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**TOWARDS A KNOWLEDGE-BASED
ECONOMY**

ARMENIA

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Introduction

The emergence of information and communication technologies (ICT) has offered Armenia, a country of limited natural resources, with a real opportunity to turn its human capital to economic advantage, thereby stimulating the country's development. In its 11 years of independence, Armenian society has faced serious economic and political challenges caused by the collapse of the Soviet Union. Since independence, Armenia has had to rebuild its economy, its infrastructure and its administrative system. Following ten years of economic decline, the period 2000-2001 has shown improvement for Armenian industry, and the emergence of high-tech businesses is one promising development for the country.

The country's economic and social indicators for the year 2001 are as follows¹:

- Population: 3,800,000
- Urban population: 2,529,200
- Nominal GDP: 2,288 mil US\$
- GDP per Capita: 602 US\$
- Sectoral contribution to GDP in %:
 - Industry: 22.9
 - Agriculture: 25.8
 - Gross Fixed Capital Formation: 16.6

ICT is considered a unique opportunity for Armenian society to solve both economic and political problems. A number of foreign and local IT companies were established in 1999 and 2000. These companies have formed a solid foundation for the development of a knowledge-based economy and information society. This in turn has encouraged the government to develop a national strategy and action plan for the development of ICT. The development process of the IT sector in Armenia is not easy due to: the low rate of domestic investment; the absence of venture capital; the low income rate of the majority of the population; and, an under-developed infrastructure. In spite of these difficulties, ICT business is becoming a reality, influencing public policy primarily in the areas of education, science, and public administration.

The Armenian Diaspora plays a significant role in the country's economy. Statistically, the Diaspora is comparable to the population of Armenia. IT professionals who left the country during the period 1996 to 1999 are an important factor in the attraction of investment to the Armenian IT industry. About 60% of recently established IT enterprises have benefited from the support of Armenian professionals living in the USA and Europe. The Diaspora is also an important factor in access to foreign markets by Armenian IT companies, who often cannot afford large-scale marketing and product promotion activities. The combination of opportunities created by the Diaspora, combined with highly-qualified Armenian IT professionals, creates a unique business mechanism that supports the growth of the IT sector.

Several favourable preconditions for the development of the ICT industry and the application of information technology in social and educational sectors are now in place. In spite of this, there are still some administrative, legal and institutional barriers hindering the emergence of a knowledge-based economy and information society in Armenia.

¹ National Statistics Agency Report, 2001

1. National strategy and action plan

Both the Government and the President of Armenia have continuously reiterated that ICT is considered a priority for Armenia. Its development is encouraged in every possible way by the political leadership of the country. The existence of highly-qualified professionals in the fields of software and microelectronics makes Armenia attractive for investments in this area. The government Action Plan specifically declares: “taking into consideration the increasing growth of information technologies in the international economy, the Armenian government shall pay special attention to the development of that field in Armenia”.

On 13 May 2001, the Government approved the Programme for the Development of Information and Telecommunication Industry in Armenia. This programme is based on the ICT Master Strategy, which was developed with substantial technical assistance from both the World Bank and USAID experts. USAID contractors, who report on its progress to both USAID officials and the Armenian Government, regularly review the implementation of the Master Strategy. The reports are analyzed by the ICT Development Council, which then provides the government with relevant recommendations.

The programme and the Master Strategy are the basic guidance documents for both government and donor organizations supporting ICT development in Armenia. The programme specifies government priorities and indicates the main directions for the activities of governmental organizations in this field. According to the programme, the activities of the Armenian government should achieve the following objectives:

- the promotion of ICT applications in different areas of public life;
- the establishment of a legal framework promoting ICT development in the country;
- the construction of a competitive ICT industry which will attract investment;
- the support of innovation as a primary mechanism for economic growth;
- the promotion of favourable conditions for the work of ICT professionals.

The Master Strategy also lists a number of objectives for the development of a knowledge-based economy and information society. These objectives are not limited to areas of government institution responsibility, but also include the potential activities of non-governmental, foreign and international organisations supporting the development of ICT and its applications in Armenia. The Master Strategy is comprised of two documents that serve as a methodological guide for ICT stakeholders. The documents are not official, but are used by both governmental and non-governmental organisations when planning and evaluating their initiatives for ICT growth.

The Master Strategy proposes the following long-term objectives towards a knowledge-based economy:

- the creation of a vibrant and sustainable ICT industry that promotes growth in other sectors of the Armenian economy;
- the inclusion of Armenia in the knowledge-based global economy.

The following conditions are identified as being essential for the development of a successful ICT industry in Armenia:

- the retention of skilled human capital in Armenia as the key to competitiveness;

- the provision of access to capital and the market for emerging ICT businesses.

One focal point of the Master Strategy is the establishment of a business incubator, which will provide small and medium ICT enterprises with: management and marketing training; access to credit; and, access to foreign markets. One of the objectives of business incubation is to facilitate the formation of venture capital in Armenia. The business incubator programme draws on best international practices to accelerate the creation of new ICT firms and aims to improve the survival and growth rates of such businesses. Other focal points of the Master Strategy include:

- the support of an active national ICT association that caters for all aspects of the sector's development by providing services and advice to its members;
- the promotion of a productivity programme to upgrade initiatives with ICT at their centre while, at the same time, developing both the market and businesses capable of supplying goods and services to it;
- the implementation of cluster development programmes to improve business capabilities, starting with the ICT sector, but scheduled to spread rapidly to other sectors.

Significant parts of the ICT Master Strategy address the issues of a favourable investment climate, and of the regulatory framework which supports the growth of an ICT industry. In accordance with the Master Strategy, the following tasks are to be accomplished by the government in order to ensure an investment-friendly environment and favourable legislation:

- the identification of a trade policy that encourages investment and local business development by focusing on simplified customs rules and regulations;
- the exemption of customs duties for products essential for ICT business development;
- the improvement of delivery services for both domestic and international products and of services facilitating e-commerce;
- the adoption of a comprehensive and standardised classification system and clearance procedure;
- the establishment of more detailed statutory regulations for the conclusion and enforcement of electronic contracts, as well as for the use of electronic signatures.

The participation of the business sector in the development of legislation, through representatives of both employers and employees, is seen as a key factor in the successful establishment of a favorable investment climate. This initiative will also ensure that legislation to supports the growth of an ICT industry is in place.

The Master Strategy also stresses the importance of maintaining and further developing human capital by strengthening the educational system and building an effective innovation system. The strategy proposed in this respect consists of:

- the building of a market-oriented higher education system;
- the introduction of computer literacy programs to different categories of state and private sector employees;
- the creation of training courses for the unemployed in order to provide them with employment opportunities in the new economy.

Important factors for the creation of effective education and innovation systems specified in the Master Plan are:

- the availability of a reliable high-speed Internet broadband connection to support remote educational systems, including distance learning software support systems, digital library access systems and logistics support systems;
- the provision of reliable and rapid forms of communication between Armenian academic institutions and their counterparts worldwide.

The Master Strategy addresses the development of a telecommunications market as an important component of the ICT industry, ensuring the growth of knowledge-based companies. The strategy proposed for the improvement of the country's information and communication system includes:

- the establishment of an independent regulatory body;
- the modification of license issued to incumbent telecom operators;
- the development and adoption of standards in the quality of telecommunications services.

The Master Strategy explicitly stresses that the development of high-speed Internet connection is an important prerequisite for the advancement of the country's information system. The expansion of adequate and affordable Internet services to provincial cities should be one of the development priorities of the Armenian telecommunications system.

The adoption of the ICT Development Action Plan is the government's next step in its advancement towards a knowledge-based economy. The Action Plan includes specific tasks and relevant benchmarks. The Ministry of Trade and Economic Development is responsible for its implementation. In addition, and in accordance with a Presidential Decree, an ICT Council has been established to coordinate the implementation of the Action Plan. The Prime Minister is chairperson of the council, which also includes representatives of governmental, non-governmental and private organisations. The council identifies the primary obstacles hindering the development of an ICT industry in Armenia, and prepares relevant recommendations for government.

2. The institutional regime

2.1 The General Department of Information and Communication

The General Department of Information and Communication (GDIC) of the Ministry of Transport and Communication implements state policy in the area of information and telecommunications. This department issues licenses to telecommunications operators and oversees their compliance with technical standards and licensing requirements. Licensing is in accordance with the Armenian licensing legislation and procedures established by the Ministry of Transport and Communication. The department is also responsible for the allocation of radio frequencies and technical standards of radio transmissions.

An additional responsibility of the GDIC is the approval of tariffs for telecommunication services provided on an exclusive basis. The tariffs are approved in accordance with the rules established by the Government of Armenia. These tariffs are calculated by evaluating the actual cost of the services and adding on to this the expenses related to network maintenance and development. The present tariffs of basic telecommunication services attempt to combine the interests of the telecommunications operator and that of different categories of users. Users of public switched telephone network (PSTN) can choose between call metering and flat rates².

The GDIC is also responsible for the coordination and support of scientific research in the areas of telecommunications and information. However, a lack of resources hinders the department from fulfilling its activities in this area. The department is also responsible for the development of quality standards in telecommunications service. Again, this has not been achieved so far due to a lack of human and financial resources. The development and adoption of the Country Telecommunications Programme, another important responsibility of the department, is not in place because of the limited capacity of GDIC.

2.2 The Ministry of Trade and Economic Development

The Ministry of Trade and Economic Development is also involved in the development of ICT. The ministry is responsible for the implementation of the ICT Development Action Plan and for the coordination of activities of other governmental institutions in this field. More specifically, the ministry is in charge of developing the legal and regulatory framework that supports the development of the ICT industry and of attracting foreign investment in this area of the economy. It is an official recipient of the World Bank Business Incubating project and other initiatives related to the establishment of the ICT industry in Armenia.

2.3 The ICT Development Council

The ICT Development Council and the Council's Secretariat play an important role in the implementation of the ICT Master Strategy and the ICT Development Action Plan. The ICT

² There are two basic telephone tariffs in Armenia. The first tariff includes a monthly fee of 900 drams (1.5 USD), 360 minutes of free calls, and 4 drams (0.006 USD) for every additional minute of telephone call or 1 dram (0.0017 USD) for every additional minute of data transfer (Internet and e-mail). The second type of tariff includes a monthly fee of 2,500 drams (4.3 USD) and unlimited use of voice and/or data traffic.

Council provides Armenian businesses with the opportunity to influence state policy and to promote favourable conditions for the growth of the entire ICT sector. The President of Armenia appoints the members of the ICT Council for a period of one year. The Council's activities include:

- the identification of obstacles hindering the growth of the ICT industry and the development of relevant recommendations for the government;
- a discussion on the implementation of the Action Plan at monthly sessions;
- weekly meetings of six thematic working groups aimed at development assessment of the ICT industry.

2.4 The Armenian Development Agency

A significant part of the responsibilities related to the promotion of foreign investments in the ICT sector is delegated to the Armenian Development Agency (ADA). This agency is a state-owned, joint-stock company established by the government for the purpose of attracting foreign investment to the economy. The Secretariat of the ICT Council is based in the ADA and uses the Agency's facilities for its everyday activities.

In spite of clearly defined responsibilities for state institutions responsible for the implementation of the ICT Master Strategy, the ICT Development Programme and Action Plan suffer from a lack of coordination between different governmental agencies. This situation impedes effective growth of the ICT sector. In some cases, state agencies compete with each other for the responsibilities under a particular governmental initiative.