

OVERVIEW OF THE ARMENIAN IT SECTOR

BACKGROUND

The Information Technology industry is one of the most successful and fastest growing industries in Armenia. The sector is comprised of both indigenous and foreign companies generating approximately US\$40 million and employing around 3,000 people³. The IT industry was growing at 30% (CAGR) in the years 1998-2003.

The major specializations include embedded systems and semiconductor design and testing, custom software development, software development outsourcing, multimedia design, web design and development, and Internet applications. The majority of foreign companies are specialized in customized software development and outsourcing, chip design and testing, and networking systems and communications.

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

- World-class R&D capabilities in computer science, physics, and mathematics enabling Armenian companies to solve complex scientific and business problems,
- A highly qualified workforce at competitive prices,
- Strong university programs with specializations in computer and related sciences,
- Entrepreneurial spirit of Armenian businessmen,
- Solid government support of the industry,
- Continued robust growth of the industry,
- Strong and successful Diaspora in Europe and North America,
- Extensive experience with large multi-national companies.

COMPANIES

There are both foreign and indigenous IT companies operating in Armenia (25 % and 75% respectively). The total number of companies is over 100. Around half of these companies is established within the last five years, while the oldest company was founded in 1956. Almost all companies are concentrated in Yerevan where a pool of qualified human resources exists and a proper infrastructure for conducting business has been established.

Most of the local companies are either newly created private organizations or recently privatized research institutions. Foreign companies tend to have software development and research centers. The average company size is around twenty five employees. Company sizes vary considerably: a healthy mix of small companies have 5 to 10 employees, larger companies employ over 150 employees.

³ Some data and figures have been adjusted since the previous edition of this Guide based on the findings of our 2004 sector study. All figures are based on 2003 data. For more information see "Report on State of Industry: Software and Services", 2004, Enterprise Incubator Foundation (<http://research.eif-it.com>).

Local companies specialize in financial and accounting applications, MIS, industrial process control system engineering, web development and e-commerce, security and encryption, network solutions, wireless applications, mathematical algorithms, airport management systems, and other areas. These companies serve the local market, and many of them are successful in exporting products and services.

The local companies adopt two major business development strategies: being an outsourcing location for software development or producing and marketing their own software products and services. Many companies are aggressively pursuing outsourcing opportunities and envision long-term development in designing and marketing IT and software products.

Armenia recently had successes in attracting FDI in the software industry. A number of foreign companies established a presence in Yerevan in the recent years: Synopsis, Virage Logic International Corp., Lycos Europe, HPLA LLC, VDI Inc., Viasphere International and several Silicon Valley based companies.

The range of activities of foreign companies is quite broad, from Internet solutions and wireless applications to embedded systems design to telecom systems. Several success stories in the past few years confirm the abilities of Armenian professionals to provide world-class solutions to their largest customers.

- *Synopsys, Inc* is a world leader in semiconductor design software and develops software that companies use to design systems-on-chips (SoCs) and electronic systems. The company sells its products to semiconductor, computer, communications, consumer electronics, aerospace and other companies that develop electronic product. In 2005 Synopsys consolidated the teams and assets of LEDA design and Monterey Design under the Synopsys brand.
- In 1999, *Virage Logic*, a leading provider of best-in-class semiconductor IP platforms based on memory, logic, I/Os, and IP development tools that are silicon-proven and production ready, opened an engineering and R&D center employing more than sixty highly qualified employees at the Armenian branch. Following its strategy to expand in Armenia, the company bought a new building and plans to increase the number of employees up to 200 in the next few years.
- On August 1st 2002, *Lycos Europe* followed its strategy of strengthening its core competencies by adding a new Competence Center in Armenia. Lycos Europe has six competence centers in Gutersloh, Copenhagen, Hamburg, Paris, Stockholm and now in Yerevan for development of its core services, search, communication, communities and shopping. Lycos Armenia employs 220 high-qualified, experienced developers with skills in the field of Applications for Mobile Business. They focus on enforcing Lycos Europe's development competence in the CommuniTainment area while providing an economic option to instantly scale development capacity according to business requirements.

- *Viasphere Technopark*, a subsidiary of Viasphere International headquartered in Sunnyvale, California (US), is a state-of-the-art technology park located in Yerevan, Armenia. Viasphere Technopark provides infrastructure to technology companies worldwide looking to extend their core development offshore. It hosts several successful US-based subsidiaries developing advanced software in a variety of fields.

TECHNOLOGIES

There is an ample amount of technologies used by Armenian companies and professionals. These companies have experience with stand-alone applications as well as client-server and net-centric applications. They also employ various modern software development methodologies and programming techniques. Along with closed proprietary software development models companies start building their business models on open source software.

Companies involved in embedded systems design and testing extensively use C/C++ and assembly languages. Java and .Net technologies are more popular with companies involved in creation of net-centric solutions. In addition, companies use Visual Basic, Delphi, Perl and other languages for developing various applications. Many Internet technologies, such as JSP, ASP, PHP, ColdFusion, HTML, DHTML, XML, and Macromedia Flash are widely applied. Some of the popular relational database management systems are Microsoft SQL Server, MySQL, Oracle, and Informix. Many companies are developing applications for Windows, Solaris, Linux and recently for handheld platforms. They have experience in creating both small-scale applications and complex solutions.

Companies and software professionals have proven to be very flexible in adapting to ever-changing technologies and are very proactive in utilizing these technologies if new opportunities and benefits can be created.

EXPORTS

Armenia is exporting software to more than 20 countries. The major markets for IT industry products lie outside of Armenia, particularly with the US, Europe, Russia, and other countries. There are also a number of companies working for the Middle East market. Around 64% of IT services / products are exported.

Foreign branches account for nearly 84% of all IT exports. However, indigenous IT companies are also becoming increasingly export-oriented, looking for new opportunities to sell products or services abroad. About 65% of IT companies are exporting their products or services.

The IT industry produces nearly 4% of Armenia's exports and almost 1.5% of Armenia's GDP while employing less than 0.5% of the total workforce⁴. Foreign companies are accountable for the majority of these revenues, but the indigenous sector has its own important share.

⁴ Based on 2003 figures

DOMESTIC CONSUMPTION

Intense business pressures have developed due to steady economic growth, competitive environment, demand for higher productivity, and need for real-time information. Many seek IT solutions to address these demands. Businesses and non-profit organizations are making increasingly larger investments into software and IT solutions. The products with the largest demand by local companies are:

- ERP systems;
- Financial, accounting, payroll, sales, logistics, warehouse, and analysis applications;
- Public administration systems;
- Banking applications;
- E-commerce / web development services.

E-GOVERNMENT

There are several e-Government projects aimed at making the Government more transparent, increasing the productivity of governmental employees, and stimulating local demand for IT products and services. An example of implementing an e-Government system is the introduction of electronic visas in 2002. Armenia was second in the world and first in the CIS to implement such a system. In most cases, e-visas can be applied for, approved, and issued online thus saving time and cost to the consular missions, which makes it more convenient to travel to Armenia.

Other e-Government projects are being implemented in customs and tax areas. Barents Group of BearingPoint (formerly KPMG Consulting) has implemented a USAID funded project, which aims at creating consolidated, robust and transparent nationwide computer systems for improved customs and tax administration. Additionally, BearingPoint assisted both State Tax Service and State Customs Committee with website development (www.taxservice.am and www.customs.am, respectively) to increase the transparency of these agencies and provide information directly to importers and taxpayers.

HUMAN RESOURCES AND EDUCATIONAL SYSTEM

Armenia has a strong tradition of higher education and an impressive research record in the fields of engineering and natural sciences. Armenia was one of the prominent Soviet republics in the fields of scientific research. Armenia's educational system produces high quality talent trained in different areas of computer science and information technologies. The major universities put great stress on training students in the fundamentals and in educating them to understand the entire engineering process.

State Engineering University of Armenia (SEUA) and Yerevan State University (YSU) are the major universities training engineers and technical leaders. They were the major force in creating a strong Armenian IT and semiconductor industry in the 1950s. Today, these universities have specializations in various areas of computer and information sciences, mathematics, physics, and hardware design. They conduct advanced research in areas of semiconductors, computer and information science, and mathematics.

There are many other universities teaching computer and information sciences and related fields. A number of new universities, IT departments and specializations have been created in the last few years:

- In 2003, Lycos-Armenia with the assistance of EIF has established two Internet Technologies Labs at YSU and SEUA. The objective of these labs is to promote advanced training and research in different areas such as Algorithms, Mobile/Wireless applications, Software Engineering and Architecture, Component Based Development, Security and Encryption. In 2005 a new specialization on IT Project Management will be opened in the YSU Faculty of Economics.
- In 2002, recognizing the role that Armenia played in the area of IT in the region, the European Union initiated an establishment of a European Regional Institute of Information and Communication Technologies in Armenia (ERIICTA) as part of the European Academy.
- Recently, American University of Armenia (AUA), an affiliate of the University of California, created a Computer and Information Science department. AUA is the first university located outside of US that has been granted the status of a candidate for accreditation as a US higher educational institution by the Western Association of Schools and Colleges (WASC). In addition to computer science graduates, AUA also offers an MBA degree program.
- The Interdepartmental Chair of Microelectronic Circuits and Systems of SEUA was founded in 2001 on the basis of agreement of cooperation between SEUA and Synopsys Armenia. The Chair trains highly-qualified specialists to carry out both scientific and practical activities in the spheres of computer-aided design of modern integrated circuits (IC) and development of software-hardware environment for computer-aided design of IC.
- In 1997, the Russian-Armenian (Slavonic) University was established by an initiative of the Armenian and Russian Governments. The Faculty of Applied Mathematics and Informatics is providing specialization in mathematics and math modeling, system programming, and math cybernetics.

There are also a number of cooperation examples between local universities and such international IT companies as Intel, Alcatel and National Instruments to introduce new learning methodologies and to provide students with access to new technologies and scholarships.

The Western two-level system of the higher education (Bachelor degree and Masters degree) is presently being implemented in several universities. Other universities and institutions of higher education practice the five-year course of study and offer the degree of diploma specialist. Most of the universities offer post-graduate studies.

In addition to the higher education system, various professional certification (e.g., CISCO, Oracle, and Microsoft), managerial and technical training programs operate in the country. Numerous private training and test centers offer courses on software design and programming for both beginners and professionals.

GOVERNMENT ROLE

On December 28th 2000, the Government of Armenia declared the development of ICT as one of the priorities for the Armenian economy. Following this decree, the IT Development Support Council (ITDSC) was created with the Prime Minister serving as the Chairman. ITDSC has a permanently working Secretariat to act as a bridge between the Government, private and public sectors.

In 2001, the Government, in close coordination and support from the World Bank and USAID, developed the ICT Master Strategy and ICT development implementation plan to establish Armenia as a regional ICT hub. The vision of the Master Strategy is “the creation of an industry that promotes the wide use and application of information technology by Armenian citizens, businesses, and government to improve the quality of life and advance every facet of the Armenian society including homes, businesses, schools, and the community.”

In May 2001, the government approved the ICT Development Concept Paper and Action Plan prepared by the Ministry of Trade and Economic Development in accordance with the recommendations outlined in ICT Master Strategy.

DEVELOPMENT INITIATIVES

Various programs have been designed by organizations to make assessment and to support development in reaction to the success in the IT sector. Programs are being implemented with support of various organizations like the World Bank, USAID, GTZ, OSI-AF, Eurasia Foundation, and TACIS, among others.

The largest IT development program currently implemented in Armenia is Enterprise Incubator Foundation project. EIF was established by the Government of Armenia in 2002 within the framework of the World Bank’s “Enterprise Incubator” project. EIF’s mission is to stimulate Armenia’s economic growth by assisting the local Information Technology enterprises in developing and growing their businesses within Armenia and internationally. EIF’s main directions are to provide business, skills development, and facility services and to create opportunities for partnership and investment.

There are two associations supporting the development of Armenian IT industry:

- The Armenian High-Tech Council of America (AHTCA), which unites many US entrepreneurs and executives in high tech area with the goal of promoting and supporting the creation and development of technology-based businesses in Armenia.
- The Union of IT Enterprises (UITE), which unites Armenian software, hardware, IT training, and Internet service provider companies.

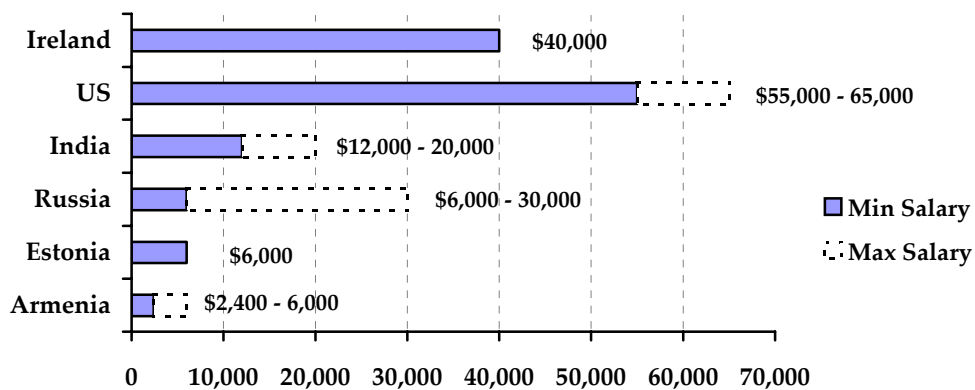
INTELLECTUAL PROPERTY PROTECTION

Armenia has started reforming its intellectual property regime in the last ten years. It has created a modern system that protects intellectual property rights. Currently, intellectual property related matters in Armenia are regulated by the Civil Code, law on copyright and neighboring rights, law on patents, law on trademarks, service marks and appellations of origin, law on protection of topographies of integrated circuits, and law on protection of the economic competition as well as by a number of international

treaties. Armenian legislation on intellectual property has been harmonized with the requirements of the Agreements on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreements). Since February 5th 2003, Armenia has been a member of the World Trade Organization (WTO).

COMPETITIVE ADVANTAGES

Armenia's R&D centers' performance matches that of the world-class companies according to McKinsey's 2003 report prepared on Armenian Software and IT services sector potential. The report also compares the salaries of software and IT services specialists in different countries. According to the report, the average salary range for IT professional in Armenia is from US\$2,400 to US\$6,000 per year. Annual salaries in Russia range from US\$6,000 to US\$30,000, in India US\$12,000 to US\$20,000, and in United States US\$55,000-US\$65,000.



Competitive Advantages of Armenia

- ✓ World-Class R&D capabilities in computer science, physics, and mathematics (IT powerhouse of the former Soviet Union);
- ✓ Talented workforce with a high degree of technical skills;
- ✓ Strong university programs with specialization in IT and mathematics;
- ✓ Highly competitive cost of labor;
- ✓ Strong Government support of the IT sector;
- ✓ Continued robust growth of the industry;
- ✓ Strong and successful Diaspora in Europe and North America;
- ✓ Extensive experience with large multi-national companies;
- ✓ Strong laws and regulations for IP protection.

The Armenian IT industry is the location of choice for developing new world-class products and solutions for foreign companies looking for fresh ideas and talent at competitive prices.