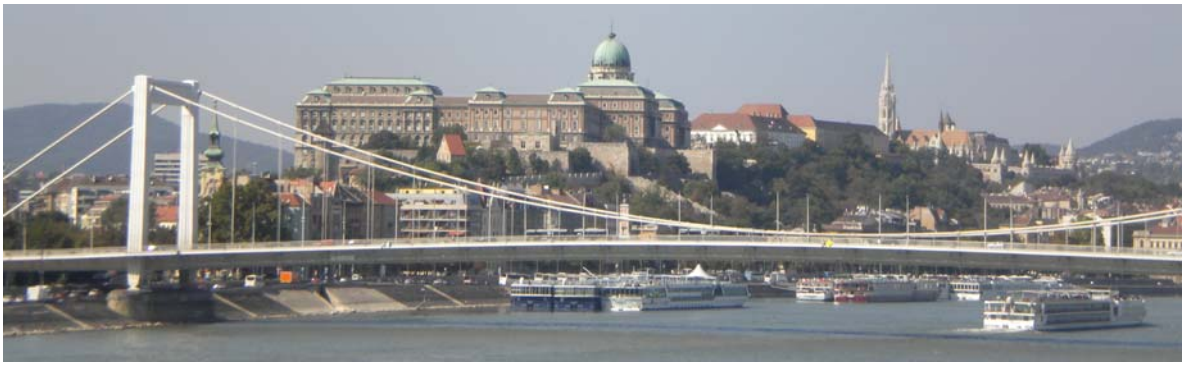
ICT Research and Innovation Challenges in Eastern European Member States (EEMS)



THE BUDAPEST TAKEAWAY

Proceedings of the IPTS – IT STAR International Conference on Research and Innovation Challenges in Eastern European Member States, 11 November 2011, Budapest, Hungary

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Annexes

Acknowledgements

The IPTS – IT STAR Conference on ICT Research and Innovation Challenges in Eastern European Member States (*EEMS*), held on 11 November 2011 in Budapest, was a successful event to the testimony of the attendees.

This achievement was based on the efforts of many individuals and organizations – speakers, co-authors and contributors, IPTS staff, IT STAR and SZTAKI representatives and the conference participants. We are most grateful to all of them and extend our heart-felt thanks to all.

There are 3 persons who were active with advice and assistance at all times. These are *Marc Bogdanowicz, Balint Domolki and Peter Inzelt*. Without their support it would have hardly been possible to organize such an important forum.

Plamen Nedkov
Conference Organizer and General Chair

1. Introduction

The preparations for the IPTS – IT STAR Conference on ICT Research and Innovation Challenges in Eastern European Member States (*EEMS*), held on 11 November 2011 in Budapest, Hungary were intense with close coordination and daily contact with the participating organizations, speakers, co-authors and other contributors.

The conference mission was to confront such facts as the very low ICT public and business expenditures in ICT R&D in EEMS in relation to their GDP, the hosting of rather low value added activities and other to the testimony of the stakeholders from academia, industry and policy so as to validate the observations, interpret their possible meaning and opt for actions that might favorably influence the future.

The program was based on well-known speakers in the region and internationally, who discussed such issues as ICT R&D policies, performance, financing, success stories and setbacks, competitiveness, multi-stakeholder partnership, participation in international programs and other from the perspectives of Academia, Industry and Government. Fifteen presentations were delivered.

In addition to the regular program, consultations and talks were organized during coffee breaks and lunch on such topics as the European Certification for Informatics Professionals (EUCIP) and its alignment with the European e-Competence Framework (e-CF) and other activities of the CEN Workshop on ICT Skills, the EIT ICT Labs, the activities of IPTS, DG-INFSO, IT STAR and other.

Fifty-five participants from 12 countries and several international organizations attended this unique forum. The participation was representative of a wide mix of stakeholders including national and international policy makers, industry, universities and R&D institutes, professional ICT societies, experts on innovation and ICT, representatives of the media and other.

The visibility of the conference and its agenda and documents exceeded by far the actual attendance. The conference website – http://eems.starbus.org – was appreciated by many. Links were provided from the Newsroom of DG - INFSO and from sites of IPTS, IT STAR member societies and other, which resulted into significant interest and traffic to the website from Europe and worldwide. In addition to the website, several Information Releases were distributed widely, the Autumn issue of IT STAR Newsletter contained conference information, other articles were published and printed, the conference was introduced at the "Global ICT industry: changing landscape? - The future of European ICT R&D" conference, organized in Brussels on 19-20 October by the European Commission's Institute for Prospective Technological Studies (IPTS).

Visibility and promotion of R&D activities are important for the EEMS. Internally, within the respective countries, there is a need for stable communication between academia, industry and governance. Externally, within the European Union, many EC Departments have produced valuable information concerning research and innovation in the EEMS, but this fact alone does not imply that the issues are recognized by policy makers so that the EU could more proactively involve and tap into the EEMS R&D potential. We hope the conference has contributed in both respects. Its proceedings are available to anyone interested via the conference website.

Finally, many valuable connections were made during the conference, which will surely result in stronger partnership within the Region and the European Union.

2. Synthesis Report

The Institute for Prospective Technological Studies (IPTS) of the European Commission has been publishing data on ICT R&D on an annual basis since 2005 and its latest report of 2011 indicates again the weakness and possible decline of the ICT industry and its R&D in several EEMS.

Therefore, the conference aimed at answering the following questions:

- What is the state and the dynamics of the ICT industry and its R&D in Eastern and Central Eastern European countries?
- What are the factors that might explain those dynamics?
- What are the potential solutions that would improve the observed dynamics, and which might be directly or indirectly influenced by national or European policies?

A worrying but expected diagnosis

The somewhat pessimistic diagnosis of the IPTS (PREDICT data) about the ECE ICT industry and its inventive capacity (R&D and Innovation) is rather shared among local experts. Several speakers described and explained the historical trajectory of this industry in their respective countries leading to the current weak situation. National characteristics confirmed also some differentiation among countries, in particular for the expected "least worrying" cases of Poland, Hungary, Czech Republic, etc.

Still, it was underlined that such diagnosis, and the traditional statistics used to analyze such situations usually miss various aspects and developments worth mentioning for a deeper analysis: the existence of sufficient S&T infrastructures and plans for their further development, the often positive legacies of the educational system, the dynamic patterns of open innovation (such as urban labs) as well as the inventive activities in smaller companies, kept invisible in the current data gathering[1].

Still, the ICT industry calls for reinventing itself in EEMS. Such situation might favor a useful “creative destruction”, under conditions that the necessary competences for such process are not dried out – a pessimistic diagnosis shared by some of the experts.

Usual suspects

Some traditional debates occurred, simply underlining the still existing divergent views about the roles of public and private research, fundamental and applied research, knowledge triangle and business environments, national and European bureaucratic procedures, etc.

More importantly, the clearly differentiated worlds and vocabularies referring to R&D versus Innovation indicated that those two activities, while often associated, seem to develop on rather different grounds, at different speeds, with different objectives, in different contexts.

[1] It was commented that the current taxation schemes rather favor R&D declaration – and return capture - by large companies only. Along similar lines, the patenting system was criticized as untrustworthy in some countries together with its analysis.

Open issues

Probably the four main disputable issues that were most illustrated and debated are the following:

- How to address the **issue of globalization** and its consequences: the rising competition with BRIC countries, the rising demand in Asia, the relocation of production, R&D centers and even clusters, the European responses such as the ICT KIC of the EIT, the ERA and FP cross-border participation efforts, the shape and future of the European "third ICT innovative wave" such as in the automotive activity with its global supply chain. **The urgent importance of looking beyond the borders of one's own country and industrial/institutional activity was underlined** by many examples.

- The current **dynamics of Innovation** are not anymore those of the past. The contrast between past institutional science and technology settings, including those of European R&D funding, and the experience of innovative practitioners in Europe or in the USA show that such **differentiated patterns call for differentiated responses**, both in everyday's practice (in companies, universities, financial institutions) but also in policy making (R&D funding, review of business environment regulations, etc.).

- The availability of **specialized competences and skills** remains a major issue and is seen as to worsen in the future being the current educational demand (for Humanities) but also the demographic and outward migration trends. Beyond this educational problem, strong calls have been made for **training people in new roles and competences**, such as those of IT integrators that would cumulate strong IT and organizational management capacities. Also, with the evolution of scientific work, multidisciplinary and multilingual competences are seen as a must.

- The need of a stronger dialogue between academia, industry and government in formulating strategies, policies and national action plans for socio-economic development within a European and Global setting. Several speakers emphasized that the process of **priority setting** often lacks the input and the vision of all stakeholders in the field.

In these debates – Globalization, Innovation, Competences, Strategies – the issues addressed when debating ICT industries' future and that of R&D, were organized further around 2 axes:

- What is specific to Eastern and Central Eastern European contexts (the historical legacy), and what are common problems shared by all European countries and beyond?

- What enters specifically the activities of R&D, defined as the scientific search for new knowledge, and those of Innovation, rather seen as the activities aiming at capturing the market value of (a set of) inventions.

Factors contributing to the dynamics

From the debates, some focus points emerged as those elements which come with their positive and negative contributions to the dynamics of the industry, its R&D and the Innovation capacity in EEMS:

- The role of the so-called bottom-up initiatives of individuals, micro-companies and SMEs in an open innovation context

- The role of multinational companies, and hence all debates around the attractiveness for such companies and reciprocally about the economic and knowledge spillovers they can generate, and the conditions thereof

- The role of educational institutions in fostering new competences but also new collaborative behaviors outside the narrow limits of their institutions

- The role of national research centers in generating new knowledge

- Last but not least, the role of the European Union and national/regional governments and organizations in addressing adequately the above, or any other facet of the issues related to the industry.

In all of the above, it also appears to be the responsibility of those individuals representing the EEMS to position correctly the problems and solutions at international and national levels as to actively support the development of the industry and its inventive activities in the East of Europe. And this, it has been underlined, needs to be led by country representatives with new and adequate knowledge and attitudes concerning the current evolution of the global context of the ICT industry and of Science and Technology.

Policy recommendations

The debate leads hence to the following general policy recommendations, the first four being rather specifically designed for the EEMS:

- It is highly advisable to improve the share of experts of EEMS in the advisory, evaluation and other bodies that participate directly or indirectly to the assessment, vision building and instrumental management of ICT-related policies at European and/or multilateral levels. This recommendation refers to such bodies as ISTAG (DG INFSO Advisory group), the experts' evaluation of national and international publicly funded projects, existing or planned prospective exercises, etc. Likewise, their participation in other multilateral analysis and evaluation groups (for research, for education, for structural funds expenditures, etc) should be favored. From the conference, it also is highlighted that it is important to reach out for experts that would have an outstanding trajectory in highly innovative activities as to avoid an excessive influence of legacy contexts.

- Promoting regional consultations and projects within an EU context are recommendable, as the research and innovation challenges appear similar for most of the EEMS, and this could play a favorable role in pooling resources and experience in areas of common interest.

- Fostering the attractiveness of EEMS at macro-regional, national and regional levels for large multinational companies, foreign or domestic, and the accompanying (foreign) direct investments, while working out, if necessary with those companies, the factors and conditions that would favor mutually beneficial spillovers at regional and national level. Such process should be thought within a global re-thinking towards trustworthy institutional settings, reliable and skilled human resources, knowledge building strategies, extended suppliers' chains, fair access to market, etc.

- Rethinking, if possible within a dialogue with the local private sector, the role and potential of private and public education institutions, mainly at post secondary level, taking, where relevant, advantage of the current bent to humanities by combining it clearly with technical skills. Also, introducing more opportunities for early mobility, access to working contexts, project-oriented multidisciplinary activities, etc. is seen as beneficiary and strongly adapted to the new context of the industry.

- Separating and probably contrasting public support activities for R&D and for Innovation by concentrating more effort on business conditions favoring fast innovative initiatives, but it is clearly stated that much can be done outside any funding framework: enhancing innovation-related networking is one possible path.

3. Summaries of Sessions

Morning Session Summary *(by Niko Schlamberger)*

During the Opening ceremony, *Messrs Plamen Nedkov (Conference Organizer), Mark Bogdanowicz (IPTS)* and *Igor Privara (IT STAR)* delivered the introductory remarks. They emphasized the importance of the Eastern European Region for its contribution to science and technology but that its visibility is not commensurate to its achievements. The aim of the Conference was to raise the Eastern European Member States (EEMS) profile, to explore what are the dynamics of information technologies in the region and what factors influence the process. IT STAR was proud to lead the course of raising the profile of CEE Countries and their respective leading informatics societies.

Keynote speaker *Norbert Kroo* put the R&D in IT in historic perspective. Technologies that were propulsive in the 1950s and 1970s are common commodities of today. Leading edge research directions now are bio-, nano- and information technologies where knowledge is of utmost importance. Challenges are speed, size, and intelligence. The content was set in the European scene, with an emphasis on the European Union Research Council, on importance of open access to scientific information, and on R&D spending which is not an expense.

Juraj Stancik focused on the R&D and ICT expenditure in the EU perspective. Figures are astonishing and provide a not very nice picture of EE Countries: EU value added in ICT amounts to 574 Bn € but the contribution of EEMS is rather low also due to little corporate investment in R&D. The patents issue was seen as one matter still not resolved to common satisfaction.

Bruno Lamborghini presented findings of the European Information Technology Observatory, an extremely important EU mechanism, and supplied novel views on IT in Europe - it is the second largest market to which C and EE countries contribute only 4% (of which Russia 2%). Important are services and mobile computing, cloud computing, social webs and IT as a generator of new professions. The main drive in future is a push towards mobile – mobile economy, new mobile devices and cloud computing.

Zoltan Horvath presented the activities of the Budapest ICT Lab as associate node of the European Institute of Innovation and Technology and the network of knowledge and innovation communities (KICS) that interact within this format.

Laszlo Palkovics made an overview of the global tendencies in the automotive industry, the R&D investment factors, the structural changes in the Hungarian automotive industry. He convinced the audience of its importance for Hungary in the past as well as for the future and argued that Eastern Europe has good opportunities in the sector, which need to be better used.

Saulius Maskeliunas and Imants Freibergs provided a view on ICT in Baltic countries. This innovative “three-in-one” presentation, giving a comparative insight in the Latvian, Lithuanian and Estonian situation, showed respective similarities and differences. Obviously the system of financing R&D is rather complicated. The R&D audit that has been recently carried out is commendable. A notable feature of the presentation is the contained series of recommendations at various levels.

Diana Simic presented the eSEE Initiative (to be followed by eSEE Plus) in which Western Balkan countries are active. She provided some convincing statistics about leading European countries in IT. A novel approach was a proposal to measure the progress in IT R&D by using data of the ACM Digital Library. A handicap for the Western Balkans’ participation in EU IT R&D research is a rather difficult access to EU funds. An important factor in the process is collaboration of all players - government, public and private companies.

Afternoon Session Summary (*by Balint Domolki)*

Having listened to the interesting presentation of *Roberto Bellini* during lunch (showing that EUCIP is much more than just another education scheme), I was preparing myself for the afternoon session with some bad feelings: in the program the title of most afternoon talks started with "ICT R&D Perspectives from…", so I imagined a series of very similar talks full of the same statistical figures and financing complaints, resulting in a rather boring afternoon.

I am very glad to report, that I have been utterly wrong! All the speakers with that identical title did talk about something interesting, a different aspect of their country situation (usually with conclusions valid for other countries as well).

Renata Jaksa introduced us to the conclusions of an interesting audit performed for DG INFSO about ICT capabilities and Framework Program participation of CEE countries. (A detailed account about the audit can be found in the recent Autumn 2011 issue of the IT STAR Newsletter!)

Barnabas Malnay did present some novel organizational forms of supporting innovation, popular mostly among the younger generation: meet-ups, FabLabs, startup competitions, etc., along with the more traditional forms of incubation.

Kiril Boyanov explained the details of different network connections within and between our countries, making possible all cooperation activities.

Niko Schlamberger convinced us about the importance of education as one of the main driving forces of competitiveness, presenting the main ideas of a new higher education strategy.

Branislav Rovan gave a detailed analysis of problems hindering innovation in (not only) his country, making (not very favorable) comparisons between the "distant past", "recent past" and "present" situation.

Marek Holynski performed a mental experiment about transferring the Silicon Valley to somewhere in Europe. The expected negative result can be explained by the rather complex "climate" factors (not only physical but mostly social and human) having made possible the emergence of the Silicon Valley phenomenon in the USA.

Finally, after the country presentations we learned from *Carlos Jose Oliveira* about some details of the novel solutions INFSO plans to realize in the forthcoming HORIZON 2020 system (formerly called Common Strategic Framework)

From the sometimes rather pessimistic country presentations one can conclude that the ICT R&D problems in any country cannot be solved on their own, without the solution of many other social and economic problems of the given country. On the other hand, it might be appropriate to refer to the quote from Albert Einstein, mentioned in Norbert Kroo's keynote presentation this morning:

"THE PROBLEMS WE ARE FACING TODAY CANNOT BE SOLVED WITH THE SAME WAY OF THINKING BY WHICH WE CREATED THEM". So, there might be the case of a generation problem here: younger people might be able to apply a different "way of thinking" to tackle the problems created by previous generation(s). A glimpse to such a new approach can be seen in the new elements of the innovation ecosystem described in *Malnay's* presentation mentioned above.

4. Abstracts of Presentations

Science for and in Information Societies

Norbert Kroo, Hungarian Academy of Sciences

In the mastering of global challenges new science-based technologies play an increasing significant role. ICTs are among them. They themselves are facing great challenges, which are partly of technical character but their social character should also not be neglected. Mathematics, physics, materials sciences, chemistry and engineering sciences, as well as social sciences, have to contribute to the solution of our problems.

On the basis of ICT technologies e-infrastructures are being developed, contributing to the increasing efficiency of research, education, networking, governance, i.e. to practically all aspects of the functioning of our information societies. Open access among others of scientific data and publications may contribute to the acceleration of innovative processes.

As far as Europe is concerned, e-infrastructures are of basic significance for the realization of the European Research Area (ERA) vision. The framework programs, research infrastructure efforts and the Ideas Specific Program (driving for excellence in frontier research and run by a scientific council) are important instruments in the realization of ERA.

The future of European R&D (HORIZON 2020) will be based on a more concentrated structure, which incorporates in addition to the elements of FP7 the Competitiveness Program (CIP) and efforts of the European Institute of Technology. It is also planned that the Structural Funds from the EU budget should have a stronger synergy with HORIZON 2020.

ICT Research and Innovation Trends in EEMS as seen in the 2001 Report on ICT R&D in the EU
Juraj Stancik, IPTS

The Institute for Prospective Technological Studies (IPTS, JRC-EC) is publishing data on ICT R&D on an annual basis since 2005 and its latest report of 2011 indicates the weakness of the ICT industry and its R&D in several Eastern European Member States (EEMS). The macro and microeconomic analyses show that EEMS ICT shares in EU ICT totals are systematically below the EEMS economic weight. Particularly, EEMS are lagging behind the rest of the EU in BERD, GBAORD, among top R&D investors, R&D intensity, and patents (all related to ICT). What is, on the other hand, optimistic is the fact that the share of EEMS in EU ICT production has been steadily increasing and that the growth of ICT BERD in EEMS is much bigger than in the EU15. Moreover, the share of EEMS ICT companies in the top EU ICT R&D has doubled since 2004.

EITO overview of ICT activities and R&D challenges in EEMS
Bruno Lamborghini, European IT Observatory, AICA

According to EITO data in EEMS the IT market value in 2011 represents around 15 billion EURO with an average growth of 10%, 2/3 more than the EU average growth rate. For the Telecommunications market growth in EEMS is around 2% close to the EU average rate.

Main drivers of the digital scenario are: social web, mobile access devices (smart phone and tablets), cloud computing. Worldwide Internet users are 2 billions expected to double in 5 years. In EEMS there are large opportunities in new apps development for mobile devices through open innovation and collaborative research.

Budapest ICT Lab – Associate Node of EIT
Zoltan Horvath, Eotvos Lorand University, Budapest

The EIT ICT Labs Budapest Associate Partner is one of the eight nodes and one of two associate partners of the EIT ICT Labs Association KIC. The coordinator of the Hungarian Associate Partner is Eotvos Lorand University. Members of the consortium are the Budapest University of Technology and Economy – BME and Cisco Systems Hungary. The consortium is in close co-operation with Ericsson Hungary, Nokia Siemens ^{2}Networks Hungary and Magyar Telekom. The Budapest Associate Consortium and its activities for ICT innovation are introduced, as well as its role in ICT development in the Eastern and Central European Region. The intention is to disseminate the results of the ICT Labs KIC in the region and involve academic and industrial partners from Central and Eastern Europe in KIC activities.

Hungarian Challenge - How to Strengthen the Role and Position of the Locally Owned SMEs in the R&D Arena
Istvan Lepsenyi, Laszlo Palcovics, Knorr-Bremse, Hungary

On the background of the tendencies and trends in the automotive industry worldwide, the presentation reviews some opportunities and challenges for Hungary, and indeed for Eastern Europe, in this field.
It elaborates on the importance of this branch for the Hungarian suppliers, the reasons of competitiveness of the European automotive industry (including the high share of R&D

investment), and discusses expectations and actions as to the way forward. The structural changes in the Hungarian automotive industry are discussed.

The Baltic R&D in ICT Scene
Marek Tiits, Institute of Baltic Studies, Tartu, Estonia
Tarmo Kalvet, Tallinn University of Technology, Tallinn, Estonia
Imants Freibergs, Latvian Information and Communications Technology Association
Linas Eriksonas, Europarama, Vilnius, Lithuania
Saulius Maskeliunas, VU Institute of Mathematics and Informatics, Lithuanian Computer Society, Lithuania

The basic ICT trends in the Baltic States are rather similar to the ones in other Central and Eastern European (CEE) countries; with the exception of the number of mobile subscribers (which is significantly better than in other CEE countries and looks very good even compared to the most advanced countries of the world).

The status of Baltic ICT R&D is thoroughly analysed by 17 "ICT RTD Technological Audit" projects, which were executed in 12 new EU member states (including Estonia, Latvia and Lithuania) and 5 additional EU Framework Program-associated countries [the final reports of these projects are available from DG INFSO]. Furthermore, an overview of the Baltic ICT R&D financing authorities is available, as well as competencies and future priorities. The SWOT analysis of each Baltic country and recommendations (at the European, national, and stakeholders levels) are presented. In conclusion, there are indicated needs in all three Baltic countries: (1) to increase a number of graduates with specific skills in the fields of national excellence; (2) to increase the participation of ICT societies in R&D efforts (acting as networks linking researchers and developers in different countries and fostering projects); and (3) to improve project planning and idea generation skills of young researchers.

EUCIP – The European Certification of Information Professionals
Roberto Bellini, AICA-EUCIP

The EICIP system and its alignment to the European e-Competence Framework are reviewed, as well as the services EUCIP offers, the results of the survey of CEPIS to review gaps of professional competences in Europe and the conclusions about focused services helping business and specialist targets to manage HR IT resources for recruiting, organizing, training, learning, and certifying.

ICT R&D Challenges for the Western Balkans
Diana Simic, University of Zagreb, eSEE Initiative

Since 2000, the Western Balkan countries have achieved a remarkable progress in Information Society development through regional cooperation within the eSEE Initiative. The countries have established institutional and legal frameworks, started building infrastructure and are making progress in the implementation of the eSEE Agenda Plus. On the other hand, even though most countries are eligible for participating in the EU research programs, the uptake is still slow, and ICT research and innovation capacity of the region is low. EU funded projects for awareness raising, research priority-setting and training in project management and the rules of the FP7 program are helping to speed up the progress, but more efforts will be needed to reduce the gap between the EU member states and the Western Balkans. The positions of these countries in the World Economic Forum Network Readiness and Global Competitiveness rankings reflect these findings.

Country Perspectives of ICT R&D Challenges in EEMS: Hungary
Renata Anna Jaksa, ICEG European Center, Budapest

On the background of the EU 27 performance in the field, the presentation reviews the role of the Hungarian ICT Sector and the country's R&D expenditures. It is based on work carried out within the recent INFSO Technological Audit Study regarding specific ICT RTD capabilities in the EU 12 and selected Associate countries and reports on selected projects and findings, also related to the Hungarian participation in FP5, FP6 and FP7.

Recent Development in the Hungarian Innovation Ecosystem
Barnabas Malnay Hungarian Mobility and Multimedia Cluster

The presentation focuses on some important changes that the Hungarian innovation ecosystem has undergone in the past few years such as the rise of business clusters, the appearance of venture and seed capital, the emergence of novel research spaces and institutes of "lightweight innovation", and other. This has all led to a range of exciting developments that have positively influenced the Hungarian innovation ecosystem. The presentation focuses on a few of these developments.

Some Aspects of Research and Development in ICT in Bulgaria
Kiril Boyanov, Institute for Information and Communication Technology-BAS
Stefan Dodunekov, Institute for Mathematics and Informatics-BAS

The presentation looks into the characteristics of research and development of ICT in Bulgaria. Information is provided on the Bulgarian Research and Educational network, the functioning GRID and Supercomputer platforms. The main structures, allowing the introduction of successful practices and skills are described. Projects with successful participation of Bulgarian scientific organizations financed by the EC are also presented.

Strategy of Higher Education with Special Attention to R&D: From Government to Governance
Franci Pivec, Niko Schlamberger – Slovenian Society "INFORMATIKA"

In 2011, the Slovenian Parliament has adopted two strategic documents, *National program for High Education* and *Research* and *Innovation Strategy of Slovenia.* These have been created separately but are harmonized. Whereas the part of 19 to 24 years old tertiary students is among the highest in the world, the graduation results are much less to be proud of. Reasons that lie in various areas – governance, culture, transition, recent economic crisis and more - for such incongruity need to be explored in depth and the result used to improve the trend. As opposed to government, which is about procedure, governance is about the content and results, which is the important matter in the long run. The difference is explained and also the importance of good governance for good results. Statistics provide an insight into a combined picture of development of a particular country and may offer also useful comparisons, but hardly provide information on who or what are the stakeholders. Knowledge, towns and human capital are the propelling factors of today.

Slovenia is a rather small EU member state as to her declarative importance of knowledge. PhDs are mostly employed in universities, which does not provide for an adequate knowledge transfer and much less for added value in the national economy. The deliverables are papers, not commodities and information, not income. An open issue is a conflicting tendency of greater

independence of universities on one hand, and the increasing public interest (including public finance) on the other. Mechanisms to turn the trend will have to be found and implemented such as financing of research by government and the private sector, novel governance in high education, digital literacy, and transparency of high education and research.

ICT Research and Innovation – Slovakia
Branislav Rovan, SSCS and Department of Computer Science, Comenius University

Slovakia ranks at the bottom of the R&D and Innovation statistics in Europe regardless of the criteria chosen. Rather than repeating the known statistics, which can be found at the web pages of the EU or OECD, the presentation identifies some plausible causes of this situation and presents suggestions for change. Although stemming from the Slovak reality, these could apply to other countries and to R&D and Innovation in general.

ICT Research and Innovation Challenges in Poland
Marek Holynski, Computer Science Institute, Warsaw

Several new institutions and developments were established in Poland as a response to the new challenges of globalization, the Polish membership in the European Union and the changes in the hierarchy of objectives related to the functioning of science. The National Science Center issues calls for proposals in basic research and offers grants for research projects. The National Center for Research and Development manages and implements strategic scientific research and development programs that translate directly into innovation development. Although both centers are supposed to cover a broad range of disciplines, ICT topics are one of their main priorities. The biggest boost to research and development in ICT has come from the Operational Program - Innovative Economy. It is one of six national programs under the National Strategic Reference Framework of the National Cohesion Strategy, which are co-financed from EU resources.

Cooperation within the European Union has had a strong impact on the advancement of ICT in Poland and in the current 7th Framework Program (2007 – 2013). Polish teams are taking part or coordinating a number of important projects, such as the Self Powered Wireless Sensor Network, Sharing Physical Resources - Mechanisms and Implementations for Wireless Networks, Carrier grade mesh networks and other. Polish institutions have been active in creating the pan-European GÉANT network and services, which enables research communities across Europe and transforms the way they collaborate on groundbreaking research.

Some thoughts were shared about the difficulty to replicate Silicon Valley in Poland, or in another EEMS. Cooperation within the Region and within the EU is the practical approach to move ahead.

Intervention of INFSO Representative
Carlos Oliveira, EC, DG INFSO-C2 Information Society and Media Directorate General

The IPTS - IT STAR initiative to explore the conference theme was welcomed and some of INFSO's activities in the field were presented with further details about the innovative ways INFSO plans to move ahead in the forthcoming HORIZON 2020 system, formerly called the Common Strategic Framework.

5. Associated Institutions and Organizer

IPTS – **http://ipts.jrc.ec.europa.eu/** - the Institute for Prospective Technological Studies is one of the seven scientific institutes of the European Commission's Joint Research Center (JRC) and is located in Seville**,** Spain. Since 1994, IPTS promotes and enables a better understanding of the links between technology, economy and society. Its mission is to provide customer-driven support to the EU policy-making process by developing science-based responses to policy challenges that have both a socio-economic as well as a scientific/technological dimension. Its work is undertaken, mainly, at the request of other Directorates General of the European Commission. IPTS collaborates closely with the other Institutes of the Joint Research Center and multiple partners across Europe.

IT STAR – www.itstar.eu - is a professional association in the ICT field in Central, Eastern and Southern Europe with a mission to assist and promote the activities of its members and to encourage and facilitate regional and international cooperation on IS matters. Its members are leading professional informatics societies from 3 "old" and 9 "new" EU members, as well as from 3 candidates for EU membership, which bring valuable national and international experience on Information Society issues – IS indicators and readiness, policies, strategies and other – as they relate to the Region, within a European and Global context. The Association facilitates partnerships by providing a professional forum with its conferences, publications, statements and other activities to national and international stakeholders from academia, government, industry and civil society.

MTA SZTAKI – **www.sztaki.hu** - the Computer and Automation Research Institute of the Hungarian Academy of Sciences is the leading national research institute in information science. The institute served as conference co-organizer and extended its support and assistance regarding organization and program implementation.

Organizer

Plamen Nedkov – www.pnedkov.com - is self-employed as consultant on ICT-related matters and was awarded the procurement contract for the conference organization. He is Chief Executive of IT STAR, Editor of the IT STAR Newsletter and member of the Steering Committee of CEN's (European Committee for Standardization) Workshop on ICT Skills. Previously, he served as Head of Department for International Organizations at the Bulgarian Academy of Sciences, Executive Director of IFSDH – Sofia Office, IFIP Executive Director and elected representative to the NGO-UNESCO Liaison Committee.