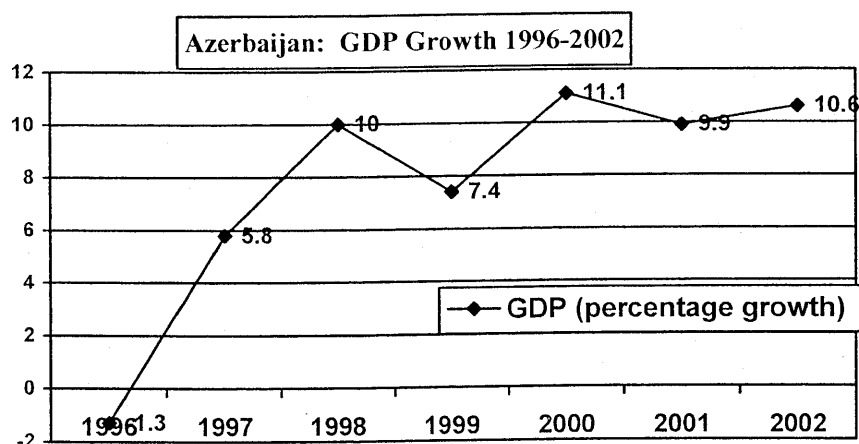


### 3. Present Situation and trends in the country's information system

#### 3.1. General Statistics on Azerbaijan

Population (January 2002)	8200000
Area (sq.km <sup>2</sup> )	86,600
US\$ Per Capita GDP (2002)	756.3
GDP Growth (2002/2001)	10.6%
International Reserves , US\$ in million (2001)	679.6
Currency Units, Manat (September 2002)	1 US \$ = 4894.2 Manat
<b>GDP Distribution (2002)</b>	
Agriculture	14.2%
Industry	34.9%
Services	50.9%
<b>Merchandise Trade</b>	
Total, US\$ billion (for 11 months of 2002)	3.3
Exports (2001), US\$ billion	1.8
Imports (2001), US\$ billion	1.5
ICT in Merchandise Trade, US\$ million	162.00
(%)	(4.38%)
<b>Penetration of ICT</b>	
TV/100 (2001)	25.9
Telephone/100 (01.01.2003)	12.0
PCs/100 (2001)	1.5
Mobile Cell Phone/100 (01.01.2003)	10.6
<i>Source: State Statistical Committee of Republic of Azerbaijan, USACC investment Guide to AZ 2001</i>	



*Source: State Statistical Committee of Azerbaijan, June 2002 and EIU*

For the first 7 months of 2002, there was an investment of 5,321.5 billion Manat in the Azerbaijani economy that has exceeded the amount of investments for the same period of 2001 for more than twice. 4,173 billion Manat (78%) of all investment were in FDI and 1,148 billion Manat (28%) was the share of the national capital. GDP growth of Azerbaijan for the period of January – December 2002 was 10.6%.

The market for telecommunication equipment in 2001 amounted at US\$ 58.5 million, compared to US\$ 60 million in 2000, a decline of 2.5%. The market for public network infrastructure was estimated to be some US\$ 36 million and private network equipment US\$ 22.5 million in the year 2001. The telecommunication market was expected to grow to US\$ 200 million by 2005 with public network infrastructure estimated at US\$ 150 million and private network equipment for US\$ 50 million. Aztelecom invested US\$ 17.3 million of its own resources in 2001 for the development of telecommunication systems and was planning to invest another US\$ 22 million in 2002. By 2005 it was expected that a total of US\$ 350 million would have been invested in the telecom sector. US\$ 110,2 million of this would be from Ministry of Communications internal resources, US\$ 51,3 million from foreign investors and US\$ 126 million from foreign credits. Aztelecom, the monopoly service provider, was slated for privatization and flow of foreign investments in telecommunication. This was expected to lead to a general improvement in the telecommunication system and thereby create a market for more advanced systems.

### **3.2. Regional and International Cooperation**

There have been implemented several joint United Nations and Azerbaijan Government Projects.

*Capacity Building and Data Transmission Network Implementation Project* for the State Customs Committee of Azerbaijan Republic. The project is the first Government cost-sharing initiative in Azerbaijan that introduces ICT into the daily management and functioning of the SCC. To main goal of the project is to enhance the technical potential and operational effectiveness of the SCC.

During the first phase of the project a sustainable connection for all Customs Checkpoints was installed that upgraded the data transmission network and expanded the network coverage so that the on-line mode of the data transmission network operates between the SCC, the Baku Chief Customs Department, and the customs checkpoints in Khachmaz, Tovuz, Astara, Ganja, Evlakh, Ali-Bayramly, Bilasuvar, Khudaferin, Samur, Yalama, Boyuk

Kesik, Sinig Korpu, Massaly, and Lenkoran. The system was thoroughly tested and the results were the subject of a technical conference attended by over 150 representatives from the State and private sector scientific and telecommunication community. Currently the dial-up mode is still being used in the Nakhichevan Autonomous Republic, Belokan, Sumgayit, and Bina customs checkpoints. Their transfer to the on-line mode is scheduled to take place in 2003.

The second phase of the project includes the establishment of a computerized database that will register violations of Customs Law, violators. The documentation will provide easier tracking of the movement and routes of illegal substances and thus facilitate the combating of smuggling and other violations of the customs law.

#### Computerized Customs Registration and Control System (CCRCS)

One of the main activities of the customs checkpoints is the registration of goods and transportation used to cross the border, monitoring and controlling the information contained in the Cargo Customs Declarations (CCD). The second phase of the project envisages utilizing information technology to improve the overall effectiveness and efficiency of the process. In addition, a computerized CCD registration and data control system should make interaction between clients and customs officials easier, more accountable, and transparent.

Computerization of CCD will allow customs brokers to provide advise to their clients, assist in the completion of documentation and serve as intermediaries. Declarations will be made electronically at checkpoints.

**UNDP** has been providing ICT assistance through a variety of projects since 1995 and it was acknowledged that it would be useful to provide an overall national strategy to assist the Government further develop the ICT sector. Therefore UNDP organized an ICT evaluation mission by an independent ICT expert Mr. R Labelle in June 2001. A draft of National ICT Strategy (NICTS) was then prepared and submitted to the Government. This project enables UNDP to provide ongoing assistance to finalization and initial implementation of a NICTS for Azerbaijan.

While the Government of Azerbaijan is responsible for the overall effective management and execution of all aspects of the project, it has selected the SSAC to be the executing agency of the project.

### 3.3. Information Infrastructure and Internet

#### 3.3.1. Telecommunications: present situation

A modernization programme to 2006 for the national communications system was being implemented in three stages with an investment of US\$ 350 million. This telecommunications development programme was based on accelerated improvement of the international television network by switching to fibre-optic and satellite channels. Now, direct channels connect the country to Rome, London, New York, Frankfurt, Ankara, Moscow and other centres. In 1991 there were only 30 direct satellite channels; by 2001 the number of channels exceeded 800.

It was planned to upgrade the communication network in the country to a digital system by the year 2007. Today, digital equipment accounts for 37.1% of operating ATE - in the city of Baku 41.2 % - with the remaining being analogue. The telecom system was concentrated in the Baku region. The Ministry of Communications plans to enhance the penetration level of telecommunications in the regions and villages of the Republic to 50 in every 100 families by the year 2007.

**Fiber-optic lines on Azerbaijan.** Within the framework of the "TransAsiaEurope" project, network of fiber-optic communication lines was built in the country that has increased application of digital technologies in infrastructure of the communication.

Also fiber-optic communication line has been constructed along the railway Baku - Tbilisi. This cable has been constructed within the TRACECA project.

**Telecoms and mobile.** Bakcell (GSM 2000) and Azercell (GSM 900) are two cellular services operators in Azerbaijan. Currently, there are more than 870,000 cellular service subscribers with a geographical coverage of 63%. Azercell planned to increase its subscriber base up to 700,000 and its coverage to 95%. Bakcell had 120,000 users and invested US\$ 10 million in 2001 to enlarge their capacity to 200,000.

#### Azerbaijan: Growth of Mobile Telephone subscribers (1993-2001)

Year	Bakcell	Azercell	Total	Growth
1994	2000	-	2000	-
1995	5000	-	5000	250%
1996	12000	2750	14750	295%
1997	18000	20371	38371	260%
1998	26000	55831	81831	213%
1999	30000	179640	209640	256%
2000	70000	380414	450414	215%
2001	120000	519346	639346	142%

## DATA ON TELECOMMUNICATIONS OF AZERBAIJAN FOR 2002

№№	Main indicators	Data of the Regional Commonwealth of the Communication and Telecommunication Conception of Azerbaijan					Place of Azerbaijan in CIS for 2001
		Azerbaijan	According to RCC		According to the Conception		
			Averages in CIS	Pages	Average data	Pages	
1	2	3	7	8	9	10	11
1	A number of telephone sets per 100 residents of the Republic	10,84	14,53	18	12,9	42	8
2	A number of telephone sets per 100 residents in the capitals of the Republic	23,4	28,24	23	42,8	42	7
3	A number of telephone sets per 100 rural residents in the Republic	3,63	5,75	18	-	-	7
4	A number of Internet users per 10000 residents	32,13	109,10	34	-	-	10
5	Tariffs for long-distance calls for 1 minute from the capitals of CIS	9,7	4,68	78	-	-	11
6	Specific gravity of investments at the own sources (%)	41,9	75,3	102	-	-	12
7	Average annual number of communication employees (thousand people)	10,60	57,60	87	-	-	6
8	Engaged in communications in % in ratio to the number of employees, engaged in economy of the country	0,43	0,78	88	-	-	12
9	Average annual number of officials (administration) in % from the whole number of employees of electronic communications	2,40	7,18	110	-	-	11
10	Average monthly salary of employees in telecommunications (in USD)	92,40	107,7	107	-	-	8
11	Quality of the work of long-distance telephone communication in %	32,8	50,8	47	-	-	9
12	Outgoing international telephone traffic (millions of minutes)	29,60	177,20	53	-	-	9

Both operators offer international roaming, which is relatively expensive. Prepaid mobile communications services, mobile banking, Internet, SMS and other value-added services allowed operators to attract customers from other telecommunication sectors, such as paging

and trunk communication. In July 2001, Azercell in cooperation with ISP Azeronline, introduced the mobile Internet in Azerbaijan.

According to research conducted by World Bank, Azerbaijan holds first place among the CIS countries in terms of its penetration rate of cellular-phone-using subscribers.

**Telecommunications in Azerbaijan.** Out of 420,000 telephone lines existing in Baku, the national operator **PO BGTS** is managing for 375,000 lines (an 89% share of the market),

**Ultel** - 15,000 lines, **Catel** - 10,000 lines, **Azeurtel** - 20,000 lines.

<b>Telecommunications in Azerbaijan (01.01.2003)</b>			
<b>Total PSTN Telephone Lines</b>	982,500		
<b>PSTN Swithes:</b>	Nakhchivan Autonomous Republic	Baku - city	Total in Azerbaijan
Step by step		6.3%	4.0%
Cross-bar		45.7%	55.0%
Digital	100%	48.0%	41.0%
<b>Telephone Lines per 100 Families:</b>		97.41%	53.66%

Alcatel's System 12, Marconi's System X, Nortel and DMC switching systems were installed in Baku. Catel (Caspian American Telephone Company), Joint Venture between Ministry of Communication and Metro media International Communication (USA) utilized wireless and CDMA technology for provision of telephone communication services. Azeurotel utilized Marconi System X for developing of their network.

#### Investments to the communication sector in 1991-2001 years

(Mln, USD)

Years	Budget Investment	Investments from Ministry of Communication		Foreign investments to joint ventures		Total
		Investment	Credit	Investment	Credit	
1991	3,7	-	-	-	-	3,7
1992	4,7	-	10,9	-	-	15,6
1993	15,1	-	-	2,3	-	17,4
1994	0,6	-	-	2,0	-	2,6
1995	3,1	-	-	3,4	-	6,5
1996	6,7	-	-	14,3	-	21,0
1997	-	8,2	-	6,5	-	14,7
1998	-	13,1	12,6	50,0	14,5	90,2
1999	-	20,0	-	26,4	25,7	72,1
2000	-	13,0	10,7	35,0	20,0	78,0
2001	-	18,2	8,3	2,4	15,0	43,9
<b>Total</b>	<b>33,9</b>	<b>71,8</b>	<b>42,5</b>	<b>142,3</b>	<b>75,2</b>	<b>365,7</b>

Density and coverage of the cellular communication services in Azerbaijan varies considerably from region to region. These offer a good market growth opportunities for the

telecom manufacturers as well as for the software developers. A third mobile operator was expected to appear shortly in the Azerbaijan market.

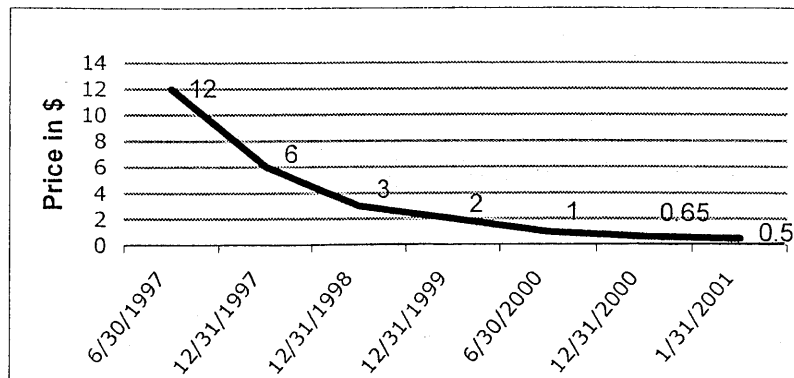
### Internet Service Providers. Internet and broadband

Currently, there were 13 Internet Service Providers. The market for Internet service providers in Azerbaijan was growing rapidly. In 1996 and 1997 a number of ISPs were established that started to offer basic services. In the beginning, the services offered were expensive and of poor quality, but constant growth of the ISPs in the country has resulted in the formation of a highly competitive ISP industry in the Caucasus region.

Internet market growth is slowed by monopoly of Aztelecom. As a result, large ISPs were switching to satellite channels in order to provide affordable services.

Discussions have been held with a number of ISPs in Azerbaijan. From these, it was learnt that the Ministry of Communications planned to reduce the prices of calls and to charge users on a per second basis rather than per minute. The Ministry has imposed a fixed monthly telephone charge of US\$ 4.32 for Internet access (2002). The average price of an Internet connection varied between \$0.70 and \$0.50 per hour in 2001. Some ISPs provide unlimited access to the Internet for \$50-30 per month, compared to \$150 in 2000. Overall, Internet access prices in Azerbaijan were falling as can be seen in below figure.

**Azerbaijan - Internet Access Pricing (1997-2001)**



Source: Azerbaijan Development Gateway: e-Readiness Assessment Report 2001

The decline of Internet access price was one of the main reasons for the growth of number of Internet subscribers in Azerbaijan. Today, it is more convenient for individuals and organizations to get unlimited access that could be purchased about \$30.00 - \$50.00 depending on provider.

### 3.4. Networked Learning

#### 3.4.1. ICT in Schools: Computerization Phase

There is no wide statistic information on levels of computerization in Azerbaijan education system. According to the Statistic Report of UNESCO, there are computer classes in 30% of schools (40% in the urban schools, and 20% in rural schools) in the Azerbaijan Republic. Average number of pupils per one computer in schools, equipped with computer classes in the Republic is 25 pupils, including 20 – in urban schools and 30 pupils in rural schools. At this percentage share of IBM-compatible computers to the total number of computers, used in educational institutions, is only 5% and percentage of the computers and using the operation system Windows to the total number of IBM-compatible computers in the schools is 60%.

30% of the schools have access to the Internet, 20% of the schools have their own web-pages. Percentage of the teachers, who passed the courses of the computer literacy (among the teachers of the primary school) is 15%, teachers on subjects, besides the teachers on computer science, is 3%, and among the teachers on computer science is 20%. At this 70% among the teachers on information technologies are able to work with spreadsheets and word processing.

Source: “The Main Indicators of ICT application in Secondary Education of the countries of CIS and Baltics” – Statistic Report of UNESCO Institute on Information Technologies in Education, 2002.

However the number of projects had been implemented within the educational institutions of Azerbaijan.

In 2002 within the framework of the first tranche of the **World Bank** (5 million USD) 20 schools in the 5 biggest cities of Azerbaijan have been provided with modern PC classes. It is expected that the second tranche for this actions from the World Bank will be amounting at 14 million USD till 2010.

International NGO *Project Harmony* implements a school connectivity project, a pilot program to connect 10 Azeri schools and conduct trainings for teachers. The project aims to create an online network of teachers and develop partnership with schools in the USA and other countries.

*Junior Achievement* (US) cooperates with the Ministry of Education in Applied Economics in 20 high schools in Baku. Each school under the framework of the program received 1 computer.



*Open Society Institute-Azerbaijan* has largely worked with high schools, and is going to expand its activities on ICT in education to the primary level. OSI runs “I\*Earn” project <http://www.earn.org> in Azerbaijan. The program provided 9 schools in Baku and 2 in Sumgait with computers (1 computer per school).

### **3.4.2. ICT and High Education**

Majority of students use computers in universities. The computers are mostly used for typing. There is also a group of students who use computers at a proficient level.

*Exxon* Company in cooperation with *OSI-Azerbaijan* and the *US State Department* assisted the State Oil Academy to develop one of its computer labs and offered computers to equip this lab.

*Baku State University* (more than 300 computers per 14000 students), with the support of *OSI-Azerbaijan* and *IREX/IATP*, has created a resource center to enhance ICT development in education. University and high school teachers receive basic computer and Internet skills at this center and then train others to transfer computer skills further.

*Azerbaijan International University* has 400 more computers per 6000 students.

*Open Society Institute-Azerbaijan* in partnership with *IREX/IATP* and *Exxon* created 5 Internet resource centers for higher learning institutions in Baku: Baku State University, Medical University, Khazar University, Western University and the Technical University. They have continued this work with the universities in 4 other regions: Nachichevan, Mingechevir, Ganja.

In 2001 for the first time the faculty of “Improving qualification and re-training” by use of distance learning tools had been established at the Azerbaijan State Economic University. At the present time 50 students study at this faculty.

*Khazar University* in cooperation with *Western University* and *IREX* initiates a distance-learning course on International Negotiations (started in Fall 2001).

Application of ICT in education was increasing gradually and was steadily growing. Higher learning institutions use IT not only for educational but also for marketing purposes. Private universities were more advanced in ICT development as they could afford the expenses being the self-funded entities.

University web-sites featured information on academic programs and courses offered, academic departments and centres, facilities, news and events bulletin, contact information, faculty and staff and online application forms. Some private universities, for example Khazar University, used their web-sites for online admission.

*Kavkaz University* works to foster development of wireless communication among 11 high schools. The teachers involved in the project within which several distance learning courses in Kuba, Alibairamli, and Nakhchivan are being currently developed.

In 2000 *Khazar University* introduced the first ever course on E-commerce delivered by professor from California State University, US. Some 50 students registered to this course experienced an extensive use of Internet in education through WebCT.

### **3.4.3. SSAC as National achievement in learning**

The Azerbaijan Republic is the first republic of the former Soviet Union, which in 1992 made a political decision on conduction of the sole admittance examinations to the higher and secondary special educational institutions of the country on the base of sole test exams. At the present time the State Student Admission Commission – body, created specially for this purpose, was charged to conduct these examinations. Since 1992 this organization develops, organizes and conducts all admittance examinations to the Higher and Secondary Special Institutions of the country and has ten-year-experience in introduction of ICT into the process of education. Since 2001 according to the Azerbaijan President's Decree, SSAC is authorized to conduct attestation on professional fitness of the state employees during their admission to the job.

During the admittance examinations SSAC evaluates the knowledge level of applicants on the base of the standards, developed on the program material within school course and provides the formation of the contingent of students for each educational institution of the country. During the arrangement, SSAC take into account demands of the Higher Educational Institutions, which include vacant places for each specialty and requirements of this educational institution to the knowledge level of their future students.

Enrollment to vacant places is conducted according to the applicants' results, demonstrated at the sole exam, and their desires, reflected in application.

All the stages of the admittance examinations process, beginning with the projecting of the optic forms, used at the examinations, formation of the state standards to the knowledge level of the applicants, creation and regulation of the database on applicants, personnel, experts, educational institutions, etc.; selection and training of the personnel, engaged in the process of examination and ending with the provision of each applicant with information concerning his/her results, and each institution with the list of their students together with statistic

analysis of the results and recommendations on its further development, are built as an open socio-technical system with full automated technological procedures.

The whole examination cycle, as the sole technological process, is divided on many stages, clearly planned by time, term of fulfillment and responsible for its realization. Applying IT technologies in management and monitoring of the whole process allows the people taking decision to justify the process and conduct correction measures in case of extraordinary situation, influencing on the conduction of examination or its one phase.

The main component of conducted admittance exams with applying the modern technologies is that they allow not only evaluate the applicants' results, conduct their assignment by the specialties within the short-term, but also give real assessment of the education level not only in the country in general, but by each region, city, village and even separately by schools and subjects.

Use of IT technologies allows to save time, human resources, excludes subjectivism and any kind of negative in the process of examinations, makes the process practically feasible

Since 1999 SSAC has its own interactive internet site ([www.tqdk.gov.az](http://www.tqdk.gov.az)), which provides the population with information service before and after the examination process. The applicant is given the chance to participate at the virtual exam, compare his/her knowledge with the other participants of this exam irrespective of his time of inclusion to the site.

Configured software and hardware of the admittance examinations process are developed by the specialists of the SSAC and is original development at the whole post- Soviet space.

Introduction of information technologies allowed to provide:

- Transparency of the examination process,
- Acceleration of the results' processing,
- Exclusion of subjectivity in assessment of the knowledge,
- Equal access to the education for various layers of the society,
- Reduction of the human and financial costs of the state on the examination process,
- Raise of the education process motivation.

#### **3.4.4. Training Centres**

UNDP has been providing ICT assistance through a variety of projects since 1995 and it was acknowledged that it would be useful to provide an overall national strategy to assist the Government further develop the ICT sector.

Particularly in the following projects:

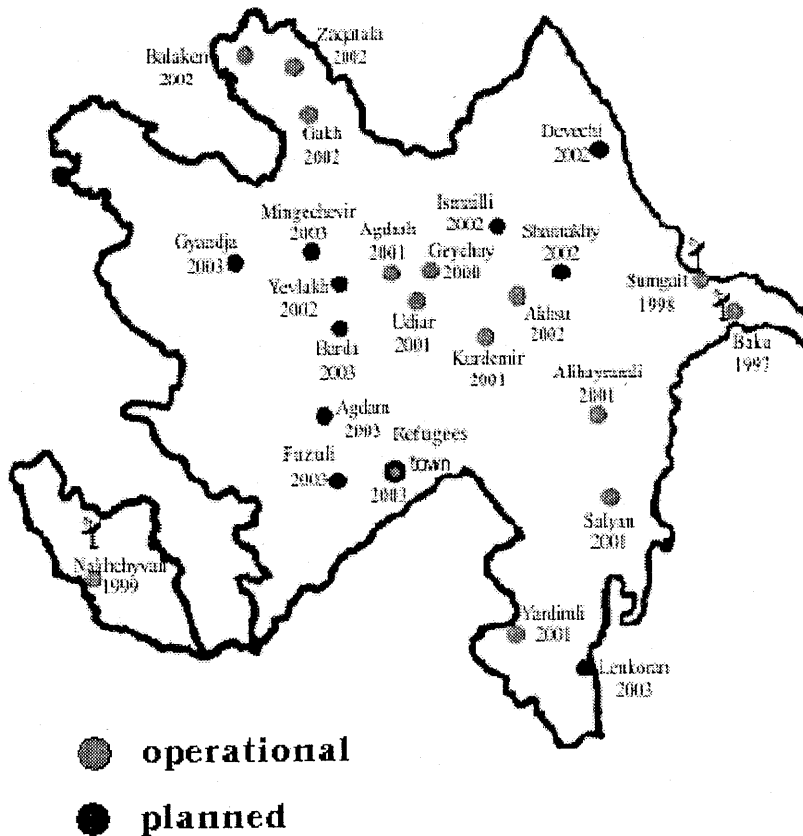
Strengthening of Computer Technology and Training Center for Azerbaijan – AZE/94/002,  
Establishment of Sumgait Computer Centre for Training and Information and

Telecommunication Services – AZE/96/007,

Establishment of Nakhchivan Computer Centre for Training and Business Information Services – AZE/97/001,

Regional Academy for Online Network Governance and System Administration – AZE/01/004.

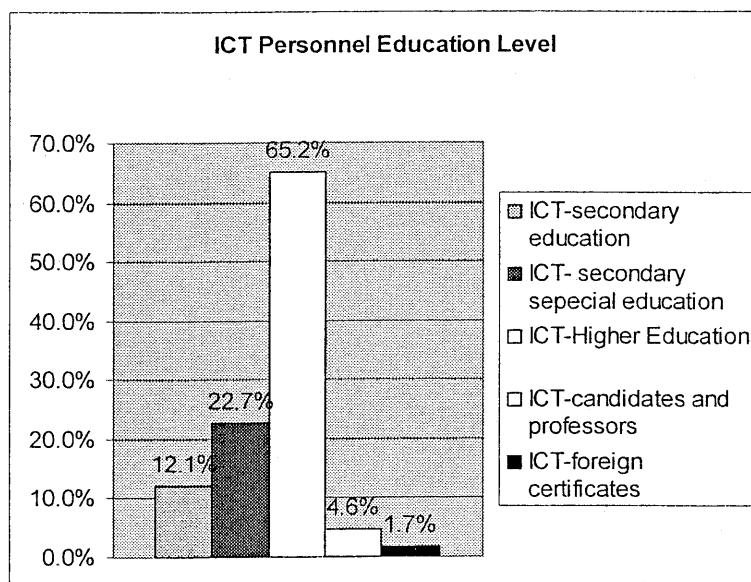
The realization of all these projects gave the opportunity to establish 14 regional information centres and to organize IT trainings in these centers:



### 3.5. Networked Society

Azerbaijani Internet services market was growing rapidly. National organizations were showing more and more interest in the Internet. According to Azerbaijan Development Gateway (AzDG), there was 12 000 Internet subscribers in 2000, 35 000 subscribers in 2001 and more than 240,000 active Internet users due to widespread Internet cafés and Universities providing Internet access for students in 2002. Predominant users (36.1%) of Internet were

18-25 years old and 14-18 years old (27.8%). Users mainly accessed Internet for chat (22.1%), e-mail (21.2%), search (18.3%), games (11.5%), and forum (8.7%).



### 3.6. E-Content

National web content in Azeri language is growing in Azerbaijan. The main constituents of the national content are web-sites of local businesses, state authorities, universities and other organizations. About 50% of private universities and 20% of state universities in Azerbaijan had their own websites.

#### Some Azerbaijani mass-media in Internet

Newspapers	URL	Language
Ayna	<a href="http://www.ayna.az/">http://www.ayna.az/</a>	Azerbaijani
Azerbaijan	<a href="http://azerbaijan.news.az/">http://azerbaijan.news.az/</a>	Azerbaijani
Bizim Asr	<a href="http://bizimasr.media-az.com">http://bizimasr.media-az.com</a>	Azerbaijani
525-ci Gazet	<a href="http://www.525ci.com">http://www.525ci.com</a>	Azerbaijani
Adalet	<a href="http://www.adalet-az.com">http://www.adalet-az.com</a>	Azerbaijani
Hurriyyet	<a href="http://www.hurriyyet-az.com">http://www.hurriyyet-az.com</a>	Azerbaijani
Xalq Jabhesi	<a href="http://xalqcebhesi.az">http://xalqcebhesi.az</a>	Azerbaijani
Olaylar	<a href="http://www.olaylar-az.com">http://www.olaylar-az.com</a>	Azerbaijani
Ses	<a href="http://www.ses-az.com">http://www.ses-az.com</a>	Azerbaijani
Sherq	<a href="http://www.sherq-az.com">http://www.sherq-az.com</a>	Azerbaijani
Yeni Musavat	<a href="http://www.yenimusavat.com">http://www.yenimusavat.com</a>	Azerbaijani
Zaman	<a href="http://www.zaman.com.az">http://www.zaman.com.az</a>	Azerbaijani
Zerkalo	<a href="http://zerkalo.az">http://zerkalo.az</a>	Russian
Echo	<a href="http://www.echo-az.com/index.shtml">http://www.echo-az.com/index.shtml</a>	Russian
Baku today	<a href="http://www.bakutoday.net">http://www.bakutoday.net</a>	English
Baku sun	<a href="http://www.bakusun.az">http://www.bakusun.az</a>	English

### 3.7. Networked Economy

According to the data of the American Chamber of Commerce in Azerbaijan, since 1994 from the moment of signing the IMF Stability Pact by Republic, considerable progress in almost all sectors of Azerbaijani society – in management of the economy, in the legislation sphere, in strengthening international and business communications, improvement of the labor conditions, etc. was reached. The economy of the country is stable, constantly developing, there is a low level of inflation and a financial stability, favorable business-climate are indicative. Till the present time Azerbaijan remains at the first place among the CIS countries by the foreign investments per capita.

#### 3.7.1. ICT - sector of Economy

According to the strategy of economic development of the country, new industrial policy stipulates the investments in the sphere of services, connected with the high technologies, in production of technologically modern equipment such as wireless and cellular phones, radio-electronic devices, specialized means of communication. The State Program on poverty reduction and economic development (started in October 2002) will allow to create a lot of job places, promote the establishment of many high-tech enterprises in the ICT sphere.

Program on assistance to the development of small and medium enterprises (started in August 2002) opens the way for the projects on creation of incubators for small companies in IT field, oriented on export of ICT products and services.

#### Azerbaijan: Market for ICT Products

(Value US\$ Million)

No.	Items	1998	1999	2000	2001	2002	2005*
<b>1.</b>	<b>EDP Computer Hardware</b>	<b>30</b>	<b>28</b>	<b>32</b>	<b>38</b>	<b>40</b>	<b>60</b>
1.1	Servers	8	6	7	10	10	15
1.2	PC& Workstations/Other add-ons	22	22	25	28	30	45
<b>2.</b>	<b>EDP Data Communication Hardware</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>7.5</b>	<b>8</b>	<b>10</b>
2.1	LAN Hardware	4	3	3	4.25	6	7
2.2	Other data communication	2	2	2	3.25	2	3
<b>3.</b>	<b>Software &amp; Services</b>	<b>4</b>	<b>3.5</b>	<b>6</b>	<b>7.5</b>	<b>10</b>	<b>50</b>
3.1	Software Products	2.5	2	3.5	4	5	20
3.2	Software Services	1.5	1.5	2.5	3.5	5	30
<b>4.</b>	<b>Telecom Equipment</b>	<b>65</b>	<b>61.5</b>	<b>60</b>	<b>58.5</b>	<b>50</b>	<b>200</b>
4.1	Public Network Equipment	40.5	38.5	38	36	20.5	150
4.2	Public Network Equipment	24.5	23	22	22.5	29.5	50
a)	Terminals Cell Phones						
b)	Phone, Faxes						
<b>5</b>	<b>Office Equipment</b>	<b>11</b>	<b>10</b>	<b>12</b>	<b>11.5</b>	<b>12</b>	<b>15</b>

5.1	Copiers	7	6.5	6.5	6.5	8	10
5.2	Other Office Equipment	4	3.5	4.5	4	4	5
6.	<b>Semiconductors</b>	2	2	2	1.5	1	---
7.	<b>Passive Components</b>	2	2	2	1.5	1	---
8.	<b>Scientific Instruments &amp; Control and Measurement Equipment</b>	10	12	12	12.5	12	15
<b>TOTAL</b>		<b>130</b>	<b>124</b>	<b>131</b>	<b>138.5</b>	<b>200</b>	<b>350</b>

Source: ITC project file / European Information Technology Observatory 2000

**The Republic of Azerbaijan: Global import / export of ICT products**  
(Value US\$ million)

Product Category	Import			Export		
	1998	1999	2000	1998	1999	2000
Semiconductors	2	2	3	NA	NA	NA
Electronic Data Processing (EDP)	15	9	17	1	1	1
Office equipment	1	1	0	0	0	0
Telecommunication	122	55	82	4	2	3
Other components	31	17	19	1	0	0
Scientific equipment	23	21	35	3	3	2
<b>Total</b>	<b>194</b>	<b>105</b>	<b>156</b>	<b>9</b>	<b>6</b>	<b>6</b>

Source: ITC/PCTAS database 1996-2000

**The Republic of Azerbaijan – Export of Electronic Products** (Value USD thousands)

Item	1999	2000	2001
Electronic calculators	0.11	0.03	0.1
Counting devices	217.1	651.1	481.3
Watches & spares	4.9	4.2	2.5
Electronic process control equipment	10067.2	5317.9	9251.5
Photo and cinema products	0.1	0.2	2.6
<b>Total</b>	<b>10289.4</b>	<b>5973.4</b>	<b>9738.0</b>

Source: State Statistical Committee of Azerbaijan, June 2002.

**The Republic of Azerbaijan - Import of Electronic Products** (Value in US\$ thousand)

Item	1999	2000	2001
Electronic calculators	293.7	77.6	395.5
Counting devices	7289.7	7693.4	12193.7
Watches & spares	189.3	343.7	342.5
Electronic process control equipment	15732.3	155641.7	121087.7
Photo and cinema products	83.4	181.7	239.6
<b>Total</b>	<b>165188.1</b>	<b>163938.1</b>	<b>134259.0</b>

Source: State Statistical Committee of Azerbaijan, June 2002

**IMPORT/EXPORT OF COMPUTERS AND THEIR BLOCKS**

*in thousand USD*

	1997	1998	1999	2000	2001
Computers, their blocks	6365.8/0.6	14066.6	7289.7	-	-
Computers, item	-	-	-	7693.4/	6698.7/

				651.1	358.6
Computer blocks and plants, item	-	-	-	6289.1/86.9	5495.0/122.7
Total	6365.8/0.6	14066.6	7289.7	13982.5/738.0	12193.7/481.3

Source: State Statistical Committee, 2002

### IMPORT/EXPORT OF COMPUTERS AND THEIR BLOCKS

*in thousand USD*

	1997	1998	1999	2000	2001
Tapes, disks, video cassettes	841.6/0.8	2028.0/5458.9	7289.7	-	-
Recording tapes, magnetic disks and cards, item	-	-	2372.0/7835.4	1975.1/2833.0	916.7/5612.0
Total	841.6/0.8	2028.0/5458.9	9661.7/7835.4	1975.1/2833.0	916.7/5612.0

Source: State Statistical Committee, 2002

### 3.8. E-Government

Azerbaijan is on 78 place among 133 countries in implementation of E-Government according to UNPAN E-Government-Global Survey.

Source: <http://www.unpan.org/e-government/globalleaderstables.htm>

About 30% of Government Ministries and Committees have its own official websites. For more details see: <http://www.gateway.az/eng/partners.shtml>.

Since 2000 the Information Recourse and Technologies Center of Presidential Office provides free of charge registration of domain **gov.az** for state organizations. At the present time 24 organizations have got **gov.az** domain.

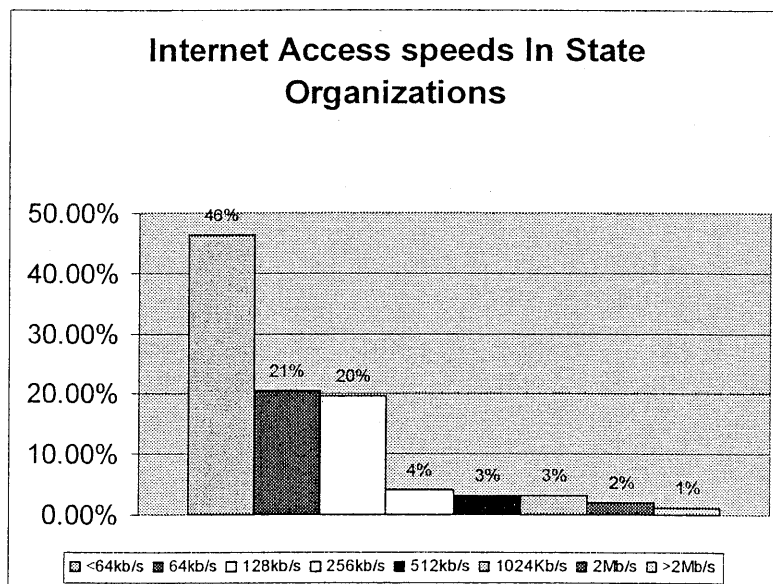
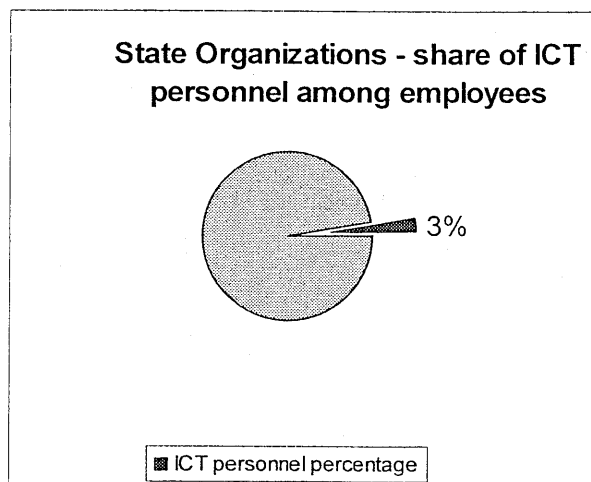
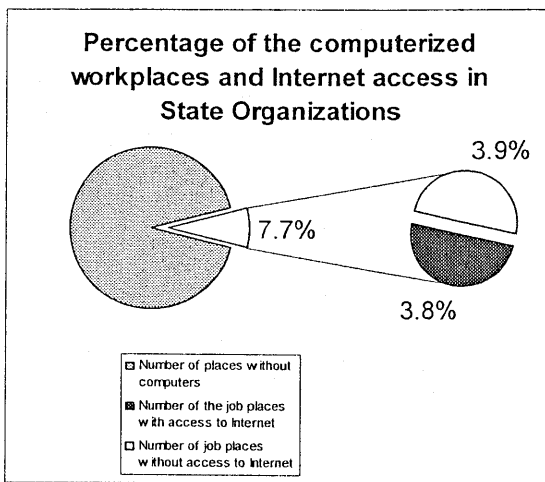
There is real need of wide application of ICT in the Republic, and there are favorable conditions for it. It demonstrates the following:

- Milli Majlis' (National Parliament) Information provision department presented web-site of Milli Majlis [www.meclis.gov.az](http://www.meclis.gov.az). Site reflects the structure of the parliament and permanent commissions, its present activity, international relations, biographies of deputies, the legislative acts.
- ICT is used for the testing attorneys, state employees. Within the framework of the reforms of the courts in the Republic, ICT was applied in selection of the judges, aptitude of the judges were determined by the tests.
- There is positive experience in formation of normative-legal base of information society in the country (see **e-regulation**, section 3.10.1.).



- Information system “Frontier: departure-arrival” is built and opportunity to apply ICT in frontier points is provided.
- With the aim of improvement of management and procedures in Customs system “Network of the transfer of data and automated system of control” is built.

There have also been a number of other important initiatives implemented by other partners from international organizations operating in Azerbaijan. However, these activities have also served to highlight the need for an overall National ICT Strategy to streamline and coordinate all the related initiatives so as to ensure lasting and sustainable results that serve the best interests of the country.



### **3.8.1. National ID-cards**

Canadian Bank Note Company (CBN) has signed a contract with the Government of Azerbaijan for approximately \$10 million US for the supply of 13 million national ID cards as well as creation of a computerized issuing system for both ID cards and passports. Additionally, the system will ensure the maintenance of a central database and perform border control functions. The solution will also include CBN's portable document inspection devices. CBN's Identification Systems Group has developed a Personal Identification Management System (PIMS) concept for governments. The system has the capacity to link all the government document issuance, inspection and tracking systems to a centralized database.

The ID cards and the system will be delivered and installed within the next 12 months by the CBN Identification Systems Group, which is the world's leading producer of passports, passport issuing systems, border control systems and travel document readers.

### **3.9. E-Business**

National development strategy was being evolved and would focus on improving e-governance, e-competency of enterprises and availability of infrastructure for conducting of e-business and e-commerce.

Existing websites of local and international private organizations operating in Azerbaijan represent consulting, IT companies, banks, insurance companies, transportation companies, mobile telecom operators and ISPs.

Websites usually provide general information on the organization and services provided, photos of products offered, contact information, on-line consultancy for the clients, FAQ, etc. The banks' websites provide information about recent financial news and information, services provided, various applications on loans and credits, which can be printed out and completed in advance. But banks still cannot offer their clients home banking via Internet. Centre of authorization of electronic credit cards Visa and MasterCard has already been established by "Azericard" processing center and will be fully implemented.

Now many Banks of Azerbaijan Republic are the members of the international system "Europay International". They offer following types of cards: MasterCard Gold, MasterCard Standard, Cirrus/maestro, Virtual card, etc.

However, many business structures deployed Internet innovations and fostered e-commerce development. International Bank of Azerbaijan introduced the Internet Card that allowed

purchasing goods and services online. It was obvious that businesses constituted the main driving force for e-commerce development as they realized e-shop benefits and were very enthusiastic about using them.

### 3.9.1. E-commerce

Project of electronic system of inter-bank payments in real time is implemented in banking system of Azerbaijan.

About 60% of local and international private organizations possess websites providing information on their activities in Azerbaijan; and about 4% were developing their websites. These websites represented consulting, IT companies, banks, insurance companies, transportation companies, mobile telecom operators and ISPs. A few websites represented sales dealers of various manufacturing products.

There are websites such as <http://www.azerbaijanEmarketplace.com>, <http://www.azel.net> etc. which provide their valuable resource for all those who want to expand their business in the Middle East, CIS countries, Africa and Indian sub-continent, whether you are buying or selling, from outside or within the region.

Various industries were presented at [www.Bazar-az.com](http://www.Bazar-az.com). It also reflects information about producers of goods, products' description and prices. Moreover, it contains information on products delivery and transportation. It is possible to sell and buy diverse products such as cars, paper, oil and corn via this site. [www.Auction.az](http://www.Auction.az) also offered wide range of goods for sale, but dealing operations were frozen due to the above-mentioned problems and absence of demand as an outcome.

The National Bank of Azerbaijan has implemented Azerbaijan Interbank SWIFT Payment System since 2001. The system consists of three main components

- CAS - Central Accounting System (conducts payment functions).
- S.W.I.F.T. System of World Interbank Financial Telecommunication - secures usage of real time payment system.
- CIM - Central Interface Module (secures connection between CAS and S.W.I.F.T.).

Top.az Company is recognized as a leader in introducing e-solutions and B2C e-commerce in particular. This company was the first in Azerbaijan to introduce online shop "Sabina" for perfume and cosmetics. The payment was performed offline through cash on delivery and through credit cards. As online payment system was still not in use in Azerbaijan, Top.az

Company was currently developing a payment system for its new online shop "Megashop", launched in June 2001. This shop sold Azerbaijani carpets, souvenirs and CDs of Azerbaijani music to foreigners.

There are also a growing number of other initiatives, like auction websites. Many Azerbaijani portals and big websites were trying to trade and conduct auctions. These websites usually offered advertisements with description of goods for sale or purchase. There were two websites [www.auction.az](http://www.auction.az) and [www.bazar-az.com](http://www.bazar-az.com) that were supposed to encourage e-trade and service infrastructure development and information exchange that will embrace countries of the Caucasus, Middle Asia and Europe. Source: <http://gateway.az/>.

Some companies had started developing B2B e-commerce application in Azerbaijan. Top.az Company, in addition to its leadership in B2C e-commerce, was working in B2B commerce development. The company was in the process of negotiations for getting B2B franchising and was offering to develop and maintain B2B section of AzDG portal.

### **3.10. Network Policy**

#### **3.10.1. E-regulation**

Azerbaijan adopted several basic laws and regulations designed to promote development of telecommunications and ICT sector. In 1998, Azerbaijan adopted the law on Information, Informatization and Protection of Information ("Information Law"), which created the legal framework for regulation of information resources, processes, systems and technologies. The Information Law authorized the use of electronic signatures only if it was possible to properly authenticate them of owner. Azerbaijan Civil Code allow to use electronic (digital) signature in commerce transactions under mutual agreement.

The Information Law further imposed restrictions on the use of "classified" information.

Unauthorized use of classified information was strictly prohibited. Information was deemed classified if it contained State secrets or was confidential. State secrets include information concerning military, foreign policy, economy, science and technology, intelligence, counterintelligence and investigations. Confidential information includes personal databases on individuals or entities not available to the public.

Box 1 (see Annex IV) shows details of national normative Acts adopted by the Azerbaijan Government to develop the information communications and technology sector.

The Government has ratified a number of international treaties with Regulatory Bodies. Some of these are listed below:

- *Charter and Convention of International Telecommunication Union, adopted on 22.12.1992 in Geneva, and amendments, signed in Kyoto on 14.12.1994;*
- *Treaty “On cooperation in the sphere of governmental communication” between the government of the Azerbaijan Republic and Ukraine Cabinet of Ministers” 2000;*
- *Provision for the establishment of the Conference of the European Post and Telecommunication Administrations, adopted on 07.09.1992 and procedure rules of the mentioned conference, adopted on 06.09.1995;*
- *Treaty “On cooperation in the sphere of provision of the governmental communication and information safety between the Ministry of National Security of the Azerbaijan Republic and Federal Agency of Communication and Information under the President of the Russian Federation, dated 2001;*
- *Treaty “On cooperation in the sphere of provision of the governmental communication between the Azerbaijan Republic and government of the Russian Federation”, dated on 08.01.01*

Information technology and communications in Azerbaijan were found to be under strong governmental regulation. Telecommunications, Internet services, subscriber television installation and operation were all subject to licensing by the Ministry of Communications. The Ministry of National Security licensed the production of information protection devices and software programs. The Ministry of Communications authorized all juridical and physical entities to provide communication services. All information systems, technologies, databases and equipment used in the ICT market must be also certified according to the State technical standards and safety requirements under the Ministry of Communications.

According to the list given in an attachment to “Rules of certification of communication services in Azerbaijan Republic”, approved by the Cabinet of Ministers, dated 25/08/1998, more than 119 types of equipment were subjected to certification by the Division on Certification, Ministry of Communication.

Services, however, were not subject to certification. Services provided in the communication field could be certified according to the “Law on Communications”. The certification laboratory met requirement of the international systems of quality. There were no non-State organizations or laboratories in Azerbaijan performing out certification or other types of testing. It was necessary to create a modern multi-profiled laboratory for certification.

Regulation of procedures on the development of the normative-legal Acts was partially on the basis of the Act of the Ministry of Communications entitled “Rules on the conduct of record – keeping at the Ministry of Communications”. According to the approved Provision relating to the Council of Informatization under the Ministry of Communications, this Council was also authorized to develop the normative-legal Acts project.

The Ministry of Communications systematically conducted analyses of the efficiency of Acts and either made the necessary modifications or abolished the Acts altogether. It was observed that closer coordination was necessary in the law-making process between the Milli Mejlis (national parliament) and the Ministry of Communications.

From May 2001 the working group on “ICT Normative-Legal base” within NICTS Project started its activity. The group developed the law drafts on “E-Signature”, “E-Commerce” and “E-Document”. The drafts were prepared using models and recommendations of international organizations (European Council, UN etc.) and best experience of developed countries. These three drafts have been already submitted to the National Parliament – the Milli Mejlis, for discussions. It is expected that adoption of these laws would remarkably increase the process of ICT developing in Azerbaijan.

The working group also carry out the analyses of European Convention on Cybercrime, adopted on November 23, 2001 in Budapest. In accordance with group outcomes the government authorities will make decision about joining Azerbaijan to Convention.

### 3.11. Main ICT projects

#### Azerbaijan: Main ICT projects

(in millions USD)

<b>Telecommunication Projects</b>	
Investments on modernization of the communication system (Upgrade of Digital Switch for IP-telephony, ISDN, Broadband network, Frame Relay, ATM, new services SDH, ADSL, etc.) till 2005	870
TRACECA project on supply of fibre optic cable system for signaling for the railways of Caucasian Countries	35
EBRD project Trans Asia Europe fibre optic cable highway	28
BP project laying fibre optic cable along Baku-Tbilisi-Ceyhan pipeline	15
<b>Information Technology Projects</b>	
“National Information Communication Technology Strategy” Project	1,2
Tax Systems Project	15
State Oil Company Computer Automation Project	15
National Bank Automatic Banking Check Clearance Project	5
Capacity Building and Data Transmission Network Implementation for the State Customs Committee	1.275
BP project for Enterprise Resource Planning implementation	10
Computer Center for Training and Information and Telecommunication Services	0,99

Source: ITC Technology Team Mission Report, 2002

### 3.12. Positive and negative factors characterizing present situation

Analysis of overall E-Readiness preparation of the country, including existing information communication infrastructure, hardware and software, information resources, information services, legal base, show that initial conditions for acceleration of the information society building process exists in the country, at the same time there are still objective difficulties.

#### 3.12.1. Positive factors characterizing present situation

- high level of population’s literacy and education;
- opportunity for lowering Internet connection prices in the country;
- existence of private telecommunication operators and their growth;
- positive experience in applying ICTs in national projects;

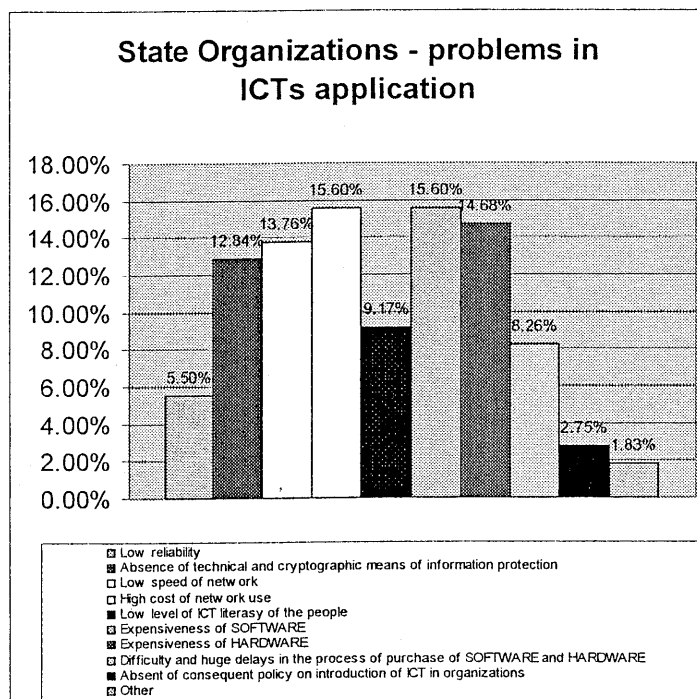
- existence of favorable investment environment and its recognition by international organizations, including OECD, and readiness of foreign investors to participate actively in applying ICTs;
- favorable geographic location of Azerbaijan and crossing of international transport highways and communication channels through the country ;
- stable development of economy and rich energy resources;
- successful continuation of widely applying ICTs in the banking system of Azerbaijan;
- modernization of the hardware and software as a result of Y2K problem resolving activity;
- formation of cellular phone network covering overall republic and its permanent development;
- upgrade and expansion of wired phone network and digital communication channels development;
- opportunities of the Internet connections via long distance telephony in most regions, etc.

### **3.12.2. Negative factors characterizing present situation**

- expedient state policy defining directions for work connected with usage of ICTs and its priorities, ensuring coordination of activities, hasn't been fully determined;
- legislative base regulating the usage of ICTs is not yet comprehensive;
- in connection with transition period of the country and existence of over one million refugees and IDPs as a result of occupation of 20% territory of Republic of Azerbaijan by Armenian Republic, the government can't allocate sufficient financial means for ICTs application;
- "brain-drain" to the developed countries in connection with transition period;
- little awareness of the population about advantages and opportunities of the ICTs;
- low level of computerizing in whole Azerbaijan;
- the disciplines connected with ICTs at all levels of educational process don't meet the up to date requirements;
- The "digital divide" between rural and urban areas of Azerbaijan;
- serious problems in broad usage of Azerbaijani language in the ICTs sphere, especially lack of Azerbaijani language support in software;
- very slow process of nation-wide information resources formation;
- the republic stays behind of many international integration projects on ICTs;



- telecommunication tariffs existing in the republic create serious obstacles to using of ICTs;
- existence of government monopoly hampering the innovations and fair competition in the telecommunication sphere.



## **4. Characteristics of the country's human resources**

With the experience of a decade of independence, Azerbaijan has entered the new millennium as a nation devoted to Sustainable Human Development (SHD), a commitment best exemplified by its current mission to eradicate poverty.

The early period of independence has by no means been an easy transition. With special consideration of the unresolved Karabakh conflict, the military occupation of territories by Armenian forces, the large subpopulation of Internally Displaced Persons (IDP) and refugees, the imbalance of economic development in the Republic's early years, and the legacy of the Soviet era, the nation's efforts to lay the foundation for human development should be applauded and further progress should be encouraged.

As part of the Soviet Union, Azerbaijan enjoyed certain advancements, especially in the areas of health and education. Achievements of this period are reflected by social indicators such as high levels of literacy, extended longevity and decreased levels of maternal and infant mortality. However, the Soviet Union, with its centralized system, fused to these gains a heritage of ideology, policies and practices, which presented certain shortcomings for a nation that wants to be in line with global standards.

Following independence in 1991, additional factors negatively impacted human development processes and contributed to the growth of poverty. The loss of the larger Soviet system meant less protection and oversight. The Gross Domestic Product (GDP) decreased decisively in the initial years, especially from 1991 to 1995. The decreasing GDP translated into lower levels of population income and diminished state allocations to education, health and other fields. As a result, human development indices decreased during this period.

Positive changes have taken place since 1996, however. Noticeable progress on human development has been achieved as a result of state policies and programs implemented with the support of international organizations. This progress is reflected in better economic indicators, an increase in the human development indices and the initiation of multi-pronged approaches to poverty alleviation.

Sustainable Human Development (SHD) has become a recognized and essential part of national, social and economic development planning, merging with the prevailing movement towards Poverty Alleviation (PA). Conceptual development of Sustainable Human Development and Ecologically Sustainable Development was decreed by the President in

2001. A Commission on Sustainable Human Development was established in coordination with the Ministry for Economic Development. Concurrently, a National Poverty Alleviation Strategy is being developed by the Government. This strategy will be based on advancements already made in sensitizing the communities and decision-making circles towards the introduction of well-planned human development approaches into poverty alleviation and economy development strategies. The commission is now working out a final version with the help of international experts and organizations.

Poverty in Azerbaijan remains the primary hindrance to sustainable human development. Its elimination or reduction will positively influence all other reforms.

#### **4.1. Current Situation, Azerbaijan in Comparison to the World**

According to the Global Reports on Human Development (UNDP: 2000, 2001), Azerbaijan's rating is gradually increasing. In 2000, the republic was ranked 90th among 174 countries, an improvement from its placement at 110th in 1999. The 2001 report places Azerbaijan 79th among 162 countries. The 2000 and 2001 reports are based on statistical data from 1998 and 1999. Growth of indicators specified for determining the Human Development Index (HDI) in 2000 and 2001 reveals progress and points out potential for sustainable development in the future. Annual growth of the Gross Domestic Product (GDP) is often interpreted as a significant factor in fighting poverty. In Azerbaijan, the GDP for 2000 grew by 11.1 percent, and in 2001 by 9.9. This slowing growth should not be understood as a reduction in economic development, but rather as a natural occurrence due to lags seen in year-to-year comparisons. Actual growth is shown by examining the per capita GDP: 574.5 USD in 1999, 654.5 USD in 2000, and 715.4 USD in 2001. Combined with Purchasing Power Parity (PPP), growth in these rates has also been recorded

A review of the HDI indicators shows that expected life duration decreased in 1992 and 1995. Starting from 1996, GDP growth and an improved quality of life have resulted in an increase in life expectancy. Expected life at birth is estimated at 71.9 years, which is 5.5 years more than world indices. Education also declined in the early 1990s, a trend that may be explained by low living standards and military conflict.

The relation of per capita GDP to HDI shows the existence of further national potential for poverty alleviation efforts. The main goal in this direction would be to address the issue of uneven income distribution and disparities in regional development, as well as in other fields such as education.

Despite HDI increases in Azerbaijan, these achievements do not reflect the potential of the country. Sufficient under-utilized growth possibilities exist and should be exploited in the future. Azerbaijan continues to have similar natural conditions (territory, population density, arable lands per capita, energy production per capita) and human potential (educational level) as a number of countries that have gained higher results in human development.

**Table 4.1 Human Development Index in Azerbaijan and its component indices**

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
<b>HDI</b>	0.718	0.707	0.696	0.692	0.697	0.706	0.772	0.738	0.746	0.751
<b>Life expectancy Index</b>	0.745	0.742	0.743	0.735	0.753	0.770	0.772	0.770	0.780	0.782
<b>Education Index</b>	0.870	0.880	0.880	0.880	0.868	0.871	0.878	0.880	0.895	0.895
<b>GDP Index</b>	0.540	0.498	0.464	0.462	0.470	0.477	0.510	0.560	0.563	0.576
<b>CDP per capi</b>	2 540	1 980	1 610	1 590	1 675	1 740	1 850	2 850	2924	3 148

In 1995, Azerbaijan's HDI was 1.8 percent higher than the average world indicators, but by 1999 the index was 3.1 percent higher than the world average. Interestingly, highly developed countries experienced similar trends, but these countries were able to achieve more in their development. Azerbaijan has a greater potential to develop in this respect.

The technological achievements and low poverty level is noteworthy for the selected comparison countries as it is for other countries with considerable gains according to the human development index. Thus, if Azerbaijan were to take advantage of technological advances and maintain its course for poverty alleviation, the nation's HDI will see continued improvement in the next few years. To measure the status of technological innovations, an overview of patent applications by citizens and non-citizens helps to outline the magnitude and find their connection to Sustainable Human Development and Poverty Alleviation

**Table 4.2 Dynamics of human development index in Azerbaijan and selected countries**

Countries	1995		1999	
	HDI	% difference from world average HDI	HDI	% difference from world average HDI
<b>France</b>	0.913	+34.2	0.924	+29.0
<b>Austria</b>	0.908	+33.5	0.921	+28.6
<b>Portugal</b>	0.853	+25.4	0.874	+22.1
<b>Hungary</b>	0.829	+21.9	0.829	+15.8

Mexico	0.772	+13.5	0.790	+10.3
Russia	0.778	+14.4	0.775	+8.2
Bulgaria	0.775	+14.0	0.772	+7.8
Azerbaijan	0.692	+1.8	0.738	+3.1
Turkey	0.716	+5.3	0.735	+2.6
Jordan	0.704	+3.5	0.714	-0.3
Iran	0.688	+1.2	0.714	-0.3
Moldova	0.704	+3.5	0.699	-2.4
Uzbekistan	0.683	+0.4	0.698	-2.5

## 4.2. Technological Achievements Index

Recent achievements in development and poverty alleviation, along with a number of political and financial factors, have been dependent on access to products of modern science and technology, which are largely responsible for the transformation in such areas as governance and social services, health protection and education, human rights and gender issues, economic opportunities and new standards in public administration.

In 2001, a new way to estimate the efficiency of such policies and assess the respective environment and achievements of science and technology was proposed in the form of the Technological Achievements Index (TAI). This index describes the efficient use of knowledge and technology, not only of that created inside the country, but also the application of existing technology from other sources. The main purpose in calculating this index is to identify differences between countries. Additionally, this measurement has great importance for the identification and implementation of proper policies by decision-makers and institutions.

Technical Achievements Index is based on four coefficients: new technology creation; new technology prevalence; traditional technology prevalence; and professional competence.

UNDP assessed TAI in several countries beginning in 2001. This assessment covered those countries in which the proper statistical information for evaluating the index was available.

For the Republic of Azerbaijan, the Technical Achievement Index was assessed for the first time this past year. Satisfactory results were found, and the TAI is rated as 0.379

**Table 4.3 Technological Achievements Index and its indicators, 2001**

<i>Indicators</i>	<i>Index</i>
New technology creation index	0
New technology prevalence index	0.043
Traditional technologies prevalence index	0.782
Professional competence of population	0.690
<b>TAI</b>	<b>0.379</b>

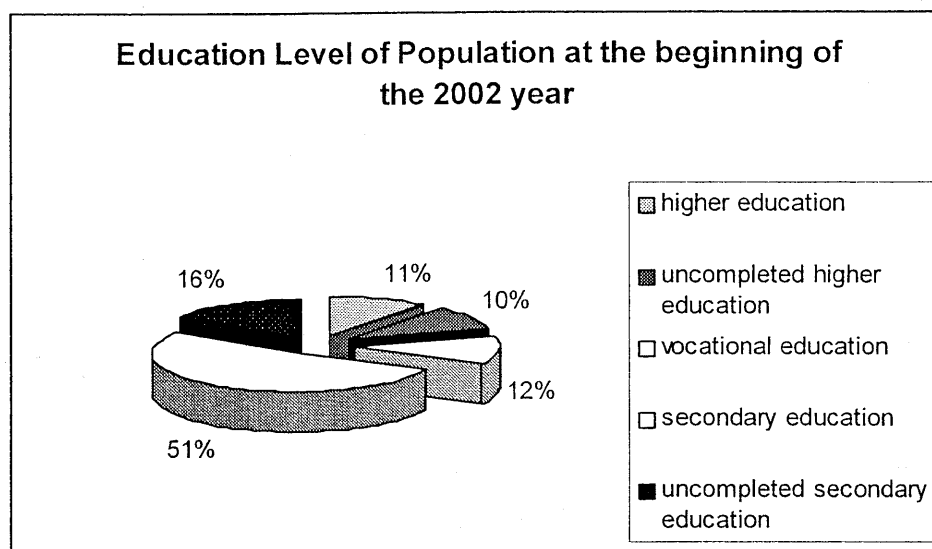
While analyzing the TAI, one can see that the number of patents issued and the payment of honoraria connected with this activity is relatively low. Increasing this index is an important factor for gradually increasing the general index. Therefore, it is necessary to develop public policies that will encourage scientific and technical progress. Speeding up the process of new technology dissemination could also play a great role in increasing the Technological Achievements Index

**Table 4.4 Comparative TAI (selected countries)**

Country	TAI	Rankng on TAI	Patents for every 1 million people	Export in high and medium technology sector, general export %	Students in natural sciences, %	Use of elect., kw/hour, per capita
Austria	0.544	16	165	50.3	13.6	6,175
France	0.535	17	205	58.9	12.6	6,287
Spain	0.481	19	42	53.4	15.6	4,195
Hungary	0.464	22	26	63.5	7.7	2,888
Cyprus	0.386	33	-	23.0	4.0	3,468
Azerbaijan	0.379	-	-	6.9	14.1	2,420
Iran	0.260	50	1	2.0	6.5	1,343

### 4.3. Education

One of the indicators defining the Technological Achievements Index is the educational level of the population and the average number of years of schooling. Azerbaijan's 1999 population census indicates a high level of average education for the population above 15 years of age, equal to 10 1/2 years of schooling. In the same age group, 805 people per thousand had either a higher or secondary school education.



There is substantial potential existed for scientific R&D in Azerbaijan. There were 25 universities in Azerbaijan providing education in science, architecture, the arts, management, engineering. In the 2001-2002 academic year, there was an output from these universities of about 1,800 graduates with the basic knowledge and skills related to the ICT industry.

There are several obstacles to maintaining this level. One-fifth of Azerbaijan's territory is under occupation, and the educational institution network in these regions has been completely destroyed. The majority of refugee and IDP children have no opportunity to benefit from normal educational processes.

School attendance has also suffered due to poverty. According to information received from NGOs, some children do not go to school for one month or longer during the school year. Understandably, the quality of their education is adversely affected. Extended absences from school are observed primarily among girls.

There are also some positive trends in the educational sector. The number of children going to kindergarten decreased from 1990 to 1996 and remained relatively low until 1998. These numbers have been changing over the last two years and have grown by 15 percent. The improvement of capital resources and fixed assets of kindergartens is an important aspect of development in this area.

**Table 4.5. Institutions of state higher education (at the beginning of academic year)**

	1990-1991	1991-1992	1992-1993	1993-1994	1994-1995	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002
Number of institutions	17	18	22	23	23	23	23	25	25	25	25	25 <sup>1)</sup>

of higher education												
Number of enrollments -total, thsd person	105,1	107,9	99,6	94,3	89,2	86,3	82,4	79,8	82,3	88,5	91,0	99,0
Number of students per 10 000 population	148	150	136	127	119	113	107	103	105	112	114	123
Number of new enrollments at the first grade -total, thsd person	19,5	20,5	12,2	13,6	13,4	15,4	16,9	18,9	18,8	19,9	20,5	23,5

In analyzing the changes that are happening in higher education, it is obvious that the emergence of private universities and the matriculation of students from these institutions is developing at a higher rate than at their state-run counterparts

Statistics about the relatively new private universities were not gathered until 1996. Between 1996 and 2001, the number of students at governmental universities and institutions grew 5.4 percent. At private universities, this growth was 43 percent

Further human development using knowledge-based development approaches will largely depend on the attention given to education in the field of natural sciences. A downward trend in the number of students studying natural sciences can be observed, while the areas of social and humanitarian sciences show growth.

The main growth has been in the field of economics; the number of graduates in this area doubled in 2000 as compared to 1990. Specialists focusing on industry and agriculture decreased 25 percent during the same period, a trend partially explained by the low level of compensation and the poor social image of workers in these fields. In order to overcome these tendencies, a special policy should be taken to involve more students in educational fields that can secure technical progress, mainly natural sciences and engineering

#### 4.4. Science

Azerbaijan has great scientific potential and already plays a leading role in the world in several sectors. This is particularly true concerning the natural sciences, including discovery, research and study in various scientific and technical fields and the efficient use of natural resources, both renewable and non-renewable.



Over the last six years, only 0.2 percent of Azerbaijan's GDP was allocated to scientific development. This amount is not enough to secure the development of science.

	Employees engaged in research	of whom them having academic degree of:		
		doctor science	of candidate science	of
<b>Total:</b>	26933	1482	8241	
of which:				
state sector	13561	692	3309	
owners sector	2748	44	303	
higher educational institutions	10624	746	4629	

However, Azerbaijan's present GDP is also less than many leading and potential leading countries. It is impossible to secure development in this field with a low percentage of government allocations for science. Considering the number of scientists and experts who are currently conducting scientific research, very little funding is available per scientist or expert. Azerbaijan's TAI index reflects the difficulty of paying for employees and providing modern equipment for the development of natural sciences.

**Table 4.6. Applications to get patents by citizens and non-citizens in Azerbaijan**

	1995	1996	1997	1998
Citizens	221	165	-	-
Non-citizens	31	16470	24308	33507
Applications total	252	16635	24308	33507

**Table 4.7. Employees engaged in scientific-research and work (person)**

	Total	of which		
		Number of employees engaged in scientific technical activities	of which researchers and technicians	support personnel and others

<b>Total:</b>					
<b>1990</b>	32315	23883	17934	5949	8432
<b>1991</b>	29975	21121	16375	4746	8854
<b>1992</b>	27178	17499	13817	3682	9679
<b>1993</b>	30555	20585	16538	4047	9970
<b>1994</b>	28617	18771	15340	3431	9846
<b>1995</b>	25869	15962	13068	2894	9907
<b>1996</b>	25316	15239	12513	2726	10077
<b>1997</b>	25322	14783	12074	2709	10539
<b>1998</b>	25587	15299	11402	3897	10288
<b>1999</b>	25969	15678	11510	4168	10291
<b>2000</b>	26370	15809	11646	4163	10561
<b>2001</b>	26933	15929	11691	4238	11004
of them who have academic degree of:					
doctor of science					
<b>1990</b>	1186	567	567	-	619
<b>1991</b>	1318	625	625	-	693
<b>1992</b>	1417	649	648	1	768
<b>1993</b>	1538	694	693	1	844
<b>1994</b>	1536	704	704	-	832
<b>1995</b>	1558	713	713	-	845
<b>1996</b>	1525	717	717	-	808
<b>1997</b>	1532	727	726	1	805
<b>1998</b>	1517	701	700	1	816
<b>1999</b>	1538	694	693	1	844
<b>2000</b>	1512	678	676	2	834
<b>2001</b>	1482	644	643	1	838
candidate of science					
<b>1990</b>	8905	4311	4299	12	4594
<b>1991</b>	8799	4063	4057	6	4736
<b>1992</b>	8704	3754	3751	3	4950
<b>1993</b>	8955	3863	3859	4	5092
<b>1994</b>	8808	3724	3720	4	5084
<b>1995</b>	8667	3610	3603	7	5057
<b>1996</b>	8445	3495	3490	5	4950
<b>1997</b>	8389	3474	3457	17	4915
<b>1998</b>	8241	3404	3388	16	4837
<b>1999</b>	8339	3381	3374	7	4958
<b>2000</b>	8380	3343	3328	15	5037
<b>2001</b>	8241	3224	3211	13	5017

As the exploitation of natural resources, mainly oil and gas, has increased with the wider involvement of foreign and local companies, some of these companies have funded scientific

development. These allocations have been directed mainly toward the oil and gas sector. Development of this sector and projects related to research in these fields can also affect ecology and natural and social environments.

Some scientific research and technological work in other fields has been implemented through grants received from international organizations and foreign governments. However, research funded by foreign sources is often directed toward specific interests and may be of only secondary importance to Azerbaijan.

The protection and development of science and technology requires an improvement of national policy in these fields. Some steps have been taken recently in this direction. The President signed a special Decree on the National Academy of Sciences in 2001, and a discussion of the law on science is on the agenda of the National Parliament.

One of the factors influencing the Technological Achievements Index is the development level of natural sciences and the share of this sector among other sciences.

**Table 4.8 For the distribution of post-graduate students according to specialization**

	1990	1995	1996	1998	2000
Mathematics and Physics	9.2	10.0	11.7	9.2	6.5
Chemistry	7.3	6.2	8.1	7.6	4.0
Biology	8.4	9.7	8.8	7.6	7.1
Technical	24.4	26.5	22.1	15.8	20.2
Agriculture	7.0	7.0	3.2	4.3	3.7
Economics	5.7	8.5	8.4	14.1	15.3
Medicine	6.5	5.0	6.2	5.7	5.6
Philology	6.5	6.2	7.2	7.3	9.3
Law	0.8	0.6	4.6	4.6	7.1