The International Science & Technology Center

IT Society in Armenia – ISTC as a part of it

Hamlet Navasardyan

Head of the Armenian Branch Office

November 2007

General Situation

In Soviet times, Armenia was considered a leading IT and electronics center with more than a dozen of large R&D institutes and manufacturing companies as of 1985. In the end of the 1980s-90s (after the collapse of the USSR) the sector witnessed significant crisis, which, however, has been overcome in the mid-1990s.

General Situation

- 2000 - the Governmental declaration of the development of information and communication technologies as one of the priorities for the Armenian economy
- 2006 - number of operating IT companies has reached 150
- 1998-2006 - Industry revenues grew at 30% and reached $84 million in 2006 and constitutes around 1.7% of GDP
- Share of foreign and local companies revenues is approximately 58% ($49 million) and 42% ($35 million) respectively.
- Total IT labor force in 2006 was 4200
- The industry should reach $250 million in total revenues by 2010

Industry Revenues

- Domestic market constitutes $32 million (38%), exports - $52 million (62%) from the total industry revenues.
- Domestic market is dominated by the services segment (84% of the domestic market). Share of services in exports constitutes 48%.
- Domestic market is dominated by the locally owned companies - 78%, foreign branches account for nearly 80% of all exports.
- All foreign branches are mainly created by their parent companies mostly for outsourcing of the software development. Only 22% of the domestic market is captured by the companies with foreign ownership.

Productivity Analysis

- Productivity of local companies - 18%
- Productivity of the foreign companies - 24% (of the U.S. levels)
- Productivity of an average Armenian IT services company is at 42%, while packaged software segment operates at levels of productivity close to 14% of that of the U.S. software packaged segment.
- Nominal productivity of Arm IT companies (per employee) - $19,500.

Human Resources

- The total IT sector workforce - 4,200 professionals, which represents on average 19% CAGR
- 67% of the total workforce - technical specialists
- Around 1,200 technical professionals are employed by the locally owned companies
- Nearly 1,600 specialists work for foreign branches.
- 33% of the total workforce - management and administrative staff.
- In total, about 1,900 individuals (46%) of the workforce is employed by the local companies and 2,250 (54%) work for foreign branches.

CS and IT in Armenia

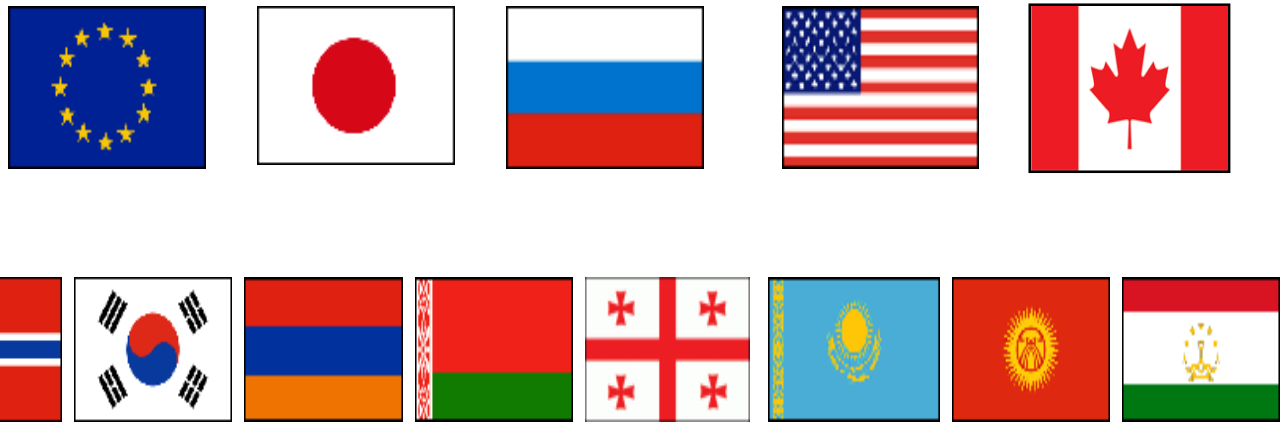
The priorities for the development :

- **Armenian Studies;**
- **Information Technology and Advanced Technologies;**
- **Earth Science and Space Exploration;**
- **New Energy Sources;**
- **Basic Research Supporting the Applied Studies.**

ISTC Objectives

- **Provide weapons experts in the CIS an opportunity to redirect their talents to peaceful activities**
- **Contribute to solution of national and international science and technology problems**
- **Reinforce the transition to market economies**
- **Support basic and applied research**
- **Integrate CIS scientists into global scientific community**

ISTC Parties & Members



- **Intergovernmental Organization established in 1992**
- ***Founding members*: European Union, Japan, Russian Federation, United States of America**
- ***Other*: Norway (1997), Rep. of Korea (1998), Canada (2004)**
- ***CIS*: Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan**

Activities and Programs

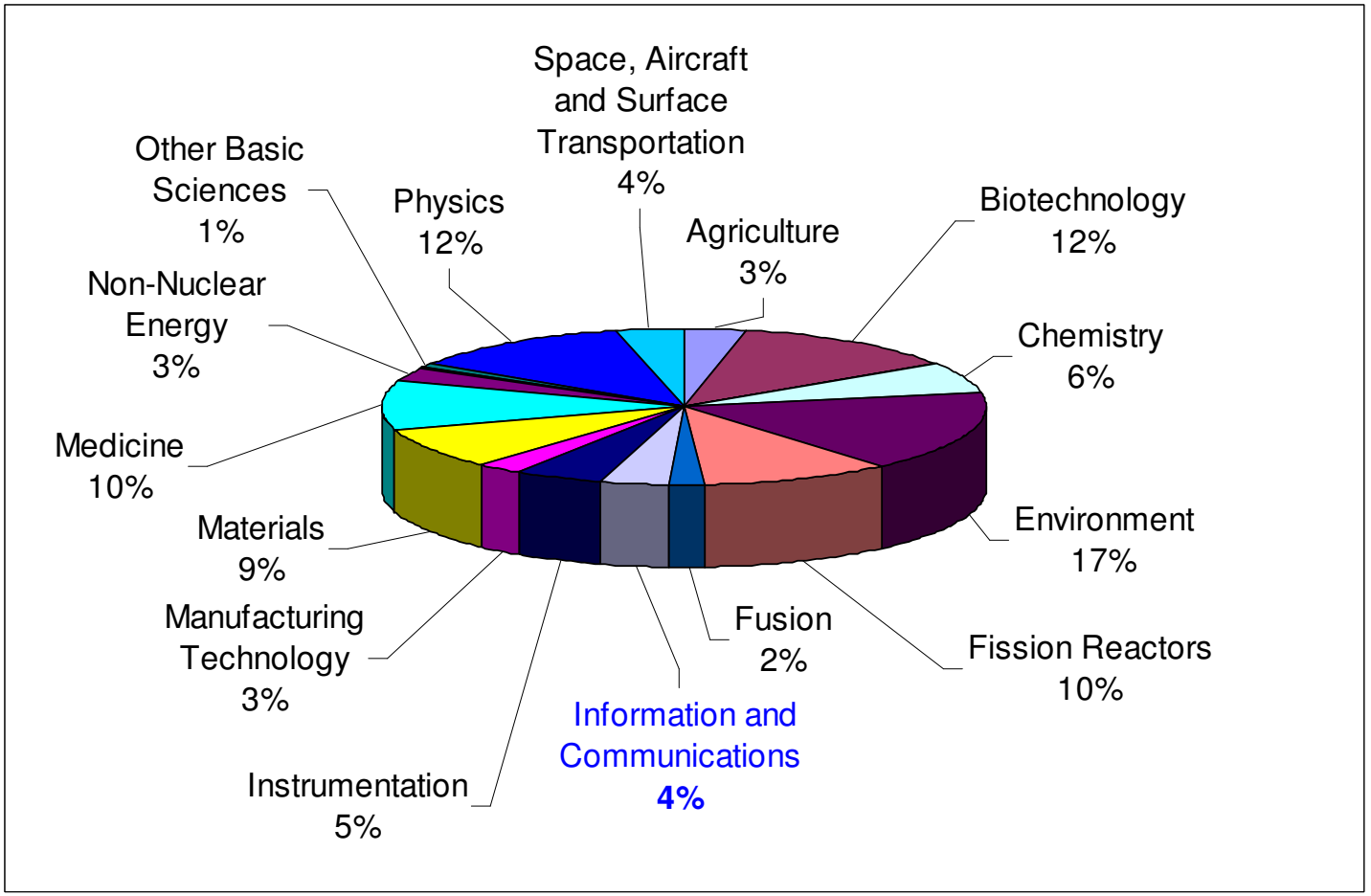
Main ISTC Activity:

- **Science Project Program**

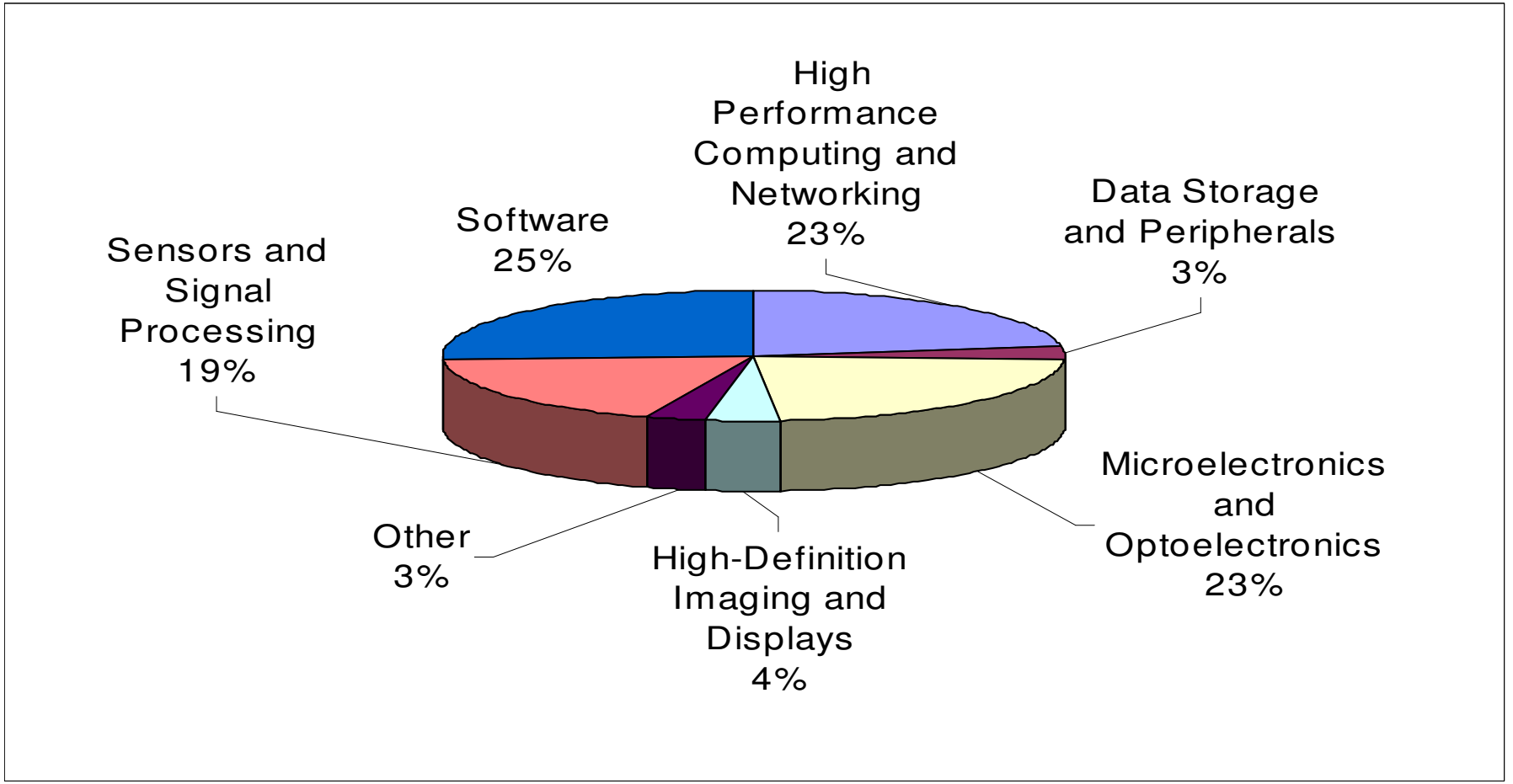
Support and Sustainability Activities:

- **Competency Building Program**
- **Travel Support**
- **Seminars and Workshops**
- **Communication Support**
- **Technologies Database**
- **Patenting Support**
- **Commercialization**

Science Project Program: Funded Projects by Technology Area



Science Project Program: Funded Projects by INF Area



Most Active Armenian Institutes

- “Viasphera” Technopark
- Institute for Informatics and Automation Problems
- Yerevan Physics Institute
- Radiophysics Research Institute
- Yerevan State University

The Institute for Informatics and Automation Problems

Main Fields of Activity:

- **Creation and propagation of artificial intellectual systems.**
- **Pattern recognition systems and distributed processing.**
- **Artificial intelligence and management support systems.**
- **Mathematical logic and automated logical deduction.**
- **Computational methods and digital image processing.**
- **Data coding and transmission problems.**
- **Discrete analyses and applied software technologies.**
- **Distributed systems software.**
- **Mathematical methods in linear algebra and linear programming.**

The Institute for Informatics and Automation Problems

In 2004 the first high Performance computing cluster in the South Caucasus region funded by Project ISTC A-823 had been developed. It consisted of 128 Xeon 3.06GHz (64 nodes) processors. The nodes of the cluster are interconnected by Myrinet High bandwidth and Gigabit networks.

The Institute for Informatics and Automation Problems

- **In 2005 the basic variant of Scientific Computing system was created in Armenia.**
- **Now within the ISTC A-1451 Project entitled "Development of Scientific Computing Grid on the Base of Arm cluster for South Caucasus Region" it is planned to extend this infrastructure by involving other computational resources and upgrading existence computational resources, as well as create virtual Grid middleware in the field of physics (quantum, astrophysics), biology, etc.**

The Integration of Armenian computational resources into international Grids

- **LHC (Large Hadron Collider), CERN**
- **SEE-Grid (South East European Grid)**
- **Grid'5000 (French National Experimental Grid)**
- **Creation of Joint Resource Operating Centre.**

Institute of Geological Sciences

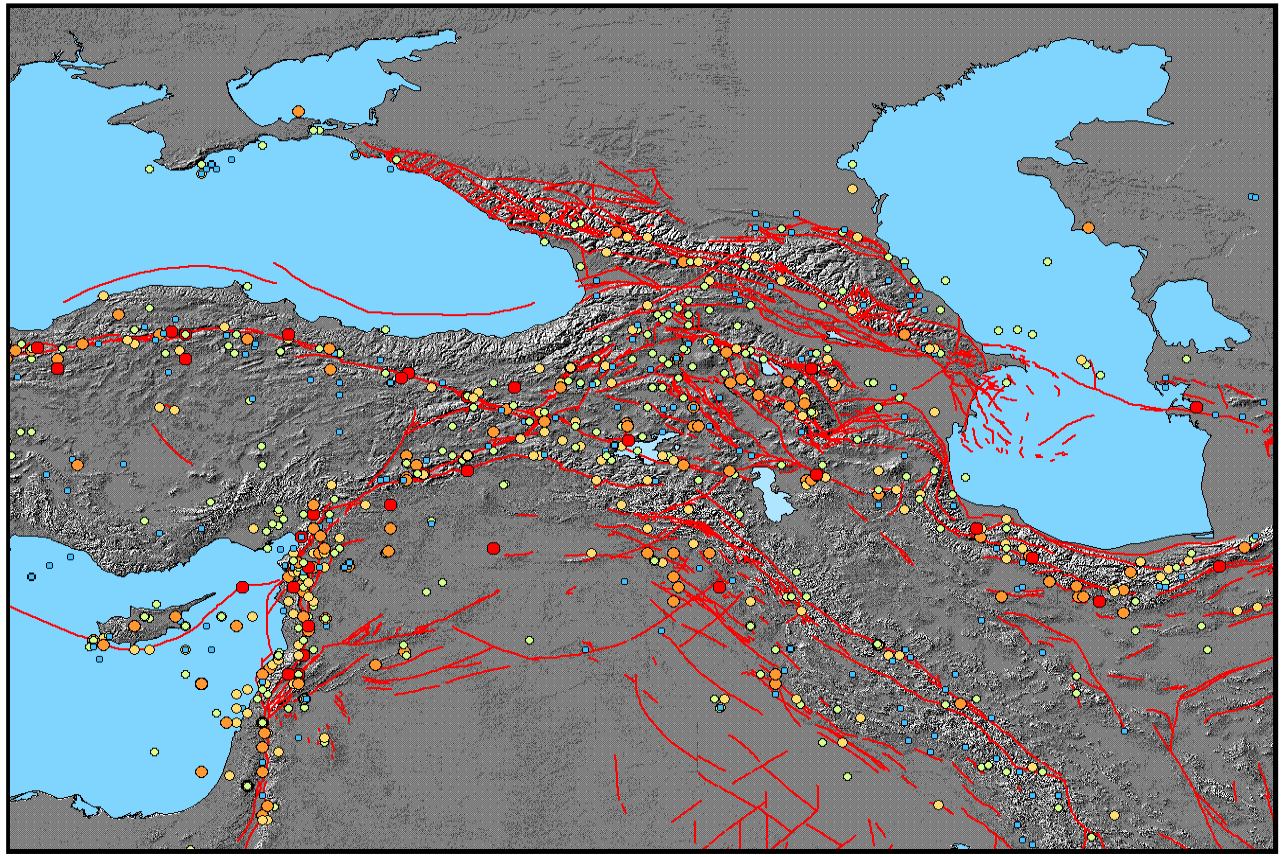
Main Fields of Activity:

General and regional geology, seismic tectonics, natural hazard and risks assessment, volcanology, geo-information technologies (GIS and remote sensing) efficient use and protection of geological environment, mapping and assessment of natural landscape geosystems etc.

The Institute of Geological Sciences together with two research units – CJC "SRC GEORISK" and SF "International Center Garni“ are the active users of the ARMCLUSTER net on the base of which and in the frames of the ISTC projects:

- 3-D digital models for investigations of the geological and geodynamic structures were elaborated;
- interdisciplinary evaluation of the natural hazard and risks and the estimation of the possible natural and man-caused catastrophes after-effects

Institute of Geological Sciences



Lines of Earthquake Faults

Strong Earthquakes' epicentres

Digital data base in the GIS format for the Republic of Armenian and contiguous territories: Active faults and strong earthquakes

Yerevan Physics Institute

Main Experimental Base

- **One of the largest in the world 6 GeV electron ring accelerator**
- **A number of modern automated physical installations for investigations using the electron and photon beams of Yerevan synchrotron**
- **High-altitude Nor Amberd and Aragats stations (2,000 and 3,200 m above sea level) for the study of cosmic rays at superhigh energies**
- **Special modern instruments and equipment for scientific and technical works in applied fields**
- **A powerful computer center**
- **A developed pilot production**

Yerevan Physics Institute

Cosmic Ray Division of the YerPhI is a center for research on the:

- 1. Origin and acceleration mechanisms of Galactic Cosmic Rays.
- 2. Processes of solar particle accelerators; maximal energy of solar particles.
- 3. Development of the network of middle to low latitude particle detectors called SEVAN (Space Environmental Viewing and Analysis Network).
- 4. Development of the interactive tools for the interactive multivariate data display and analysis. CRD`s Data Visualization Interactive Network (DVIN) won the World Summit on Information Society award in 2003 in Geneva.
- It runs two high-altitude Cosmic Ray Stations on Mount Aragats (3,200 m) and Nor Amberd (2,000 m).

Yerevan Physics Institute

- The experimental physics, electronics, and computer laboratories of the CRD are equipped with modern facilities to design and assemble state of the art components, including sophisticated miniaturized Control and Data Acquisition electronic boards.

- The development of the SEVAN network aims to improve fundamental research of space weather conditions and to provide short and long-term forecasts of dangerous consequences of space storms. The United Nations Basic Space Science Observatory Development program and International Heliophysical Year 2007 (IHY 2007) recognized SEVAN as one of the main activities carried out within the framework of the program of employing Space Weather detectors in developing countries to involve these countries in space research.

- All this became possible thanks to the active support of the ISTC and the participation of CRD of the YerPhI in the various ISTC projects and programs.

Perspectives

- Armenian IT industry has been growing at 30% CAGR from 1998 to 2006. If this trend continuous further, the industry will reach around $250 million in total revenues by 2010.
- Two growth scenarios are identified: pessimistic and optimistic
- Pessimistic scenario assumes that by 2010, workforce will reach around 6,500 specialists and industry will generate nearly $180 million in revenues. At the same time, increased shortage in qualified specialists, negative comparative productivity growth rates, and increased operating costs will make Armenia less attractive for foreign companies in terms of starting new IT businesses, thus contributing to a further decline in industry growth rates.
- Optimistic scenario assumes that workforce will grew at a higher rate (20%), and average productivity growth rate will be around 12%. In this case, by 2010, workforce will reach around 9,000 specialists and industry will generate nearly $260 million in revenues.

Some figures for this Presentation are taken from the Enterprise Incubator Foundation report (Yerevan, Armenia) www.eif-it.com

Contact Information

Armenian Branch Office of International Science and Technology Center

Baghramian Ave. 24, rooms 7 & 8,
0019, Yerevan, Republic of Armenia
Tel: (374 10) 524-740
Fax: (374 10) 584-483

E-mail: navasardyan@istc.ru
Website: www.istc.ru