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The Role of the Republic of Türkiye in the Formation of the İnternet in Azerbaijan*

Abstract

In the modern era, the influence of information and communication technologies (ICT) and the Internet is expanding gradually, covering state structures, science, education, economy, culture, and other fields, forming a virtual society. Information technologies penetrate intensely into all processes in society and become a leading position. Currently, the strategic strength of the world countries is measured by their scientific intellectual potential and integration into the global information environment. In the paper, the role of Türkiye in the creation of Internet infrastructure in Azerbaijan, the historical facts about the establishment of relations between ANAS and TUBTAK are examined. In the research, the strategic partnership relations between the two brotherly countries, the projects, investments and joint efforts implemented by Türkiye in the direction of developing the Internet in our country were investigated. Archive materials of the Azerbaijan National Academy of Sciences were used in the preparation of the paper.

Azerbaycan'da İnternetin Oluşumunda Türkiye Cumhuriyeti'nin Rolü

Öz

Modern çağda, bilgi ve iletişim teknolojilerinin (BİT) ve internetin etkisi giderek artmakta, devlet yapılarını, bilimi, eğitimi, ekonomiyi, kültürü ve diğer alanları kapsayarak sanal bir toplum oluşturmaktadır. Bilgi teknolojileri toplumdaki tüm süreçlere yoğun bir şekilde nüfuz etmekte ve lider konuma gelmektedir. Günümüzde dünya ülkelerinin stratejik gücü, bilimsel entelektüel potansiyelleri ve küresel bilgi ortamına entegrasyonları ile ölçülmektedir. Çalışmada, Azerbaycan'da internet altyapısının oluşturulmasında Türkiye'nin rolü, ANAS ve TÜBİTAK arasındaki ilişkilerin kurulması ile ilgili tarihi gerçekler incelenmiştir. Araştırmada iki kardeş ülke arasındaki stratejik ortaklık ilişkileri, Türkiye'nin ülkemizde internetin geliştirilmesi yönünde gerçekleştirdiği projeler, yatırımlar ve ortak çabalar incelenmiştir. Çalışmanın hazırlanmasında Azerbaycan Milli Bilimler Akademisi'nin arşiv materyallerinden yararlanılmıştır.

Giriş

The emergence and formation of network technologies and the Internet in Azerbaijan is a significant component of our history of informatics. In our country, the formation of network technologies began in the 80s of the XX century, and global network technologies (X.25, DECNET, TSP/IP, SNA, etc.) were used. Data Transmission Network was developed based on X.25 technologies. Inter-node transfer speed was 600 bits/sec. (AzScienceNet network development stages, 2013). In the mid-1980s, new technologies began to be used to create local area networks. Technologies such as Ring, Ethernet, Arcnet, and Token were used to connect and use computers (Scientific and technical achievements in the field of cybernetics, 2012). Beginning from the late 1980s, the events in the direction of the collapse of the former USSR, as well as the general chaos and crisis experienced in the first years of independence, slowed down the development of the radio and television broadcasting network in the republic, and led to its decline. The formation and development of the Internet in Azerbaijan began after the collapse of the USSR. The events occurring in the country at the beginning of the 90s of the last century influenced the development of ICT and led to the weakening of this field. On January 19, 1990, the explosion of the power block of Azerbaijan state television resulted in the information blockade of the country and the interruption of relations with the international

world. The complicated political situation surfaced in those years, and the lack of national information and communication infrastructure in Azerbaijan caused the country's voice not to be heard in the world. In the first years of the USSR collapse, the unstable situation in the country and the economic recession negatively impacted the development of the Internet as well as in all areas All these factors necessitated the provision of ICT sovereignty in Azerbaijan.

The process of stabilization in the country only began with the retrieval of Great Leader Heydar Aliyev to the leadership of the country. Even in the first years of independence, the national leader paid attention to information technologies and accepted the necessary steps for its development (Scientific and technical achievements, 2012). In such an intricate historical period, the brotherly country Türkiye, as well as in all fields, supported our country in the scientific and technical sphere and carried consecutive purposeful measures in the direction of the construction and development of the national network infrastructure in Azerbaijan.

In the early 1990s, diplomatic relationships between the two countries began to be established. On the eve of the collapse of the Soviet Union and the restoration of our state independence, the Turkish Consulate General was opened in Baku on May 25, 1991. At the meeting of the Presidency of The Republic of Türkiye held in November 1991, a decision was made regarding the recognition of Azerbaijan's independence. Thus, Türkiye has gone down in history as the first country to recognize Azerbaijan's state independence.

Azerbaijan-Turkey diplomatic relationship were established on January 14, 1992. In February 1992, documents on cooperation and visa-free travel were signed between the ministries of foreign affairs of the two brother countries (Azerbaijan-Turkiye relationships, 2022). In 1992, the establishment of scientific relations between Türkiye's Trakya University and the Academy of Sciences of Azerbaijan was started. In 1993, the Presidium of the Azerbaijan Academy of Sciences adopted a decision on cooperation between the Institute of Cybernetics and the Faculty of Management of Istanbul University. In the framework of this cooperation, Turkish specialists assisted in carrying out scientific researches in Azerbaijan, preparing investment projects on current topics, providing training and consulting services, and exchanging personnel and experience. The main goal of the cooperation was to contribute to the development of the economy of both Turkey and Azerbaijan and to strengthen relations (Decision No. 6/11, 1993). From February 8 to 11, 1994, the first official visit of the then President of the Republic of Azerbaijan, Great Leader Heydar Aliyev to Türkiye, encouraged the development of partnership between the two countries. On February 9, Azerbaijan and Türkiye signed a protocol on cooperation and mutual assistance, an agreement on cooperation in scientific, technical, cultural, and other fields, a friendship and partnership arrangement, and

other significant documents (Azerbaijan-Turkiye relationships, 2022). In 1995, the President of Türkiye Suleyman Demirel was elected an honorary member of ANAS. Thus, the strengthening of the bilateral relationship and the development of friendly relations have opened broad prospects for scientific cooperation between Azerbaijan and Türkiye.

1. Initial Steps in The Establishment of the Internet in Azerbaijan

In 1991, at the meeting of the Presidium of the Academy of Sciences of the Azerbaijan USSR, to increase the effectiveness of the scientific and technical relations of the Academy with foreign scientific centers, the implementation of necessary measures and the preparation of highly qualified personnel for our republic in foreign countries that have modern technology in the fields of informatics and computer technology is defined as one of the main goals.

Also, the Department of Automated Management Systems (AMS) of the Academy of Sciences was directed to implement measures to connect the Academy's information processing system (AIPS) to the European academic and research network (EARN), and assigned to create software and technical tools for using the Academy's international e-mail and international data bank (Decision No. 1, 1992). The Azerbaijan node of the European Academic and Research Network (EARN) organization was established in the AMS department (currently the Institute of Information Technologies), thus the establishment of the Internet network in our country began. In the implementation of these works academician Ali Abbasov, academician Rasim Aliguliyev, and other scientists and specialists played a great role. In 1991, the first Azerbaijani node of the AzScienceNet network was founded, connecting the local networks of the AMS department and the Presidium of the AS of the USSR. Firstly in 1991, by joining the international "Sovam Teleport" network, the Azerbaijan branch of the e-mail service began to operate. This mail service provided the scientific institutions and organizations of ANAS, and many state institutions with the opportunity to use the services of international networks such as "Sovam teleport", RELCOM, BITNET, IASNET, etc.

In 1991, Dr. Wesley Fisher director of IREX (International Research & Exchanges Board), a global development and education organization, on Soviet programs, visited Azerbaijan and met with several high officials, scientists, and specialists of the country. As a result of the activities carried out within the framework of that meeting, for the first time in Azerbaijan, an electronic mail (e-mail) was sent to the international network using UUCP (UNIX-to-UNIX Copy - a program that ensured the transfer of information). The connection speed was only 9600 Kbit/s. One of the important achievements in the development of the Internet was the establishment of an international e-mail service station within the automated

information processing system in the AMS department and the provision of information exchange with subscribers in foreign countries.
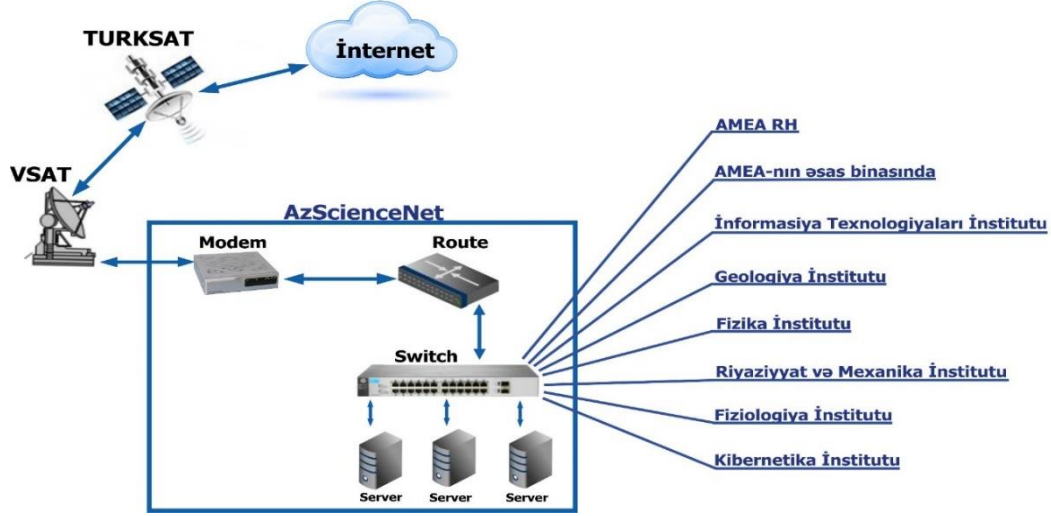
At the meeting of the Presidium of the Azerbaijan Academy of Sciences held in 1994, noted that the informatization of the republic - the formation of a general information environment is extremely important. Also, the creation of a local information-computing network by providing access to international networks was decided (Decision No. 11/2, 1994). In 1994, the AS local computing network was established and connected to the international INTERNET system. The informatization concept of the Republic was prepared and discussed at the meeting of the Presidium. A decision was made for the development of new information technologies and on the basis of it, the expansion of the services connecting republican nodes to international computer networks (Decision No. 5/1, 1995). In 1996, the infrastructure of the Azerbaijani part of the INTERNET and EUROMATH international computer networks was strengthened, and the mass application of electronic services based on network technology was greatly expanded (Decision No. 2/1, 1997). In those years, the measures implemented in the direction of access to the Internet and the development of ICT played a significant role in spreading real and complete information about the Nagorno-Karabakh conflict between Azerbaijan and Armenia, overcoming the information blockade and fighting the enemy's propaganda (Abbasov & Aliyev, 2010).

2. Establishment of Relationship Between Azerbaijan Academy of Sciences and TUBITAK

The Republic of Türkiye had a direct support and role in the creation and development of the Internet in our country. Since the 90s of the 20th century, as in all spheres of social life, relations between Azerbaijan and Türkiye have begun to occur in the fields of science and education. One of the essential directions of these scientific relations is the ICT partnership between the two countries.

In 1994, with the support of Turkey and the "British Petroleum" company, the AMS department developed the first Internet hub in the republic in the main building of the AAS. Several workstations and devices were provided to the network of the Academy of Sciences with the support of the BP company (Aliguliyev & Alakbarov et al. 2015). Via "Turksat" artificial satellite, a connection was established between the Internet center of the Middle East Technical University and access to the Internet was ensured (Fig. 1).

Fig. 1 All these works were carried out from 1992 to 2000 under the leadership of Sinan Oğan, the Azerbaijani representative of TİKA (Turkish International Cooperation and Development Agency).

In 1995, the Minister of Foreign Affairs of Turkey, Erdal Inonu, during his official visit to Baku, held discussions with scientists and specialists of ANAS in establishing the national Internet infrastructure of Azerbaijan and identified the problems. Hereafter, with the support of the brotherly country, significant measures were carried out for the development of the Internet in Azerbaijan (Erdal Inönü's visit to Baku, 2021). In 1995, the II Azerbaijan node of AzScienceNet started to function (Decision No. 1/3, 1996). The first website in Azerbaijan under the name www.ab.az was created in the same year in the AMS department and was placed on the servers of the AzScienceNet network.

Generally, during 1991-1994, WAN - global network technologies (X.25, SNA, TCP/IP, DECNET, etc.) were investigated for the first time in Azerbaijan. Based on CM-4 type Electronic Computing Machines, a network of computing machines consisting of 3 nodes, and an X.25 network was created between the cities of Moscow-Baku-Tbilisi. LAN - local network technologies have been studied and applied in various enterprises. The corporate Presidium Network was created, and the digital signature technology, the electronic document circulation was developed and put into use (Azerbaijan National Academy of Sciences - 60, 2005). In 1991-1995, the subscriber network of the Azerbaijan node of the INTERNET international computer network was developed in the AMS department, and various AAS institutions joined the network. A new Baku-Ankara satellite connection cable was opened and put into use to improve the connection of the Azerbaijan node with the INTERNET network. On the contrary, to create an Azerbaijani node of the Euromath computer network, relations with Euromath nodes of other countries were expanded and a technical project was prepared for the creation of that node

(Decision No. 1/3, 1996). In 1996, first, the Intrans company presented commercial Internet services in the republic (Gunduz, 2006). As a result of the intended policy of Great Leader Heydar Aliyev in the late 90s, prominent foreign companies began to show great interest in the development of Azerbaijan's Internet infrastructure. So, in 1997, the DEC company (Sweden) and the EmNet Society (Denmark) sent high-performance network servers to the AAS. The scientific research department of the NATO North Atlantic Treaty Organization has provided all costs for the distribution of an artificial satellite channel with a speed of 64 kbit/s, which can ensure the connection of the III Azerbaijan node to the international computer network. This was channel III, which allowed to connect to external computer networks. All the mentioned necessitated the creation of the III Azerbaijan node of the Internet (Decision No. 13/15, 1997). In those years, institutes and organizations of the AS, as well as other state organizations, successfully used the services of I and II Azerbaijan Nodes of the Internet.

In 1997, the Azerbaijan Nodes of the International Internet Computer Network were developed, and the subscriber and software-technical configuration was expanded. The design of the III Azerbaijan Node of the Internet has been completed and the laboratory version has been developed (Decision No. 1/1, 1998). At the meeting of the AAS Presidium held in 1998, the informatization issue of the republic by using modern information technologies, the creation of its informatics infrastructure, and its connection to the global information system was widely discussed. As a result of the work done, the state of Azerbaijan began to widely use paperless information technologies and significant work was done in creating a common information space of the country. It has led to the facilitation of information exchange with foreign countries, and generous opportunities have been created for establishing the country's activities at a qualitatively modern level in the international world and for more rapid development of our economy. Already in 1998, most scientific organizations of the AS and many state bodies joined the Azerbaijan Nodes of the Internet Computer Network as subscribers. At the meeting of the Presidium held in 1999, the accelerating issue of the implementation of Internet-television and Internet-telephone systems in the Academy of Sciences was discussed. Broadcasting of television programs through the Internet was proposed to be implemented in AR State and Television Company.

The foundation of the Internet Node of the Azerbaijan State Library named after M.F. Akhundov at ITEM, the creation of an Internet system in state universities, and the organization of Internet access for the President of the Republic of Azerbaijan were significant measures in the development of the Internet in Azerbaijan (Decision No. 2/1, 1999). In 2000, the institutes and organizations of the Azerbaijan Academy of Sciences were provided with about 50 high-

performance computers and telecommunication equipment and connected to Azerbaijan Nodes of the INTERNET (Decision No. 1/1, 2000). In ITEM, complicated assignments related to the development of the Internet were carried out and the introduction of a paperless information system was initiated. The Science Committee intends to develop a grant project for the development of the Azerbaijan Internet hub, as well as the financing of the connection of educational institutions of the republic to this resource.

At the same time, the Presidium of the ITEM took the necessary steps to implement the project "Creation of an information exchange system for Scientific Research and Educational Institutions of the Republic of Azerbaijan", which envisages the application and development of Internet technology in Azerbaijan according to world standards. Also, decided to take the necessary scientific-practical and organizational-technical measures to ensure that this system operates together with the Azerbaijan Nodes of the INTERNET. For this purpose, comprehensive measures have been taken to extend the infrastructure of Azerbaijan Internet Nodes and increase their capabilities. Wide application of the "Paperless Information Technology System" operated by the Presidium based on the technology of corporate networks in scientific departments of the AAS has been started. Connecting with the development of the Internet network, repairing the existing technical base, increasing its technical capabilities, as well as expanding it with the latest computer equipment and telecommunications equipment have been started in the AAS scientific departments (Decision No. 2/1, 2001). At the meeting of the Presidium of ANAS held in 2002, completing the work of improving the www.ab.az portal and organizing its permanent operation was considered necessary (Decision No. 1/1, 2002). In 2002, the Institute of Information Technologies was established on the basis of ITEM (Decision No. 2/3, 2003). In 2003, the www.ab.az site was updated on the UNIX platform, based on modern requirements, and named the www.science.az portal by the specialists of that institute. programming languages. On the one hand, the portal has created an opportunity for the scientific institutions and organizations of the Academy and the employees of that institution to exchange information with each other, become familiar with scientific research, use information resources on a large scale, and the other hand, they have been recognized in the world information space (Decision No. 20/1, 2003). In the early 2000s, the I and II Azerbaijan Nodes of the Internet Network were significantly developed, all scientific institutions and laboratories of ANAS were connected to the AzScienceNet network through an optical cable and a direct channel and gained direct access to the world's information resources (Academician Rasim Aliguliyev's report, 2003). A new development stage of the Internet has

begun in this scientific institution with the assignment of the implementation of the "Virtual Silk Road" project proposed by the NATO Science Committee. The main goal was to strengthen the information exchange between the academic societies of the countries participating in the project (Azerbaijan, Turkmenistan, Georgia, Uzbekistan, Kazakhstan, Kyrgyzstan, Tajikistan, and Armenia) and to provide the necessary opportunities for solving problems in the fields of science and education.

On May 15, 2003, the opening ceremony of establishing the VSAT-type terrestrial satellite communication system sent to Azerbaijan within the framework of the "Virtual Silk Road" project of the NATO Science Committee took place at the Institute of Information Technologies. This project has led to the further expansion of access to the Internet of higher schools and scientific institutions of Azerbaijan through the "Turksat" network (Alakbarov, 2016).

Conclusion

In the paper, a partnership between Turkey and Azerbaijan in the direction of the formation and development of the Internet is studied from a historical point of view. Within the successful partnership of the two countries, Turkey's participation and support in expanding the exchange of science and knowledge through the Internet in Azerbaijan is examined. The conducted studies show that the role of the brotherly country in the creation and development of the Internet infrastructure in Azerbaijan is crucial from several aspects. Foremost of all, Turkiye played an essential role in the digital development of Azerbaijan and in ensuring the information sovereignty of the state. Turkiye, a strategic partner of Azerbaijan, contributed to the formation of the Internet infrastructure in our country and strengthened its development. Geographical nearness and strong scientific and political relations have created a substantial foundation for a steady partnership between the two brotherly countries. In addition, the projects enforced by Turkiye in Azerbaijan were not limited only to the development of network infrastructure. Considering the significance of the Internet not only as a means of communication but also for the promotion of knowledge and the development of society, the brotherly country has extended relations with Azerbaijan in the sphere of science and education. The role and support of Turkiye in the invention of the Internet in Azerbaijan is not just a historical fact, but also an example of partnership and steady unity between the two nations. It is proof of the undeniable role of international partnership in shaping the digital future of the two Turkish states in the globalized world. Today, the friendly and brotherly relations between the two countries are successfully continued under the leadership of the President of Azerbaijan,

Mr. Ilham Aliyev, and the President of Turkey, Mr. Recep Tayyip Erdogan, and are moving towards new peaks.

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