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Published in Slovak Republic  
European Journal of Economic Studies  
Has been issued since 2012.  
ISSN: 2304-9669  
E-ISSN: 2305-6282  
2017, 6(1): 18-24

DOI: 10.13187/es.2017.6.18  
[www.ejournal2.com](http://www.ejournal2.com)



## IT Sector as the Most Perspective High-Tech Industry in the Republic of Armenia

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### Abstract

Nowadays the economic growth and economic stability are the main state strategic directions for any economy. The Republic of Armenia is not an exception for that issue. Moreover, during 2016 the country faced with many political and economic challenges which made the Government reorganize as it had not been able to provide economic growth and higher results in many economic areas. Nevertheless, there are some spheres where the growth was noticed and one of that spheres is considered to be the Armenian IT sector, which comes to be the most sustainable and perspective in the country as it does not mostly depend on geographic location, borders, political and other competitive advantages. The article describes the trends of growth of the Armenian IT sector, the current positions of Armenian IT products and the regulatory policy held by the Government of the state, which fosters the sector growth and gains more and more productive results.

**Keywords:** information technologies, knowledge-based economy, high-tech industry, innovation, technological development, outsourcing, clusterization, technopark.

### 1. Introduction

For building a competitive and sustainable economy, every developing country defines a couple of real challenges and builds the strategy for its' economic growth based on those challenges. The Republic of Armenia is not an exception for that case. The transitional economy of the country, compared to its neighbors, has much more disadvantages for the context of providing economic growth. The most noticeable disadvantages are: absence of oil and gas resources, closed borders with eastern and western neighboring countries due to political and territorial conflicts and absence of sea access.

Nevertheless, the country continues to take on with some of its neighbors, build close economic relations with the whole world, being a member of Eurasian Union and having strong relationships with the European Union. Besides that, the country has some telling achievements especially in the spheres connected with human capital and intelligence. By that reason, the country has very strong potential in developing high-tech industries and build knowledge-based economy, and recently the ongoing development strategies are mainly based on the challenges for building innovative economy with high-developed knowledge-based industry. The most notable high-tech industry in Armenia is concerned to be information technologies (IT). These kinds of spheres step-by-step tend to be the basis for the economic growth and stability in the country.

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Generally, nowadays, the role of high-tech industries in global and local markets acquires more and more importance.

## 2. Study Area

The industrial direction, mentioned above – IT industry, is defined as one of the high-tech industries by the OECD experts. The classification is based both on direct R&D intensity and R&D embodied in intermediate and investment goods proposed ([OECD Directorate for Science, 2011](#)). The best definition for IT is the one classifying IT as a technology for processing information.

In the production aspect, the main mission for IT is to increase the degree of automation in creating, processing and transmission of information. At the same time information technologies take the human out of the technological process of information processing and offer him the choice of programs for uncountable activities. Due to the informative explosion and, first of all, by the forceful development of IT, nowadays economy as such turns into a knowledge-based economy and IT becomes to act as a main basis for the informatization and globalization processes of modern society, also affecting on transition of human's social and cultural life.

Generally, for building a competitive economic system streaming on high levels of nowadays technology revolution, the strategy of the current state should be concentrated on the existing spheres and work out a strong basis for development of other high technologies. For the last years the countries of G8 consider the formulation of symptoms for completely new scientific and technological revolution, connected with the appearance of newest nano-, bio-, telecommunication and cognitive science (NBIC – Nanotechnology, Biotechnology, Information technology and Cognitive science). As mentioned by W. Bainbridge and M. Roco, technological convergence is progressive in two important senses of the term. First, the NBIC fields are in fact progressively merging, step by step, and apparently at an accelerating rate. Second, the unification of the great realms of technology will promote human progress, if they are applied creatively to problems of great human need. Indeed, unless convergence takes place, in both the technical and social realms, it is hard to see how humanity can avoid conflicts, such as those that marred the 20th century, caused by limited resources for available technology and social differences within each country and globally. Only by moving to a higher technological level it will be possible for all of the people of the world to achieve prosperity together without depleting essential natural resources to the point at which the future of civilization itself is in doubt ([Bainbridge, Roco, 2006](#)). Therefore the new bunch of challenges appears for the global economy and the economy of the Republic of Armenia.

## 3. Discussion

The countries' rating for its performance in building knowledge-based economy shows the perspectives of the state to become a regional center for innovations and especially, for high-developed information technologies. By the Global Innovation Index 2016 Armenia holds the 60-th position among 128 countries (from the neighboring countries with transition economy: Georgia is the 64-th, Azerbaijan is the 85-th) ([Dutta et al., 2016](#)). The R&D costs from GDP in Armenia are growing continuously. In 2013 – by 0.19 %, in 2014 – by 0.21 % and in 2015 – by 0.24 % ([National Statistic Service...; The website of the World...](#)). Besides that, the well-organized doing business infrastructure is being created in the country which is also important for fostering innovations and knowledge-based industries. By the ranking of the ease of doing business mentioned in Doing Business 2017 annual report, Armenia holds the 35-th position from almost 198 countries (neighboring Georgia is the 16-th, Azerbaijan is the 65-th) ([Doing Business...](#)).

The recent growth of innovative potential in the country is mostly related with the ICT sector. According to the UNESCO science report, over the past decade the Armenian ICT sector has been particularly active: a number of public–private partnerships had been established between ICT companies and universities, in order to give students marketable skills and generate innovative ideas at the interface of science and business ([UNESCO, 2015](#)). A notable characteristic for this sector is the involvement of transnational corporations inside there (Microsoft, IBM, Synopsys, Mentor Graphics, Synergy International Systems, National Instruments, etc.). The impact level of these corporations to the Armenian economy can be described by mentioning their positions among 1000 largest tax-payers in 2015 and 2016, which is shown at [Table 1](#). The highest growth of taxes paid by ICT companies located in Armenia can be registered in Microsoft Armenia.

**Table 1.** Positions of Multinational ICT organizations in Armenia among the 1000 largest tax-payers of the country in 2015 and 2016 ([The website of Tax...](#))

Company name	Position among 1000 taxpayers		Growth rate of paid taxes (%)
	2015	2016	
Synopsys Armenia	71	65	14%
Mentor Graphics	266	241	15%
National Instruments AM	308	406	-24%
Synergy International Systems Armenia	335	435	-22%
Microsoft Armenia	940	561	86%

**Table 2.** Positions of Multinational ICT organizations in Armenia among the 1000 largest tax-payers of the country in 2015 and 2016 ([UNESCO, 2015](#))

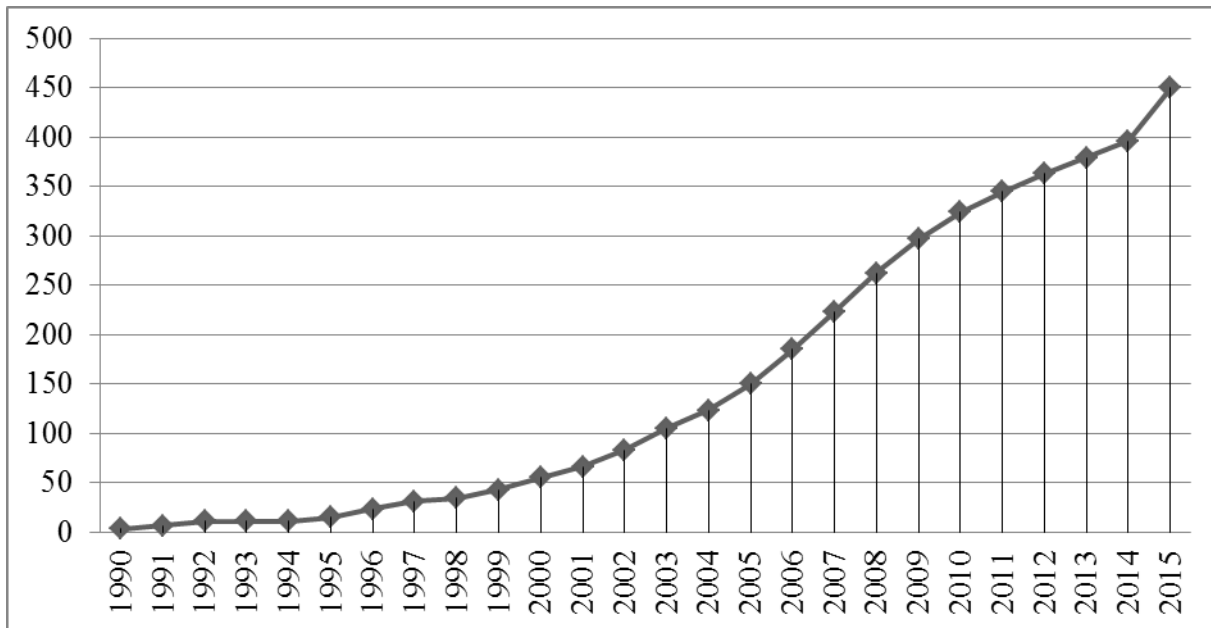
Company name	Position among 1000 taxpayers		Growth rate of paid taxes (%)
	2015	2016	
IUNetworks	62	61	6%
Picsart	400	251	78%
L-Soft	626	644	-0.4%
Triada Studio	-	638	-

Besides that, there are other key-players in the Armenian IT industry of Armenian origin, which are also significant tax-payers ([Table 2](#)). Actually some of them are mainly based and registered in the USA Silicon Valley, but continue their developing processes in their motherland, having a high level of international recognition. The most famous among the Armenian IT products are «PicsArt» and «Shadowmatic». Armenian IT company PicsArt was found in 2011 and its product – photo editing and sharing mobile application is considered to be among the 5 hottest startups of 2015 by Forbes ([Solomon, 2015](#)). The application offers a lot of handy features for users, with a handful of photo manipulation tools, filters and other effects to play around with. It's not just photo editing, the app also give users the ability to create collages ([Solomon, 2015](#)). With 300 million+ installs and 80 million monthly users, PicsArt spans the globe and is available in 20 languages ([The website of...](#)).

In April 2016 PicsArt announced a USD 20 million funding from «DCM Ventures» and «Siguler Guff & Company». PicsArt allocated the sum to developing its activity in China and Japan ([Saleem](#)).

The other well-known Armenian IT product «Shadowmatic» is designed in Triada Studio. It is a mobile application-game, a puzzle where the player rotates abstract objects in a spotlight to find recognizable silhouettes in projected shadows, relevant to the surrounding environment. The company was launched on January 2015 and it was honored at some awards organized in Armenia and Russian Federation. Nevertheless, the most significant goal for «Shadowmatic» was the win in Apple Design Award in 2015 ([Daneghyan, 2016](#)). Both organizations – Picsart and Triada Studio are partly located and registered in USA.

In the [Figure 1](#) the growth process of a number of the ICT companies is illustrated. It comes to approve the tremendous growth of this sphere. Nevertheless, the overall picture of this sector is very specific one. Only in 4 % from the whole number of the companies are employed 100 and more specialists, which come to be the 43 % of the overall workforce in the sector, and in 81 % of companies there are less than 25 specialists employed, which is the 30 % of the overall workforce. Thereby the dominants from Armenian ICT companies are the smaller ones.

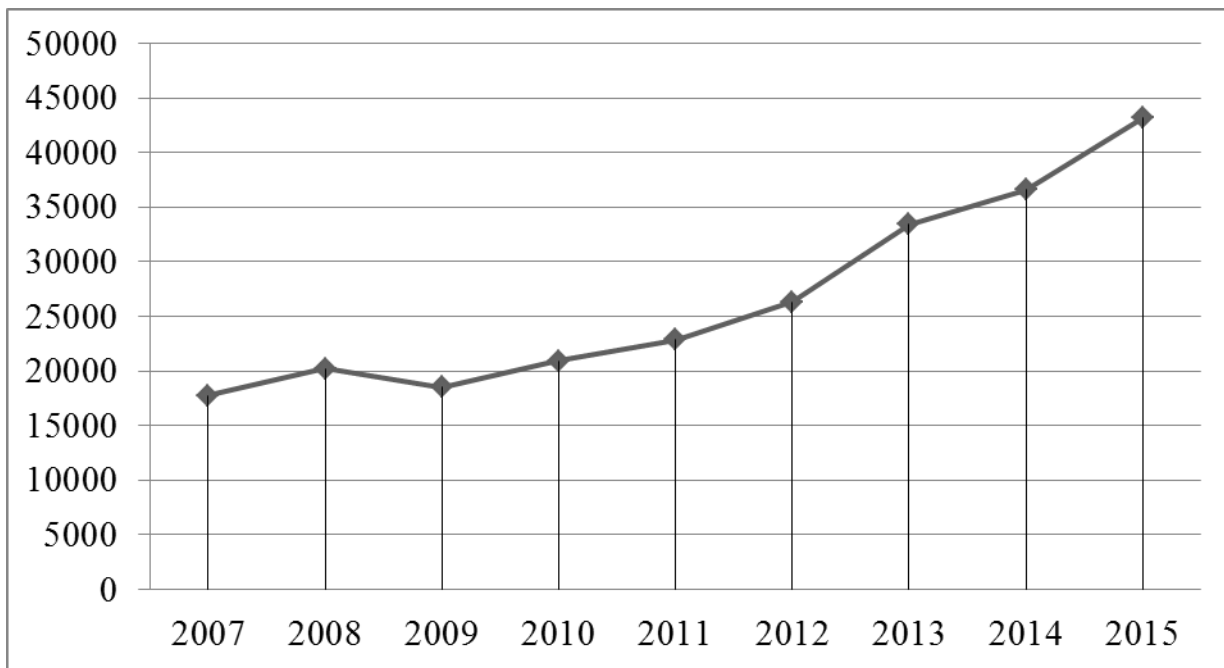


**Fig. 1.** The number of ICT companies in the Republic of Armenia at 1990

*Source:* Armenian ICT sector 2015 State of the industry report: Information and telecommunication technologies sector in Armenia, Enterprise Incubator Foundation (EIF), Yerevan: 2015, 43 p. p.11

Generally, the share of local companies in total industry revenues is about 50 %, as compared to 45 % observed in 2014. Local firms are now in better shape than they were five years ago; they have more employees and their technical expertise and knowledge of the market has improved (Macstories). Remarkably there is a huge lack of employees in the sector (at least 2500 vacant positions (EIF Armenia, 2015), as the current speed of its growth is higher than the higher-education processes.

The official statistics also shows the growth of the size of information technologies and information services. Figure 2 describes the positive dynamics of the size of information technologies and information services in Armenian currency – drams (AMD) in 2007-2015. From 2014 to 2015 the overall size mentioned above has grown by 15 % up to 91mln USD. The indicator shows the highest level of development of this sector among other high-tech directions. Basically this field continues to have tangible success due to outsource services which it does for bigger «players», mostly because of cheap workforce and high quality. Otherwise, to foster local development of the sector, as well as creation of new brands in Armenian IT sector, the Government initiated some regulatory measurements. In fact the IT sector in Armenia continues to grow.



**Fig. 2.** The size of information technologies and information services in the Republic of Armenia in 2007–2015

Source: composed by the author based on materials: National Statistic Service of the Republic of Armenia, annual reports «Social-economic situation of the Republic of Armenia in January-December» 2007–2015.

State measurements to stimulate this growth make more IT start-ups to be launched. For further growth of IT sector in the country and the need of rising the competitiveness of Armenia as a leader in IT industry for the region, in 2014 the below laws were enacted: «The law of the RA on state fostering of information technologies», «The law of RA on changes and additions in the law of RA on income tax», «The law of RA on changes and additions in the law of RA on profit tax». Due to this legislation the new economic entities in IT sector can apply for getting a special certificate from the Government of the Republic of Armenia, which will give them an opportunity to profit from certain tax privileges. The incomes from the realization of information technologies by the certificate active date – 2020, are recognized as non-taxable. According to the mentioned laws, by the certificate active date the tax agent calculates only 10 % of salary incomes paid to the employees by the IT firm, who are involved in making and designing information technologies (Sedrakyan, 2016).

The main gap in the process of realizing strong, competitive innovation system with high developed IT sector is considered to be the weak connections between education and industry, especially, undeveloped university-business collaboration. Doubtless the biggest international players in Armenian IT industries (especially Synopsys Armenia, Microsoft innovation center) organize training courses and other dual educational programs with most technologically-oriented university of the country (National Polytechnic University of Armenia), and the technologically well-equipped center of creative technologies («TUMO» center) is launched in the capital and other regions for teenagers to be close to IT industry, but nowadays the size of available vacancies in the sector continues to rise mostly because of rising demand of outsourcing programming and computer services from abroad. In terms of university-business collaboration, Armenian IT sector needs to implement a strategy of clasterization, which can be a good example for clasterization of all the capacity of the country, by connecting other research areas and well-developed, perspective scientific directions (e.g. physics, engineering, chemistry, arms industry, biotechnologies, pharmaceutical industry, medicine etc.) to foster innovations in the country. According to D. Smith, there are a number of features of clusters that are particularly conducive to innovation. These features include: (The law of the RA...)



- Networking
- Specialization
- Ease of entry and exit
- Resource mobility

Each mentioned criteria can be visible in the concepts of technoparks, which is a unique form of cluster, mostly used in IT sector. There are three technoparks in Armenia: Viasphere technopark, located in the capital - Yerevan, Gyumri Technology Center, located in the second largest city of Armenia – Gyumri, and Vanadzor Technology Center, located in the third largest city of Armenia – Vanadzor.

1) Viasphere Technopark is a state of the art commercial technology park in Yerevan, providing infrastructure to local startups and ICT companies worldwide looking to extend their core development offshore. Viasphere Technopark is a wholly owned subsidiary of Viasphere International operating since July 2000 currently housing several US-based subsidiaries developing advanced technologies in variety of ICT fields. The Technopark is a hotspot of companies looking to capitalize on Armenia's proven technical capabilities ([The website of Viasphere...](#)).

The Gyumri Technology Center (GTC) has been established by the Enterprise Incubator Foundation, the Government of the Republic of Armenia and the World Bank. The goals of the GTC include development of technical and business skills, promotion of technological entrepreneurship, commercialization of innovative research undertakings, creation of new technology companies, attracting of foreign investment and others ([The website of Enterprise...](#)).

Vanadzor Technology Center (VTC) was also established by the Enterprise Incubator Foundation with the support of Government of the Republic of Armenia and the World Bank. The mission of the VTC is to turn Vanadzor into a regional and international high-tech center by creating a dynamic environment of opportunities and services that will promote job creation, support talented youth and organizations in implementing innovative business ideas ultimately contributing to the sustainable development of the region. VTC focuses on assisting technology companies in a variety of areas including: business consultancy, mentoring, marketing and promotion, introduction to funding opportunities, establishment of business connections for increasing the competitiveness of companies in the global marketplace ([The website of Vanadzor...](#)).

Offering place for establishment of the IT firms and a huge number of consultancy capacity the abovementioned institutions make Armenian IT industry more competitive and collective, especially in the non-capital cities of the country.

#### 4. Conclusion

Realizing that kind of activities, the Armenian IT sphere can provide development of new, competitive technologies and new IT products which is very important for the future development of the sector, as nowadays, high concentration on providing outsourcing services can be dangerous, connected with the enormous competition with the other players of that field – India, Philippines and China.

Besides that, the Government of the country will unconditionally foster new investments in the sphere, especially by building strong relationships with the well-known international venture foundations and members of worldwide Armenian Diaspora. The Government may also continue to take on measurements connected with tax policy and other laws to make IT companies free of excessive problems.

In general, the Armenian IT sector has spanking growth, and going on challenges connected with collaboration between the main components of this industrial-educational system the Republic of Armenia has a great opportunity to become the main hub for information technologies (including plentiful services, consulting, outsourcing, etc.) in the region and in the Eurasian Economic Union.

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