

5. National innovation capacities, capabilities and their effectiveness

5.1. Assessment of Azerbaijan's R&D capability

There were a lot of universities and scientific organizations in Azerbaijan providing education in science, architecture, the arts, management, engineering, etc. In the 2001-2002 there was an output from these universities of about 1,800 graduates with the basic knowledge and skills related to the ICT industry.

The Institute of Cybernetics of the National Academy of Sciences of Azerbaijan and the Institute for Information Technology were the leading scientific institutions with training programmes in IT as well as fundamental and applied researches. Training and research was conducted in computer science, control systems for process industries and the application of IT in the communications sector, including satellite and fibre optics.

Efforts were being made through organizational restructuring to make Azerbaijan's scientific research and development more competitive and more focused on resolving problems in the industry, and on completing projects on time and within stipulated budgets. Government would assist the institutions through budget support to carry out high-tech R&D programmes and to provide the human resources trained to Doctorate and Masters levels that were needed in information technology.

The Azerbaijan Education and Research Network Association had been set up to share research ideas and projects, and to develop appropriate techniques to improve the IT sector and its application in the oil, gas and other industries. A scientific research and education network was being established to integrate the universities using fibre-optics for local connections, radio for the 5 to 6 km range, as well as satellite and other communications techniques. This would enhance the quality of the research output. It was further noted that during a meeting of NATO held in the Trans-Caspian region, Azerbaijan's R&D potential was rated as being among the highest and there were distinct possibilities of NATO awarding projects to Azerbaijan R&D institutions.

One of the major achievements of the R&D institutes was their development of a strong mathematical model based on fuzzy logic for the optimal placement of platforms in the oil fields. Application software was also developed based on the analysis of noise accompanied by signals to improve the effectiveness of the different types of signalling processes in the oil industry.

According to the Institute of Cybernetics, other intellectual achievements and software applications included:

- Diagnostics of sea oil and gas production platforms;
- Diagnostics of the process of drilling;
- Control and diagnostics of technical states of cyclic processes;
- Determination of seismic stability of the sea deep-water stationary platforms;
- Multi-channelled telemeter for the transfer of information with delta modulation;
- Device for the control over dynamic characteristic systems of drilling of wells;
- Device for the management of work of marginal well;
- Intellectual information-measurement system of determination of the weight of oil products in reservoirs;
- Multi-channelled device for the registration and analysed of seismic signals;
- Device, revealing vessels of bad capacity in circulatory system of the human at the appearance of thrombus;
- Device and software for submission of information through electronic multi-coloured panel of indication;
- Software for the solution of the problem of identification of parameters of technological processes robust methods and algorithms;
- Software for calculation of supplies of liquid oil;
- Software for modelling of the process of research of oil and gas fields, deposits of liquid oil; underground storage facilities, created in aquifers;
- Software for optimal distribution of sea oil and gas purifying platform;
- Software for minimization of vibrations of oil and gas pipelines, created by the internal hydrodynamic forces and other wave factors;
- Software for the regulation of systems of transportation of gas, including system of calculation;
- Optimization of adopted decisions in the systems of transportation of oil products;
- Software for the modelling of the processes of multi-phased filtration and diagnostics of contiguity of the water with oil during the movement of oil;
- Software for diagnostics of professional diseases in oil industry.

6. Major National Initiatives

Azerbaijan has geopolitical and political–economic prerequisites of the regional leader in ICT sphere, more precisely:

- *Republic is the geographic bridge between the Europe, Central Asia and Middle East; favorable climatic conditions – presence of 9 climatic zones out of 11 (there are not only permafrost and the tropics), and weather conditions are also favorable for all-the-year-round functioning of the thruway.*
- *It has natural resources in particular international experts evaluate oil-gas resources as 15 percent of the world supply.*
- *There are sufficient number of universities and schools, population has high level of literacy, scientific potential is high.*
- *According to the data of the American Chamber of Commerce in Azerbaijan, beginning from the moment of signing the IMF Stability Pact by Republic in 1994, 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. is reached.*
- *The economy of the country is stable, stably developing, low level of inflation and financial stability, favorable business-climate are indicative. The growth of the Gross Domestic Product (GDP) in Azerbaijan made up 10,3% for nine months of the current year.*
- *Legislative base is developing.*
- *Till the present time Azerbaijan remains at the first place among the CIS countries by the foreign investments per capita. For ten months of the current year investments in the economy of Azerbaijan made up 1.57 billion USD. It is 93.3% higher than for the same period of 2001. The share of the foreign capital made up 1.254 billion USD, or 77% of all investments.*
- *The country successfully moves forward by the way of democratization of the society, political situation is stable, politically opened for international cooperation.*
- *The culture of the country is unique, as it absorbed both Asian and European traditions, and although English and Russian are not state languages, but they are*

widely used in the society, hence exactly in Azerbaijan it is possible to create headquarters of international organizations, representatives of international organizations as of Asian so of European type without any difficulties.

A number of projects in economy, based on the wide application of ICT and realized with the support of UN, EU and a number of international organizations were reflected in the introduction part of this report. Azerbaijan is a member and participant of tens of international organizations and regional projects:

Since 2001 Azerbaijan is the member of the Council of Europe and has serious intentions to be a member of the European Union. In the spirit of documents of EU and the UN, aimed to the global change of countries' development level and level of living standards. Azerbaijan developed and will keep on developing the concrete programme measures to fight the poverty, develop all the business forms, bridge the digital divide, recover the ecological situation, develop the health care. We carefully follow the European indicators of development including the ICT sphere and consider them our target function. The European Union also considers our country as potential recruit and carries out the economic support of the republic. Till 2006 EU will allocate 35.5 million EURO as a grant to Azerbaijan.

Azerbaijan is the member of NATO's "Partnership for Peace" Programme. The North Atlantic Alliance is interested in the development newest technologies in Azerbaijan. In the framework of the scientific – research and educational network, jointly implemented by NATO, National Academy of Sciences and AZRENA Association, besides the creation of fiberoptic network for the Academy and a number of republican universities, it is envisaged to develop the satellite and wireless communication of the Trans Caspian and Central Asian Countries. Projecting TransCaspian Network has been called as "Virtual Silk Highway" or simply "Silk Project". "Silk Project" will not only influence on fundamental, applied science and higher education, but also will stimulate the activity of governmental organizations and the third sector. - ***International Transport Corridor Europe Caucasus Asia (TRACECA)*** and revival of the Great Silk Way – project, which collected representatives of the eight Republics of the Southern-Caucasian and Central-Caucasian regions in May, 1993 in Brussels. EC decided to carry out the program of longstanding aid, technical assistance and stimulation of the interest in international financial layers to the development of the transport infrastructure along the axis East-West. Later, within the

framework of this initiative on September 8, 1998 in Baku authorized representatives of Azerbaijan, Armenia, Bulgaria, Georgia, Kazakhstan, Kirgizzistan, Moldova, Romania, Tadjikistan, Turkey, Uzbekistan and Ukraine, expressing the intention to develop the economic relations, trade and transport communication in the regions of Europe, Black sea, Caucasus, Caspian sea and Asia, signed the Main Multilateral Agreement on international transport on development of the corridor Europe Caucasus Asia – TRACECA and revival of the historical Great Silk Way – economic and cultural bridge between the East and West.

Organization of Black sea economic cooperation (OBSEC). The headquarter of the organization was created by the countries – founders in Istanbul on June 25, 1992. This organization includes Azerbaijan, Albania, Armenia, Bulgaria, Greece, Georgia, Moldavia, Russia, Romania, Turkey and Ukraine.

Poland, Egypt, Israel, Slovakia, Tunis, Italy and Austria have status of observers in it. Organization, initiator of which is Turkey, is created for arrangement of multilateral cooperation between the countries, adjoining to the basin of the Black sea in such spheres as infrastructure, transport, *telecommunications, communications*, tourism and ecology. Today share of the OBSEC is 5% of the world trade.

Organization of Economic Cooperation (OEC) is founded in 1985 and is the assignee of the Organization of the Regional Cooperation for Development, functioning on the base of Charter – Izmir Treaty, signed by three founders – Iran, Pakistan and Turkey on March 12, 1977.

Till the beginning of 1992 cooperation within the framework of this organization has mainly bilateral character. From 1992 the activity of OEC considerably activated in connection with the voluntary joining of 7 new states – Kazakhstan, Azerbaijan, Afghanistan, Kirgizistan, Tadjikistan, Turkmenistan and Uzbekistan. At the present time region of the OEC countries embraces territory of 7 million kilometers with the population of more than 300 million people.

The main task of OEC is the creation of the favorable conditions for the economic development in the region, consistent and gradual integration of the countries of the region into the system of the world economic relations of international community via arrangement of mutually beneficiary intra-regional economic cooperation and active mutual aid on different aspects of the social-cultural and scientific – technical development.

- *SUMMITS OF THE TURKISH SPEAKING STATES.* After the collapse of the USSR and gaining the independence by the former Soviet Republics, with the aim of coordination of the actions on general contribution of the Turkish speaking states in the affair of the world, security, stability and development in Eurasia, taking into account the special ties of relations, based on the commonness of the history, language and culture and wish to create conditions for the improvement of relations with other countries of the region, by the initiative of the President of Turkey T.Ozal on October 30-31, 1992 heads of Azerbaijan, Kazakhstan, Kirgizistan, Uzbekistan, Turkmenistan and Turkey gathered in Ankara. Summit became the first direct contact at such a high level between the Turkish speaking states of the region, brought new stream in the relations between our countries, promoted the best mutual understanding each other, laid the fundament for regular meetings at the high level.
- *Azerbaijan is the participant of a number of huge international projects in the sphere of oil and gas production and transportation. Yet in 1994 Azerbaijan signed large-scale contract on joint development by a number of large western companies, such as BP, Exxon, Mobil, Chevron Texaco, Elf, Total, Fina, which according to the assessment of the Fobs journal are referred ton a tens of the bets world companies. It was called “Contract of the Century”, and was the fundament of a number of other contracts on the development of oil and gas fields. Recently the contract on construction of pipeline for the transportation of oil and oil products from Baku to Jeyhan (Turkey) via Georgia was signed. In the coming years foreign investments of billions of USD in the economy of Azerbaijan are also expected.*

6.1. The ways of transforming Azerbaijan in ICT-leader at the South Caucasus and TransCaspian space

On the base of statistic information, collected in the country, examination of the activity of the state organizations, private companies and NGO in the Republic technological ITC group made conclusion on strategic opportunities of Azerbaijan:

- *Scientific-technical, economic, intellectual potential of the country allows considerably increase the export of ICT-products and services.*
- *During 10 years Azerbaijan might increase the export of ICT production and ICT-services in ten times and reach the level of 500 million dollars by the 2011.*

- *Azerbaijan might become the center of TransCaspian Cybernetic Market (TCCM)*
- *Azerbaijan might become the integrator of E-Business in TransCaspian region.*

For business structures it is time for strategic strategically though-out, coordinated with the Government of Azerbaijan steps on liquidation of the oil narrowness of the country and development of a number of fields for ICT development and on the base of ICT development.

According to the strategy of economic development of the country, which was mentioned above, 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, i.e. in the ICT sphere. The State Program on poverty reduction and economic development will allow to create a lot of job places, promote the organization of many high-technology enterprises in the ICT sphere.

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

Creation of the Monitoring Center of TransCaspian Region

Sharp struggle take place at the market of information production, created on the base of information resources basically as petrol is produced from oil. Besides, information resources are that used by the person type of resource, which created by himself, but not the nature. On the one hand, it is necessary to learn to create information resources, demanded by the “export” users, on the other hand, to develop in a rapid way information technologies, aimed on the creation of the competitive high-technology production. One of the main technologies of creation of information resources and production is monitoring.

Taking into account geopolitical-economic importance of the Caspian sea region, uniqueness of the ecology of the Caspian sea, interest of many countries to the region is huge. First what is necessary for the realization of the opportunities of the region is information resources. For example, there is scientific project NATO “Caspian region: examination of the atmosphere circulation, balance of the mass and energy, changes of regional climatic system”.

Regular renewal of the idea on creation of some monitoring center of the Caspian sea, idea which recently again appeared at the regional level – it was supported by the President of Azerbaijan, Kazakhstan and Russia. It is necessary to support and develop these ideas for the

establishment of civilized relations at the Caspian market of information services. World experience shows that the most optimal way of regional monitoring system is approach, at which the function of the collection of the information is distributed between the participants and further exchange of the obtained information is stipulated. Such principle was used by the Azerbaijani specialists when the sea systems for the Main Sea Coordinating-Saving Center of USSR and Caspian Steam Navigation were created in the nearest past.

It is proposed to create regional information center in Azerbaijan for analyze of the state of political, economic and ecological space of the Caspian sea.

In the composition of the information system we can emphasize three components. This is first of all. National subsystem of each member – state, secondly, this is regional subsystem with orientation on information provision of general interests of Transcaspians states and mutual information exchange. Finally, this is corporate subsystem, mainly oriented on needs of the private companies (**especially transnational**), expressing active interest to the strategic information on political, economic and ecological situation in the Caspian region. There is necessary potential in Azerbaijan for becoming the integrator of this process.

Creation of the Regional Monitoring Center and Experience Exchange in building Information Society

The present stage of the human development allows to reach abrupt improvement of the standards of living of the population on the basis of application of ICT in different spheres of the human activity within short period of time. Joint work with UNDP, spirit of this organization, directing the application of ICT for the extension of the opportunities of the people and range of selection versions of the development requires sober assessment and account of electronic situation of the country on the basis of many indicators, periodic collection of the qualitative statistic data, certifying the building of Information Society. A number of indicators can not be gathered by the state service on statistics, and requires the creation of national analytical monitoring centers. However, taking into account the regional character of many processes, it is expedient to create the Regional Monitoring Center and Experience Exchange in building of the Information Society.

Creation of the Regional Techno-parks and Incubators of small and medium companies in ICT field at the Caspian shore of Azerbaijan

Small companies, oriented on export of software products and services on development of software, are meant.

The main goal within the framework of the project is the activity on execution of investment and innovation projects, introduction of science-intensive developments, high technologies and production of the competitive at the world markets production. Such techno-parks and incubators are created for the assistance of formation and development of the science intensive firms and other organizations, fulfill the function of active management of the transfer of technologies and knowledge in the business sphere to the organizations, situating at its territory. Analyze of the activity of the national Academy of sciences, scientific-industrial unions, universities show that Azerbaijan has necessary potential for becoming the leader of this process.

Development of e-Business on the base of Information-processing Centers of international e-Commerce

It allows to provide internal and external cooperation of the participants of the trade within the frameworks of the sole information space, decrease the costs and improve the conditions of international trade via creation of favorable environment for information exchange with application of modern ICT in format of standards of ***Electronic Data Interchange (EDI)***.

These centers are called to promote first of all, the engagement of the small and medium enterprises in the division of labor and international trade. The main tasks of the centers are information provision of the participants of the foreign trade activity, assistance to the exporters and importers going out to the foreign markets, attraction of the investments for small and medium enterprises, execution of the foreign trade transactions, use of electronic data interchange for the reduction of documents circulation and simplifying the trade procedures.

As a result of realization of these projects Azerbaijan will become the integrator of e-Business in TransCaspian region.

Export Program of science-intensive information technologies in TransCaspian Cybernetic market

The Program is prepared by the National Academy of Sciences and is based on fundamental researches of the scientists of Azerbaijan. There are such structures of qualified partners in the system of the Academy of Sciences as Institute of Cybernetics and Institute of

Information Technologies, which developed models, algorithms, methods of synthesis of systems, based on unclear logic, developed by our compatriot Lutfi Zade, other components of *soft-computing*, robust systems, adaptive systems. Above-listed types of systems has purely practical aspect, might be successfully brought to the level of ICT-productions and be offered at the world market.

Creation of the electronic library of Turkish speaking countries within the frameworks of the project “Information Silk Way”

Project activity in the ICT field does not limited by the E-Commerce and e-Business. Within the framework of the Summit, due to direct contacts at the high level between the Turkish speaking states of the region (Azerbaijan, Kazakhstan, Kirgizistan, Uzbekistan, Turkmenistan and Turkey) it is supposed to create electronic library of the Turkish speaking countries.

Conclusions

In the Republic of Azerbaijan, significant attention is given to: strengthening of economic, social and intellectual potential of the country via improving of national education system, creation and development of information and knowledge market; realization of effective, transparent and controlled state regulation and local government; formation of the developed ICT infrastructure of the society, expansion of ICT services; creation of the favorable environment for the provision of human rights and distribution and use of information; creation and development of legal base of information society; preservation of the national heritage. Significant state-level attention is given to adopted “The National Information Communication Technologies Strategy (2003-2012) for development”, that will lead to Action Plan creation under the Cabinet of Ministers of the Republic of Azerbaijan. Provision of information need of the citizens, promotion of intellectual potential of the country, creation of the favorable conditions for the building of information society; strengthening of economic potential of the country through introduction of ICT, must be developed.

Azerbaijan’s scientific-technical potential, technological achievement, educational level, are well developed and more than sufficient for building a knowledge-based society. But government allocations to science, education and ICT are not adequate enough to ensure development of this spheres, it is necessary to adopt special measures and special state-supported program aimed at considerably increasing the financing of science, including the salaries of scientific workers.

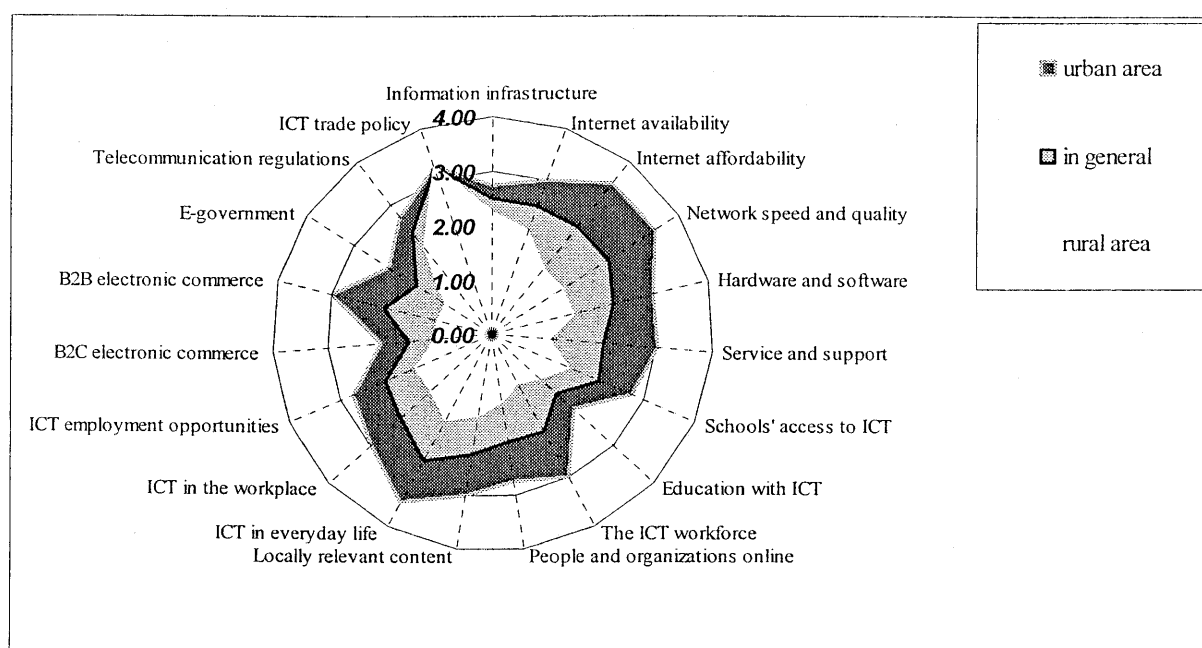
Azerbaijan is the politically and economically open country. The main tasks of National ICT Strategy include integration of the country to the world electronic information space.

However, at the present time the economy of Azerbaijan is in transition, and it is not able to support all our initiatives of local and integration order in full volume. Government can only finance the most important socially oriented projects. That is why Azerbaijan needs financial aid of international institutions and investments.

Political and economic situation in Azerbaijan are stable, investment climate is favorable. It is necessary to take into account, that considering the unique position of Azerbaijan, due to above-mentioned arguments, any large-scale projects, including projects of new knowledge-based economy, if they are carried out in Azerbaijan, simultaneously got integration aspect and become regional ones.

Annex I - Benchmarking

Indicators		Levels of advancement		
		in general	urban area	rural area
I	Network access			
1	Information infrastructure	2.5	2.75	2.25
2	Internet availability	2.5	3.00	2.00
3	Internet affordability	2.5	3.50	1.50
4	Network speed and quality	2.5	3.50	1.50
5	Hardware and software	2.3	3.00	1.50
6	Service and support	2.0	3.00	1.00
II	Networked learning			
7	Schools' access to ICT	2.1	2.75	1.50
8	Education with ICT	1.6	2.00	1.20
9	The ICT workforce	2.0	3.00	1.00
III	Networked society			
10	People and organizations online	2.0	2.75	1.25
11	Locally relevant content	2.3	3.00	1.50
12	ICT in everyday life	2.6	3.50	1.75
13	ICT in the workplace	2.3	3.00	1.50
IV	Networked economy			
14	ICT employment opportunities	1.5	2.00	1.00
15	B2C electronic commerce	2.0	3.00	1.00
16	B2B electronic commerce	1.6	2.25	1.00
17	E-government	1.5	2.00	1.00
V	Network policy			
18	Telecommunication regulations	2.4	2.75	2.00
19	ICT trade policy	3.3	3.25	3.25



Annex II – Knowledge-Based Economy Indicators

1. Network access

Annex II- Knowledge-Based Economy Indicators

1. Network access

1.1. Information infrastructure

Number of mainlines per 100 person of population:

- 1998 - 9.28
- 1999 - 9.42
- 2000 - 10.23
- 2001 - 10.84

A number of telephone sets per 100 residents in Baku - 23.4

Mobile wireless penetration (%), growth trend in 1994-2001

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

Total number of mobile telephone subscribers per 1000 people

79 mobile subscribers per 1000 people

Wireless penetration (percentage of the population)

Mobile phones services are now available to 95% of the population and about 65% of the republic's territory (excluding the occupied areas).

Total number of cable TV subscribers:

NA

Cable TV subscribers, % of households:

NA

1.2. Internet availability

Total number of ISP providers:

- 1997 - 5
- 1998 - 6
- 1999 - 8
- 2000 - 12
- 2001 - 13

Prevailing types of ISPs' networks (microwaves/radio...):

Public telephone lines, dial-up

Percentage of unsuccessful local calls:

About 5%

Is there competition among ISP providers?

Strong competition between ISPs in the capital city. However, only a few ISPs offer their services in rural areas.

What are opportunities for public Internet access (libraries, Internet-cafes, etc.)?

Last year, a rapid growth in Internet public access points was recorded. Internet-cafes remain the most common public access point. However, due to the support of international and foreign sponsors, the Internet is available for free in some public libraries. Public access points exist only in Baku and some other relatively big cities.

. Are there dedicated line lease possibilities? Are there competing providers?

Dedicated line services are available from almost all ISPs. However, ISPs do not have their own network and therefore re-lease lines from the incumbent telecom operator.

1.3. Internet affordability

. What are the prices of Internet access (unlimited access, per minute charge)?

Depending on the ISP, Internet access can be charged on a time and traffic basis. Usually, ISPs combine time and traffic tariffs to offer more flexible prices to their clients. Unlimited access to the Internet (unlimited time and traffic) costs from 50 to 60 US dollars. The average per hour price of dial-up access is 0.3-0.4USD/hour now.

. Is it affordable for the majority (compared with average salary/income)?

ISPs offer flexible tariffs including night tariffs. The most affordable price is about 10 USD for "night tariff", i.e. unlimited access during the night (depending on the ISP "night access" may start at 00:00 - 02:00 and end from 07:00 - 08:00). Night tariffs are primarily used by students, university professors, scientists and other professionals. However, the majority of the population cannot afford full time unlimited Internet access services.

. What are the rates for leasing lines?

Depending on connection speeds vary from 400 USD (64 Kbps) to 2500 USD (128 Kbps).

. Are the rates affordable for small businesses or individuals?

Leased lines services are affordable only for a very limited category of the population and medium-sized businesses.

1.4. Network speed and quality

. What is the percentage of successful calls?

About 95%

. What is the quality of voice connection?

Normal

. How many faults are reported per year for each 100 telephone mainlines?

About 2-3%

. How long does it take to clear faults (48 hours, a week, month)?

Depending on the fault, from 0.5 to 12 hours

. Which services are supported by local telecommunications infrastructure: e-mail, high-speed modem connection, what is the maximum speed?

E-mail, modem connection with a declared highest speed of 56, 700 kb/sec and an actual speed from 28.800 to 56.700 kb/sec.

. Are there sufficient backbone facilities/networks? Even for peak demand?

Yes

. What is the percentage of packet loss by the network?

About 0.03%

1.5. Hardware and software

. Are there local IT hardware/software sales points?

Approximately 40 computer stores in the capital city as well as a few hardware/software sales points in provincial cities.

. Is the price of IT hardware/software affordable for majority/minority of citizens/businesses?
Affordable only for a small section of the population (about 15%). The majority of small and medium sized businesses can afford computer equipment.

. Is there software available in local languages?

There are a few software products in the local language. Basic software products (operation systems, word processors, Internet and e-mail applications) are in English and Russian. Specific software products, such as accounting programs, legal databases onLine dictionaries and library applications exist in Azerbaijani.

. Is software imported or adapted locally? (Percentage of the imported, adapted, produced locally hardware or software in total number in circulation)

Basic software products (operation systems, word processors, communication software) are imported.

. Is there a broad variety/some/very few software business applications?

There are a few types of software business applications. Accounting and logistics software is the most commonly used application. Some consumer "tailored" software (databases, computer applications for industrial processes) are developed by local companies.

. Are the IT software/hardware retail and wholesale markets competitive and vibrant?

There is strong competition among hardware retail companies and dealers of worldwide brands. There is also competition among local software companies for public procurement contracts and client-tailored products.

1.6. Service and support

. How long is the waiting period for telephone line installment? (Total number of those on the waiting list; waiting period: days, weeks, months, years)

N/A

. How long is the waiting period to repair reported telephone line problems? (Minutes, hours, days, etc.)

Depending on the problem reported, from one hour to one day

. Are there software developers, web designers, network administrators and other technical personnel, and how many (working where, employed/unemployed)?

There are a number of professionals in area of software development and web design. There are fewer network administrators in the country.

2. Networked learning

2.1. Access by schools to ICTs

. Are there computers in schools? How many students per computer? On which level (university/secondary/primary)?

◆ *Schools*

Number of schools - 3148

Number of computers in schools - 7988

Number of schools with computer labs - 834

Number of computers per school - 2.5

Number of students - 350 000

Students per computer - 14

% of schools with computer labs - 26.5%

◆ *State universities*

Number of universities - 20

Number of computers in universities - 1739

Number of universities with computer labs - 18

Number of computers per school - 87

Number of students - 79 000

Students per computer - 12

% of schools with computer labs - 90%

. Who has access to computers (technical staff/faculty/students)?

Technical staff, faculty has free access to computers. Usually, students are provided with access to computers under the supervision of technical staff and instructors.

. What is the quality of hardware (386/486/Pentium..)?

Computers are generally modern (Pentium), but in many schools older computers such as 486 or 386 PCs are in use.

. Are there LANs in schools? Regional WANs? National school networks?

LANs exist in 52 schools and 10 universities

. Do schools have connection to the Internet? Is it dial-up or through a leased line, wireless?

31 schools in Azerbaijan have Internet access (27 schools use dial-up). 15 universities have Internet access

2.2. Enhancing education with ICTs

. What is the percentage of students and teachers who use computers? (Universities/primary schools/secondary schools)

In schools 20% of students and 5-10% teachers use computers

In universities 70% of students and 20% teachers use computers

. What are the computers used for? What is the level of computer literacy/skills?

In universities, computers are mainly used for training students in computer literacy. In universities with well-equipped computer labs students may use computers for Internet and/or database access.

. What is the level of information and communication technologies integration in the curriculum?

Middle

2.3. Developing the ICT workforce

. Are there training opportunities for programming, maintenance, and support?

All types of training opportunities exist in Azerbaijan.

. Who is offering them (Public/private centers)?

State and private universities, several regional information-education centers created with the support of international organizations

. Are they affordable for majority/minority of the population?

Some state universities and regional information-education centers provide free training to faculty students admitted on comparative basis. Private centers offer computer literacy courses that are affordable for the majority of the population.

. Is on-line training available?

Azerbaijan State Economic University, Khazar University, Western University, Kavkaz Universit provide on-line training courses

. Do employers offer training?

Only a few employers offer training to their staff

3. Networked Society

3.1. People and organizations online

. What percentage of the population: - is aware of the existence of the Internet?

According to different sources, between 40% and 60% of the population is aware of the Internet.

- has used the Internet recently?

N/A

- uses the Internet regularly?

According to different sources, between 3% and 5% of the population use the Internet regularly

. What is the structure of users by gender, age, social and educational status?

There are no official statistics on the structure of users. However, according to Azerbaijani ISPs, the largest user group includes young people. So predominant users (36.1%) of Internet were between 18-25 years old. The second range (27.8%) was between 14-18

. What is the number of locally registered domain names (per 1000 people)?

N/A

. Is there advertising for online companies, and how common is it?

In spite of the fact that many Azerbaijani companies have web sites, online advertising is not properly developed in the country. An Internet banner network was created but is not actively used.

3.2. Locally relevant content

. Are there (and how many: no, few, some, many) websites:

There are no official statistics on the number of websites but number of websites significantly increased in 2000-2002.

- Providing local topics?

Most of the websites registered in the AZ zone provide local topics (news, company/organization information, entertainment, cultural and educational content).

- In local languages?

Many websites are in two or three languages (Azerbaijani, Russian, English).

. How often are they updated and is content static or dynamic?

The majority of websites are regularly updated.

. Are the above websites created in the community?

Yes

. Are bulletin board systems, Usenet groups, newsletters, and/or listservs in use?

There are many newsletters distributed for free. Usenet groups and listservs are in use, but not on a large scale.

. Are there opportunities for Web-related training?

There are many web design and publishing training centers in the capital, but very few exist in the provinces. Centers offer web training primarily on a commercial basis, but there are some donor-supported initiatives offering free training.

3.3. ICTs in everyday life

. Does the population include information and communication technologies (phones, faxes, pagers, computers) in everyday life?

Phones and mobile phones are widely used in everyday life. Computers are used by a limited section of the population due to the high cost of computer equipment (According to different sources the number of PCs per 100 person is 1.5).

. Are there phones, wireless phones, digital assistants, pagers, PCs and are they being used regularly? Are they used for household commerce (banking, online shopping, investing) and social and commercial interaction (bartering, online chat and etc.)

Phones and mobile phones are widely used by the majority of population. Phone use in villages is limited due to insufficient number of telephones. Pagers are not widely used. Telecommunications are not widely used for household commerce due to the absence of efficient electronic payment systems.

. Are there PCs with e-mail capability available (cyber cafes, telecenters) and are they being widely used?

There are many Internet cafes in the capital city, Baku. They are widely used, primarily by young people.

3.4. ICTs in the workplace

. Do employees have: - (Un)limited access to phones?

Yes, in most cases

- Personal e-mail accounts?

Some government employees have personal e-mail accounts. Employees of oil companies, consulting firms, banks, and other intellectual businesses also usually have e-mail accounts. Only a few employees of large trade and service companies would have personal accounts.

- Internet access from personal workstations?

Employees of oil companies, consulting firms, banks, other intellectual businesses usually have free access to Internet. Many office clerks employed by large trade and service companies have Internet access from personal workstations.

- E-mail and web addresses on business cards?

The majority of government officials and employees of large companies have e-mail address on business cards.

. What percentage of businesses and government offices have computers, how many of them, how many employees use them?

There are no precise statistics about the penetration of computers into business. However, normally if there are computers in an office they can be accessed by the majority of staff members. According to some sources the number of computerized workplaces in governmental organizations is 8.2%. The number of computerized workplaces with access to Internet is 4.5%

. Are they networked?

Computers are networked in a few business offices. Computer networks usually exist only in large companies.. Government offices usually have computer networks (ministries and agencies).

. Is business mostly conducted in person or by-mail, or is there data-sharing, enterprise, reporting, transaction, and research applications? How intensively are they used?
The majority of Azerbaijani businesses communicate in a traditional way: face-to-face, by fax, or by phone. Data-sharing, reporting and research applications are used in a few advanced business and governmental offices.

. Are there efficiency gains resulting from the use of ICT systems?
Yes

4. Networked economy

4.1. ICT employment opportunities

. Are there opportunities for technically skilled workers within the country?
There are limited opportunities for technically skilled workers in Azerbaijan. However, some professionals, such as programmers, are in great demand.

. Are companies from outside of the country investing in IT related projects?
During the period 2000-2001 a number of us companies opened branches in Azerbaijan employing about 200 programmers.

In communication sphere Foreign investments to joint ventures are (million USD):

- 1998 - 42.8
- 1999 - 54.8
- 2000 - 72.1

. What is the proportion of knowledge-workers and information-related businesses in the economy? (Percentage of labour force, percentage of GDP)?
N/A

. Are businesses considering IT in their strategies?
A lot of large businesses in Azerbaijan are considering IT in their strategies

4.2. B2C electronic commerce

. Do local businesses have websites and how many? Is content current or static?
According to different online catalogues, the number of company websites varies from 200 and 300. The majority of online business resources are relatively static (updated once a month or less).

. Are there online B2C transactions, or are transactions mainly oral and/or paper-based, phone or fax-based?
There are no B2C transactions in Azerbaijan. Some companies offer online catalogues, but the transactions are made by phone/fax or in writing.

. Is online retail a noticeable component of overall commercial activity?
No

4.3. B2B electronic commerce

. What are the sources of market information and are they sufficient for providing transparency?

There are some sources for marketing information, but not sufficient to carry out significant market research.

. Are there online B2B transactions, or are transactions mainly oral, paper-based, phone or fax-based?

There are no B2B transactions in Azerbaijan. The majority of transactions between companies are made on paper or by fax.

. Can transactions be conducted online without paper documents? Is the process automated? Does it allow online tracking, monitoring?

N/A

. What portion of B2B activity is conducted on line? Is there gain in efficiency?

N/A

4.4. E-Government

. Number of government resources online? Do they include information, hours of operation, any services? Is information current and relevant?

There are a few online government resources. Those resources include official web sites of the President of Azerbaijan, National Parliament (Milli Mejlis) Ministry of Economy Development, State Statistics Committee and etc., (about 30 state organizations) All of these sites contain mission statements and at least a general description of the responsibilities and structure of the relevant state institution. As a rule, there is no information provided on operation hours, specific responsibilities of departments/officials or other similar content present on government sites. Only some agencies regularly update their websites. Some websites contain document templates and service rules procedures.

. Is there online interaction between government and citizens, or is interaction mainly oral, paper-based, phone or fax-based?

There is no online interaction between the government and citizens. Usually, citizens communicate with government official by phone or in writing.

. Is there online interaction between government and suppliers and contractors, or is the interaction mainly oral, paper-based, phone or fax-based?

Communication between contractors/ suppliers is normally oral or paper-based and; less frequently, fax-based.

. Is it possible to download applications from the websites?

At the moment this type of service is offered by few governmental organizations, such type the Ministry of Taxes. Some organizations are planning to start an online publication of application forms.

. Can citizens apply for permits, licenses, and taxes on line?

No, these services do not exist in Azerbaijan.

5. Network Policy

5.1. Telecommunications regulation

- . Is liberalization of the telecommunications sector planned or implemented?
Liberalization and privatization of the telecommunications sector is planned since 2003
- . Is there competition between telecommunications service providers?
Competition exists between Internet Service Providers, cellular services operators.
- . Is broadband Internet access offered?
Yes, wireless broadband Internet access offered by several ISP
- . Is regulation set and enforced by an independent body?
No, at present the telecommunication market is regulated by the Ministry of Communication

5.2. ICT trade policy

- . Do tariffs or other restrictions (technical standards, domestic regulation, etc.) exist?
Telecommunications tariffs are provided on an exclusive basis. They are regulated by law and are subject to government approval.
- . Are there restrictions in the service (including information services) sector?
There are no restrictions for business activities in Azerbaijan. However, production of some types of services/products is subject to licensing.
- . Are there disproportional taxes on electronically delivered services?
According to Azerbaijani tax legislation all businesses are taxed at the same rate. No tax benefits are prescribed for a particular type of business activities, including electronic commerce and electronically paid services.
- . Is Foreign Direct Investment in IT sector existent, and is it encouraged, discouraged, restricted?
Yes. See 4.1

6. Media

6.1. Radio, TV and newspapers

- . Number of radio and TV stations, newspapers
*Over 600 registered newspapers, 110 journals, 25 agencies, 8 TV and 30 radio.
2 state and 4 private large TV stations in Baku, some small TV stations in regions
2 state radio and 28 private radio*
- . The size of audience/circulation.
*The size of audience of state TV is 100%
The size of audience of state radio is 100%
The size of audience of private TV and radio is from 40% to 80%*

6.2. Employment in the media

- . Number of employees in the media

NA

. Trend: is the number increasing/decreasing?

NA

7. Intellectual Capital

7.1. Patents

. What is the number issued per annum?

The Republic of Azerbaijan has adhered to the following Conventions, Treaties and Agreements, which entered into force since 25 December 1995:

- 1. Convention Establishing The World Intellectual Property Organization (1967)*
- 2. Paris Convention for the Protection of Industrial Property (1883)*
- 3. Patent Cooperation Treaty (1970)*
- 4. Madrid Agreement Concerning the International Registration of Marks (1891)*
- 5. Eurasian Patent Convention (1995).*

Since 27 December 2001 a new organization named as "State Agency on Standard, Metrology and Patents" used to be responsible for implementing state policy on protection of industrial property (inventions, utility models, industrial design, trademarks and geographical indication).

The forms of protection of the industrial property are the patents for the inventions utility models and industrial designs, with which in frameworks the special complex Law "On patents" of the Azerbaijan Republic that has entered valid in August 2, 1997, the right protection in territory of the Azerbaijan Republic is given.

. What are the trends?

Dynamics of granting patents on invention the following:

1995 - 31; 1996 - 82;. 1997 - 79; 1998 - 96; 1999 - 234; 2000 - 275; 2001 - 168. During the period 1995-2001, 965 patents for inventions have been granted, including 87% to national applicants and 13% to foreign applicants.

The greatest numbers of applications for invention are filled by applicants on section "C" (Chemistry, Metallurgy) and section "A" (Human Necessities). Section "0" (Textiles, Paper) appears to be the least popular section among applicants.

From the data given in the table the number of the submitted applications on the inventions is visible, that on the part of the national applicants after coming into force of the new law is rather stable (more than 200 applications per year).

Applications for industrial designs filed during the period 1992-2001 are - 76 (national applicants - 35, foreign applicants - 41).

Applications for utility model filed during the period 1998-2001 are - 6.

Commission of Appeal of The State Agency on Standard, Metrology and Patents during the period 1997-1999 considered 13 disputes concerning to inventions and 12 of them have been solved and expertise decision has been abolished.

7.2. Copyrights

. What is the number issued per annum?

N/A

. What are the trends?

N/A

7.3. Licenses

. What is the number issued per annum?

The total number of license contracts for inventions registered during the period 1996-2001 amounted to 45. While 80% of them belong to oil sector. In all license contracts for inventions registered both contracting parties are national persons.

The total number of license contracts for trademarks during the period 1996-2001 are 12. As a rule, the license contracts are concluded for all goods and services for which a trademark is registered.

. What are the trends?

N/A

7.4. Trademarks

. What is the number issued per annum?

The basic document regulating the legal relations concerning trademarks and the geographical indications in the Republic of Azerbaijan, is the Law "On trademarks and geographical indications" of the Republic of Azerbaijan, which has come into force on August 28 1998.

In total was registered - 8465 trademarks. 14729 trademarks are in power in the territory of Azerbaijan Republic according to Madrid Agreement, which is about the registration of international marks (the data are given for the period 1996 for 2001). On 274 registered marks in the International bureau with the indication of Republic of Azerbaijan the decision on refusal in legal action of their international registration in territory of Republic of Azerbaijan was born.

Contracts on assignment to trademarks have been registered 89 in the year of 2000, while 71 trademarks have been registered in 2001.

The Commission of Appeal during the period 2000-2001 considered 71 oppositions concerning to trademarks. By the results of examination of oppositions the Commission of Appeals passed 59 decisions on trademarks. The Commission of Appeal admits the decisions on in valued the registration of 6 trademarks and on 5 oppositions were admit refuse decisions. More than 80% of appeals against decisions in order to refuse the legal protection to trademarks submitted by foreign persons.

. What are the trends?

Dynamics of registrations of trademarks: 1994 - 27; 1995 - 792; 1996 - 250; 1997-1892; 1998- 2152; 1999 - 1581; 2000 - 1236; 2001 - 535.

7.5. Scientific and/or technical associations

- *Azerbaijan Research Educational Network Association - AzRENA*

In 1995 a network of Academician institutes was created in Azerbaijan. It was the only non-commercial network in Azerbaijan Republic connecting the major government organizations, institutions and academician institutes.

From 1995 to 2000 the academician network connected all the main buildings of the academy via fiber-optic and leased lines. The central node of the academy had the leased line 64kbps to the local ISP.

In August of 2000 the National Academy of Sciences and leading universities of Azerbaijan founded on the basis of the Academician network Azerbaijan Research

Educational Network Association - AzRENA. This Association is non-governmental organization.

8. Education

8.1. Higher education

. Total number of higher education establishments (Public/private).

Public -20; private - 15

. Total number of students (total average per annum, in both the private and public sectors)

state sector - 99000, private sector - 21500

. Prevailing specialisations. (distribution of students among the fields)

In state sector prevailing specialisations are as follows:

<i>- Economics</i>	<i>- 15100 students</i>
<i>- Health, physical training and sport</i>	<i>-10800 students</i>
<i>- Education</i>	<i>- 42200 students</i>
<i>- Transport and communication</i>	<i>- 1900 students</i>
<i>- Arts and cinema</i>	<i>- 2900 students</i>
<i>- Industry and construction</i>	<i>- 234200 students</i>
<i>- Agriculture</i>	<i>- 2700</i>

In private sector prevailing specialisations are as follows:

<i>- Economics</i>	<i>- 6500 students</i>
<i>- Education</i>	<i>- 15000 students</i>

. Cumulative number of population with higher education degrees (total in the fields of both science and technology)

Degrees in science field (2001) have 9723 persons.

8.2. Distant learning

. Distant learning facilities

In 2001 for the first time the faculty of “Improving qualification and retraining” with distance form of education was created at the Azerbaijan State Economic University. Khazar University in cooperation with Western University and IREX initiates a distance-learning course on International Negotiations. Caucas University works to foster development of wireless communication among high schools. The teachers involved in the project are currently developing several distance learning courses in some regions of Azerbaijan.

. Number of students trained per center

About 50 students per each university

9. Labor Force

9.1. Employment in science and technical fields

. Number of employees and trends in the fields

According to official statistics in 1998, the number of people employed in the field of science is 31200 (0.8% of the total working population)

. Compensation rates in the fields (average salaries)
Average salary in the field of science is 183 240 manats or about 46 USD(1998)

9.2. Employment in the electronics industry

. Number of employees and trends in the fields
No official or other statistics concerning the number of people employed in the electronics industry. For industry in the general number of employees is 251 100 (1998) or 6.8% of the total working population.

. Compensation rates and trends in the fields
Average salary in the electronics industry is 277049 manats (1998) or 61 USD.

9.3. Employment in telecom industry

. Number of employees and trends in the fields
Total number of employees in communication sphere - approximately 22000 (1998).

. Compensation rates and trends in the fields
Average salary in the field of communication is 263 576 manats (1998) or 66 USD

10. Research and development

10.1. Research institutions

. Number of research institutions
96 research institutions currently operating in Azerbaijan.

10.2. Investments in research and development

. The total amount
N/A

. Government and private business breakdown of total investment in research and development
Governmental investment in scientific research and development – 89 546 million manats or about 18 million USD (2003)

11. Other issues

Annex III – The Decree of the President of the Republic of Azerbaijan on “The Adoption of National ICT Strategy (2003-2012) for development of the Republic of Azerbaijan”

The Decree of the President of the Republic of Azerbaijan on “The Adoption of National Information Communication Technologies Strategy (2003-2012) for development of the Republic of Azerbaijan”

Taking into consideration the importance of “National Information Communication Technologies Strategy (2003-2012) for development of the Republic of Azerbaijan” jointly developed by United Nations Development Programme in accordance with the decree of the President of the Republic of Azerbaijan, № 865, January 9th, 2002 and approved by national and international organizations, for the Azerbaijan Republic, I decree:

- 1. “The National Information Communication Technologies Strategy (2003-2012) for development” is to be adopted.*
- 2. The Cabinet of Ministers of the Republic of Azerbaijan is due to address all the issues in this regard.*

Heydar Aliyev

The President of the Republic of Azerbaijan

Baku, February 17th, 2003

Annex IV – Box 1: National Normative Acts & International Treaties of the Republic of Azerbaijan

- The Decree of the Cabinet of Ministers of the Azerbaijan Republic on the Statute of the Ministry of Communications of the Azerbaijan Republic 04.04.1994
- Law on Communications, dated 20.06.97;
- Law on Creation of the Azerbaijan Republic State Commission “On Radio Frequency”, dated 15.08.96
- Resolution of the Cabinet of Ministers of the Azerbaijan Republic № 136 “On approval of the Provision of the Azerbaijan State Commission on radio frequency”, dated 03.10.96;
- Resolution of the Cabinet of Ministers of the Azerbaijan Republic № 138 «On approval of the protection of the means and devices of communication of the Azerbaijan Republic” dated 03.12.97;
- Resolution of the Cabinet of Ministers № 90 “On approval of the Rules on Use of transport means for post service of the Azerbaijan Republic”, dated 20/04/1998;
- Resolution of the Cabinet of Ministers № 175 “On approval of the rules of certification of the communication means of the Azerbaijan Republic”, dated 21/08/1998;
- Law of the Azerbaijan Republic “On approval of the treaty on cooperation in the development of cellular-mobile systems and their use”, dated 30.03.1999;
- The Order of the Ministry of Communications on rules of the utilization of general communications network 31.08.99
- Law on Mass Media, dated 08.02.2000;
- Law of the Azerbaijan Republic “On annexation to the Charter and Constitution of International Telecommunications and correction documents”, dated 14/03/2000;
- Law on Information, Informatization and protection of information, dated 03.04.1998;
- Law of Azerbaijan Republic on approval of treaty “On cooperation in the field of Governmental communication” between the government of the Azerbaijan Republic and Ukraine Cabinet of Ministers, dated 24/04/2000;
- Law of Azerbaijan Republic “On annexation to Provision for establishment of the Conference of the European Post and Telecommunication Administrations and fixed procedure rules”, dated 02.05.2000
- Code on Administrative infringements, dated 01.09.2000
- On joining of the Azerbaijan Republic to the Provision for establishment of the European Post and Telecommunication Administrations, adopted on September 7, 1992 and to the procedure rules of mentioned Conference, adopted on September 6, 1995;
- Decree of the Azerbaijan Republic President № 389 on issues of approval, came into effect and regulation in connection with this Code of administrative infringements, dated August 29, 2000;
- Resolution of the Cabinet of Ministers “On conduction of the measures, proceeding from the provisions of the treaties, signed between the government of the Azerbaijan Republic and government of Russian Federation in Baku on January 9, 2001, resolution dated 07/02/2001;
- Decree of the Azerbaijan Republic President "On maintenance of performance of the Law on the information, informatization and protection of the information " dated 4/07/ 2001.

- Decree of the Azerbaijan Republic President dated 16/03/2001 "On conduction of the state regulation of the modern communication services in Azerbaijan"
- Agreement between the Azerbaijan Republic and Uzbekistan on Cooperation in communications and telecommunications sphere.25.07.97
- Agreement between the Azerbaijan Republic and Kazakhstan on cooperation in communications sphere.01.02.99
- The CIS Agreement on the cooperation, development and utilization of systems of cellular mobile communication 30.03.99
- The Agreement between the Government of the Azerbaijan Republic and the Cabinet of Ministers of Ukraine on Cooperation in the sphere of government communication 24.03.00
- The Protocol on corrective action in the Agreement on Cooperation in development and utilization of systems of cellular mobile communication 24.10.00
- The Law of the Azerbaijan Republic on Corrective and Supplementary actions to communications, operating and searching activities 17.05.2002
- Decree of the President of the Azerbaijan Republic "On privatization of some enterprises and establishments under the Ministry of Communications of the Republic of Azerbaijan" 29.03.01
- Resolution of the Cabinet of Ministers dated 4 august 2001 № 143 on implementation President's decree " ON maintenance of performance of the Law on the information, informatization and protection of the information " dated 4/07/ 2001.
- The Decree of the Cabinet of Ministers of the Azerbaijan Republic "On Establishment of Tariff(Price) Board" and the Statute of Tariff(Price) Board of the Republic of Azerbaijan 31.01.02
- The State Programme on Development of small and medium sized entrepreneurship. (The Presidential Decree dated August 17, 2002) Paragraph 4.2 To provide the assistance to SME in the sphere of "Internet business" services
- Decree of the President of Azerbaijan Republic dated September 2, 2002 '*Rules for Issuance of Special Permission (License) on Some Types of Activities in Azerbaijan Republic*', and '*List of Types of Activity that Require Special Permission (License) and of Organs of Executive Authority that Issue*
- Resolution of Council on Tariffs (prices) " On payment of services long-distance, international, rural telephone and radio communications " dated 12.12.2002.

Source: Ministry of communication of Azerbaijan Republic