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Lithuania*

Trends and status in chip design and EDA

Rimantas Šeinauskas
Informatics Faculty
Kaunas University of Technology (KTU)
Kaunas, Lithuania
rimantas.seinauskas@ktu.lt

I. INTRODUCTION

Lithuania is a parliamentary republic. The Seimas (Parliament) has 141 members elected for a period of four years. The President is the head of the state of the Republic of Lithuania. The President is elected by citizens for a term of five years. The Prime Minister (head of the government) is appointed or dismissed by the President with the approval of the Seimas. Lithuania has been a member of the European Union since 2004. In the second half of this year Lithuania will preside over the Council of the European Union.

Lithuanian language, as well as the kindred Latvian, belongs to the Baltic group of Indo-European languages. Lithuanian and Latvian are thought to have separated from a common source in the 7th century. Lithuanian has retained more of the old vocalic system and more morphological features than any other living Indo-European language.

The Lithuanian coat of arms called Vytis is one of the oldest state symbols still in use. It developed from 14th-century grand-ducal seals and signified the knight-defender of Lithuania driving the enemy from his land. Until 1795 the Vytis coat of arms represented the Grand Duchy of Lithuania; from 1918 and again since 11 March 1990, it represents the restored state of the Republic of Lithuania.

Lithuania borders Latvia, Belarus, Poland, Kaliningrad Region of the Russian Federation. Ethnic composition: 82.3% Lithuanians, 8.2% Russians, 6.9% Poles, 1.5% Belarussians, 1% Ukrainians, 0.1% Jews and 0.7% other nationalities.

The most prominent production sectors: electronics, light industry (textiles, ready-to-wear clothing, furniture and household appliances), chemicals, food processing, transport and services.

II. CHIP DESIGN AND EDA PRESENCE

Lithuania is emerging fast as a key electronics manufacturing hub in the Baltic region with 227 companies employing 7,200 people. The country is renowned for its electronic, computer and optical products which account for 20.8% of national engineering production in 2012.

The country has many electronic manufacturing services (EMS) companies that produce primarily industrial electronics and telecom equipment. Niches like defense and medical electronics are expanding as well as high-end consumer electronics and computing storage.

Lithuania provides a near-sourcing EMS hub for European firms through contract manufacturers including Kitron and Jotron (Norway); LittleFuse (US); Carlo Gavazzi (Switzerland) and Selteka (Lithuania).

The laser industry in Lithuania outstrips other traditional spheres of manufacturing. No other branch of industry in Lithuania dominates the world markets, whereas picosecond lasers manufactured in Lithuania constitute half the market, femtosecond parametric light amplifiers account for as much as 80% of the global market. Lithuanian lasers are widely used in scientific research, introduced to industry and medicine.

Only a few companies are working on ASIC design in Lithuania. Companies do not have the capacity to produce chips in Lithuania. Chip manufacturing is outsourced to other countries. Companies of electronics design in Lithuania can be found at: <http://www.elecdir.com/site/country/144/>. Market Research Reports, Statistics and Analysis of Consumer Electronics Industry in Lithuania are presented at: <http://www.reportlinker.com/ci02060/Consumer-Electronics.html/coverage/Europe:Lithuania>



Capital Vilnius
Language Lithuanian
Area Total 65,300 km²
Population 3,692,600

Currency Litas (Lt.) 1 EUR=3.45 Lt.
Internet TLD .lt
Type of government Parliamentary republic
Independence day 16 February

III. ACADEMIA

University studies are oriented towards universal academic education, theoretical training, and the highest level of professional excellence. The most common duration of full-time Bachelor's studies is four years. Students can pursue their studies for a Master's degree; the duration of Master's studies is 1.5 to two years. Upon completion of the Master's studies, students who wish to be engaged in academic activities can pursue doctoral studies (they last four years).

Kaunas University of Technology and Vilnius Gediminas Technical University prepare electronics design professionals. This is done in Computer Science, Electronics and Control Engineering faculties of Kaunas University of Technology and in Electronics Faculty of Vilnius Gediminas Technical University. Kaunas University of Technology has implemented chip design graduate studies. Kaunas University of Technology is a member of the EURORACTICE, has Cadence and Synopsys software licenses. University graduates are the key staff of several small companies focusing on chip design. University graduates have the necessary skills for FPGA design.

Vilnius Gediminas Technical University prepares bachelors specializing in designing electronic devices and masters specializing in Micro and Nano electronics. CMOS technology is used in the design and production takes place on MOSIS initiative.

Micro-and Nano electronics Center, has about 30 employees, cleanroom technology area of 150 m², technical lodgments-400 m², the area of design and research and analysis office - 300 m². Laboratory area is 350 m². The whole area is 1650 m².

The laboratory of Micro technology processes is used by Vilnius University and Vilnius Gediminas technical university, Micro - and Nano electronics systems design and research laboratory located in Vilnius Gediminas Technical University. Photovoltaic technology laboratory is used by Vilnius Gediminas Technical University and the Applied Research Institute for Prospective Technologies).

IV. GOVERNMENT INITIATIVES

The government initiated the construction of laboratories, created or renewed the implementation of science valley projects and the laboratories currently located in research and higher education institutions will work on the basis of open access (the resources of laboratories will be accessible for all interested parties from other institutions or business organizations in accordance with the Regulation of Management of Open-Access Centers). The government attention is focused on R&D as well as science and business integrated collaboration. Financed by

EU structural funds, National Integrated Programmes are designed to ensure sustainable development of specific knowledge susceptible business subsector with complex combination of preparation of highly-skilled professionals, implementation of research and experimental development activities, strengthening of science and business relationships and in this way forming the basis for the development of R&D susceptible business subsector and more intense international competitiveness.

Science and Technology Park is a legal entity whose main function is to stimulate processes of scientific knowledge communication and technology dissemination, to create conditions for commercializing research results, to foster relations between science and business, and to promote a culture of innovations. Science and technology parks create favorable conditions for establishment of enterprises which carry out applied research and experimental (social, cultural) development works, and implement innovations.

Lithuanian Innovation Strategy for the year 2010-2020- is the long-term strategic planning document, which sets vision, objectives, goals and results to be achieved in the sphere of innovations up to 2020. The purpose of this Strategy is to mobilize and manage state resources effectively: create competitive knowledge economy based on the latest technologies and qualified human resources.

The goal of the High-tech Development Programme for the year 2007-2013 is to develop already existing branches of high-tech production with long-term global expansion perspective, which have research potential and would enable manufacturing of products competitive on the world market. Programme objectives are to promote research and experimental development in these areas: biotechnology, mechatronics, laser technology, information technology, nanotechnology and electronics. National technology platform of Nano electronics and electronics (2007 – 2013) has been developed. Research fields cover design and technologies of ICs, high-frequency electronics, technologies of THz electronics, power electronics, molecular & bionano electronics, optoelectronics, electronics of organic materials, functional organic materials & polymers, nanostructured & composite materials

Useful links:

- Agency for Science, Innovation and Technology; (<http://www.mita.lt/en/>)
- Lithuanian Innovation Centre; (<http://www.lic.lt/index.php?510623179>)
- Statistics Lithuania. (<http://www.stat.gov.lt/en>)



Rimantas Seinauskas is a professor at the Faculty of Informatics, Kaunas University of Technology. He became a certificated Engineer in 1968. He acquired the first degree of candidate of technical sciences in 1972 at Kaunas Polytechnic Institute. His second degree of Doctor of Technical Sciences was gained in 1982 at Leningrad Institute of Energy. Scientific and educational activities are related to Kaunas University of Technology. He was Director of Information Technology Development Institute from 1992 to 2012. He is Editor-in-Chief of ISI journal "Information technology and control". His research interests include computer-aided design, hardware and software testing.