come cheap. Thinking in terms of sustainability, this is not a viable option. The Iridium Satellite LLC is offering narrow-band communication of 2.4 kbps through dealers for ca \$1-1.50 pr minute³².

According to the Telecommunications and Internet Policy Final Working Draft, Global Mobile Satellite Service Providers must obtain a license to provide services over the territory of Afghanistan. Furthermore, satellite phones shall only be distributed through authorized dealers⁵.

ⁱⁱ E-mail communication with Christian Quick, Internews Afghanistan, 7.May 2003



Figure 4. Terrestrial telephone lines and TV antennas in a Kabul neighborhood.

Cable television services

Before October 2001 at least 10 television broadcast stations existed, where one government-run central television station was situated in Kabul with regional stations in nine of the 32 provinces. In 1997 there was also a station in Mazar-e-Sharif reaching four northern Afghanistan provinces².

In cable companies provide services to about 7,000 subscribers in Kabul³³. These are mostly among middle class, but it is even possible to watch TV in small video saloons. Improvised satellite dishes are made locally out of sheet metal from tin cans.

According to the MoC's Telecommunication and Internet Policy Final Working Draft any cable services operator that seeks to provide two-way or interactive telecommunications or Internet services must apply for the appropriate licenses from the TRAA⁵.

Temporary network infrastructure

United Nations (UN) network

Ericsson established a mobile network in Kabul mid-January 2002. Ericsson gave UN 200 mobile phones and necessary equipment. The Minister of Communication at that time, Abdul Rahim, complained that he had not been consulted before transmitters were set up in Kabul. Ericsson planned to remove the network after six months of operation³⁴, but in July 2003 the mobile network was still run by the UN World Food Programme, restricting its use to humanitarian workers and government officials.³⁵.

The UN computer network includes Internet access over private satellite network facilities³. The international VSAT link is on 7 Mbps according to UNDP ⁱⁱⁱ. Other NGOs are renting some of the capacity.

ⁱⁱⁱ Phone contact, Marc Lepage, UNDP, spring 2003

Internet Domain and Internet Service Providers (ISPs)

MoC's regulations

According to Telecommunications and Internet Policy Final Working Draft providers of Internet services are required to obtain a licence from TRAA. Before TRAA establishment MoC issues these licences⁵.

Afghanistan will implement a two-class system of licences for ISPs that distinguishes between providers of international Internet protocol connectivity (International Transit ISPs) and domestic Internet service providers (National ISPs):

• An International Transit ISP license will be required for any commercial provider of Internet services that relays Internet traffic from any point inside Afghanistan to any point outside Afghanistan whether through its own network facilities or via transit or peering relationships with non-Afghan ISPs. The TRAA will issue International ISP licenses, taking into account an assessment of national security requirements and an assessment of market conditions. The International Transit ISP licenses will apply nationwide.

International Transit ISP license holders will be allowed to obtain National ISP licenses, but only through a distinct and separately incorporated subsidiary or affiliate. Even where commonly owned, the International Transit ISP entity will be required to provide its international IP connectivity services to its retail ISP entity at the same prices it offers other National ISPs.

• National ISP license holders are authorized to offer any permitted Internet service, including but not limited to dial-up connectivity, leased lines, Internet cafes, transit connectivity, domestic backhaul and wireless local area networks. National ISPs are prohibited only from providing international IP connectivity, which can only be obtained from an International Transit ISP. The licensing will be aimed at being simple, streamlined and inexpensive in order to promote a competitive market and a stable investment climate⁵.

.af domain

Afghan Network Information Center (AFGNIC) operates and administers the Internet name space for .af domains³⁶.

The .af domain was first established 16. October 1997 and the renewed domain was up and running by 12. February 2003. The homepages of IANA³⁷ has registered the Minister of Communication as administrative contact and Marc Lepage from UNDP as technical contact. Ministry of Communication is sponsoring the establishment. UNDP did a lot of the practical work to get the .af domain established.

Though it is preferable for a ccTLD to have its technical operations inside the country, it was not an option for Afghanistan in May 2003. To carry out its responsibilities as the new technical manager of the .af ccTLD, UNDP agreed to host the main country code domain server at its headquarters in New York, where the bandwidth, power, and skilled support are available to run it. A secondary server has been provided to the Ministry of Communications staff for training in the area of management of ccTLD. Beyond technical assistance and expertise, UNDP is providing guidance with registration policies³⁸.

At least 138 domain names were registered by January 2004^{iv}. The first registered domains were www.moc.gov.af and www.undp.org.af³⁶. Quite a few web sites to be found are still made by the Afghan Diaspora. Since access to local Internet and knowledge of how to make homepages are limited, it prevents the local content development market to flourish.

According to the MoC's ICTs Policy, the MoC will oversee the management of the .af top level domain and the process of domain registration under it. In addition, through the National Data Centre, the MoC will establish a common Internet presence for the GoA. This will enable the GoA to be visible to the outside world in a coordinated fashion. The MoC will directly manage the registration services of the gov.af domain⁶.

GoA ISP provider

Afghan Assistance Coordination Authority (AACA)

Afghan Assistance Coordination Authority (AACA) was established by the GoA in April 2002. The World Bank provided Internet access to the office. AACA provides Internet services to the GoA³⁹.

National ISP licenses

By January 2004, there are at least nine national ISPs with a license^{iv}.

ISPs offering Internet in Afghanistan sometimes filter the content to leave out sites with obscene content.

Ariana Telecom

Ariana Telecom, an Afghan owned company, received their National ISP license 30. May 2003. Their location of operations is Kabul, Jalalabad and Khost**Error! Bookmark not defined.**⁴⁰.

AWCC

In addition to GSM services, AWCC also offers Internet access through IEEE 802.11 connections in Kabul and Herat. Kabul was online in July 2002, Herat in early August the same year. By January 2003 AWCC had plans also for wireless Internet access in Jalalabad, Kandahar og Mazar-e-Sharif¹⁸.

Center for Research and Technical Support (CeReTechs)

CeReTechs, an Afghan owned company, started its services in Kabul in March 2002 to provide a full suite of information technology services and products, including Internet, LAN and email

^{iv} E-mail Muhammad Aslam, UNDP Afghanistan, 10. January 2004

service, technical support, and IT consulting and implementation⁴¹. 31. May 2003 CeReTechs received their national ISP license and operated in Kabul with around 110 customers per mid-Aug 2003³⁹. CeReTechs has plans to provide ISP services also in Herat, Jalalabad and Balkh⁴¹.

Instanet

Instanet, an Afghan owned company, got their National ISP license 31. May 2003 operating in Kabu ^{39,42}.

Itehad Internet Company

Itehad Internet Company (100% Afghan) launched on 1 March 2003 Kandahar Province's first Internet service⁴³.

Itehad was under establishment as a national ISP in mid-August 2003. It had then 50-100 customers in Kandahar³⁹.

Neda

Neda ⁴⁴, was established as a national ISP in 11. Januar 2003 and has about 300 customers in Kabul and 50 in Mazar-i-Sharif. Of these eight Internet cafes and two English schools as their clients in Kabul together with four Internet cafes in Mazar-i-Sharif. By the end of February 2004 they expect to launch services in Herat and Kunduz^v.

Neda, an Afghan-Austrian-US partnership, has plans to expand its services to 12 cities across the country in the next two years (March 2003)⁴⁵.

Park-Telecom

Park-Telecom is one of the national ISP providers. Otherwise no data is available^{iv}.

Roshan

Roshan (see above) has a license as a national ISP provider^{iv}.

Sarfaraz Bahadur/ Trasil Telecom

Sarfaraz Bahadur/ Trasil Telecom, an Afghan-American company, was established 14. November 2002 in Herat. They have 150-200 customers³⁹.

NGO ISP providers PACTEC

PACTEC is registered as an NGO being allowed to install Internet access for other NGOs only. They have installed more than 60 VSAT connections for NGOs in Afghanistan, also including LAN installations⁴⁶.

^v E-mail communication with Nikolai Ushakov , Neda Telecommunications Afghanistan, 17.January 2004.

GoA

Intranet and internet connection Kabul

In September 2002, the World Bank had connected the following governmental institutions to Internet⁴⁷:

- The Afghanistan Assistance Coordination Authority (AACA)
- Da Afghan Bank (Central Bank)
- Ministry of Finance
- Ministry of Foreign Affairs
- Ministry of Rural Reconstruction and Development
- Ministry of Communication
- President's Office

UNDP has also done work regarding network building. It helped to ensure internet connectivity with direct satellite access for⁴⁸:

- Chairman Karzai's Office
- Afghanistan Aid Coordination Authority
- Ministry of Women's Affairs.

The World Bank has also provided telephone facilities through PABX technology, which connects with the various ministries providing them with international telephone connections. The technology used is a VSAT link using C band at the central hub with 1.5Mbps, which is connected to other sites via E1 microwave technology⁴⁷.

UNDP has provided a KU band satellite connection to an ICT centre to MoC, UNDP has also helped connect a computer training centre in the Ministry of Women Affairs to the Internet facility in the UNDP main office through an E1 microwave link⁴⁷. A UNDP provided assistance to the creation of the Government's intranet system, including the training for and installation of microwave towers in ten sites⁴⁸.

UNESCO has installed KU band satellite connections in a number of locations: the Main Library and Faculty of Journalism of Kabul University, the Ministry of Culture and Information, ARMAN News, Karwan Democracy office, AÏNA Media Center. The Ministry of Education will be connected to the Ministry of Culture and Information through a microwave link⁴.

Government Communications Network (GCN)

USAID, in collaboration with MoC, has been implementing a link from GoA in Kabul to its 31 provincial governments through an electronic network. USAID has been funding equipment purchase and personnel training. MoC is funding operational costs, including maintenance and repair in Kabul and the provinces. The equipment is high frequency radio sets, Codan technology. It can be used for transmitting voice messages, e-mail and scanned documents, as well as operate as a telephone. The system is connected to the local and international phone/e-mail systems in Kabul. The system enables the central government officials to have two-way communications with the provinces, and the provinces are able to communicate with each other⁴⁹.

In December 2002 the project began with training and installation of radio sets in Kabul and the provinces of Khost, Paktia, Bamyan, Nooristan and Kunduz which were identified by the

government as its highest priorities. By the end of March all high- frequency radios were in place. The communication centres is based at the local MoC headquarters and managed by ministry staff⁴⁹.

The plans have been to open the system to the general public on a fee basis⁴⁹.

14. December 2003 GoA invited for sealed bids for the Government Communications Network (GCN) and the operation and maintenance of this network and its facilities specified in this document. The expansion of GCN include (a) all remaining ministries, important government offices in Kabul (28) and all 31 provincial capitals of Afghanistan; and (b) the integration of the satellite network consisting of 4.5M antennas at five locations: Kabul, Herat, Kandahar, Jalalabad, and Mazar-e-Sharif. The contract will be for supply, installation and commissioning of the complete GCN and for operation and maintenance of the GCN for two years after final acceptance. The implementation will be done in two phases⁵⁰.

Phase 1 includes supply, installation and commissioning of the network for 14 ministries and all Tier 1 (5 provincial capitals) and Tier 2 (11 provincial capitals) including establishing a central hub station at the MoC building in Kabul. It should meet the existing and the proposed expansion of both phases and transferring to it the central hub functions from the AACA office where it is currently located.

Phase 2 includes supply, installation and commissioning of the network for an additional 13 ministries and 15 provinces⁵⁰.



Figure 5. Students working at the TTC UNDP/MoC lab.

GoA computer labs UNDP training centres

UNDP supported a programme creating 11 ICT training centers in Afghanistan, three in Kabul, two in Mazar-e-Sharif, one in Kandahar⁵¹, two in Jalalabad, two in Herat and one in Kunduz. The

IT and computer training will target Afghan civil servants, women and the population at large. It will also provide skills needed to support the government and private sectors.

The first of these centres opened in November 2002 and is located in the Telecom Training Centre of MoC. Its main role is to train government employees from Ministry of Communication and other ministries⁴.

The second and third of the centres in Kabul was opened in the Ministry of Women's Affairs 11. December 2002. UNDP with the support of the International Labour Organisation (ILO) provided materials and equipment to renovate two computer labs within the Ministry that can hold up to 30 people per session. The courses offered provide women with basic accounting and word processing skills. Training from this centre will be offered to Afghan women working in the Ministry and in NGOs⁵¹.

In December 2002 also the ICT training centre located in the Directorate of Communications at Mazar-e-Sharif was renovated and equipped by UNDP. This centre can hold up to 10 people per session. In the first week 30 men and 10 women civil servants had their first training course⁵².

Ministry of Education

20. May 2002, The UNESCO Information and Communication Technologies Access Centre located within the Ministry of Education was opened. It was equipped with 19 Compaq Pentium 4 computers, a Compaq Proliant server and network printer. It also included overhead projection equipment for training purposes and a high-speed Internet connection. The centre was the first of its kind within any Ministry in Afghanistan. The Centre was funded through UNESCO by the Government of Japan. The training facility is utilized by Ministry of Education staff for developing skills and for educational purposes⁵³.

Ministry of Commerce

In July 2002 USAID gave a grant of \$50,000 to the Ministry of Commerce to build an Internet Center. The Center has 10 computer terminals with Internet connectivity and will enable Afghan business persons and traders to sell their products and services worldwide via e-commerce. The Center will give both Afghan traders and dealers and the Ministry itself, access to the Internet. It is the wish of the Ministry of Commerce that such centres will be expanded throughout the country⁵⁴.

Data Processing

Afghan Assistance Coordination Authority (AACA)

Afghan Assistance Coordination Authority (AACA) is a governmental organization established April 2002. AACA has initiated a project to strengthen the capacity of government employees in different departments including the usage of computers and related technologies. Moreover, AACA is developing a comprehensive database of donor pledges, commitments and programmes⁵⁵.

National Data Centre (prev. Afghan Computer Center)

The Afghan Computer Center (ACC) was founded in 1970. The centre was a member of UNESCO, RINSCA (Regional Informatics Network for South and Central Asia) and UNESCAP.

The centre's shareholders were the Ministry of Finance, Da Afghanistan Bank, Ariana Airways, National Insurance and Central Statistics Department. The main functions of the centre were: Keeping records on foreign trade, maintaining updated information of pension beneficiaries, issuing bills for utilities, operating a database for the bank, maintaining a statistical database, managing the ticketing and reservations system for Ariana Airways⁴.

The first system installed was an IBM 360 which was imported in January 1971 by Afghan Business Machine (ABM). It was based at the Intercontinental Hotel, Kabul. ABM was founded jointly by the Afghan National Bank, Ariana Airways and Afghan Textile. In 1978, ABM processed all the statistics of the country under the supervision of the Central Statistics Department. In the same year UNDP donated two IBM 34 systems and two printers. The centre has not been operational since 1993⁴.

The GoA will through MoC establish by 2004/2005 (mid of Islamic year 1383) a National Data Centre charged with the task to provide Ministries, administrative units and other Government departments critical services such as:

-Networking and Internet Access

- -Electronic Data Processing (EDP)
- -File storage
- -Intranet hosting, web site hosting, common Government email
- -Data and Network Security

Afghan Computer Centre which is an entity used for the EDP of different government offices in the past will become part of the MoC, and will perform as National Data and IT Centre⁶.

Computer education

It is difficult to get any exact idea of how many students are enrolled in computer training centres in Afghanistan. Beside the universities, an guess of people who has received basic computer education is maybe the following (January 2004)^{vi}:

Place	Number of students
Kabul telecom training centre	200
Kabul – MoWA	500
Kabul – MoLSA	500
Kabul – private sectors	1000
Kandahar – Communication dept	300
Mazar – Communication dept	400
Herat - DoWA	300
Herat - Communication dept	300
Jalalabad –Communication dept	300
Jalalabad – DoWA	300
Kunduz - Communication dept	300
Sum	4400

Table 2. Students educated from some of the public computerlabs in Afghanistan.

vi E-mail communication with Najib Raie, Bittss, 15. January 2004.

In addition there are universities students and other private computer schools, besides those educated abroad, mainly in Pakistan. In a speech held 12. October 2003, Minister of Communication Masoom Stanekzai stated that "more than 8000 Afghan men and women are trained or under training in more then 120 small and medium sizes private and public ICT training centers around the country"⁵⁶.

Universities

Islamic University for Science and Technology (IUST)

The Islamic University of Science and Technology (IUST) in Jalalabad with a branch in Herat opened its Department of Computer Science in 2001. It offers a four year bachelor degree in computer science⁴. The university has a computer lab but no Internet connection. The IUST is also established with a branch in Herat.



Figure 6. Faculty of Science at Kabul University.

Kabul University

Kabul University is Afghanistan's largest and was established in 1932.

Kabul University opened a Department of Computer Science in 1995. Kabul University offers a four year bachelor degree in computer science. Since the opening only 19 students have graduated from the department however⁴. In 2003, 200-300 students wanted to take the bachelor degree at the university. The large number has been explained with the fact that it is assumed to be easy to find a job afterwards^{vii}.

There is an IT Center in Kabul University (ITCK) for staff use only which contains 50 computers funded by the Technical University of Berlin. This center is supposed to take care of maintenance of all computers in Kabul University. Computer Science Department is not responsible for its maintenance^{viii}.

For the students at Computer Science Department, 40 computers were donated by Morning Star Development in Pakistan for a General Computer Lab. Of these 20 is working and the remaining 20 were damaged in shipment^{viii}.

All computers at Kabul University labs are running either Windows XP or Windows 2000^{vii}.

Some of the courses offered are within networking (Cisco Networking Academy, see below), databases, operating systems (DOS, Windows, Machintosh, Linux and Unix), artifical intelligence, Java, visual Java, visual C, Assembly, mathematics, linear algebra, probability theory, system analysis and design, compiler design, calculation of numbers in computing, computer hardware and English. The last autumn semester the students can choose to make their own projects related to a real world task where external companies or institutions can submit their suggestions to Kabul University^{vii,viii}.

The students graduates in December and so far students have been graduated the four last years^{vii}.

Cisco Networking Academy at Kabul University

UNDP in partnership with Cisco Systems and the Kabul University opened 1. September 2002 a Cisco Networking Academy in Afghanistan. It offers a two-year IT degree for both men and women in the Faculty of Science. Cisco Systems trained the Afghan teachers and provided the networking equipment. Cisco Dubai sponsored the training center with 3 switches and 5 routers. UNDP supported the training, provided the computer hardware, and facilitated the private sector partnership with the Universit^{viii,57}.

19 computers were donated for the Cisco Networking Lab, 10 from the UNDP and 9 from the World Bank^{viii}.

Other Universities

There are altogether eight universities in Aghanistan today. They are located in Kabul, Jalalabad, Herat, Mazar-e-Sharif, Khost, Kandahar, Badakshan and Takhar. Kandahar University and Khost University/Afghan University also has a computer science department.

vii Meeting with Mohammad Homayoun Naseri, Kabul University, early September 2003

viii E-mail communication with Mohammad Tariq Meeran, Kabul University, 7. January 2004

Microsoft education

5. August, 2003 UNDP Country Director Ercan Murat signed a partnership agreement between UNDP and Microsoft Gulf. The agreement with Microsoft Gulf is for UNDP Afghanistan to administer and manage a cash contribution of \$65,000 to enhance ICT based programme delivery for Afghanistan.

The donation from Microsoft Gulf covers a programme of training via a Train the trainers format for knowledge sharing which will be based in 12 IT training centers. These ICT training centers are based in towns and cities across Afghanistan which provides basic ICT skills, mainly to civil servants but also to the general public, with a special emphasis on women, youth, and returnees from the Afghan diaspora. The training centers will concentrate on providing ICT skills that enhance civil service productivity and provide income-generating opportunities for Afghan entrepreneurs⁵⁸.

Kabul telecom training centre

Kabul used to have a telecoms training institution (TTC), which was damaged in the conflict between the Taliban government and the US-Northern Alliance assault. It was in December 2002 being reconstructed with the help of the ITU and USAID⁵⁹. There is a Cisco academy in the TTC where GoA employees and private sector can get a two-year Cisco education. This project is funded by ITU and implemented by UNDP and MoC (see UNDP training centres).



Figure 7. One of the many Computer learning institutes of Kabul. The banner announces "Where your future begins. Soon. Opening PSI Computer Science College".

Private computer (and English) training centres

In Kabul there are quite a few computer training centres which often combines computer education often also with English learning. Such training centres also exists in

Jalalabad, Mazar-e-Sharif, Herat, Kandahar and even in Kunduz⁶⁰. Liwal Ltd is announcing their computer training centre in Khost⁶¹. There is also information on a computer centre in Paktia and Gardeez, and that there are some good private training centres near the borders of Pakistan^{ix}. Altogether such centres together with the NGOs probably are responsible for a large part of all computer education within Afghanistan. The computer training they offer is typically basic hardware and software training; Microsoft (MS) Windows and MS Word, Excel, Powerpoint and Access. In addition there is Internet use training. Today there seems to be few who offers education within making web pages or computer programming.

A problem is that each institution offers their own curriculum and study materials so there is no standards amongst the institutions (nor is it today amongst the government labs).

^{ix} E-mail communication with Najib Raie, Bittss, 15. January 2004

Free training labs and Internet Cafes

Some institutions are offering free computer training and access to Internet. Usually these are run by NGOs or media. In most cases their offers are limited to certain groups in the society, such as a NGO's employees, journalists and media people, students, women's representatives etc. The labs are often used both as Internet cafes and for shorter training courses. Some of these labs will likely become commercial after the initial funds have run out or they may have even have done so already.

Here we have also included labs that are run on an idealistic base that we do not know accurate current status of.

News media

ΑΪΝΑ

AÏNA Media and Culture Center houses the following projects in the same building: an informal meeting place, a library, an Internet space, a computer room, and offices dedicated to the administrative team. UNESCO has equipped the centre with ten computers connected to the Internet via satellite. The Media and Culture House is open to both Afghan and foreign journalists as well as the other organizations the center will host^{62, 63}.

Internews

Internews Afghanistan has a computer training center in Kabul. Quite a few journalists have had their training in basic Windows and Office from this lab⁶⁴.

Afghan Bakhtar Information Agency

In February 2002 a press release informed that UNESCO will help to computerize the operations of the state owned Afghan Bakhtar Information Agency in Kabul, to give the Centre access to the Internet and to train staff in the use of the new equipment. The project also includes the modernization of Bakhtar's news archive. UNESCO will provide equipment and training to digitalize the newspaper collections. Since this collection is going back to the 1950's, it will facilitate the use of the archive⁶⁵.

Education

Library of Faculty of Journalism at Kabul University

In February 2002 UNESCO funded and started building of the INFOYOUTH Computer Centre at the Faculty of Journalism at Kabul University. The Centre provides basic information and communication facilities, including access to the Internet and offers ICT training to the students, with special priority on young women. The project was implemented in partnership with the Afghan Ministry of Higher Education and included the purchase of equipment (computers, printers and software) and the development of ICT training programmes that are adapted to local needs⁶⁶.

This Internet café will likely be a part of a larger UNESCO programme, aiming at a provision of integrated library systems and information technology based services in all Afghan libraries, public as well as school and university. The initial stages of the programme should offer:

- Free Internet access for all in the premises of the University, school and public libraries.
- A local administrative library IT-system handling catalogue, loans and other administrative tasks.
- An electronic library network system giving all libraries access to a system for a national union catalogue, an ordering system for inter-library lending and other networking facilities⁶⁷.

Nangarhar University in Jalalabad

The La Jolla Golden Triangle Rotary Club and Relief International are soon setting up a satellite based computer /internet lab for use by the faculty at the Nangarhar University. This will provide a high speed broad band connection for 10 networked computers, two printers, a copy machine and generator. External USB pin drives will be available for professors using the network. Cal Poly at San Luis Obispo contemplates providing technical agriculture information to Nangarhar University through the computer lab. There is a wish for especially connecting to the University of Peshawar in Pakistan. The lab is meant to be for the faculty, for student use and distance learning⁶⁸.

San Diego State University is considering ways to assist with distance learning through the computer lab to be established at Nangarhar University^x.

Women

UNIFEM / MoWA labs

Ministry of Women's Affairs (MoWA) together with UNIFEM are building women's ICT centres in the provinces⁶⁹. In September 2003 UNIFEM had received used computers which were checked for upgrade possibilities before setup.

Afghan Women's Resource Center (AWRC)

Afghan Women's Resource Center has a small computer learning center sponsored by Afghan women's NGOs. The centers cater exclusively to women and are popular with Afghan women's NGOs⁶⁹.

Afghan Women's Resource Centre⁷⁰ and Afghan Women's Welfare Department⁷¹ are both offering women basic vocational skills also including computer training.

Humanitarian Assistance for the Women and Children of Afghanistan (HAWCA)

Humanitarian Assistance for the Women and Children of Afghanistan (HAWCA), is a non-profit organization, and was established in 1999 by a group of Afghan youth.

^x E-mail communcation with Steve Brown, La Jolla Golden Triangle Rotary Club, 22. December 2003

In order to provide free computer education for poor and needy youth in Kabul, HAWCA has established a computer center in Khayerkhana, Kabul⁷². The centre is equipped with 15 computers, so far training 160 students: 60 girls and 60 boys. In addition, 35 girls has been registered the in December 2003. Boys and girls classes are separated. The project is being funded by Associació pels Drets Humans a l'Afganistan (ASDHA), a Spanish NGO from Barcelona. The training provides basic knowledge such as Windows, MS Word and MS Excel^{xi}.

Community

UNESCO community multimedia centres

During 2002 it has been planned to build 10 community multimedia centres with interactive television and Internet technologies in towns across Afghanistan, including the Kabul University, Balkh University, Herat University, Nangarhar University, and in community centres in Kandahar, Zaranj and Kunduz.

The objectives of the project are:

- To create access to objective, pluralistic information that meets urgent development needs;
- To enable learners to access educational and training materials in a supportive environment;

- To encourage local communities and individuals to participate in the creation, management and exchange of information;

- To promote good governance by providing public information and encouraging debate; Encourage income generation by providing office services to local businesses and promoting new activities such as commercialisation of local handicrafts.

Sustainability of the centres are planned by basing them on an economic model including multiple sources of incomes such as public funding and payable training services by individuals, administrations and companies⁷³.

ITU Multipurpose Community Telecentres

ITU has plans to implement multipurpose community telecentres. A fundraising has been started by ITU, the UN High Commissioner for Refugees (UNHCR) and the International Golf Associates Franco-Suisse Chapter (IGA-FS). The initiative is called The International Day of Charity – Golf (IDC-G). It is envisaged that the management of the telecentres will be entrusted to a group of women from Kabul⁷⁴.

These centres is planned to include:

- Basic services: Telecommunications: Telephone, Fax.
- *E-Mail Service:* Electronic mailboxes "leased" to Telecentre users.
- *Information services:* access to regional, national and international electronic on-line or CD-ROM based databases, regional library files, local authority information, as available.
- *Data-processing services:* word-processing and desktop publishing programs. Professional programs (business accounting programs, agricultural programs, etc.).
- *Training and education:* introductory computer courses and "Open University" type on-line or CD-ROM based tutorials.

^{xi} E-mail communication with Orzala Ashraf, Hawca, 4. January 2004

- *Telemedicine applications:* Workstations, scanners and software to enable the hospital to acquire second opinions from medical practitioners.
- Desktop Publishing (DTP): possibly provided on a "cost recovery" basis.
- Secretarial and Administrative Services: such as typing, accounts administration; database development and filing also provided at cost.
- Training, Mentoring and Support Services
- *Information & News:* The MCTs can provide the community with relevant news captured from news services or Internet and prepare it for the local community e.g. by a journalist user group.

In December 2003, the funds raised was 12,489 \$USD and not 50,000 \$USD as hoped for. The charity is still run under IDC-G home pages⁷⁴.

Relief International

Has proposed the programme "Afghanistan: Telecenters for Community & Schools Through Women's Centers"⁷⁵

Commercial Internet Cafes

According to the first draft paper on information and communication technology policy, by the year 2002 the Internet penetration rate was 0.00227 in the country⁴. By the end of 2003, likely access to Internet has increased substantially compared to the last year, foremost considering the amount of recently established ISPs. Most of the number of users having access to the Internet is still in Kabul. Likely there is around 50 Internet cafes in the capital, and perhaps around 100 others (private companies, NGOs etc) with Internet access. In addition it is suggested that Mazar-e-Sharif, Kandahar and Herat has around 10 Internet cafes each. The overview below thus only aims at mentioning a few of the most well known ones.

The commercial Internet cafes offer Internet access for a limited amount of time for a fixed fee. They have the advantage of being accessible by everybody, provided that payment can be made. Some cafes are purely for profit and their audience is therefore usually foreigners and rich Afghans. Others are run on idealistic basis where the main aim is to train people in using computers and Internet and the prices thus are just enough to keep the initiative sustainable.

Post Office Telekiosk project

26th July 2003 the Minister of Communications officially inaugurated the Central Post Office Telekiosk as one of four post offices already opened within Kabul but part of a larger delivery plan⁷⁶. The project is a three way working partnership development between the UNDP, Ministry of Communications and the French Government. The Telekiosks offer affordable prices to use Internet and offer free basic computer training.

The Telekiosk is an area within a post office with four computers and a printer connected to the Internet for public use and with two trained staff persons, one man and one woman to assist the users. The Telekiosks are connected via the Ministry of Communications' satellite data access; having a backbone of 1.5 Mbps, via an IP-compliant IEEE 802.11a wireless LAN that provides a maximum throughput of 11 Mbps between the Ministry and Telekiosks at the ISM license-free

5.8 GHz band. There is a base station installed at the MoC (the tallest building in Kabul) that gives 360 degree coverage of Kabul city with a range of 10 km without a repeater.

The nine Telekiosk offices in Kabul:

- Central Post Office
- Pashtunistan Post Office
- Jade Maiwand Post Office
- Shahre Naw Post Office
- Taimany Post Office
- Khair Khana Post Office
- 3rd Macrorayan post Office
- 1st Macrorayan Post Office (Likely opened in September 2003)
- Kabul Airport (Likely opened in September 2003)

Another part of telekiosk Project is the Telekiosk portal based on Postnuke Content Management System free software. The site aims at collecting as much information about Afghanistan as possible⁷⁷.

According to the Telecommunications Development Strategy, the MoC also has visions for delivering satellite-based network connectivity to all 423 administrative districts in the country. MoC wish to install VSAT terminals at local post offices to quickly provide access to the outside world. Each post office will house a local public tele-center offering low-cost public voice and email facilities that can act as an electronic billboard for surrounding communities³.

According to the MoC ICTs Policy, in order to make data services equally accessible to urban and rural communities, the MoC will equip 50 percent of Post Offices with Internet terminals and enhanced communication capabilities by the end of 20. March 2004 (end of Islamic year 1382). These upgraded post-offices will function as tele-centers offering services including e-mail, high-speed Internet access, bill paying and e-banking¹.



Figure 8. The central post office with an Internet café.

Intercontinental hotel, Kabul

Kabul's (and Afghanistan's) first Internet cafe was established in July 2002 by AWCC at the Intercontinental Hotel (with 11 PCs, 128 kbps connection)⁷⁸. The Internet cafe was opened during the time of the Loya Jirga (grand assembly) in Kabul. To get Internet up and running a wireless IEEE 802.11b network has been set up connected to the GSM network.

The café is running Net Nanny, a program that allows administrators to block websites, chat and newsgroups, as well as monitor online activity⁷⁹.

Sabir Latifi, Kabul

Sabir Latifi, the owner of Park Tourism Group in Kabul, opened Afghanistan's second Internet cafe around December 2003. He has spent \$50,000 installing 20 terminals in a room next to Kabul hotel. The café is open 24-hours, and was in February 2003 attracting more than 50 persons a day.

Latifi has blocked Internet access to sex websites and frivolous chatting in his café. The computer network access is from AWCC ⁸⁰.

Mustafa Hotel, Kabul

There is an Internet café at the Mustafa Hotel in Kabul that was one of the earliest Internet cafes in Kabul. AWCC provided Mustafa hotel with their Internet connection.

The Mustafa Hotel was also probably the first hotel in Afghanistan with their own web pages⁸¹ although the server is not in Afghanistan but USA.

First Internet café Herat

The first café in Herat was opened by AWCC in August 2002¹⁸.

Videoconferencing facilities

Kabul Distance Learning Centre

The videoconferencing facilities of the Afghan Assistance Coordination Authority (AACA) distance learning centre is a part of the Global Distance Learning Network of the World Bank. Using Polycom equipment, the bandwidth is up to 256 kbps, and the maximum number of participants 26⁸².

The AACA distance learning centre provides videoconferencing facilities to government officials, NGOs and other donor agencies.

Computer interest groups and associations

Afghan Computer Science Association (ACSA)

Afghan Computer Science Association (ACSA) was started in 1999 by a group of Afghan computer science students at the International Islamic University Islamabad. ACSA is a non-profit and nongovernmental trust, which aims to motivate people in the country to explore the field of IT. ACSA is involved in developing software for the business and administration sectors of the country. It is also developing educational and entertainment software for the use of the youth and children. The department endeavors to design software for universities, schools, hospitals, government offices and businesses in the country.

As there is no standardized computer science curriculum in the country, the association is working on a curriculum for high schools. The Education Department of the association is publishing a bimonthly magazine *The Computer Science*, which is the first computer magazine published in Pashto and Dari. One of the priorities of the association is to promote professional networking among the computer scientists of the country. The Relations Department is helping to establish good relationships among the different governmental and nongovernmental organizations and associations, working in the field of computing and IT, and will motivate them to work in collaboration for the advancement of the IT sector⁴.

ACSA also has an e-mail list for their members⁸³.

Aims and Objectives are defined as⁸⁴:

- To facilitate the professional advancement of personnel engaged in Information Technology (IT) and related occupation.
- To promote knowledge of the development and use of IT equipment and related techniques.
- To provide facilities for exchange of information and views of IT equipment and related techniques.
- To foster and encourage high standards of professional ethics and conduct among its members.
- To prescribe professional qualifications and to conduct examinations for members and others in the field of Information Technology.
- To establish the first IT research Center in the country.
- To promote Internet and Intranet literacy in Afghanistan through country-wide Computer Education and Training programs.
- To promote constructive, healthy and positive uses of Internet technology amongst the young generation.
- To keep the members posted with the latest revolutions and upcoming permutations of computer technology.
- To issue bio-monthly magazines The Computer Science and news letters to keep the members informed and aware of the modern innovations and developments.
- To encourage trend of software development.
- To illuminate Afghanistan on Internet.
- To provide with Computer/Internet Education to children

Commercial companies

Afghan ICT companies

In 2002, there was a small computer hardware market was present in Afghanistan. This comprised of a few computer shops in Kabul, Herat, Kandahar and Mazar-e-Sharif⁴. The market has since expanded in Kabul, and likely in the other cities mentioned and even beyond. The hardware being sold is typically desktop computers, printers, scanners, uninterrupted power supply units, and networking equipment (hubs and switches).

Below is a list of companies that develop software or offers making of graphics and Internet pages. Registering the companies that sell and maintain basic hardware is believed to be too extensive for this report. ISP companies are also found in the section on ISPs above.

Afghan ITT

Afghan ITT Limited ("AfghanITT") is an entity registered in Kabul with offices in Kabul and Melbourne, Australia. Future offices planned in the major cities in Afghanistan⁸⁵.

Afghan Tech

Afghan Tech is a company working with Pashto keyboard support and Pashto fonts. They are also providing web designing and development for English/Pashto and Dari websites⁸⁶.

Liwal Ltd

The first Afghan IT Company founded in 1992 with the main focus on developing fonts for the Pashto, Dari and Urdu languages to be used with Windows 98, XP and 2000 operating systems. The company was the first to attempt to provide Internet connectivity to the country in 1998, but government constraints at that time forced the project to be abandoned. The company has started working on the localization of Windows XP/2000 and is currently also developing a curriculum which will enable computer users to learn which software to use and how to use it for a specific task. Asia Soft is the software division of Liwal Ltd^{4,87}.

Bittss (Bakhtar IT & Technical services and solutions)

Bittss Ltd. was established in May 2003 in Kabul and is a registered Afghan IT and Technical service and solution provider in Afghanistan. They are offering a wide range of services like webpage designing, registering and hosting, database and software design and development⁸⁸.

Enabling Technologies

Enabling Technologies Limited (ET) was initiated in June 2003. ET is a professional ICT company specializing in data networks, Internet and software solutions⁸⁹.

Khpala Pashto

Khala Pashto is a company devoted to working with development of software that uses the Pashto language. The company is also offering making of web pages for customers⁹⁰.

Mashriqsoft

Mashriqsoft is a company working with integrating the Pashto language with computer software⁹¹.

Global ICT companies

Sometimes the status of a country with respect to ICT can be measured by the number of establishment by large global ICT companies. If a large, global ICT company establishes themselves in a city, it reflects their belief in the local market.

Siemens

October 2002 Siemens opened a permanent office in Kabul, Afghanistan. Siemens left Afghanistan more than 20 years earlier. In February 2002 Siemens issued the following information on their web pages:

Siemens will primarily concentrate on the areas of power generation, transmission and distribution; medical engineering; information and communications systems; and transportation systems. In addition, the company will also offer components for low-voltage systems, as well as mobile phones and lighting products from Osram.

Three Siemens Groups, Industrial Solutions and Services, Medical Solutions and Power Transmission and Distribution, have received contracts in Afghanistan⁹².

Computer software

An immediate challenge is the lack of national language fonts. The official languages of the country are Pashto and Dari. All official documentation is done in these two languages. The Farsi language is supported by Microsoft, which fulfils the requirements of the Dari language; but as about 60% of the population is native Pashto speakers, this does not support and meet their requirements. A project for the Pashto and Dari character ISO set registration has been initiated in 2002⁴. The report is now completed and the MoC is working on the registration and discussing with software companies. They are hoping that Dari and Pashto will be available in the operating systems from next year on.

Furthermore, a Pashto keyboard support for Windows 2000/XP and also Pashto fonts has been developed⁹³, and a newer version of this for Windows 2000/XP/.Net server is under construction in accordance with the new layout proposed by MoC.

Also, there are some other vendors offering Pashto keyboard and font support ^{86,90,91}.

Liwal Ltd is providing Pashto, Farsi and Urdu support for Windows 2000 and XP⁸⁷.

The operating systems used in Afghanistan are both Microsoft and open source plateforms. The MoC are using both Solaris and Linux for their servers but with MS Windows based clients^{94, 95}. There is quite an interest in Afghanistan for using open source operating systems and coding, at the same time most of the public training is done on Microsoft Windows based computers.

In MoC's recent ICTs Policy, their aim is stated to promote localized software development and adoption of a national standard for computerized character representation applicable to the languages of Afghanistan. In addition, the GoA will promote the use of open source software and applications where appropriate⁶.

Books

There are bookstores in Kabul that offers computer books. Somewhere like 10-15 books basic computer books are available in Dari and Pashto, the rest is in English. In addition, books are brought in mainly from Pakistan and Iran. However, there is in general a great lack of relevant books for computer education.

Kabul University has a small library of English computer books for their computer teachers and students.

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