



CAICT

The 2005 Briefing Book of the Central Asia ICT Project



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About the Project

Information and communication technologies (ICTs) are playing an important role in social development around the world. Technologies such as mobile phones and the internet are used for preserving and consuming cultural content, and as logistical tools in development assistance projects. Such technologies are being used to bring transparency and accountability to government processes, but are also being used to control the news media.

The project explores the role of information and communication technologies in the region's cultural, economic and political development. To what extent do ICTs replace community-based information sources? How do adoption patterns reinforce or conflict with cultural traditions? How does culture affect issues of trust and confidence in ICTs and how can this inform the development of cross-culturally relevant trusted computing practices? What elements contribute to the use of internet technologies as primarily a communications or information medium?

The project consists of a series of foundational activities that provide interpretive context for the data collected. Central Asia was chosen because of its cultural isolation and because of its status as a digitally emergent region. The project includes a multi-year survey and interviews with experts in education, health and governance. The benefits and encumbrances of ICTs are being studied in comparative contexts across Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan.

Activities

The project examines how the internet is affecting

existing cultural and social behaviors of users and nonusers. Besides studying how patterns of behavior change, the researchers also assess how technological infrastructure, policy, and culture are transforming. Another component of the project is to track how education and health workers react to the increasing presence of ICTs.

Project staff use a range of methods to pursue lines of inquiry, from participant observation of cybercafes in Tajikistan to archival work in government ministries in Kyrgyzstan and interviews with teachers in Uzbekistan. Different kinds of data are being analyzed, including content from websites, systematic observations from internet access point at 34 sites across six cities, and survey responses. The project has trained dozens of regional researchers in social science methods.

Findings

Information and Social Networks. With Soviet legacies and traditional Central Asian cultures, the region has a unique informational environment, and its people have distinctive information seeking habits, and technology attitudes. Social networks are commonly used for acquiring information. Uzbeks, for example, trust information from their friends and family much more than information from official media. People use technology to support existing cultural norms such as family interaction. These uses emphasize traditional communication patterns rather than new community formation or expanding business networks.

Infrastructure and Content. These countries have very different kinds of infrastructure and adoption patterns. Mobile phones, computers, and internet

access are very expensive relative to average incomes. Technology adoption is evolutionary, not revolutionary. Teachers and mobile phone users are using technology in ways that fit existing cultural norms. ICTs support English and Russian content over local content and local language applications, impeding widespread adoption. However, it is too early to determine how this may change. New technology adopters may create more local content, or continue availing themselves of Russian and English content. Such content may be a factor in encouraging new users.

Methodological Findings. Cultures and contexts have complex effects on instrument administration and validation, including issues of access and trust, a changing political environment, and expanding citizen surveillance.

ICTs, Authoritarianism, and Aid. Conventional wisdom is that authoritarian states face constraints both in the design and implementation of an ICT regulatory regime. For three countries—Kazakhstan, Kyrgyzstan, and Uzbekistan—it is not technological but economic resources that most directly bear on public policy. Authoritarian states have limited economic resources and are dependent on Western assistance, so ICT policy is more open. Richer regimes, such as Kazakhstan, make infrastructure investments on their own, without foreign aid. They can pursue more repressive policies on ICT content and use. Reliance on foreign aid seems to lead to more open ICT policies and can have democratizing effects on electronic media. This, in turn, shapes the content of what information can and cannot be accessed through new ICTs.

Rates of ICT adoption, however, are not consistently correlated with economic wealth alone. The cost of an hour of internet use is often several times the average daily income (Figures 1-3). This report is not just about communication technologies, it is about cultures in transition, our research findings, and the questions that must be asked next.

Figure 1: Internet Access, % of Total Population

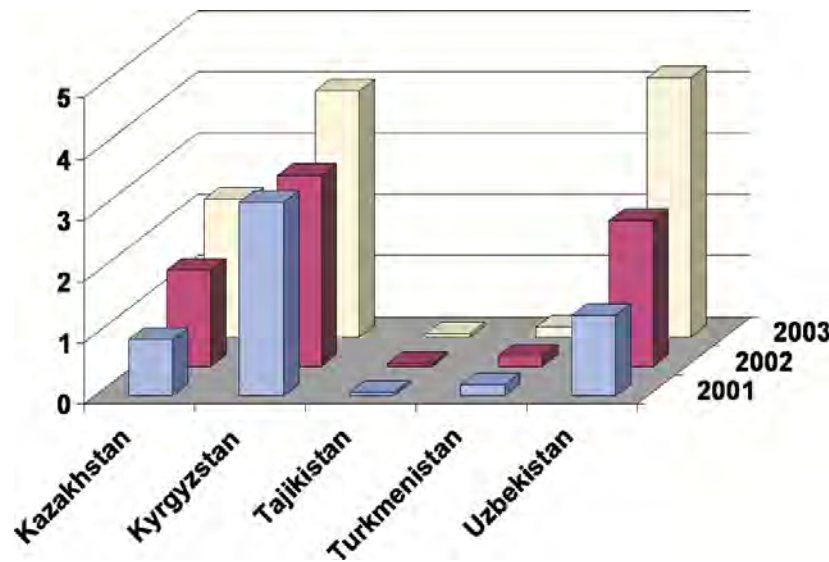


Figure 2: Internet Users, per Million \$ of GDP

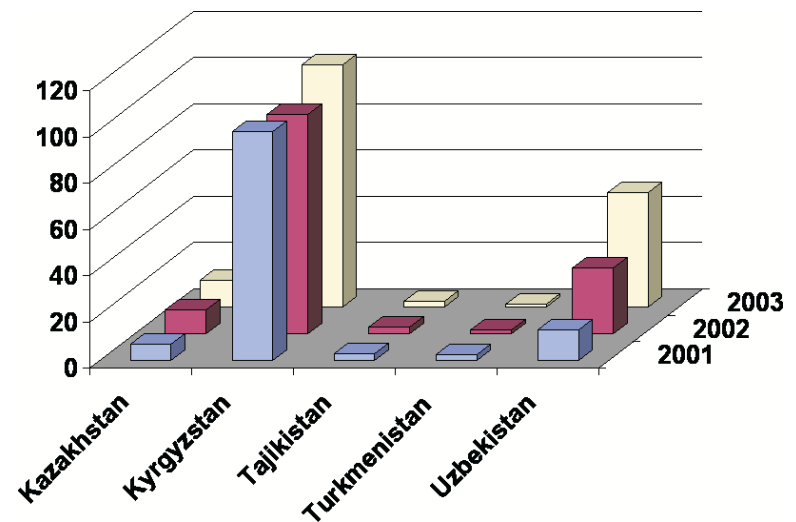
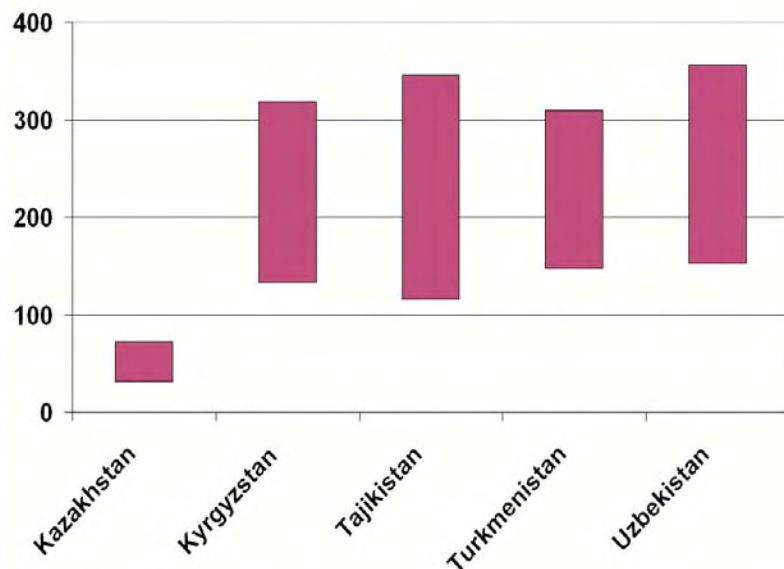


Figure 3: Cost of One Hour at Internet Access Point, % of Daily Income, GDP per capita, 2005





Kazakhstan

1991
Independence

1995
President Nursultan Nazarbayev broadens his power to crack down on private ICT media he views as political opposition

1997
President approves new government program called the ICT Application in Secondary Education Systems

2001
Law amendments in 2001 block internet sites and restrict news media outlets

2004
Government launched its first telecommunications satellite

2005
US Export-Import Bank guarantees USD48 million to increase digital and fiber-optic technology

Kazakhstan is the second largest republic of the former Soviet Union. With an area of 2.7 million square kilometers, Kazakhstan is the ninth largest country in the world. Bordering Russia, China, Kyrgyzstan, Uzbekistan and the Caspian Sea, it is the largest land-locked country and the most sparsely populated. The population of over 15 million has declined from emigration since the country's 1991 independence, and 56 percent of its population resides in major urban centers.

Kazakhstan is culturally diverse, and a social link between Islamic and western customs. In addition to Kazakh and Russian, the two spoken languages and main ethnic groups, there are over 120 linguistic and ethnic minorities. Kazakhstan's cultural mix makes developing a unified identity an important challenge.

Upon independence Kazakhstan appeared to be well positioned for success because of its highly educated workforce, size and enviable natural resources. The country has three of the world's most substantial oil fields and mineral reserves appraised at USD10 trillion. Kazakhstan emerged as the fourth major nuclear power and as a center for technology with Baikonur Cosmodrome, the oldest and largest working space facility.

At present, its nuclear threat has since been bought out by the US. Foreign direct investment in technology and infrastructure has made Kazakhstan's economy one of the fastest growing economies in the world. Conversely, the nation remains at the bottom of global indicators with a Gross National Income per capita averaging USD1,510 and a weak telecommunications network. Experts attribute the country's disappointing performance to political problems that stem from an absence of a tradition of limited government, a barrier that no foreign investment can overcome.

Kazakhstan is dominated by burdensome regulation, favoritism and corruption. The constitution stipulates freedom of speech, press, mass media and other basic rights; but insufficient checks on authority have resulted in increased regime control. In 1995, the democratic republic reformed the constitution placing considerable power with the President.

ICT Development

Inspired by the spirit of freedom during the 1990s, a free print and broadcast media flourished. The private sector boomed with new newspapers, radio stations and television stations. Telephony and computer access also improved. In 1995, however, President Nazarbayev extended his political power by cracking down on private ICT media that he viewed as political opposition. Statutory orders from the President created a tender process requiring expensive fees and licensing by the Information, Transport and Communications Ministries to obtain broadcast rights. Nazarbayev's daughter and husband were also appointed as heads of ICT industries that are 60 percent state owned. Amendments in 2001 added further limitations resulting in blocked internet sites and a decline of media outlets. This alarms Reporters Without Borders and the International Federation of Journalists, groups that catalogued the government's aggressive intimidation and closure of opposition media. In addition, the Prime Minister called for full market liberalization in 2004, and in 2005 a public rally protested the government's shutdown of the newspaper Republiksa, Parliament is considering implementing national security laws that increase media scrutiny to prevent any political uprisings similar to its neighbor Kyrgyzstan.

In 2004, government launched its first telecommunications satellite, and in 2005 the US Export-Import Bank guarantees USD48 million to increase digital and fiber-optic technology. In the spring of 2005, Golden Telecom initiated construction for 1,000 new high-speed internet access points in the nation's capital, Astana. KaR-Tel, a leading mobile phone operator, also announced a USD100 million deal with Motorola to supply GSM networks, thereby extending mobile communications. While there are 2.4 million landline subscribers, there are now 3 million mobile subscribers. Additionally, the World

Bank supports infrastructure expansion with programs that bring ICT skills to rural communities while the UNDP seeks to make vital information exchange accessible. Government compliments ICT investment interests with e-development, trying to increase its 300,000 online population by teaching internet skills in primary school and having 75 percent of its 722 secondary schools online.

ICT in Kazakhstan is progressing with technology centers and computer clubs. Email and mobile phones are proving effective ways to overcome communication barriers in the often unreliable postal and landline telephone systems.

CAICT Research

Project staff have studied the complexity of ICTs in Kazakhstan, a country that has both a strong modern economy and a backward authoritarian government. Kazakhstan stands out in Central Asia as the largest state and richest economy with considerable ICT purchasing power, benefiting from direct foreign investment in its oil and natural gas industries. During the 1990's, for example, Kazakhstan received as much foreign direct investment as did Russia, a country with a population ten times the size. Due to unlimited financial support, the nation has funds to buy ICT equipment on its own without having to abide by foreign donor policies. This advantage over its neighbors, who rely on foreign aid to acquire new technologies, creates a unique democratic authoritarian regime that successfully maintains control over traditional and electronic media.

As the all powerful President of Kazakhstan, Nursultan Nazarbaev has strict authority over communication technology. Here, the government's craving for monopoly power matches the state's monetary advantage to ensure rule over the internet. In Kazakhstan, where domestic actors fund the development of ICT infrastructure, regulation is vague and state interference is widespread. This allows two government-owned companies, Kazakhtelecom and Nursat, to dominate the internet market. The government uses these corporations that are actually monopolies, to keep new ICT media from threatening its regime.

With a monopoly on internet service providers, the

government uses extreme caution in negotiation with outsiders for ICT investment. To obtain such necessary technology as fiber optics and digital switching equipment, the government contracts with outside companies such as Siemens, WorldCom, Nortel, Cisco, and Lucent Technologies. While most businesses oblige to provide hardware and leave internet and telecommunications provisions to Kazakhstan's two companies, some pursue entrance into the ICT provider market. However, the government easily blocks outside businesses from influencing ICT development by increasing license tariffs. These strategies keep the government in control of potentially destabilizing new technologies.

The government does its best to maintain its monopolies and monetary holdings. For instance, while the President maintains he wants his nation to gain status into organizations such as the WTO, he foresees ways to dodge membership requirements which would require him to break up the state's monopolies. In order to comply with WTO rules but keep command, the Nazarbaev regime plans its own ICT rules to counter possible dissolution of its monopoly corporations. The state maintains tight control over electronic communications.

The Kazakh government covers blatant ICT regulation changes made to keep its monopoly by justifying its actions in the name of national security. For instance, the Kazakh Transport and Communications Minister, Karim Masimov, warranted his government's refusal of a Russian company's bid by appealing to national defense: "I think it would be wrong if a company which provides the government with communications was controlled by a private company.... We are talking about national security (Interfax-Kazakhstan 2000)." While security is a valid concern of the Kazakh political elite, they are more worried about their own political security, than the protection of the nation.

Kazakh opposition parties have attempted but rarely succeeded in using the internet as a tool to mobilize opposition against the Nazarbaev regime. Opposition websites such as Eurasia.org.ru and the online newspapers Navigator and Assandi-Times have continually exposed corruption and graft in the presidential administration. This negative press keeps the government even more vigilant about its monopoly

on media. Monopoly control allows the Nazarbaev government to block Kazakh citizens' access to free press thereby blaming "technical" problems for website shut downs.

Nazarbaev's democratic authoritarian government may be the envy of other Central Asian authoritarian leaders. In fifteen years, the country has built a modern ICT infrastructure. At the same time, it keeps the regime's monopoly control over internet service provision and limits regime-destabilizing effects that often accompany modernization. Kazakhstan is an example of a Central Asian nation whose government is caught between a repressive desire for regime control and movement forward in the free modern world of ICTs. In the next few years, CAICT survey fieldwork will reveal more about how people in Kazakhstan adapt and adopt ICT in their daily lives.

Country Comparison: Making ICT Accessible

The Central Asian governments in this study have a wide range of approaches to governing ICT. Kazakhstan's Ministry of Transport and Communications is in the process of privatizing the national telecommunications company, Kazakhtelecom. Compared to its neighbors, the cost of internet access in Kazakhstan is a significantly less, though still a substantial portion of the average person's daily income. Since 2001, Kyrgyzstan has had a Council on ICT, which includes the President, the secretary of defense, and directors of the largest educational institutions. The Kyrgyz national ICT Plan provides goals for e-government, e-education, and e-economy, and telecommunications. These activities are formally regulated by the Law on Communications, Law on Licensing, and the Law on Informatization. Tajikistan's Ministry of Communications operates with guidelines of the country's 1994 Constitution, and a series of Presidential decrees on the press and other news media, on television and radio content, on copyright, and on state secrets. In contrast, Turkmenistan has few clearly stated rules for ICT governance. Its Ministry of Communications is largely tasked with restricting internet use. In Uzbekistan, the Cabinet of Ministers created a Communication and Information Agency of Uzbekistan. This agency develops computer and information technologies for educational purposes and with encourages private entrepreneurs to open new commercial internet access points.

A 2003 survey showed that more than half of Uzbekistan's computer users get access to the Internet at Internet cafes. Since 2004, CAICT researchers have collected data on users and equipment at public sites. This longitudinal study will continue for three more years at sites in all five Central Asian states. Public policy helps structure, or constrain, the market for internet access. ICT policies have an impact on the amount of time it takes to download news from around the world, and on the social circumstances in which ICTs will be used.

Figure 4: Most Common Internet Access Points, 2004

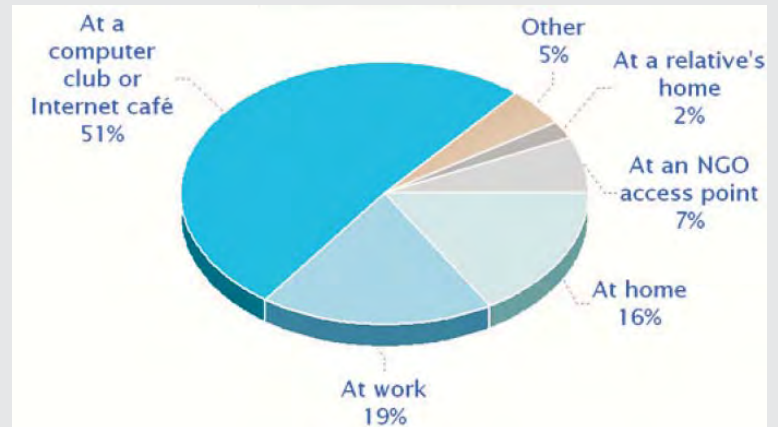
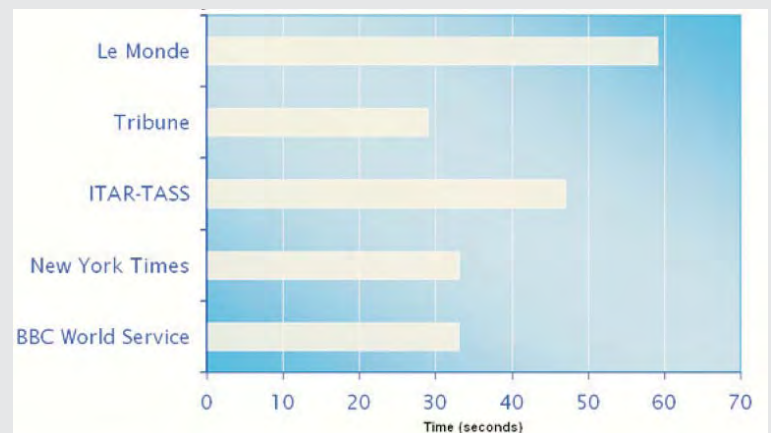


Figure 5: How Long Does it Take to Get the News from other Parts of the World? Mean Download Time





Kyrgyzstan

Kyrgyzstan has a population of 5.2 million people and 38 percent of the population live in major urban centers such as Osh and the capital Bishkek. The nation's official languages are Russian and Kyrgyz. Despite a high literacy rate of 97 percent, the nation has struggled economically in the early post-Soviet era. In recent years, the economy has improved. Kyrgyzstan was the first Central Asian state accepted to the World Trade Organization in 1998.

However, government instability continues to raise concerns. Kyrgyzstan, once considered Central Asia's most democratic nation, has become increasingly repressive. The government has restricted civil liberties, increased pressure on independent media, intimidated opposition leaders, and engaged in corrupt election practices. Tension between the government and its citizens escalated in March 2005, when 15,000 opposition demonstrators demanded former President Askar Akaev's resignation. After they stormed the presidential administration building, Akaev fled to Russia and resigned in April. Prime Minister Kurmanbek Bakiyev led the interim government, and was elected President in July 2005.

- 1991
Independence
- 1998
1,400 Mobile phone subscribers
- 2003
National ICT plan approved
- 138,300 Mobile phone subscribers, constituting 25.9% of all telephone subscribers
- 2005
15,000 opposition demonstrators demanded former President Askar Akaev's resignation, mobile phones used to photograph events and coordinate demonstrations

Timeline

ICT Development

The telephone system in Kyrgyzstan is poorly developed, with only 8 telephone lines per 100 inhabitants, compared to the Western average of over 50 lines per 100 inhabitants. The demand for telephones is greater than Kyrgyzstan's ability to supply them, resulting in hundreds of thousands of unsatisfied applications for household telephones.

Mobile phones are a popular alternative, with 1,400 subscribers in 1998 and 138,300 in 2003. This group of subscribers represents 26 percent of all telephone subscribers.

In recent years, interest in the internet has also increased. Since 2000, the Kyrgyz government has planned to privatize a 51 percent share of the state telecommunications company Kyrgyztelecom. Three international tenders have been completed, but there is still no foreign owner. The first two winners, the Swiss consortium Swedtel and Russian long distance provider Rostelecom, defaulted during the second phase of the tender. Even as a German consortium was announced as the third winner in summer 2004, there was speculation that the privatization plan would not be completed. Indeed, both houses of Kyrgyzstan's parliament voted to suspend privatization on the grounds that the tender process violated national laws. Parliament also justified this decision because the tender offers were lower than desired and because of the loss of revenue to the government from selling the profitable company. There may also have been political motives to ending privatization, as the government would lose monopoly control of telephone and electronic communications.

Kyrgyzstan faces other challenges in computerizing the country. In 2003, there were 200,000 internet users, a figure limited by the shortage of computers, poor infrastructure, and lack of access in hard-to-reach rural areas. In hopes of making the internet more widely available, the U.S. Department of State and the UNDP opened several information centers, offering free internet access in both rural and urban areas. There are now around 70 commercial and 113 public centers.

The UNDP also partnered with Kyrgyzstan's Council on ICTs to conduct a national survey on the ICT industry. The survey revealed that almost all ICT companies formed after Kyrgyzstan gained independence in 1991, suggesting that they represent a new generation responsive to rapid

technological changes. Ninety-two percent of ICT companies surveyed have internet access and are generally satisfied with its price, speed, and quality of service.

Kyrgyzstan's National ICT Plan was approved in 2003. It begins by discussing e-government, which involves distributing information, providing services, and completing transactions through ICTs. The groundwork for e-government has already begun to develop. The State Automated System "Shailoo" connects 95 percent of the nation's political units, including 6 regional centers and 53 districts, for elections. The State Computer Network connects 25 percent of all governmental bodies; 58 percent of all governmental bodies have their own websites. However, quantity does not equal quality. Most websites are outdated, do not offer online services, and cannot be found through search engines. Furthermore, spending on ICT constitutes just 0.1 percent of state expenses. The National ICT Plan calls for active government websites, increased online services, and the integration of e-government into society.

The plan moves on to discuss e-education, claiming that 65 percent of schools have personal computers, an average of one computer per 240 students. Less than two percent of schools, primarily in Bishkek and other urban centers, are connected to the internet. Universities fare better, with a ratio of 37 students per computer and internet access available at almost every institution. The integration of ICT into the university system has begun, with use of the "Aknet scientific and educational network," computerized exams, and a significant growth in ICT-related majors. However, Kyrgyzstan faces a shortage of ICT specialists as graduates leave for higher salaries abroad. The National ICT Plan aims to computerize all schools, provide internet access in at least 50 percent of schools, and retain more ICT graduates.

The plan concludes by discussing e-economy, the distribution, marketing, sale, or delivery of goods

and services through ICT. Factors in establishing a dynamic e-economy include internet, hardware, and software availability. The majority of internet users are centered in Bishkek, hardware units are limited with only 1 computer for every 78 inhabitants, and about 90 percent of software products are pirated. Pirating is attributed to the financial difficulties of software users and the short time period in which software, licensed or not, becomes outdated as new products enter the market every one to two years. The National ICT Plan outlines two stages of e-economy development: creating a business-friendly online environment and increasing the number of transactions completed through ICT.

Ultimately, the National ICT Plan aims to progressively transform society. E-government fosters the democratic ideals of free information exchange, government transparency, and active citizen engagement. E-education empowers students with technical skills, essential in bridging the digital divide and investing in the nation's economic future. Finally, e-economy expands economic possibilities and prepares Kyrgyzstan for its entry into the international economy.

CAICT Research

Citizens with internet access have the ability to increase personal awareness, rapidly exchange information, and effect social change. CAICT researchers found that there were three males for every one female, and six teenagers for every one adult at internet access points. Customers engaged in a variety of activities, such as browsing the internet, emailing, chatting online, word processing, and downloading games, movies, music, and mobile phone melodies. Windows XP was on 62 percent of the computers, Windows 2000 on 12 percent, Windows 98 on 12 percent, and Windows ME on 4 percent. All internet access points surveyed had Microsoft Word.

Project staff have written that while Central Asia's presidents have pursued similar strategies in

controlling media sources, countries differ in their policies toward what is potentially the most politically destabilizing of all media outlets, the internet. Nationalizing printing presses, radio, and television broadcast channels, hamstringing the few independent media outlets that do exist with endless court cases, and restricting the information and communication environment. Researchers found that when authoritarian regimes invest in ICT with domestic funding, they can maintain control over new electronic media. In contrast, when governments rely on foreign aid, states have markedly less authority in controlling internet use. This is the case in Kyrgyzstan.

Starting in 1993, international organizations took an active role not only in the provision of ICT equipment in Kyrgyzstan, but also in the implementation of legislation. The Law on Communications, the Law on Licensing, and the Law on Informatization regulate the activities of ICT companies. Although legislation is still under consideration, the government currently does not impose restrictions on internet use. Among others, USAID, UNDP, and the Soros Foundation take credit for the formation of Kyrgyzstan's relatively liberal ICT policies. Furthermore, UNDP considers work done in Kyrgyzstan as exemplary. In the past few years, a range of internet centers have opened to provide public internet access. NATO financing developed a project to provide ICT and satellite equipment to enable free internet access for educational institutions, libraries, and hospitals. The state has made efforts to provide free internet access in women's prisons and in rural areas, where more than half of the country's population lives. The government has also mandated that state ministries and departments develop their own websites, a policy intended to make them more transparent and accessible. As evidence of a fairly decentralized regulatory environment, a private internet service provider, Asia-Info, is authorized to register "KG" zone domains.

Although Kyrgyzstan's media has enjoyed greater

freedom than its regional counterparts, it has been subject to mounting pressure in recent years. As the 2005 parliamentary elections approached, concern over media freedom increased. During the unrest preceding the ousting of former president Askar Akaev in March 2005, Kyrgyzstan's internet was a battleground. Two leading internet service providers suffered an alleged hacker attack and were pressured to remove information reporting on the country's growing instability. Some opposition leaders seized on the attacks, claiming that the government had launched an online censorship campaign. The seriousness with which the internet service providers, the government, and the opposition are treating this matter suggests that the internet is an increasingly important battleground. This is confirmed by the fact that new communication technologies appear to have aided the overthrow of the authoritarian Akaev government, demonstrating that ICT can have democratizing effects when post-Soviet republics turn to international organizations for funding.

The CAICT Project plans several research endeavors, aimed at examining ICT developments in diverse settings. In summer 2005, the CAICT project will field a large survey regarding information-seeking behaviors and individual relationships to technology will be administered across Central Asia. Project staff will explore the relationship between the internet and Islam, a significant area of study considering that Muslims constitute 75 percent of the Kyrgyzstani population. Researchers will lead discussions with individuals active in the Muslim community, in hopes of discovering the ways in which the internet is used for religious purposes, such as the distribution of sermons online or the use of chat rooms as religious forums.

Complementing this study of ICTs from a religious perspective, other researchers will look at ICTs from a political viewpoint. Staff plan to visit Kyrgyzstan to research the influence of mobile phones in the recent revolution. They will

interview regular citizens and members of select NGOs, attempting to answer questions regarding the political implications of ICT. Did Kyrgyzstanis use mobile phones to communicate during the revolution? The crowd of protestors outside the presidential administration building grew larger and larger, yet the media was not able to report the political unrest; so how did people find out about the demonstrations in time to join them? How was information transmitted and received? To further explore the relationship between politics and ICT, the CAICT Project will also interview Kyrgyzstani government officials and investigate the progress of e-government initiatives. Ultimately, efforts in Kyrgyzstan and Central Asia contribute to the CAICT Project's mission of understanding the past, present, and future of ICTs in developing communities.



Tajikistan is a small, geographically divided country of about 6.3 million people. A civil war broke out in late 1992, officially lasting for 6 months, but contributing to civil unrest until 1997. The war destroyed existing infrastructure and eroded international willingness to invest in the unstable country, delaying the inflow of foreign capital for several years. Much of the territory is still not under the government's control; drug and arms trafficking over the Tajik-Afghan border remains a major concern. The difficulty of building infrastructure across the rough and mountainous terrain, combined with unnatural international borders, hinders the development of any kind of industry, but particularly affects the development of ICTs.

President Emomali Rakhmonov, the most powerful figure in Tajikistan from 1993 onward, has consolidated presidential power and oversees an extensive patronage network that favors members of his clan. The authoritarian Tajik government reacted very strongly

Tajikistan

- 1991
Independence
- 1996
First appearance of mobile phone technology
- 1998
Telecomm Technology offers first internet access
- 2000
Appearance of first internet cafés
- 2001
Tajikistan receives USD 13 million to finance telephone modernization and establishment of radio networks
- 2003
Authorities begin blocking critical news website tajikistantimes.ru, and state-run printing house refuses to print copies of critical weekly newspaper Ruzi Nav
- 2005
Government indicates intent to strengthen control over internet content, and shuts down sole independent television station

Timeline



Internet learning center at a Tajik school, administrated by the Relief International's School Connectivity Project.

to the 2005 revolution in neighboring Kyrgyzstan, and admitted that it sought to repress the spread of potentially revolutionary ideas. The authorities control most outlets of mass media, but still fear the influence of foreign NGOs that know how to use the news media effectively.

The Tajik economy is, by most indicators, the poorest in Central Asia. It is heavily dependent on the outside world, receiving extensive aid from the United States and other nations. The country is in talks with China regarding development of oil reserves, and recently received credit from India for development projects. Tajikistan still depends heavily on Russia for security. It had next to no indigenous armed forces during Soviet times, and only with Russia's help has been able to begin training its own army. In October 2004, Russia agreed to forgive most of Tajikistan's national debt in return for permission to upgrade its 201st Motorized Rifle Division, stationed there, to an official military base. Likewise, Tajikistan's military cooperation with the United States has led to a favorable financial relationships with the West.

ICT Development

A number of factors impede development of ICTs in Tajikistan. First of all, the state heavily monitors and restricts all media; what little print media exists tends to avoid political topics. In September 2001, Rakhmonov signed a resolution to form a data transmission network and regulate access to world networks. In April 2003, the Tajik authorities began blocking the critical news web site tajikistantimes.ru, ostensibly because it criticizes the Tajik government. Later that year, the state printing house refused to print copies of the newly critical weekly *Ruzi Nav*. Although the government already controls much of the traditional mass media, it is now attempting to gain control over the internet.

Geographical factors also make the development of ICTs very difficult. Tajikistan's roads are in disrepair, blocking infrastructure projects of all

kinds. The two largest cities in Tajikistan, Khujand and the capital, Dushanbe, are linked by road, but the mountain pass between them is blocked in winter months. An unreliable electricity supply causes problems for the telecommunications system. Overall, Tajikistan is the least developed of all the former Soviet republics in terms of telecommunications, and foreign investment is the factor most responsible for ICT development.

Despite these obstacles, communications technologies have been expanding in the last several years. Tajikistan has received ICT development aid from the European Bank for Reconstruction and Development, which in 2001 financed a USD5.5 million switch upgrade in Dushanbe and allocated USD6 million for the installation of digital switches in regional centers. In that year, Tajikistan also received a USD2 million grant from Switzerland to help with these two projects and the establishment of radio networks. AO Tajiktelecom, a 95 percent state-owned company, is the main operator. However, many lines are poorly developed and not well-maintained, and the existing network does not reach many towns, particularly the more rural ones. Internationally, Tajikistan is linked by cable and microwave radio relay to other CIS republics and by leased connections to the Moscow international gateway switch, and the capital, Dushanbe, is linked by satellite-earth station Intelsat to an international gateway switch in Turkey. Nonpayment is a major problem for telephone services; as of 2001, the debt for domestic calls alone was USD5.5 million and nearly USD9 million for international calls.

Limited range mobile phones appeared in Tajikistan in 1996. Today, mobile phone users make up only about five percent of the telephone-using population; in 2004, there were 80,000 mobile phone subscribers. There are 3 satellite stations in eastern Tajikistan, and GSM networks with roaming capabilities first appeared in 2000. China has also recently entered the mobile phone market in Tajikistan.

While internet users still make up a very small percentage of the population, proportionally, internet usage has grown at a significant pace. Between 2000 and 2002 the number of internet users in Tajikistan increased from 400 to 5,000. As of 2004, there are approximately 14 ISPs. These networks are available to approximately one-third of the population, mostly in the largest cities. Internet cafes also began to appear in 2000, particularly in the capital city, and grew as Afghanistan became an important site of international journalism.

The four main ISPs in Tajikistan are Telecomm Technology (www.tajnet.com), Babilon-T (www.tojikiston.com), AsiaPlus (www.asiaplus.tj), and Eastera (www.tajik.net). Telecomm Technology, the main provider, was founded in 1994 and first offered internet access in 1998. In 2003, its services penetrated the mountainous eastern region Gorno-Badakhstan, an area disproportionately underserved by ICT. Babilon-T, founded in 2000, provides internet, email, and e-commerce services, as well as peer-to-peer networking. The company runs internet access centers in addition to private lines, and has a "school of information technologies" for school-age students, which provides free computer science classes.

CAICT Research

For Tajikistan, the CAICT project has trained field researchers who are collecting data on user and nonuser behaviors. The field researchers, who are locals in the countries they observe, conduct data point access surveys, some results of which have already been analyzed. The project also funded a researcher field trip to Dushanbe in summer 2004 to collect information on internet usage. CAICT researchers used a four-prong research strategy to ascertain the overall state of internet usage in Dushanbe: first, they created a database of all the city's access points; second, they conducted archival research with the Ministry of Communication and Culture and with the major ISP; third, they interviewed civil society groups that study

telecommunications policies in Tajikistan; fourth, they observed participants in a sampling of 10 internet access points, split between commercial, academic, government, and non-profit sites. A general survey of 1,000 people, asking about their information-seeking behavior and their attitudes toward communications technology, will also be conducted in Tajikistan.

By February 2005, the project had collected information on internet access points in Tajikistan's two largest cities, Dushanbe (9 points surveyed) and Khujand (5 points surveyed). The project found that, for most sites, the majority of the spaces and furnishings were new and upscale, and the majority of the computers ran Windows XP. For all the sites, the types of equipment most likely to be found were computers, floppy drives, CD-R drives. Over a quarter of the sites also featured some sort of computer game.

Focusing exclusively on the capital city Dushanbe, one of the project's papers discusses some findings based on observations of internet use. First, project authors found that obtaining computer equipment is a complex and difficult process in Tajikistan, because of its geographical isolation and the costs and physical difficulties of transport.

Second, there is a high demand for internet use and for computer training; while people are generally literate, they must overcome computer illiteracy with the aid of either family and friends or formal training sessions.

Third, internet usage is often social. They authors give the examples of a couple writing an email together, a group of children crowding around one workstation, and the collective social environment of networked gaming, where users in a café are not only linked online, but sharing conversations, discussing strategy, or getting tips from one another in the physical social space of the café.

Fourth, existing social norms have affected patterns of internet use; for example, the custom of having

women at home after dark prevents them from getting involved in the after-hours gaming culture of the internet cafés. Women also tend to use the internet for social purposes, such as writing emails, while men tend to use commercial sites for business-related work.

Finally, the primary factor implying differences in internet usage is paid versus unpaid internet access. Due to the costs and complications associated with different kinds of technology usage (for example, the relatively high bandwidth usage required for access to cultural information such as music and cinema), only commercial access

points allow activities such as downloading and file-sharing. The team's findings indicate that the social uses of the internet are of primary importance to users in Dushanbe. Knowledge and skills are passed along to friends and family, and social gaming seems to be a driving factor behind the expansion of equipment and technology. Internet usage in Tajikistan is very public and often supervised. Managers can monitor users' activities, whether by partitioning the space itself so that the gaming users have a separate space or by monitoring user behavior from a desk in the center of the room.

Gaming in Tajikistan: Observations from a Cyber Café in Dushanbe

On Ruedeki Street in the center of Dushanbe stands the Bratva Club, named for the Russian slang word for "brotherhood" or "gang." The 3-year-old business is kept up-to-date by its 23-year-old owner, Azim, who believes it is important to keep the place looking hip, clean and fresh. Azim has arranged for service from two ISPs, to ensure that there is always one good connection to the outside world, and because they each run servers with nationally networked Counterstrike play. This club, after all, hosts the city's annual Counterstrike competition, where the café's best players compete with teams from across the city. Low-cost networked gaming here attracts young men who play fight and use rough language, coming in from a quick stop home after work. Some players are serious and absorbed in the game, others discuss strategy and cuss out their killers or victims. The store often sponsors trainings and competitions for Counterstrike gamers, and some prize-pots run into the USD1000s.

At the Bratva Club, with its modern atmosphere and large, separate room designed exclusively for gaming, one witnesses a phenomenon in the cultural process of technology adoption in Tajikistan. According to the

managers of commercial internet access points, almost all of the growth in their business is in networked gaming, not pornography, or the kind of 'work' we think people in developing economies should be doing with the Internet. While Counterstrike may not be the game of choice in other countries, there is ample evidence that networked gaming of some kind is a key part of the cultural business of internet access in the developing world. The prevalence of networked gaming, an almost purely social use of the internet, gives us insight into the ways that Tajiks are integrating technology into their lives. Studying communication means looking into both the transmission of data, whether economic or political. But it also means studying ritual, and the CAICT Project has several lines of inquiry into the cultural impact of ICTs.



Turkmenistan

Timeline

1991
Independence

1996
President Saparmurad Niyazov negotiates for financial support from USAID to have MCI develop the country's internet access points

2000
President Niyazov's Ministry of Communications revokes the license of all private internet service providers

2005
Remains most expensive country in the region for telephone service and internet access

Turkmenistan shares borders with Iran and Kazakhstan, and has a population of about 5 million, the majority of whom are Muslim. The main spoken language is Turkmen, but Russian and Uzbek are spoken by 20 percent of the population.

The President, Saparmurad Niyazov, controls virtually every aspect of the country, which in turn has sparked both corruption in the government and oppression amongst the Turkmenistan citizens. President Niyazov controls all aspects of media dispersion including print, television news, and the internet.

ICT Development

Turkmenistan's telephone technology is poorly developed. In 2004, there were 374,000 telephone lines in operation. The few telephones that do exist are linked by cable and microwave radio leased by connections from Moscow-based international gateway switch. President Niyazov, however,



A high school student at a USAID training course in Ashgabat, Turkmenistan.

has taken recent steps to develop the mobile phone reach of Turkmenistan by implementing and introducing a national mobile phone network.

Turkmenistan's internet development has been even more politicized than the development of its telephone system. The internet arrived in Turkmenistan in 1996 when President Niyazov signed a contract with MCI with the financial support of USAID. At the start of 2000, Turkmenistan had 6 internet service providers; two run by the state and four privately owned. In May 2000, President Niyazov's Ministry of Communications revoked the license of all private internet service providers. This, in turn, allowed Niyazov to establish an official telecommunications provider of the government of Turkmenistan. Turkmentelecom monopolized the distribution of information and messages and halted the ability for the free flow of information.

Turkmenistan has an absolute state monopoly on the mass media. All non-state publications are strictly prohibited and state owned printing companies are under strict control and regulation by the founder and publisher of all printed media, President Niyazov. Turkmeni citizens can apply to produce a website by providing documents and outlines to the Ministry of Communications. The Ministry will evaluate the proposal to see if it meets with President Niyazov's belief system; if accepted the ministry will charge a licensing fee of USD 1,500. President Niyazov believes that peace and stability in Turkmenistan are due to his ability to manage the news media and communications between ethnic groups.

Turkmentelecom, the all encompassing, governmentally owned media company in Turkmenistan, hopes to add 50,000 new mobile phone numbers in the country. In total, 25,000 numbers will be installed in the capital Ashgabat, and the other 25,000 numbers will be dispersed to surrounding regions of Turkmenistan.

To this end, the monopolization of the mass media

by Turkmentelecom severely restricts any empirical numbers on internet users and internet service provider's. Almost all internet users are in the capital Ashgabat. Turkmentelecom has apparently tightened the control of online media to the point where accessibility to the web is limited to Web pages of Turkmenistan.ru, Rukhnama.ru, and other official sites that evangelize the ideologies of President Niyazov.

To maintain his ability to monopolize the mass media in Turkmenistan, President Niyazov communicates very little information concerning their inner workings of Turkmentelecom and the information that is transmitted is overwhelmingly questionable in its accuracy and reliability. In 2003, the statistics showed that there was a total of 544 internet hosts, and that there were 1.12 hosts per 10,000 inhabitants. However, the number of people with personal computers is unknown.

CAICT Research

The CAICT project has several research goals in Tajikistan, but authoritarian structures make the country difficult to study. President Niyazov controls all aspects of media dispersion including print, television news and the internet. He has even completed volumes of textbooks to be used in schools in Turkmenistan that conform to the ideologies of his system and hails his family lineage of one of greatness. President Niyazov not only has complete control of all media outlets, he severely limits the distribution of information to its citizens.

According to CAICT researchers, the limitations of access to precise data on Turkmenistan's information technology have spurred deliberation whether or not Turkmenistan will be able to produce useful or practical information for the project. An analysis could be made about the progression of social and cultural patterns since the advent of the internet; however, these patterns will be rather vague with its connections to what in fact generated the change. The CAICT project

is trying to draw parallels between a state's information technology and its affect on social and cultural change amongst its citizens. Without a contextual frame of raw statistics about the information technology of Turkmenistan a sound argument will be hard to create. The project understands this and has continued to pursue alternate ways of studying the impact—and

suppression—of ICTs in Turkmenistan. At this point, Turkmentelecom and President Niyazov's Ministry of Communication have censored all constructive and practical information. Undoubtedly, without access to this information the possibility of the CAICT project actually being able to implement its project goals concerning Turkmenistan is becoming questionable.

Country Comparison: ICTs and Education

Education funding and infrastructure are declining rapidly in the CIS countries, according to a 2004 UNDP report. ICT penetration remains low as do the percentages of students with access to computers.

Nevertheless, governments are targeting educators and students for training as knowledge workers and technology champions. During the past two years international donors have made significant investments in ICT development in the educational sector in conjunction with school reform efforts. Integration of educational technology is viewed as advancing pedagogical change, replacing Soviet-style rote learning with activity-based, student-centered learning. In addition, access to the Internet is viewed as a crucial pathway to a civil society. However, reliance on donor agencies leaves schools at risk when program and funding priorities change.

Beginning in 2003, school connectivity projects in Uzbekistan and Tajikistan established Internet access points and community computer centers in 60 and 20 schools, respectively, accompanied by extensive training for potential users. Funded by the U.S. Dept. of State, the project in Uzbekistan established a massive educational portal (www.connect.uz) providing resources such as lesson plans, an e-library, and

numerous forums. The project also facilitated teacher exchanges and partnership agreements with U.S. schools as well as contests promoting development of local content for Web sites. Recently renamed the Global Connections and Exchange-Uzbekistan (GC&E), school connectivity staff report providing access to 200,000 students, 25,000 teachers, and 5,000 administrators and training to 195,000 users.

Although Uzbek schools are still in the early adoption stages, CAICT researchers have found that differences are emerging between teachers at schools connected to the Internet and non-connectivity teachers. For example, at non-connectivity schools computer use is often limited to informatics classes and testing activities. Teachers and students participating in GC&E activities use the Internet to locate information and materials, engage in email, forums, and chats, and develop project Web sites that they enter in international competitions. Connectivity teachers are more likely to espouse interactive methods, collaborate with other teachers on projects and to be knowledgeable about Web-based resources available to them.



Uzbekistan

- 1991
Independence from the Soviet Union
- 2001
President Islam Karimov officially launches the internet in Uzbekistan
- 2002
Government of the Republic of Uzbekistan officials approved the National ICT Development Program
- 2004
The total number of collective Internet access points is 348 compared to 106 in 2002.

Timeline

The Republic of Uzbekistan gained independence from the Soviet Union in 1991, and has a population of more than 25 million. More than 60 percent of its people living in urban centers. This post-communist regime's legal system is an evolution of Soviet law, and government officials have applied a gradual approach towards privatization. Largely, ICT development has been gradual and of low priority in Uzbekistan. In 2003 there were about 492,000 internet users and 1,040 internet hosts. In 2002, there were about 135 ISPs. There were about 1,717,100 main telephone lines in use and 320,800 mobile phones. Overall, the communications system is in serious need of modernization.

However, government officials have recently began to use ICTs as a comprehensive tool to resolve social and economic issues. In May 2001, President Islam Karimov officially launched the internet era in Uzbekistan. In May 2002, Uzbek officials approved the National ICT Development Program. The main objectives of this



Afghan refugees receiving computer training at a United Nations Refugee Center in Tashkent, Uzbekistan.

program include promoting ICT growth through:

- (1) the perfection of legislation and regulations which promote attraction of investments and increases competitiveness in the industry;
- (2) the development of ICT infrastructure, and provision of information security, for the government and individuals; and,
- (3) the creation of favorable tax and custom conditions for industry development.

The development of ICT infrastructure could lead to the expansion of a software industry and could establish computer hardware production facilities within the country. This would increase computer and ICT usage among citizens. Moreover, it would help citizens overcome the high transportation costs of living in a mountainous, landlocked state. Improving communication could unleash the significant creative energy of the country's entrepreneurs.

Some successful ICT efforts in Uzbekistan include the UzSciNet project. This project has provided the high-speed internet backbone network for thousands of computers in scientific, medical and educational organizations across the country. And perhaps the most consistent project is one organized by the UNDP in Uzbekistan. This effort has been promoting access to the internet in Uzbekistan for more than five years and remains the major consistent partner of the government in ICT development. However, when the UNDP and the government of Uzbekistan initiated the first ICT aid project in 1996, the establishment of a high-speed internet did not produce desired results. Instead, weaknesses were exposed, such as unsatisfactory infrastructure, low internet usage outside the capital area, low purchasing power, government monopolies, lack of local internet content and lack of awareness about the benefits of ICT.

Many unfavorable conditions have had an impact on ICT development, such as a lack of clearly

formulated government policy on ICT, the poor computerization of the society and insufficient laws and legislation on information, intellectual property and copyrights. ICT development would require a range of concerted efforts, ranging from information management and administration to a supportive legislative and policy environment and to a strong focus on human capacity development. Uzbekistan's current monopolistic ICT atmosphere also poses a threat to ICT development. Uzbek officials must create a competitive environment in the ICT sphere. This would suggest the removal of monopolistic access rights from state internet service provider "Uz PAK" to create fair business conditions.

ICT Development

During a national ICT summit in 2004, Uzbek officials discussed the current state and perspectives of ICT development. The summit was organized by the Digital Development Initiative of the UNDP, the Uzbek Agency for Communication and Information (UzACI) and ITE Uzbekistan, among others. The conference participants focused on problems and achievements of IT introduction in state management, the development of e-education and access infrastructure as well as perspectives of e-commerce in the country.

The number of internet service providers in Uzbekistan increased from 135 in 2002 to 416 in 2004. Some 568,000 people now have at least occasional internet access. In 2004, the total number of collective internet access points is 348, compared to 106 in 2002. The access speed increased from 18 Megabits per second in 2002 to 44 Megabits per second in 2004. Moreover, Deputy director-general of the UzACI, Asad Hodjaev, said that over four-fifths of Uzbek cities were covered with telecommunication networks, as well as one third percent of regional centers and three quarters of the rural areas. Only 3 percent of the country was served by digital networks. He also noted that 92 percent of

governmental establishments, 81 percent of large enterprises and 100 percent of banks had their websites. More than 2,800 domains were registered in .uz zone compared to 2,563 in the beginning of 2004.

CAICT Research

In 2003, CAICT researchers conducted the "Daily Life in Uzbekistan" survey, a national, multi-stage survey of 317 adults. The survey provides baseline information regarding the demographics of users and non-users as well as data regarding their informational seeking behavior, and use of and attitudes toward ICTs. Summary results from this survey are available as a Toplines Report on the CAICT Project Web site. Subsequent analysis has identified the most reliable predictors of Internet use-English knowledge, college graduation, male gender, more household possessions and services, and smaller household size-as well as how the use of local languages serves as a sign of

resistance towards globalization. Qualitative methods have been used to collect supplementary data on specific technologies and the impact of their use on specific populations (see box on mobile phone study this page).

The CAICT Project is conducting a longitudinal study of secondary teachers in Uzbekistan that contextualizes how computers and the Internet are transforming pedagogical practices. Researchers are studying teachers' activities online as well as how ICTs are embedded in their classroom practice and everyday lives. This study entails live in-person interviews with teachers as well as observation of Web-based artifacts and online resources. CAICT staff are exploring innovative methods for combining online and offline research methods in the context of a multilingual, cross-national study.

Country Comparison: Mobile Phone Use

In the summer of 2004, CAICT researchers conducted a qualitative study of mobile phone use in Tashkent, Uzbekistan. The study consisted of observing mobile phone use in public spaces, and interviews with mobile service providers and both mobile phone users and non-users, especially young people and businessmen. Uzbeks use mobile phone technology to support existing cultural norms and values such as family interaction. For the most part, people choose to have only brief phone conversations in public spaces, but do choose to display their mobile phones in upscale restaurants. Men are more likely than women to use mobile phones in public spaces. Young people reported feeling that mobile phones should be treated with care because they are so expensive, and reported that parents gave them phones as a way of controlling their movements.



Public mobile phone use, such as depicted here in Tashkent, is a rarity.

Data Appendix

Data sources include the CAICT research papers, the International Telecommunications Union, World Bank, and the UNDP. Additional data and specific source details for this table are available online at <http://depts.washington.edu/caict>.

TABLE I: General Comparisons	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan	USA
Population (2004, millions)	15	5	7	5	26	293
Rate of Population Growth (2000-2004, annual percent)	0	1	2	2	2	1
Urban Population (2004, percent)	56	34	28	46	37	...
Rate of Urbanization (2004, annual percent)	-0.32	1.02	-0.39	1.97	1.02	1.44
Population of Largest City (2000, thousands)	1,129	753	576	604	2,143	8,085 [03]
Population Under Age 15 (2002, percent)	26	33	34	35	35	22
Total Fertility Rate (2000-05, births per woman)	2.0	2.6	3.1	2.7	2.4	2.1
Human Development Index Rank	78	110	116	86	107	8
Gross Domestic Product (2004, USD, billions)	118.4	8.5	7.9	27.6	47.6	11,750
Gross Domestic Product Per Capita (2004, USD)	7,800	1,700	1,100	5,700	1,800	40,100
Gini Index (1998)	31.3	29.0	34.7	40.8	26.8	40.8
Literacy Rate	98	97	99	98	99	97
Infant Mortality Rate (2004, deaths per thousand live births)	31	37	112	73	71	7
Primary Education (2000, net enrolment ratio)	89	83	103	...	99.6	94
Primary Education (2000, gross enrolment ratio)	96	102	105	...	...	100
Secondary Education (2000, gross enrolment ratio)	87	83	76	...	...	94

TABLE 2: Media	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan	USA
Radios (1997, thousands)	6,470	520	1,291 [91]	1,225	10,800	757,000
Radio Broadcast Stations (1998)	AM 60, FM 17, Shortwave 9	AM 12, FM 14, Shortwave 2	AM 8, FM 10, Shortwave 2 [02]	AM 16, FM 8, Shortwave 2	AM 20, FM 7, Shortwave 10	AM 4,854, FM 8,950 Shortwave 18 [04]
Radio Services (2004)	1 state-owned, several private	1 state-owned several private	3 state-controlled	1 state-controlled	1 state-controlled	7 networks, 12,932 commercial stations
Television Services (2004)	1 state owned, several private	1 state-owned 1 independent	1 state 5 independent	1 state-controlled	2 state-controlled	10 networks, 1,145 commercial stations
Television Receivers (2000, thousands)	3,910	240	2,000	875	6,800	235,000
Television Receivers Per 100 Inhabitants (2000)	24	5	33	20	28	85
Cable Television Subscribers (2000, thousands)	67	11	...	...	74	69,369
Home Satellite Antennas (2000, thousands)	...	...	...	...	25	16,000
Daily Newspapers	7 principal, 900 other registered	4	weekly, but not daily newspapers	2	3	1,480
Daily Newspaper Circulation Per 1,000 People (2004)	30	27	20	7	3	196 [00]
Widest Circulating Daily Newspaper (2004)	Zhas Alash [99]	Vechernyi Bishkek	Digest-Press	Turkmenistan	Khalq Suzi	USA Today
Widest Circulating Daily Newspaper (2004, thousands of prints)	130 [99]	20-60*	8	23	170	2,250
Students Per Computer in Classrooms	62	57	48	...	100	...

TABLE 3: Communication Infrastructure	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan	USA
Telephones, Public Pay (2000, thousands)	7	2	0.3	0.2	6 [2002]	1,720
Telephones, Main Lines (2003, thousands)	2,228	396	245	376	1,717	181,403
Telephones, Main Lines Per 100 Inhabitants (2003)	14	8	4	8	7	62
Telephones, Main Lines In Largest City (2000, thousands)	293	156	74	88	531	...
Overall Country Teledensity (2000)	11	8	4	8	7	...
Telephones, Total Subscribers (2003, thousands)	3,109 [02]	534	293	382 [02]	2,038	340,125
Telephones, Subscribers Per 100 Inhabitants (2003)	20 [02]	10	5	8 [02]	8	117
Telephones, Automatic Main Lines (2000, percent)	100	97	100	100	100	100
Telephones, Digital Main Lines, (2000 percent)	29	7	7	20	34	92
Telephones, Residential Main Lines As Proportion of Total (2000, percent)	89	81	79	80	84	66
Telephones Faults Per 100 Main Lines (2000, annual)	...	...	125	46	93	13
Telephones, Number of People Waiting for Service (2000, thousands)	156	58	10	61	33	...
Internet Service Providers (2002)	10 [01]	16 [03]	4	1	416 [04]	...
International Telephone Circuits (2000, thousands)	...	0.2	8	...	10	...
International Outgoing Telephone Traffic (2000, million minutes)	105	23	6	16	77	34,641
International Outgoing Telephone Traffic Per Subscriber (2000, minutes)	63	46	42	64	36	126

TABLE 4: Media Governance and Law	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
Corruption (2004, Transparency International index)	2.2	2.2	2.0	2.0	2.3
Political Rights (2005, Freedom House index)	6	6	6	7	7
Civil Liberties (2005, Freedom House index)	5	5	5	7	6
Press Freedom, Legal Environment (2004, Freedom House index)	24	23	26	30	26
Press Freedom, Political Influences (2004, Freedom House index)	27	26	26	33	36
Press Freedom, Economic Pressures (2004, Freedom House index)	22	22	24	29	24
Press Freedom, Total Score (2004, Freedom House index)	73	71	76	92	86
National Telecommunications Provider	Kazakhtelecom In the process of privatization.	Kyrgyztelecom Exclusive license expired in 2003, but remains a national monopoly.	AO Tajiktelecom National Monopoly.	Turkmentelecom National Monopoly.	Uzbektelecom In the process of privatization, with state remaining majority stakeholder.

TABLE 5: Development Economics of ICT	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan	USA
Foreign Direct Investment (2002, USD, millions)	2583.3	4.8	36.1	107.9 [97]	...	39,633
Foreign Aid (2002, percent of imports)	1	24	17	1 [97]	6	...
Multilateral Overseas Development Assistance (ODA) (2002, USD, millions)	8	40	86	3	25	...
Bilateral ODA from OECD-DAC (2002, USD, millions)	250	108	94	9	126	...
Total ODA (2002, USD, millions)	258	148	180	12	151	...
Total ODA Per Person (2002, USD)	17.20	29.55	25.74	2.27	5.81	...
Residential Telephone Connection Charge (2000, USD)	100	9	3	58	32	44
Residential Monthly Telephone Subscription (2000, USD)	3.10	0.60	0.30	0.20	1.50	20.80
Cost of Three Minutes Local Call (2000, USD)	...	...	0.01	0.4	0.01	...
Business Telephone Connection Charge (2000, USD)	360	29	22	385	114	72
Business Monthly Telephone Subscription (2000, USD)	7.90	1.00	2.2	9.6	10.6	41.8
Mobile Phone Connection Charge (2000, USD)	...	...	284.00	...	50	...
Mobile Phone Monthly Subscription (2000, USD)	...	...	35.50	...	10	...
Mobile Phone Cost of 3 Minutes Local Call (2000, peak, USD)	...	1.10	...	0.90	...	...
Mobile Phone Cost of 3 Minutes Local Call (2000, off-peak, USD)	...	1	...	0.4	...	...
Mobile Phone Subscribers (2003, thousands)	1027 [02]	138	48	8 [02]	321	158,722
Mobile Phone Subscribers Per 100 Inhabitants (2003)	6.4 [02]	2.7	0.7	0.2 [02]...	1.3	54.6
Number of Internet Hosts (2004, thousands)	22	12,299	0.069	0.524	1 [03]	162,209 [03]
Numbers of Internet Host per 10,000 Inhabitants (2003)	13	11	0.1	1	0.4	5,578
Internet Users (2003, thousands)	250 [02]	200	4.1	8 [01]	568 [04]	161,633
Internet Users Per 10,000 Inhabitants (2003)	157 [02]	384	6	17 [01]	192	5,558
Number of Personal Computers Per 100 Inhabitants (2003)	...	1.4	...	.06 [01]	...	66 [02]
Cost of 1 Hour at Internet Access Point in Largest City (2005, USD)	1.50-2.00	1.20-1.68	0.60-1.20	4.50-5.00	1.75-2.35	5.00
Cost as Portion of Average Daily Income (2005, percent of GDP per capita)	31-41	133-186	115-231	147-163	152-204	...
Annual Investment In Telecommunication Infrastructure (2000, USD, millions)	72	2	0.1	4.2	57	28,779

CAICT Research Papers and Presentations

Abstracts for these these papers and presentations are available online at <http://depts.washington.edu/caict>

Papers

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Credits

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