

Computing in Post-War Afghanistan

Reflecting on recent history and the context of current events.

Afghanistan's history can be traced back over 5,000 years. Many of its cities thrived as trading centers on the ancient Silk Road. In the mid-1960s, King Zahir Shah started Afghanistan on the road toward democracy with nascent free elections, a parliament, civil rights, and emancipation for women [8]. The King was ousted in a coup in 1973, which was followed by other largely pro-Soviet coups. In 1979, the Soviet Union invaded Afghanistan but was forced to withdraw 10 years later by U.S.-aided anti-communist and Islamist mujahidin. After the Soviet departure, the country descended into civil war, which was supplanted by Taliban rule after the regime captured Kabul in 1996.

Following the Sept. 11, 2001 terrorist attacks, the Taliban was defeated by the U.S.-led invasion, which backed Afghanistan's Northern Alliance. In late 2001, leaders from the Afghan opposition groups and diaspora met in Bonn, Germany. They agreed on a plan for a new governmental

structure. On Oct. 9, 2004, Hamid Karzai was elected president and in December 2004, Amirzai Sangin took up the position as the Minister of Communications.

Afghanistan has a population of 29.9 million, with 47% less than 15 years old. An estimated 80% works in agriculture. The literacy rate is 36%, which breaks down into 51% of men and 21% of women.¹ The per capita GDP in purchasing power parity is \$800. There are large variations between regions and ethnic communities. The wars have left the country in poverty with a lack of educated workers, poor infrastructure, and many residual land mines [4].

¹Readers should be aware that some figures in this column may not be as accurate as corresponding data for many Western countries. Both statistical databases and academic sources are often nonexistent due to lack of infrastructure after the past wars.

TELECOMMUNICATIONS

Siemens installed Afghanistan's first telephone network in 1957 in Kabul with a capacity of 5,000 lines.² During the Taliban regime in 1998, the CIA estimated there were 29,000 functioning telephone lines for a country about

²Ironically, what may have been the world's first military use of the telephone in a war zone occurred on the northwest frontier of the British Raj during the campaign against the Jowaki tribe, 1877-78, near what is now the Afghanistan-Pakistan border. This use of the telephone occurred within a year or two of its invention [5].

International Perspectives

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the size of Texas. By 2001, approximately 20,000 lines remained mainly at bazaar phone booths in the largest cities [3]. The Taliban controlled the telephone networks. Only Herat province had a modern digital network with a total capacity of 7,000 lines. The cost of an international call was \$1.20 per minute in 1999; it decreased to 80 cents a year later.

Only a month after the Bonn agreement, the Afghan-American entrepreneur Ehsan Bayat established the Afghan Wireless Communication Company (AWCC) with support from the interim government. A year later AWCC was present in four of the largest cities: Kabul, Kandahar, Mazar-i-Sharif, and Herat. All communication infrastructures had to be built from scratch. Gravel and other building materials were transported from Pakistan to install cell towers and base stations [3]. Local negotiations concerning the setup of cell towers and base stations were necessary because

Afghanistan was still strongly influenced by warlords. During 2002 and 2003, AWCC suffered from overselling, and poor connections, but the quality has since improved. AWCC also owns the primary international satellite gateway for phone traffic routed through Guam.

In 2002, the Ministry of Communication (MoC) announced a second GSM license. That October, Telecom Development Company Afghanistan Limited, a consortium trading as Roshan, won the bidding round. When Roshan announced its first day of phone sales, approximately 6,000 people queued up.

People driven out by the wars have given Afghanistan a large diaspora. This has caused a huge demand for communication with families and friends abroad. Roshan has since expanded to become Afghanistan's largest telecom operator, establishing mobile services in 25 cities by June 2005 [11]. AWCC and Roshan both charged 45 cents per minute for an international phone call.

As part of the MoC, the

Telecommunications Department is responsible for the terrestrial network that existed during the Taliban era. The network has been upgraded and expanded with the help of aid funds and is available in 34 cities. In September 2005, the Telecommunications Department was officially separated from the MoC and transformed into a state-owned enterprise named Afghan Telecom. Afghan Telecom is encouraged to become a market-oriented and commercial enterprise by engaging operating and investment partners. Afghan Telecom was charging 35 cents per minute for an international phone call by June 2005.

The MoC consists of nine departments. The Spectrum Management Office issues spectrum licenses for radio, among other duties. The Regulatory Authority of Afghanistan is responsible for the implementation of a national policy on competition and market liberalization. Moreover, this department issues licenses for provision of telecommunication network and Internet services.

In mid-2005 there were approximately 900,000 phones, giving the country a teledensity of 3. The cities with telecommunications are connected via very small aperture terminals (VSATs). The MoC and its partners have plans for telecommunication access in a three-tier structure. The first priority has been to provide access to the largest cities, thereafter to provincial capitals, and finally to the individual municipalities. By mid-2006, 90 districts are expected to have connections through VSATs. Furthermore, two new licenses for GSM were issued in September 2005 to Investcom/Alokozai and Watan Mobile LL. A fiber ring project was recently opened for the solicitation of bids.

COMPUTING

Afghanistan's computing history dates back at least to 1971 when the Afghan Computer Centre installed an IBM 360 computer at Kabul's Intercontinental Hotel. The computer was used to process the country's demographic and economic statistics. During the following years, the Afghan Computer Centre bought four mainframe computers. The Centre was closed in 1993, and did not reopen until 2001. In June 2005, it was reconstituted as the Afghanistan National Data Centre.

After the Taliban era, a number of computer shops opened in the larger cities. Typically, these shops sell desktop computers, printers, scanners, uninterruptible

power supplies, and network equipment such as network cards, hubs, and switches.

There are approximately 30 companies in Afghanistan offering software development and computer engineering, which focus mainly on providing Internet access, Web development and hosting in addition to consulting services and teaching. As with many other developing countries, intellectual property rights are often not respected, which forces companies to emphasize other income-generating activities. After the war, a surge of approximately 200 non-governmental organizations (NGOs) established offices in Kabul, creating a demand for Internet access and Web pages.

The MoC has plans for an industrial park to spur company growth. So far, the plans have failed due to lack of funds. However, through World Bank collaboration the MoC has established videoconference studios in Kabul and 20 provinces, which are publicly available on a commercial basis.

Computer education is a fairly profitable industry. There are possibly 500–1,000 private computer training centers in Afghanistan, many of which are located in Kabul. Usually these training centers offer basic computer education along with English courses.

The centers' activities have been encouraged by the NGO presence. Together with the

United Nations Development Programme (UNDP), the MoC has established 12 computer training centers in Kabul, Herat, Jalalabad, Mazar-i-Sharif, Kandahar, and Konduz for civil servants, women, and the general population. Two labs are certified Cisco Networking Academies and there were plans to extend the academies to three more provinces by the end of last year.

At the level of higher education, the Kabul University Computer Science Department opened in 1995. During the Taliban regime, five teachers were employed. The department graduated nine of 30 enrolled students. However, the department lacked electricity and computers, resulting in a purely theoretical education.

Today, a four-year bachelor degree is offered, and the department has 80 computers for the students. Languages taught include Java, Visual Java, Visual C, and Assembly together with five operating systems. Kabul University also houses a Cisco Networking Regional Academy.

Computer literacy is in great demand, perhaps because it is seen as providing a secure livelihood. At Kabul University, computer science education has been on an open admissions basis, and thus no applicants are rejected. By autumn 2004 there were 320 students, of which 120 had just enrolled that term. Education is still suffering from the wars; only 45 students have received diplomas since the department opened. Besides Kabul University,

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four other universities offer a bachelor's degree in computer science.

Afghanistan has a computer association with 62 members. The Afghan Computer Science Association (ACSA) was initiated in 1999 by a group of Afghani computer science students enrolled at the International Islamic University in Islamabad, Pakistan. ACSA participates in a wide variety of computer-related activities, and publishes a bimonthly magazine, *The Computer Science*, which is available in the local languages Dari and Pashto [1].

THE INTERNET

According to the CIA, there was one Internet provider in Afghanistan in 2000. In July 2001, Taliban foreign minister Maulvi Wakil Ahmad Mutawakil banned the Internet allegedly due to "fear of broadcast of obscene and immoral material, and material on the Internet that is against Islam." In late August, the ban also included computer disks; CDs

were banned at an earlier stage [7, 9].

The only computer in the entire country permitted Internet access was at the Taliban headquarters. Even government officials were denied access, but if needed, they could apply to the Kandahar government office [6]. The Taliban's Internet access was received from Pakistan, where their official Web site was designed and hosted. In spite of the ban, it has been reported that others had Internet access through telephone lines from Pakistan or satellite phones, among them one of the Northern Alliance leaders Ahmad Shah Massoud [10].

Three months later, attitudes changed when the Taliban military regime was forced out of Kabul. On Sept. 10, 2002, the Internet Assigned Numbers Authority (IANA) received a request for re-delegation of Afghanistan's country-code top-level domain, .af. Originally, the .af domain was assigned in 1997, but during the subsequent wars IANA lost contact with the

owner. In February 2003, IANA re-delegated the domain to administrative partner MoC after spending nearly seven months tracking down the previous .af owner [6].

Being responsible for the technical administration of the country domain, the Afghan Network Information Center obtained the MoC as their first registrar a year after the removal of the Internet ban [2]. As of June 2005, 257 domains were registered. Yet the largest number of Afghan Internet sites can still likely be found amongst the three million people in the diaspora.

In July 2002, the first Internet café opened in Kabul at the Intercontinental Hotel. The café was equipped with 11 PCs and a 128Kbps satellite-based Internet connection. The number of Internet cafes countrywide has since grown to approximately 100. A fair number of non-commercial Internet cafés and training centers also exist, serving both NGO expatriates and Afghans. Afghans usually access

the Internet through cyber cafés and at work rather than on home computers.

The MoC has initiated a post office telekiosk project. While restoring the post offices for ordinary postal services, a small Internet café was also established. An Internet portal has been created for the telekiosks. So far, the Ministry has established nine kiosks, while the plan is to connect all the country's 352 administrative districts via VSAT terminals at local post offices. The MoC wants to make voice communication and email widely available.

INCLUSION OF WOMEN

During the Taliban reign women were excluded from education and work life, which often forced widows to beg for a living. Even wearing a burkha, it was considered indecent for a woman to visit a bazaar where phone booths were located.

By July 2004, 68 of 117 certified trainers at the Kabul University's Cisco Networking Academy were women. At the MoC, UNDP, and other NGOs, there are women trained and employed in computing. In Kabul, there is at least one Internet café with a female owner.

Some NGOs offer computer education to women in separate classes, while at Kabul University and the MoC, the classes are mixed. The MoC's post office telekiosk project hired both male and female employees to ensure female participation.

FUTURE CHALLENGES

No doubt, the government's attitude toward IT has changed substantially since the Taliban regime. Today's Afghan government should be acknowledged for a targeted and effective approach to information and communication technology (ICT). The MoC's choice of conditional sector liberalization has been positive. The government has established a Telecommunications Development Fund to spur further growth that receives 2.5% of gross revenues from the mobile and fixed service providers. Afghanistan also benefits from a second-mover advantage, which allows the country to largely avoid maintenance of cumbersome legacy systems that more developed countries face. However, continued progress is highly dependent on donor funds.

After the Taliban regime ended, Afghanistan reappeared in the Western news, which helped increase international development assistance. With the decrease in media focus it is likely that some funds have been reallocated. Afghanistan's export income is still low, which forces the government to make difficult budgetary decisions between IT and other priorities. Funds for IT often have low priority.

ICT penetration is also an important issue. Poverty remains a large obstacle. While in many Western countries phone call rates of less than 50 cents a minute are inexpensive, it may be prohibitive to poor Afghans. Fur-

thermore, the phone itself is often a large investment. Prices for Internet access at cafés average one dollar per hour.

A large number of illiterate individuals, two official languages (and a number of unofficial ones), make ubiquitous Internet access a challenge. Understanding Web-based text requires literacy, computer literacy, and knowledge of English. The MoC and ACSA work on translation of different versions of Microsoft Windows and Office into Pashto and Dari. Also, the diaspora provides Afghanistan with a percentage of its skilled individuals.

In addition to language barriers, cultural barriers to Internet use exist. Active Afghan involvement is needed to make Web content understandable and applicable for the common people. For example, belief in spirits and shrines is commonplace, which may cause difficulties for Afghans trying to understand e-health information explained in terms of bacteria and viruses. ACSA and Internews Europe are now administering a project to promote Internet use.

There are also other barriers between people with ICT access and those without access. Most Afghans still live as farmers in rural areas where neither electricity nor ICT infrastructure exists. The presence or absence of an Internet ban makes little difference to these people.

Some of the remaining highly conservative, often rural, parts of

the country may be suspicious or negative toward ICT. Often these societies also put social restrictions on women that prevent them from computer education and from using public Internet cafés or phone booths. Overcoming all obstacles demands funds, education, and acceptance among people toward changes. ■

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