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# ICT COUNTRY PROFILE

## ARMENIA

2011

REGIONAL COMPETITIVENESS INITIATIVE

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### **DISCLAIMER**

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## I. EXECUTIVE SUMMARY

The purpose of this report is to provide an outside look at the ICT development in Armenia and identify the possibilities for regional ICT cooperation. The desktop research should reveal the national strategies, policies and action plans for ICT development from one side and the activities held in that direction from another. The overall goal of the report is to disclose the real picture of the local ICT market and identify the possibilities for regional cooperation.

In order to be as objective as possible the author of the report used different researches, analyses and statistics from international organizations (World Bank, World Economic Forum, United Nations, etc.) and domestic state agencies and profit and non-profit organizations (Ministry of Economy, Enterprise Incubator Foundation, etc.). The respective sources are quoted as footnotes at the end of each section.

The Armenian government sees big potential in the development of Information and Communication Technologies (ICT). For that reason for the last years ICT is one of the main priorities in the country development. According to a survey of the Ministry of Economy the major competitive advantages of Armenian IT industry in are<sup>1</sup>:

- Research potential corresponding to the world standards in the field of informatics, physics and mathematics;
- Presence of highly skilled experts;
- Cheap labour force;
- State support of the sector;
- Steady and continuous growth of the IT sector;
- Presence of Armenian communities in Europe and Northern America;
- Presence of legislation directed at the protection of intellectual property.

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<sup>1</sup> [http://www.mineconomy.am/files/docs/25\\_en.pdf](http://www.mineconomy.am/files/docs/25_en.pdf)

## II. ANALYSIS OF THE ICT SECTOR IN ARMENIA

### A. PAST, PRESENT AND FUTURE TRENDS

During the Soviet Union era Armenia was one of the regional hubs for Information Technologies. The majority of highly skilled experts were situated in Armenia. This meant that from one side after the dissolution of the Soviet Union the country had the tradition and know-how to develop a competitive IT industry, but on the other a large pool of highly skilled specialists had to be retrained or lost qualification. Besides, the focus of the industry was changed from large-scale R&D and production for military and industrial applications to software development and outsourcing. In the 1990s a couple of US-based software companies established branch offices in Armenia. This was a significant boost for the industry development.

The majority (80%) of Armenian software companies were established in the period from 2000 until 2010. The Armenian companies offer a full range of IT services and products. Furthermore they meet the requirements of world recognized quality standards and methods. These are valuable prerequisites for foreign investments. A proof for that is the fact that many global corporations are developing business in Armenia. The majority of high-tech corporations have opened development and R&D centers in the country.

At the end of 2000 the Information Technologies industry was proclaimed as one of the main priorities of Armenian economy, and a Concept for the development of the IT industry was adopted. A revised version of the Concept was accepted on the 28th of August 2008. The main goals that are expected to be achieved are:

- Improved telecommunications infrastructure;
- Favorable conditions for business incubation;
- New mechanisms for support and financing of technology start-ups;
- Increased number of technical graduates;
- Improved quality.

The Diaspora is also considered to be one of the driving forces behind the Armenian economy. The Diaspora representatives support the direct foreign investments, export opportunities, knowledge transfer, visibility, etc.

During the global financial crisis (2008-2010) the industry in Armenia registered a growth of 16%. The IT industry exports compound 8,5% of the total exports of the country. Despite this growth the share of revenues of local companies decreased from 45% in 2008 to 39% in 2010. This trend can be explained with the fact that foreign companies in Armenia are mostly outsourcing centers, which are working with a small profit margin. The biggest part of their profit does not stay in the country.

Basic figures of the IT sector in Armenia for 2010:

- Share of the industry in country's GDP is 1,7%;
- Industry revenues around 150 million US dollars;
- Industry exports around 58 million US dollars;
- Around 200 operating companies;
- Around 5000 professionals working for the industry;

The IT sector is well positioned to continue its growth in the following years based on a combination of different factors and advantages:

- R&D potential in computer science, physics, and mathematics;
- Highly qualified labor force;
- Competitive prices;
- Strong university programs with specializations in computer and related Sciences;
- Solid government support of the industry;
- Strong and successful Diaspora;
- Strong laws and regulations for IP protection.<sup>2</sup>

### COMPETITIVE INDEXES AND DATA<sup>3</sup>

	Population (m)	GDP \$ (b)	GDP per capita \$	WEF GCR index Rank (value)	GCR innovation Rank (value)	WEF GITR Rank (value)	E-gov. development Rank (value)	E- participation Rank (value)
Albania	3,2	11,8	3,7	88(3,94)	121(2,57)	87(3,56)	85(0.4519)	86(0.1286)
Armenia	3,1	9,3	3	98(3,76)	116(2,63)	109(3,24)	110(0.4025)	135(0.0429)
Azerbaijan	8,9	51,1	5,7	57(4,29)	61(3,16)	70(3,79)	83(0.4571)	68(0.1714)
BiH	3,8	16,9	4,5	102(3,70)	120(2,59)	110(3,24)	74(0.4698)	135(0.0429)
Georgia	4,4	11,7	2,6	93(3,86)	121(2,51)	98(3,45)	100(0.4248)	127(0.0571)
Kosovo	1,8	5,6	3,1	n/a	n/a	n/a	n/a	n/a
Macedonia	2,1	9,1	4,4	79(4,02)	97(2,88)	72(3,79)	52(0.5261)	55(0.2143)
Moldova	3,6	5,8	1,6	94(3,86)	129(2,49)	97 (3,45)	80(0.4611)	58(0.2000)
Montenegro	0,6	4	6,4	49(4,36)	45(3,48)	44(4,09)	60(0.5101)	76(0.1571)
Serbia	7,3	39,1	5,4	96(3,84)	88(2,93)	93(3,52)	81(0.4585)	135(0.0429)
Ukraine	45,8	138	3	89(3,90)	63(3,11)	90(3,53)	54(0.5181)	48(0.2571)

## B. ICT ASSOCIATIONS

### UNION OF INFORMATION TECHNOLOGY ENTERPRISES (UITE) – [www.uite.org](http://www.uite.org)

A non-profit, non-governmental organization established in 2000. The UITE membership list includes Armenian software, hardware, ICT training, and Internet service provider companies. The organization was founded by the private sector in order to represent the interests of IT companies, stimulate business and foster research in the ICT field.<sup>4</sup>

### ENTERPRISE INCUBATOR FOUNDATION (EIF) – <http://www.eif-it.com/>

The Foundation was established in 2002 as a joint initiative of the Armenian Government and the World Bank. The main goal of EIF is to support the development of information technology industry in Armenia. The main activities of the foundation are to provide business support, advisory services, create opportunities for partnership and investment, etc.

<sup>2</sup> <http://www.eif.am/files/557/Armenian-IT-Industry-Report-/EIF-ArmenianITIndustryReport-2010-ENG.pdf>

<sup>3</sup> [http://www2.unpan.org/egovkb/global\\_reports/10report.htm](http://www2.unpan.org/egovkb/global_reports/10report.htm) ; <http://www.worldbank.org/http://gcr.weforum.org/gcr2010/> ; <http://www.networkedreadiness.com/gitr/>;

<sup>4</sup> <http://www.digitec.am/static.php?lng=eng&id=16>

## **YEREVAN TELECOMMUNICATION RESEARCH INSTITUTE – [www.yetri.am](http://www.yetri.am)**

Yerevan Telecommunication Research Institute (YeTRI) was founded 30 years ago. It is specialized in the fields of:

- Software development;
- Development of hardware and software for telecommunication systems;
- Research, development & manufacturing of functional RF & MW microelectronic elements and radio devices;
- Microcontrollers for Technological Control systems;
- Design Radio and Fiber optic communication networks;
- Training specialists in the field of IT and Telecommunication.

The company's production is based on modern technology, using advanced techniques and high quality. YeTRI is organizing its works in compliance with the standards of the ISO 9001: 2000 Quality Management Systems.

## **ARMENIAN YOUTH ASSOCIATION OF DEVELOPING INFORMATION SOCIETY (ARISO) – <http://www.ariso.am/>**

Armenian Youth Association of Developing Information Society (ARISO) is a public, non-commercial and non-profit organization. ARISO brings together Armenian and foreign students, graduate students, researchers, scientists, lecturers, native and foreign higher education institutions, research institutions, academic institutions which as a result of joining the Association are ready to support the program for building and developing an information society and improving the rating of the IT sphere of the Republic of Armenia.

### **C. PROFILE OF SELECTED COMPANIES**

In order to understand the characteristics of Armenian IT market, one must take a look at the differences between local companies and branches of foreign companies.

The majority of foreign companies in Azerbaijan were established in the period 2000-2009 and are branches of American or Russian owned companies. In most cases they usually open development centers with a small operating team, gradually increase the number of employees and afterwards focus on higher value-added services. The branches of foreign companies work in compliance with internationally recognized standards and usually are not responsible for activities like business development, strategic management and marketing since these are responsibilities of the head office. Furthermore the foreign owned companies allocate more resources for trainings of their employees. A rather negative tendency is that these companies work with a fixed budget and the bulk of their profit doesn't stay at the country.

In comparison local companies rely on competitive costs, most of them are oriented to low-end services and products, and highly skilled professionals. In the last 10 years Armenian companies have gained skills and experience to offer complex higher value added software solutions and services. A lot of companies focused on engineering, systems development and R&D. Other areas of specialization are web design and development, Internet applications, provision of Internet services. The Internet services are bringing the highest profit (around 34%). The main reasons for that are the increased demand for internet services, the favorable conditions for entrepreneurs to start such a business and the termination of the monopoly of the Armenian Telephone Company.<sup>5</sup>

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<sup>5</sup> <http://www.eif.am/files/557/Armenian-IT-Industry-Report-/EIF-ArmenianITIndustryReport-2010-ENG.pdf>

Some of the leading companies in the ICT sector in Armenia are:

**A2 LTD - [www.a2ltd.am](http://www.a2ltd.am)**

Design, production and warranted maintenance of electronic programmable devices on the basis of microprocessors and microcontrollers, intended for measuring, registration and control of the of the technological processes as well as design of the devices in the field of telecommunication information technologies and systems. The users of the manufactured products are the Ministry of Communication, Gas, housing municipal services, enterprises.

**BI-LINE LTD - <http://www.bi-line.am>**

Bi-Line was established in 1996, and since then has become one of the IT industry leaders. The company has two main operating segments: hardware and systems integration and software development. Bi-Line is a distributor, dealer and service provider for a number of leading computer equipment and systems manufacturers including Alcatel, APC, Canon, Cisco, IBM, HP, Oracle, and Siemens. Bi-Line's clients are Ministries of Foreign Affairs and Sate Revenue of Armenia, UNICEF, USDA, the World Bank, Marriott, the Central Bank of Armenia, a number of major banks and manufacturing companies in Armenia.

**EpygiArm LLC - [www.epygi.com](http://www.epygi.com)**

Founded in 2000 by Sam Simonian, former Chairman of INet Technologies, EpygiArm LLC is a hardware and software development company specializing in design and development of systems for IP Telephony, Network Diagnostics and other areas in Telecommunication.

**Hitegrity LLC – <http://www.hitegrity.am/>**

Hitegrity LLC provides high quality engineering and project management services to help companies in the product development lifecycle.

**ADDITIONAL COMPANIES**

More companies can be found at: <http://itguide.eif.am/?id=0#top>

## **D. ACADEMIC PROGRAMS**

**STATE ENGINEERING UNIVERSITY OF ARMENIA (SEUA) -**

<http://www.seua.am/eng/comp/index.htm>

Faculty of Computer Systems and Informatics

**YEREVAN STATE UNIVERSITY (YSU) -**

[http://www.y-su.am/site/index.php?lang=1&page=3&p\\_num=&id=6](http://www.y-su.am/site/index.php?lang=1&page=3&p_num=&id=6)

Faculty of Informatics and Applied Mathematics

**RUSSIAN-ARMENIAN (SLAVONIC) UNIVERSITY - <http://www.rau.am/faculties.php?l=0&id=4>**

Faculty of Applied Mathematics and Information Technologies

**AMERICAN UNIVERSITY OF ARMENIA (AUA) - <http://cis.aua.am/>**

College of Engineering

Armenia has strong traditions in higher education. After the dissolution of the Soviet Union the government has put in a lot of efforts in order to create a modern educational system. According to data from the UNESCO

Institute for Statistics 99,5% of the adults(15+ years) and 99,8% of the youth(15-24 years) are literate.<sup>6</sup> The main challenges for the educational sector lie in the insufficient funding (proportion student fees vs. governmental funding), outdated libraries, outdated technological base, insufficient cooperation with the industry and other international academic institutions. However in the last years the cooperation between academic institutions and industry has become more intense and the following initiatives should be mentioned:

- Interdepartmental Chair of “Microelectronic Circuits and Systems” established by LEDA Systems (acquired in 2004 by Synopsys Inc.) and SEUA. The Chair, now part of Synopsys University Program, supplies more than 60 high-quality VLSI and EDA specialists each year. Later Synopsys expanded this initiative through opening interdepartmental chairs at YSU and Slavonic;
- Internet and web technologies laboratories established by Lycos Europe, EIF and Sourcio CJSC at SEUA and YSU in 2005;
- Sun educational laboratories formed by Sun Microsystems, EIF, and USAID at SEUA, YSU, and Slavonic in 2008;
- Gyumri IT Center, first IT training center in the city of Gyumri, established by the Fund For Armenian Relief (FAR) and EIF in 2006.

In 2008, nearly 7,000 students were enrolled in various IT related fields at 5 main Armenian IT universities. Around 85% of these students study at SEUA and YSU. Representatives of IT firms point out that the number of graduates is insufficient for industry’s demand for technical specialists.<sup>7</sup>

## **E. STATE AGENCIES AND ORGANIZATIONS**

**MINISTRY OF ECONOMY - <http://www.mineconomy.am/en/>**

**ARMENIAN DEVELOPMENT AGENCY - <http://www.ada.am/index.html>**

The Armenian Development Agency (ADA) was established in 1998 by the Government of the Republic of Armenia to facilitate foreign direct investments and promote exports. It acts as "one-stop shop" agency for investors assisting them in setting up their business in Armenia, helping in project implementation, performing a liaison role with the Government, providing information on investment opportunities in the country, as well as investment related regulations and laws. In its export promotion activities ADA helps to find markets for products, undertakes market studies and seeks out partners for joint ventures aimed at increasing the volume of exports and development of Armenian enterprises. ADA also organizes international conferences, business-forums, trade fairs and exhibitions.

The Armenian Government considers ADA as the main national intermediary for bridging gaps between policy development and implementation and the public and private sectors. The Chairman of the Board of ADA is the Prime Minister of the Republic of Armenia.

ADA coordinates the work of the Secretariat of the Business Support Council of the Republic of Armenia, which provides an effective mechanism to channel issue of concerns in the Business Community to the Government, and the Secretariat of the IT Development Support Council of the Republic of Armenia.

**EUROPEAN REGIONAL INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN ARMENIA (ERIICTA) – <http://www.eriicta.am/>**

The European Regional Academy is an interstate and a non-profit fund with RA Government’s involvement which offers graduate and post-graduate programs, short and long-term courses in vocational training and qualification as well as college (vocational) educational programs in accordance with European standards in Yerevan and in other regions of Armenia as well. ERA is an interstate higher educational institution which was set up on the basis of

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<sup>6</sup> <http://www.ibe.unesco.org/en/worldwide/unesco-regions/europe-and-north-america/armenia/links.html>

<sup>7</sup> <http://www.eif-it.com/download/EIF-ArmenianITIndustryReport-2009-ENG.pdf>

contracts and agreements signed with a number of European countries. The Government of RA is the constituent party of ERA.

## **F. NATIONAL STRATEGIES AND POLICIES FOR ICT DEVELOPMENT**

As part of its efforts to support the ICT development in 2008 the Government adopted a 10-year industry development strategy focused on building infrastructure, improving quality of IT graduates, and creating financing mechanisms for start-up companies. The vision of the concept paper is to achieve:

- Sustainable information society with advanced ICT infrastructure, high-level computer literacy, high level of computer saturation and internet access, extended use of e-services systems, existence of large local IT market and progressive knowledge-based industry;
- Developed and internationally recognized Information Technology sector, with companies creating big surplus value and providing complex engineering solutions and services, local IT products competitive in international markets.

The action plan of the concept paper aims to achieve the following:

- 1) In 1-3 years - build world class ICT infrastructure;
- 2) In 3-5 years strengthen the ICT infrastructure and make the “Armenia IT brand” visible on the global market;
- 3) In 5-10 years – participate actively on the global markets and, particularly, in targeted high-growth market segments. Contribute to the growth of ICT, increase in sector revenues and development of knowledge-based economy through ICT infrastructure and information society development.

The concept paper will influence the following key areas:

- Increase of economic competitiveness and productivity;
- Increase of RA population’s living standard;
- Increase of volume of R&D activities;
- Creation of highly remunerated jobs;
- Increase of IT productivity;
- Increase of quality of education.<sup>8</sup>

A recent initiative of the Armenian government towards development of the ICT industry in the country is the establishment of an Indian-Armenian Center of Excellence. The initiative was discussed and agreed between the Governments of India and Armenia and set forth in the respective Memorandum of Understanding signed on June 26<sup>th</sup>, 2009.

The Project’s overall objective is to establish a specialized infrastructure for delivery of IT-related trainings and R&D programs from one side and to create new opportunities for IT workforce skills development in Armenia from another.

The Project key objectives are:

- Delivery of IT training;
- Training of Trainers;

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<sup>8</sup> [http://www.mineconomy.am/upload/file/IT%20Concept%20paper\\_Final%20eng.pdf](http://www.mineconomy.am/upload/file/IT%20Concept%20paper_Final%20eng.pdf)

- Exchange program;
- Promotion of joint R&D projects.

This project is implemented by Enterprise Incubator Foundation (from Armenian side) and C-DAC center (from Indian side).<sup>9</sup>

## G. DONOR PROGRAMS IN THE IT SECTORS

The development of the ICT sector in Armenia has been fostered by a number of international organizations. Various programs for assessment and provision of the necessary support have been designed by Donor organizations and their implementing agencies. Some of the latest projects in that sector include:

### USAID – CAPS PROJECT

Since 2005, the USAID-funded Competitive Armenian Private Sector (CAPS) Project has provided assistance to Armenia's IT cluster development, directly contributing to economic growth and job creation, and enabling that growth to spread to other sectors of the economy. The CAPS approach to IT development is largely focused on capacity building amongst all stakeholders (government, educational institutions, business associations, business service providers and individual enterprise) in the industry. In 2009, CAPS began work with the Public Services Regulatory Commission (PSRC) to support the further liberalization, and increase the efficiency of the telecommunications sector in Armenia. CAPS will assist the PSRC to establish rules and procedures designed to increase competition and user choice, attract investment, and encourage network development in the telecommunications sector.<sup>10</sup>

In the summer of 2010 the Minister of Economy Nerses Yeritsyan, U.S. Ambassador to Armenia Marie L. Yovanovitch and USAID/Armenia Mission Director Jatinder Cheema signed two Assistance Agreements under which the U.S. Government will provide up to \$50 million to the Government of Armenia for the period of 2010-2013 in support of the country's economic development and health and social services reform.

USAID will assist in the development of a more competitive and diversified private sector. The program aims to increase the competitiveness of small and medium enterprises in certain high value sectors by targeting areas that support innovative technologies, improve policy and the regulatory environment, strengthen workforce development, and enhance public-private sector partnerships.<sup>11</sup>

In May, 2011 the newly established USAID-supported Microsoft Innovation Center (MIC) officially opened at the State Engineering University of Armenia (SEUA). The Center in Yerevan is the first in the Caucasus region and was jointly established by the Armenian government, USAID Armenia, Microsoft RA (the Armenian branch of Microsoft Corporation), Enterprise Incubator Foundation (EIF), and the State Engineering University of Armenia. The Center was created as part of the three-year Global Development Alliance between USAID and EIF.<sup>12</sup>

<sup>9</sup> <http://www.eif.am/eng/projects/india-armenia-center-of-excellence-in-ict/>

<sup>10</sup> [http://81.16.4.58/itconference2009/materials/CAPS\\_Assistance\\_to\\_IT\\_Cluster\\_eng.pdf](http://81.16.4.58/itconference2009/materials/CAPS_Assistance_to_IT_Cluster_eng.pdf)

<sup>11</sup> <http://armenia.usembassy.gov/news080610.html>

<sup>12</sup> <http://armenia.usembassy.gov/news051111.html>

## **ISTOK-SOYUZ: INFORMATION SOCIETY TECHNOLOGIES TO OPEN KNOWLEDGE FOR EASTERN EUROPE AND CENTRAL ASIA - a project part of the European Seventh Framework Program.**

The ISTOK-SOYUZ project is an extension of the ISTOK.Ru project ([www.istok-ru.eu](http://www.istok-ru.eu)) implemented in Russia in 2006-2008.

The project will:

- (1) Promote the EU ICT program, raise awareness about benefits of mutual collaboration;
- (2) Identify potential for R&D ICT collaboration between the European Union and 9 addressed countries from Eastern Europe and Central Asia;
- (3) Expand the EU-Russian ICT research community to 4 targeted countries (Ukraine, Belorussia, Armenia and Kazakhstan) through the opening of an ISTOK competence platform and implementing pilot actions such as networking & brokerage events and assistance to integration into the European Technology Platforms and Networks of Excellence;
- (4) Provide support to research teams from the targeted countries with the goal of increasing the number of ICT FP7 partnerships between researchers from Europe and targeted countries.<sup>13</sup>

### **‘COMPUTER FOR ALL’ PROJECT – joint venture of the Ministry of Economy of Armenia, Enterprise Incubator Foundation and HP**

The main objectives of the Project are to:

- Increase the PC usage in Armenia;
- Build capacity and competencies among Armenians from different age groups;
- Stimulate the development of the local hardware and software industries;
- Increase the Internet usage and the number of people using online services, thus creating a basis for the introduction of new electronic services from the Government, businesses, educational institutions, etc;
- Decrease the software piracy rate in Armenia through offering licensed preinstalled software packages.

The project is led by a team of experts from the Government of Armenia, EIF, and HP/Unicomp and other partners.<sup>14</sup>

## **E-SOCIETY AND INNOVATION FOR COMPETITIVENESS (EIC) PROJECT**

The project development objective is to strengthen the ICT infrastructure and enable innovation environment.

There are three components to the project.

1. *E-society infrastructure development*: Support the design and development of the ICT infrastructure required for e-society through:

- (a) Support sub-projects for deployment of national broadband information infrastructure;
- (b) Improve the credibility and uptake of electronic services through creation of a digital citizen program;
- (c) Promote increased computer penetration and digital literacy through the ‘Computer for all’ program.

2. *Fostering enterprise innovation*: Establish a favorable environment for knowledge and technology-driven companies through:

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<sup>13</sup> [http://cordis.europa.eu/fetch?CALLER=PROJ\\_ICT&ACTION=D&CAT=PROJ&RCN=89490](http://cordis.europa.eu/fetch?CALLER=PROJ_ICT&ACTION=D&CAT=PROJ&RCN=89490)

<sup>14</sup> <http://www.eif-it.com/index.php?page=projects&section=computerforall>

- (a) Promote grant programs for knowledge innovation and technology-intensive firms, and create a Seed and Early Stage Venture Fund;
- (b) Support the establishment of the Gyumri Technology Center. The Center will provide technology support and incubation services to local firms and entrepreneurs;
- (c) Support skills and technology development, promote connections with international markets, including establishment of sales force representation Office.

3. *Project management*: assistance for project management and monitoring.<sup>15</sup>

## H. EXHIBITIONS, CONFERENCES AND EVENTS

The major events held in Armenia in 2011 are:

<b>February 18<sup>th</sup> - 20<sup>th</sup></b>	<b>ICT leaders meeting without ties forum</b>
<b>March 4<sup>th</sup> -5<sup>th</sup></b>	<b>ArmRobotics</b>
<b>April 1<sup>st</sup> -3<sup>rd</sup></b>	<b>Armenian-Georgian IT Business Forum</b>
<b>April 26<sup>th</sup></b>	<b>Armenian-Georgian IT business Forum</b>
<b>June 17<sup>th</sup> -18<sup>th</sup></b>	<b>DigiTec Business Forum</b>

## I. IT NEWS: SOURCES OF INFORMATION

Generally the various local media like online newspapers, magazines, forums are easily accessible. Most of them are available not only in Armenian, but also in Russian and English.

Liberalization of the mass media was one of the main challenges for the sector. The Open Society Institute Assistance Foundation – Armenia supported a Mass Media Program aimed to foster independent, unbiased and pluralistic media in Armenia by means of creating a progressive and favorable legal framework regulating the field and harmonizing it with internationally-recognized principles and standards. This is achieved through professional training of media managers, ensuring access to new Information Communication Technologies in the sphere of media and through establishment of media self-regulatory mechanisms.<sup>16</sup>

There is lack of specialized IT media. The most recent news in the ICT sector could be found on the websites of IT related organizations and associations.

Some of the existing ICT related media are the information journal for ICT news **ArmTech** ([www.armtech.am](http://www.armtech.am)) and the weblog **Armenian National Information System** (<http://www.armeniagis.com/>).

<sup>15</sup><http://web.worldbank.org/external/projects/main?pagePK=64312881&piPK=64302848&theSitePK=40941&Projectid=PI15647>

<sup>16</sup> <http://www.osi.am/massmedia.asp>

### **III. IT FOR OTHER INDUSTRIES IN THE COUNTRY**

Information and Communications Technologies (ICT) are a key factor for the development of a more competitive economy. There is a high level of awareness regarding the importance of implementation of ICT in other industries. Therefore a lot of projects related with the internet penetration in the country, e-Government and e-services, computerization of the education system, computer trainings for vulnerable community groups are being implemented.

Despite the registered progress in this field still a lot needs to be done.

The web platform IT2Business ([www.it2business.org](http://www.it2business.org)), an online catalogue with successful practices and Information Technology (IT) solutions for the business, is aimed at increasing the ICT competitiveness in Eastern Europe and Caucasus. The platform is designed and launched by USAID funded RCI (Regional Competitiveness Initiative) project through European Software Institute - Center Bulgaria/Eastern Europe to bring together the leading ICT companies in the region and their customers and suppliers. It fosters the direct contact between IT and other economic sectors. This enables the promotion of the local industry and the region as a whole. Currently there are 51 companies and 117 products/solutions registered in the platform. 7 Armenian companies are part of the online catalogues IT2Business.

## IV. QUALITY TRENDS

Working in compliance with the international quality standards is one of the obligatory prerequisites for developing a competitive ICT industry and gaining strong positions on the international market for every country.

The standardization and metrology activities in Armenia are a priority of the National Institute of Standards. The Institute maintains the national fund of standards of the Republic of Armenia which contains International (ISO), Interstate (GOST), Regional (EN), Armenian (AST) and other state standards.<sup>17</sup>

According to data provided by the World Bank Organization in 2009 26,9% of the companies in Armenia own ISO certification.

Four Armenian owned companies participated in a pilot project for ITMark implementation including Improvement of Software Engineering Processes based on CMMI, Information Security Processes based on ISO 270001 and General Business Processes. In 2007-2008 two companies were able to achieve ITMark certification and two Armenian consultants were qualified for the corresponding services. The project was supported by USAID CAPS and RCI projects and SRA. Generally the companies are aware of the necessity to implement the latest relevant standards. On this ground one can assume that process improvement initiatives in the country would be of great interest to the local companies and training organizations.

The Armenian IT companies need to gain awareness of the benefits to be part of the common capacity fund of ICT training and certification providers in Eastern Europe.

The web platform Quality2IT ([www.quality2it.org](http://www.quality2it.org)) – Eastern Europe Training and Certification Network, provides excellent opportunities to participate in the establishment of a common regional ICT brand based on high quality and innovations. The platform is designed and launched by USAID funded RCI (Regional Competitiveness Initiative) project through European Software Institute - Center Bulgaria/Eastern Europe. For the time being there are 19 companies with 90 services registered in the platform and 2 of them are from Armenia.

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<sup>17</sup> <http://www.sarm.am/en>

## V. SWOT ANALYSIS

The SWOT analysis of Armenian ICT environment generated the following conclusions:

### Strengths:

- Companies are already aware of the need for software process improvement;
- Availability of resources and IT specialists;
- Existence of active local associations and organizations;
- The government is supporting and promoting the development of the ICT sector;
- Strong fundamental education;
- Export-oriented industry;
- Increasing domestic demand for ICT products and services;
- Low labor costs;

### Weaknesses:

- The ICT products and services are not accessible to a wide audience;
- The country does not have a coherent image of an IT supplier or outsourcing destination;
- The potential of the regional market is not fully used;
- Outdated educational system and insufficient trainings;
- Lack of management experience in big international projects;
- Insufficient R&D activities;

### Opportunities:

- Implementation of world recognized models and practices;
- Great potential for development of the ICT industry;
- Increased understanding of software process improvement methodologies;
- Tendency to improve the IT image of the country;
- Support of world organizations (USAID, UNDP, World Bank, etc);
- Willingness of the Armenian Diaspora to support the ICT industry;
- Development of own products;

### Threats:

- Loss of export demand and decrease of the export prices;
- Lack of a coherent industry image;
- Political instability;
- Brain Drain of leading IT specialists;

### **CMMI IMPLEMENTATION CAN SUPPORT FOLLOWING OPPORTUNITIES:**

- Implementation of world recognized models and practices;
- Increased understanding of software process improvement methodologies;
- Great potential for development of the ICT industry;

### **CMMI IMPLEMENTATION CAN HELP MITIGATE THE FOLLOWING WEAKNESSES**

- Lack of management experience in international projects;
- The country does not have a coherent image of an IT supplier or outsourcing destination;
- Outdated educational system and insufficient trainings;

For further information please do not hesitate to contact the RCI IT team in ESI Center Bulgaria/Eastern Europe, [office@esicenter.bg](mailto:office@esicenter.bg), tel. +359 2 4899740