Newsletter - *Calibrated for Creative Communications*

Vol. 13, no. 3, Autumn 2015

Chapeau, les dames

Judging by the sheer number of men professionally interested and involved in informatics, ICT is generally considered as a "Male playground".

To tackle this gender issue, many programs at various levels are attempted. Our contribution in this regard is the Autumn Newsletter, with the following authors:

- Gabriele Anderst-Kotsis, J. Kepler University, Linz
- Jutta Breyer, CEN WS on ICT Skills
- Giuditta De Prato, IPTS – IS Unit, joined by Andrea de Panizza and Ibrahim Kholilul Rohman
- Dorothy Hayden, IT STAR NL

A tribute to *Clementina Marinoni* is published on behalf of the CEN Workshop on ICT Skills.

The Issue contains an introduction to IT STAR's 9th Workshop on ICT Strategies & Applications, and an article on Smart City Strategy in Hungary, by Kalman Kovacs.

Take the Journey!

The Editor

Contents

Editor

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Introduction to the 9th IT STAR Workshop on ICT Strategies and Applications

16 October 2015, Warsaw, Poland

Plamen Nedkov

Plamen is Chief Executive of IT STAR and Moderator of its conference series. He is Steering Committee member of CEN's WS on ICT Skills, Fellow of the Global Salzburg Seminar and holder of IFIP's Silver Core and the BAS President's Award and Medal.

8 in 1[1]

The drivers of the current workshop are similar to these of the previous eight IT STAR events, i.e.:

- Continuity of the Association's Information Society agenda
- Parity representation of academia, industry and government
- Broad dissemination of results and spin-off

IT STAR's conference series have addressed issues related to ICT research & development, universities and the ICT industry, CEE Information Society experiences, ICT skills, education and certification, electronic business, digital security, and history of computing. Their presentations, statements and other documentation are available at www.starbus.org/conferences.

So what does 8 in 1 imply? Previous debates and conclusions would be further regarded and refined in order to trace patterns of development. In a dewdrop, here are conclusions of previous events that would assist the debate on ICT Policies and Applications:

- *The increasing relationship between investment in new digital technologies and economic development is obvious and countries unable to take active part in the new digital scenario risk to be marginalized with increased unemployment and reduced competitiveness and quality of life.*

- *Continuous ICT education and encouragement of IT professionalism need to be high on governmental agendas. A stable R&D environment in ICT with appropriate regulations, financing and incentives should be ensured to keep the best scientists at home and the leading national R&D institutions competitive and integrated within the European network of programs and institutes. Good university education is essential and stronger collaboration between informatics*

1 For further reference please check www.starbus.org (conferences and publications)

EDITORIAL POLICY

This Newsletter maintains a world-class standard in providing researched material on ICT and Information Society activities from the perspective of Central, Eastern and Southern Europe (CESE) within a global context. It facilitates the information and communication flow within the region and internationally by supporting a recognized platform and networking media and thus enhancing the visibility and activities of the IT STAR Association.

The stakeholders whose interests this newspaper is addressing are

- IT STAR member societies and members
- ICT professionals, practitioners and institutions across the broad range of activities related to ICTs in government, business, academia and the public sector in general
- International organizations

Special arrangements for the production and circula-tion of the Newsletter could be negotiated.

The newsletter is circulated to leading CESE ICT societies and professionals, as well as to other societies and IT professionals internationally. Everyone interested in CESE developments and working in the ICT field is welcome to contribute with original material. Proposals for articles and material for the Newsletter should be sent two months before the publication date to info@starbus.org.

http://www.starbus.org/ws9

Program

DRAFT PROGRAM
9th IT STAR WS on ICT Strategies and Applications

Friday, 16 October 2015
Venue: Hotel IBIS Warszawa Stare Miasto (Old Town)
Registration desk open from 08.30

09.00 Opening and Setting the Scene – Keynotes
E-skills and e-leadership for the digital scenario
Bruno Lamborghini, EITO Chairman and AICA President
From Smart Items to successful business models – value adding applications with the Internet of Things
Martin Przewloka, Senior Vice President, SAP SE
Digital competences – do we appreciate their role and importance?
Włodzimierz Marciński, Plenipotentiary of the Polish Minister for digital competences in Administration

11.00 Coffee

11.30 Topic I. National Strategies, Policies and Action Plans
Bulgarian ICT National Policy and Strategy – Slides
Kiril Boyanov, Ivan Dimov, Blagovest Sendov (BAS)
Smart City strategy in Hungary – Slides
Kálmán Kovács (Budapest TU)
Lithuanian National Digital Coalition: Purposes, Possibilities and Opportunities for Digital Jobs – Slides
Renata Danielienė, Eugenijus Telešius (ECDL Lithuania)

13.00 Lunch break

14.00 Topic II. Industry, Innovation and Take-up
EU ICT in a Venetian Mirror
Waclaw Iszkowski, President, Polish Chamber of Information Technology and Telecommunications
GoSwift Queue Management Service – Slides
Jaan Oruaas, Madis Sassiad, Sébastien Mure (GoSwift)

15.00 Coffee

15.30 Topic III. Skills and e-Leadership

e-CFPlus System
Roberto Bellini (AICA)
Coding for Children: an Initiative of the Austrian Computer Society (OCG)
Ronald Bieber (OCG)
Procedural Reasoning and Programming for Kids: AICA's „LOGIC" initiative – Slides
Pierfranco Ravotto, Giuseppe Albano (AICA, ANFOR)

17.00 Closing

departments and business/application communities should lead to the establishment of multi-stakeholder partnerships, in which universities play a major role in extending the provided products and services by utilizing and combining the respective strengths and resources of government, the private sector and civil society.

- *To be efficient in providing the regulatory framework of national IS developments, governments need objective assessments and periodical revision of their own policies and institutions. Issues such as information ownership, information clarity, availability, accessibility, protection and processing remain the crux of governmental responsibility. Reliable and transparent information streams should be sustained to avoid information bunkers and the growth of an e-bureaucracy.*

- *The e-Business paradigm is based on the exploitation of informatics and Internet technologies to energize key business processes. The availability of ICT in a company by itself, however, is not sufficient for a successful e-business practice - there are many social, organizational, legislative and security aspects, including users' trust and confidence. E-Leadership competences are of crucial importance and should be seen against the rapid penetration of web approaches transforming traditional top-down organizational schemes into dynamic structures based on collaboration and free exchange of knowledge.*

Format

The 9th WS will provide a forum to some 50-60 participants.

Three Keynote speakers – Bruno Lamborghini, Martin Przewloka and Włodzimierz Marciński – will share their thoughts and experience on aspects of the general conference topic[2], and, on that base the debate will proceed within 3 distinct areas:

1.National Strategies, Policies and Action Plans

Three presentations are envisaged here:
The presentation of *Kiril Boyanov, Ivan Dimov and Blagovest Sendov* will review the **Bulgarian ICT Policy and Strategy**. ICT is one of the five priority areas of the Strategy for Development of Science in Bulgaria until 2020. A critical analysis of the Bulgarian ICT national policy, activities and instruments would be presented and the following two activities will be concretely analyzed - Creating an environment for introducing information and communication technologies, and Introducing Open Access to scientific information and research data.

Kálmán Kovács will discuss the **Smart City Strategy in Hungary.**[3]

2 Please see Vol. 13, no.2, Summer 2015 of the NL for the abstracts of their presentations
3 An extended abstract is published on p. 5.

Renata Danielienė and Eugenijus Telešius will introduce the **Lithuanian National Digital Coalition: Purposes, Possibilities and Opportunities for Digital Jobs,** which has the mission is to increase youth employment by promoting ICT knowledge and achieve more effective use of the digital potential by supporting the implementing of the Digital Agenda for Lithuania 2014-2020.

2. Industry, Innovation and Take-up

Wacław Iszkowski, President of the Polish Chamber of Information Technology and Telecommunications, will deliver a presentation titled **EU ICT in a Venetian Mirror** with an overview of critical aspects related to the topic.

Jaan Oruaas, Madis Sassiad and Sébastien Mure will present the **GoSwift Queue Management Service,** an innovative queue management system developed in order to answer the problems created by traffic jams of vehicles waiting to cross the EU border from Estonia into Russia.

3. Skills and e-Leadership

This topic is drawing significant interest, with the majority of presentations scheduled in this section.

Roberto Bellini will introduce the **e-CFplus System**, which is based on the e-CF framework and further details the operational terms to assess the professional digital skills possessed by ICT specialists, and to evaluate them and develop a suitable action plan to enhance their value. It provides an enriched and structured model of knowledge and operational skills, completed by well-known methods and web tools to manage the assets of business skills in a simple and effective way.

Ronald Bieber will present **Coding for Children – an Initiative of the Austrian Computer Society**, which supports innovative competences and aims to increase the attractiveness of coding and informatics in primary schools, and even in kindergartens. The learning of algorithmic thinking is not necessarily connected with computers - computer science unplugged enables teachers, who are not so familiar with computers, and schools, which are not well equipped, to teach children at an early stage core-competences for basic informatics knowledge.

In the same stream, *Giuseppe Albano and Pierfranco Ravotto* will present AICA's **"LOGIC" Initiative – Procedural Reasoning and Programming for Kids**, which is intended along with ECDL to be offered to schools. It consists of training and certifications for teachers and pupils concerning computational thinking, algorithms, coding and robotics.

Further details about the authors and the presentations are posted at the 9th IT STAR WS site – www.starbus.org/ws9. The online registrations process is open at the conference website. ■

Smart City Strategy in Hungary

Kálmán Kovács

*Prof. **Kálmán Kovács** is Director of the IT Knowledge Center of the Budapest Technical University. He served as Hungarian minister for IT during the period 2002 – 2005.*

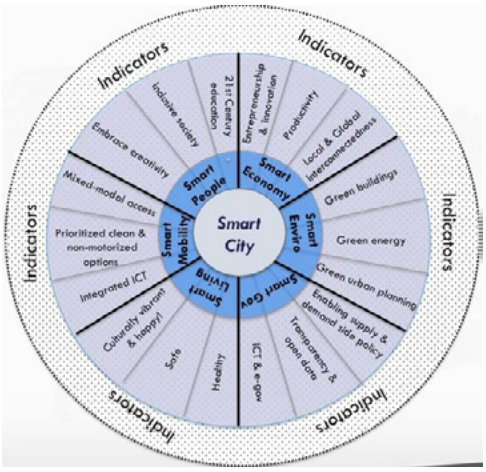
Introduction

Since the opening of the twentieth century, energy and mineral consumption, depletion of resources, and environmental impact of the world is continuously increasing; and in parallel with all, the urbanization process is accelerating. As regards the sustainability of processes, surveys in several fields show we will have reached a tipping point by early third millennium. In some areas we need to radically change the trends. Such are carbon emission, fossil fuel stock, rain forests, or the area of freshwater reserves, where we need to achieve decrease instead of further increase. And, clearly, there are areas where we are unable to amend the trend. For example, the process of urbanization: more than half of the world's population lives in cities, and in the case of the European Union, this reaches 75 per cent. Moreover, energy consumption (and environmental impact) increases most dynamically in cities because of the increasing demand for mass service and personalized services satisfying individual needs. It is therefore in the urban environment where we primarily need to find solutions that may provide for long-term sustainability.

Smart City efforts

There are several points of conflicts in cities. Such are public works (e.g. power and water supply, traffic), environments of everyday life (e.g. residential buildings, institutions, workplaces), industrial and service areas and green areas. We need to find intelligent or so-called smart solutions that, besides being very efficient and sustainable, promote economic prosperity and the increasingly comfortable and safe ways of life. This can be most efficiently achieved by mobilizing the totality of urban resources and creating a development strategy in a coordinated manner, using new technologies.

During the last decade the smart city concept became reality by the accelerated development of new technologies (especially the development of info-communication technologies, intelligent systems, micro-sensing technologies, smart energy support, green housing systems, etc.) and the increasing need of society for establishing sustainable, cost-effective, green and safe living environment. Therefore development of smart cities is one of the key elements of Horizon 2020 dedicated to generating excellent science, creating industrial leadership and tackling social challenges. Smart City initiatives of the EU are supposed to accelerate investment and the rate of innovation in European cities with the aim of achieving social, economic and environmental objectives. According to the Cohen vision (1. figure)[1], the most important components of smart cities are smart economy, environment, government, living, mobility and people.



1. figure Key components for the smart cities

Hungarian SC strategic plans

Professional background to SC strategy development and implementation

Several professional organizations were formed with the aim to assist the development and contribute to the operationalization of this strategy. Most prominent among these are the Future Internet National Technology Platform established in 2011 and the Smart City Section established within it in 2014, which, by way of its members, covers the whole competence area. Its membership includes Ministry of National Development, Ministry of National Economy, National Innovation Office on the government side; all significant technical and science universities of the country and the relevant Academy institutes on the research side; and all significant telecommunications and information technology businesses, professional organizations and associations on the industrial service side.

On the basis of the Budapest University of Technology and Economics, with support from Smartpolis H2020 Widespread 2014–1 Teaming project, the establishment of a multi-country competence Smart City Center of Excellence has been started. Its operation will have considerable influence on local smart city programs by

(i) developing new solutions, new technologies, new knowledge;
(ii) developing the knowledge transfer policy and strategy based on the concept of open innovation,
(iii) and supporting smart city developments.

1 Cohen, B.: http://www.ubmfuturecities.com/author.asp?section_id=219&doc_id=524053

Strategic frames for Smart City developments		
EU Digital Agenda	***National (Hungarian) Infocommunication Strategy 2014-2020***	***Digital Nation Development Program 2014-2020***
EU-wide broadband coverage by 2013	reaching all domestic settlements with optical cable by 2016	
EU-wide min. 30Mbps broadband coverage by 2020	all domestic households with min. 30Mbps broadband access by 2020	all households with min. 30Mbps broadband access by 2018
min. 50% of EU households with min. 100Mbps broadband Internet subscription by 2020	min. 50% of households with min. 100Mbps broadband Internet access by 2020	min. 50% of households with min. 100Mbps broadband Internet access by 2020

Figure 2. Strategic frames for Smart City developments

Stages and major elements of SC Strategy development

In the first stage of SC strategy development, the evaluation of the situation, goals and opportunity and the formation of a reasonable framework of these were completed.

As the first step of the second stage, the establishment of the SC professional platform and panning environment was completed.

Then the definition and categorization (state, community, business) of relevant intelligent city services, and the establishment of the joint technological platform commenced.

Smart City Platform

Key prerequisite to the efficient dissemination of Smart City solutions is the definition of certain common elements, characteristics, on this basis the evaluation of recipient communities (settlements), and the grouping of communities, the development of generic solutions and the support of their adaptation.

The Smart City Technical-Technological-Service Platform, or Smart City Platform in short, which is formed over broadband network, provided for a possible frame for this. A number of business solutions would be connected to, based on and performed over this platform, and on the other hand, this platform would ensure that the services are implemented in a single integrated system.
As a starting point, depending on the endowments of the city, fully or partially community services would be built on the Smart City Platform. A section of these services should be established in every settlement (Smart City Basic Services: e.g. security and monitoring), other elements would be created on partly community, partly business bases, and the operation of these can also be mixed (Smart City Community Services: e.g. smart traffic, health care), but there will be clearly business solutions, as well.

New Business Model

It is necessary for sustainable and widespread solutions that involved areas develop new business models, because traditional solutions (interests) are not sustainable. The new approach is market-oriented, sustainable in the long run, is based on the strategy of individual-community cooperation (public-private cooperation), and unifies complex urban needs and industrial, service industry interests.

The elements of a business model for smart cities therefore are based on modular approach, and the adaptability of local ecosystems, and create the market for solutions, technologies and services developed for smart cities, where we can pick the solution of our choice on the basis of economies of scale, local characteristics and financing environment.

Parallel to this, the establishment of supportive environment (calls for proposals and regulation) to integrated solutions and continuous monitoring and application development environment takes place.

Funding sources for Smart City development programs

Multiple financing models should be applied for Smart City developments:

i) Countrywide broadband Internet coverage and Smart City Platform are fundamental priority goals; therefore they will be implemented in significant part from EU and domestic government development resources.
ii) A business model sustainable in the long run, and appropriate for the development and operation of further Smart City services needs to be developed, as a prerequisite to grant funding. These services will be implemented on the basis of local needs and investor interests, mostly not from community resources.

The projects to be implemented in the frame of the Smart City strategy touch upon nearly all walks of life, and are based on development activity realized in the cooperation of several professional areas and ICT. Therefore, nearly all Operative Programs are expected to include calls for applications that accommodate SC projects. ■

IPTS

Prospective Insights on R&D in ICT (PREDICT): Have we escaped from the crisis?

Andrea de Panizza, Giuditta De Prato, Ibrahim Kholilul Rohman

Andrea de Panizza *holds a PhD in Political Economy and has been serving at the Italian National Research Council (CNR), at Statistics Italy (Istat), at the European Commission Joint Research Centre (JRC) and at the OECD, where he has been managing the unit and the Working Party on measurement and analysis of the digital economy from 2012 to 2014. He is currently working as senior scientist at the Information Society Unit within the JRC. Andrea has also been consulting for several research projects on innovation, ICT and R&D issues and authored a number of studies and reports in applied economics.*

Giuditta De Prato *joined the IS Unit in 2009 to contribute to projects on the economic aspects of the Information Society and on the impacts of Information Society Technologies, mainly focusing on ICT R&D, the software sector, patents and innovation. She has a PhD in Economics and Institutions from the University of Bologna (Italy). Before joining IPTS, she was a software developer and IT consultant from 1992 to 2005, and from 2005 to 2009 contract research assistant and lecturer at the University of Bologna.*

Ibrahim Kholilul Rohman *joined the Information Society Unit in October 2013 as part of the ICT Industry Analysis team. He attended Chalmers University of Technology in Gothenburg, Sweden and obtained his PhD degree in 2012.*

The Prospective insights on R&D in ICT Project (PREDICT) aim at analysing the state of the Information and Communication Technologies (ICT) sector and its Research and Development (R&D) in the European Union (EU) and beyond. This analysis, co-funded by DG CNECT, is carried out by the Information Society Unit of the Institute for Prospective Technological Studies (JRC-IPTS) in collaboration with the Valencian Institute of Economic Research (Ivie). The study provides detailed information on the dynamics of the ICT sector and its component industries.

The collection of PREDICT data is based on the latest available information from official sources, including the Statistical Office of the European Communities (Eurostat), the Organisation for Economic Co-operation and Development (OECD) and National Statistics from EU and non-EU countries. The 2015 edition covers the period 2006-2012 and, for public funding, goes up to 2013. PREDICT data provide detailed information on ICT industries based on the NACE Rev 2 classification by the OECD (2007), reported in Table 1.

Table 1: The ICT sector (2007 OECD definition)

Nace Rev. 2	Description
261-264, 268	**ICT manufacturing industries**
261	Manufacture of electronic components and boards
262	Manufacture of computers and peripheral equipment
263	Manufacture of communication equipment
264	Manufacture of consumer electronics
268	Manufacture of magnetic and optical media
465, 582, 61, 62, 631, 951	**ICT total services**
465	**ICT trade industries**
4651	Wholesale of computers, computer peripheral equipment and software
4652	Wholesale of electronic and telecommunications equipment and parts
5820, 61, 62, 631, 951	**ICT services industries**
5820	Software publishing
61	Telecommunications
62	Computer programming, consultancy and related activities
631	Data processing, hosting and related activities; web portals
951	Repair of computers and communication equipment

Based on the 2015 study, in the EU:

- The ICT sector weights are about 4% in value added and 2.7% in employment. The labour productivity is about 50% higher than the whole economy average. R&D intensity (the ratio of Business enterprise expenditure in R&D (BERD) to value added) in the ICT sector stood at about 5.6% in 2012, against an overall rate of about 1.3%.
- The share of R&D public funding (GBAORD, Government Budget Appropriations or Outlays on R&D) in ICT in 2013 was estimated within PREDICT at about 6.8% of total GBAORD, representing about 0.05% of EU GDP.
- PREDICT estimates of GBAORD also show a growing gap with respect to the target of doubling public spending on ICT R&D by 2020 with respect to 2007 set up in the Digital Agenda for Europe, adopted by the European Commission. By 2013, the estimated cumulative growth rate was only about 12.5%, against a targeted rate of nearly 40%, corresponding to an actual expenditure of €6.2 billion vs a target of €7.6 billion (Figure 1).

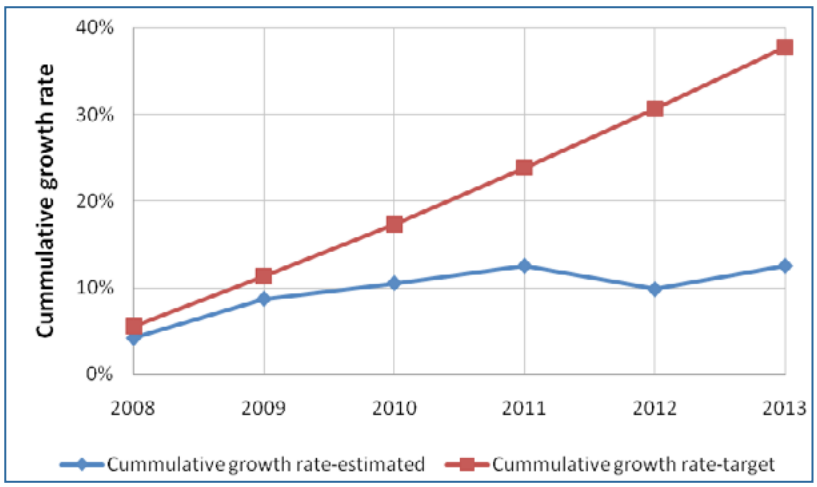


Figure 1: EU ICT GBAORD and DAE target evolution (2007-2011)

- Service industries (Telecommunications and Information services) now represent more than 90% of total ICT sector value added; the weight of ICT manufacturing industries swung with the business cycle and, overall, diminished from 12.2% in 2006 to less than 8% in 2012.
- Compared with ICT services, the ICT manufacturing sector has a higher R&D intensity, although its share has been declining since 2006. In 2012, ICT manufacturing represented 40.9% of BERD and 29.2% of R&D personnel in the ICT sector (down from 42.5 and 30.1% respectively in 2011).

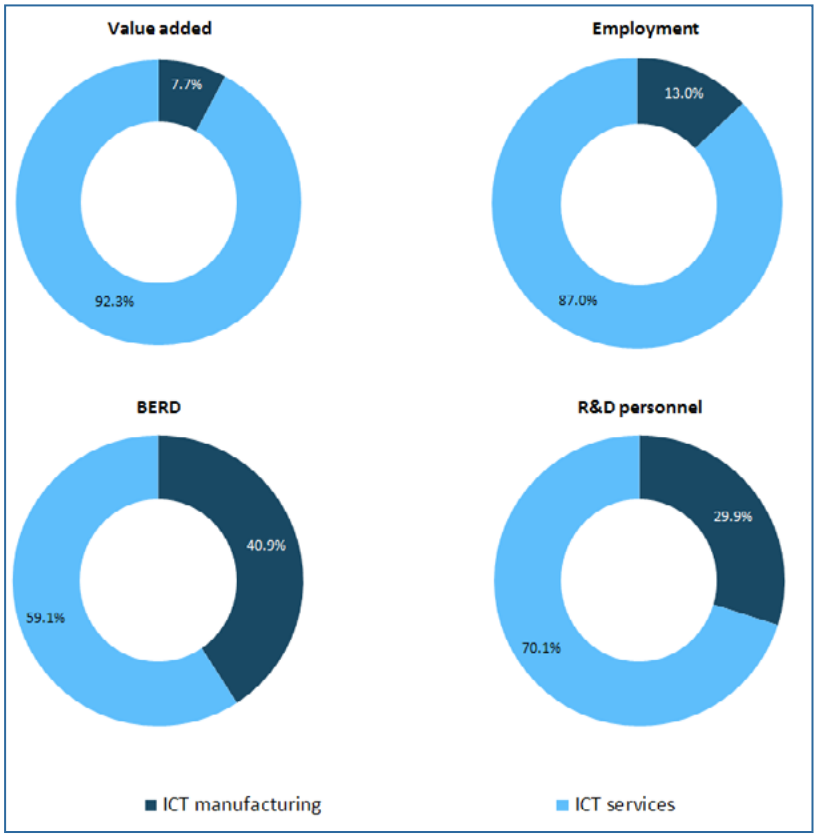


Figure 2: Comparison between ICT manu-facturing and services on value added, employment, BERD and R&D personnel in 2012

Source: Eurostat, elaborated by Ivie and JRC-IPTS.

- At member states level, the five largest EU economies combined accounted for almost 70% of EU value added in the ICT sector: the United Kingdom (UK) (18.9%), Germany (17%), France (15.4%), Italy (11%) and Spain (7%). However, in terms of the intensity, the ICT sector share ranged from 10.2% of total VA for Ireland down to 2.9% for Poland and Lithuania.
- The comparison for other variables is shown in Figure 3.

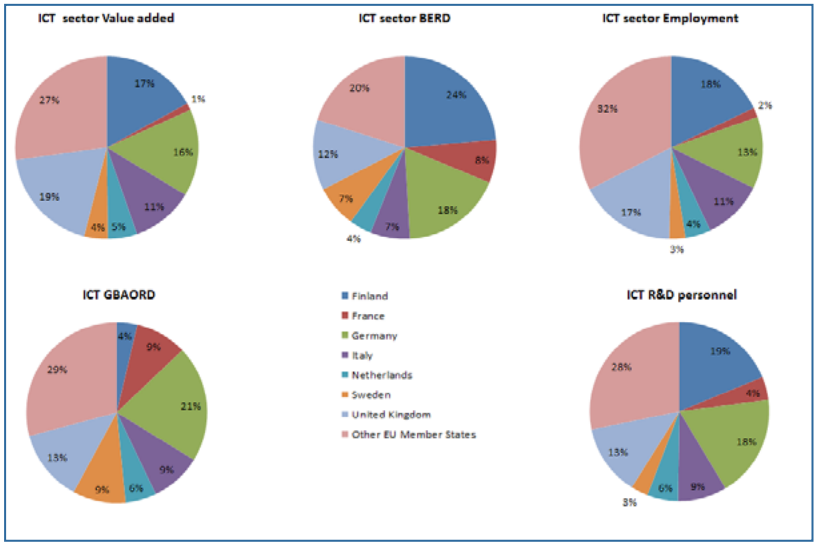


Figure 3: Comparison of ICT VA, ICT sector employment, ICT BERD, ICT GBAORD and ICT sector R&D personnel by Member State (2011)

Source: Eurostat, elaborated by Ivie and JRC-IPTS.

- Furthermore, the following Figure 4compares the ICT indicator in the EU with other economies

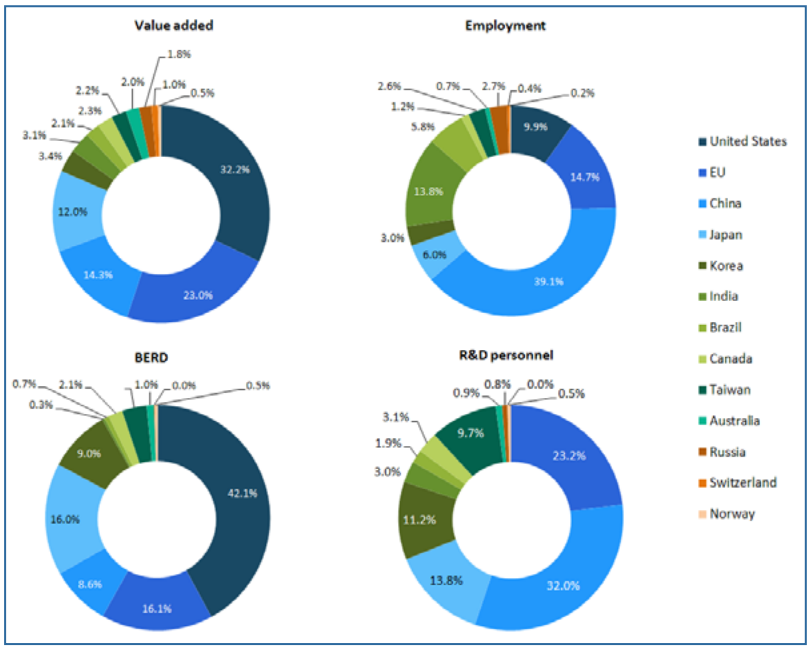


Figure 4: Comparison of ICT sector value added, employment, R&D personnel and BERD for other economies and the EU (2011)

Note: ICT totals correspond to the operational definition of ICT sector.
Under **R&D Personnel** data for US not available.

- From Figure 4, we can see that the US leads the world league in the ICT sector in terms of both industry size and R&D activities, while having a relatively moderate ICT employment (10%). The EU comes second in all of indicators after the US and China in employment.

- When it comes to the relative importance of the ICT sector, its share on total value added is highest in some Asian countries, most notably Taiwan (12.3%) and Korea (7.9%). The EU comes with a lower share than most of countries with the ratio only 3.6% (operational definition).

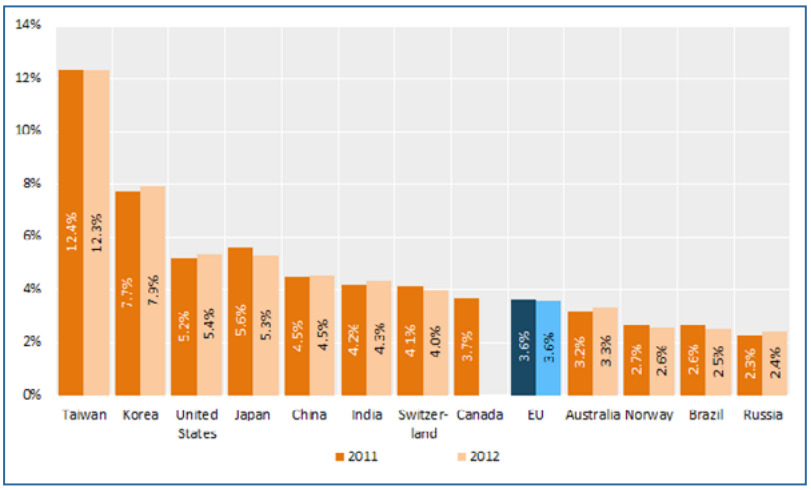
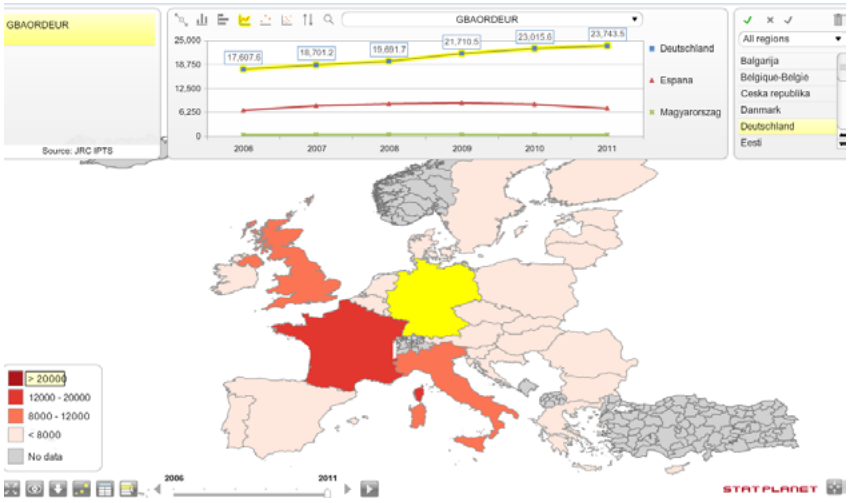


Figure 5: ICT sector VA share of GDP for the European Union and other economies (2011 and 2012)

Note: ICT VA not available for Canada in 2012.

- In the near future, PREDICT will provide additional insights on developments in ICTs, including data and analyses on the media and content industry within the Information economy sector, as well as on ICT trade and ICT employment through the economy. In addition, the PREDICT model will be further developed, to address different scenarios with respect to public support to ICT R&D and its macroeconomic impacts.



- PREDICT data are publicly available on the IPTS web site and on the JRC Science Hub, together with visualisation and analytical tools.

- Most recent trends in ICT industry, R&D and related policies in the EU will be debated at the annual PREDICT conference, which will be held on November 25 in Brussels. The PREDICT Conference 2015 will discuss the transformation of the ICT industries and their R&D and its impact on the economy, and also address how European ICT industries stand vis-à-vis their competitors in the global market. It will bring together around one hundred industry representatives, analysts and policy makers to present their interpretation of the above issues and to discuss the role of European policies. ■

ICT Research at Johannes Kepler University, Linz – a Multidisciplinary Application Oriented Approach

Gabriele Anderst-Kotsis

Gabriele Anderst-Kotsis *holds a full professor position in computer science at Johannes Kepler Universität Linz. She is chairing the Department of Tele-cooperation with a research focus in mobile computing, multimedia and hypermedia systems as well as cooperative and collaborative systems. Research in these areas includes the investigation of methods, techniques and tools for system development as well as evaluation and analysis with focus on performance evaluation. She started her scientific career at the University of Vienna. She received her Masters degree (1991, honored with the Award of the Austrian Computer Society), her PhD (1995, honored with the Heinz-Zemanek Preis) and the venia docendi in computer science (2000) from the University of Vienna. Before joining JKU Linz in October 2002, she was working as a researcher and teacher at the University of Vienna (1991-2001), at the Vienna University for Economics and Business Administration (2001) and at the Copenhagen Business School (2002). Prof. Anderst-Kotsis is member of the OCG, the ACM and the ACM Europe Council. From April 2003 to April 2007 she was president of the Austrian Computer Society. From October 2008 to September 2015 she was Vice Rector for Research at the Johannes Kepler University, Linz.*

The rapid development of information and communication technologies in recent years constantly provides new challenges to research and education at European Universities. At Johannes Kepler University Linz the departments of computer science, business informatics and mathematics are joining their efforts in a common field of excellence as an opportunity for the intensification of the long-standing co-operation and interaction of those disciplines and for the realization of joint visions for a common occurrence in teaching, research and knowledge transfer.

The strong integration of those disciplines into the industrial landscape of Upper Austria is reflected in an application-oriented alignment of the work areas of the departments. This is documented by the establishment of various centers and laboratories dedicated to knowledge transfer.

The **Hagenberg Software Park** was founded in 1989 jointly by the JKU and the province of Upper Austria as a research-based, business-oriented technology park for Software Science. Through joint work of several JKU Departments, including among others the Institute for Symbolic Computation, the Department for Applied Knowledge Processing, the Department of Knowledge-Based Mathematical and Department of Economic Computer Science, the Software Park has been established as national and international showcase for knowledge transfer.

The laboratory for **client-centric cloud computing** is devoted to address primarily the research problems associated with the client side of cloud computing. That is, the key questions addressed are the following: What are the expectations and benefits for companies, in particular small and medium enterprises, in cloud computing? What are the security and privacy hazards (loss of control, data leaks, etc.) for clients and how can they be addressed to gain trust in cloud computing? How is flexibility of the clients guaranteed to join and also leave clouds, whenever they decide to do so? The research includes an intensive study of performance and scalability for cloud services based on real world applications.

The Austrian Research Studio for **Pervasive Computing Applications** plays a key role in technology and knowledge transfer for information and communication technologies, which are embedded and integrated into our everyday environment. “Pervasive computing” denotes the combining of distributed, embedded and interactive systems with the principles and methods of communication, collaboration and coordination. Pervasive computing pertains to the next generation of innovative information technologies. Through the miniaturization and embedding of microelectronics into diverse objects, these technologies merge with everyday work environments and are indiscernibly integrated into basic commodities, thus making living spaces, which respond intelligently to a human reality. Selected projects on developing market-oriented prototypes include SPECTACLES, a multi-sensory, wireless internet connected mixed reality glasses system, Lifebelt, a vibro-tactile harness for evacuation assistance, Power Saver, an accelerometer based activity detection system for intelligent energy consumption control, or Smart City Light, a person-aware display system which adapts to the specific viewer interests.

An increasing number of software systems today are **very-large-scale software systems** (VLSS) with decentralized control, support for multiple platforms, inherently conflicting requirements, continuous evolution and deployment, as well as heterogeneous, inconsistent, and changing. VLSS are often based on system-of-systems architectures comprising multiple heterogeneous systems, which evolve over many years to meet customer, market, and technology requirements. Such systems are often developed by globally distributed teams and communities. This paradigm shift from “building houses” to “building cities” requires new approaches and tools supporting monitoring and evolution. Research groups at JKU (Institute for System Software, Institute for Software Systems Engineering) develop monitoring and evolution techniques for three different stages of VLSS development — operation and production, staging and simulation, development.

With groundbreaking basic research in the field of music analysis worldwide recognition has been won by the Institute of Computational perception, including an ERC Grant. Thanks to research in fields like **Music Information Research** (MIR), computers can do many useful things with music, from beat and rhythm detection to song

identification and tracking. However, they are still far from grasping the essence of music: they cannot tell whether a performance expresses playfulness or ennui, solemnity or gaiety, determination or uncertainty; they cannot produce music with a desired expressive quality; they cannot interact with human musicians in a truly musical way, recognizing and responding to the expressive intentions implied in their playing. The project to be pursued with funding from the ERC grant is about developing machines that are aware of certain dimensions of expressivity, specifically in the domain of (classical) music, where expressivity is both essential and -- at least as far as it relates to the act of performance -- can be traced back to well-defined and measurable parametric dimensions (such as timing, dynamics, articulation). Systems will be developed that can recognize, characterize, search music by expressive aspects, generate, modify, and react to expressive qualities in music. To do so, it will bring together the fields of AI, Machine Learning, Music Information Retrieval (MIR), and Music Performance Research; integrate theories from Musicology to build more well-founded models of music understanding; support model learning and validation with massive musical corpora of a size and quality unprecedented in computational music research.

The Institute of **Integrated Studying** performs basic and applied research in the field of integration of people with disabilities and provides numerous student services that enable a barrier-free design of the information society.

An initiative currently under development is oriented towards **Future ICT based manufacturing systems**, which aim at a radical individualization of products (Lot-size 1) under the condition of highly flexible mass production environments. A key challenge towards such systems is the confluent collaborative cooperation between man and machines. A joint effort of departments in computer science and mechatronics (under the lead of the Institute for Pervasive Computing) aims at attention-aware self-adaptive machines pacing the interaction with human workers based on observed user attention and task performance, and up-to-the minute adaption of the level of assistive support provided to human workers during the manufacturing process. A reference implementation of attentive machines based on formal models of human attention, multisensory recognition architectures and embedded subtle assistive support mechanisms will be empirically evaluated with show cases of Austrian manufacturing companies. ■

Member Society News & Events

Bulgaria

International Conference on Advanced Computing for Innovation (ACOMIN 2015)
10 – 11 November 2015, Sofia, Bulgaria
Organizer: Institute of Information and Communication Technologies – BAS
Website: http://www.iict.bas.bg/acomin15/index.html

Czech Republic

42th SOFSEM - International Conference on Current Trends in the Theory and Practice of Computer Science
23-28 January, 2016, in Harrachov (Czech Republic)
Organizers:
CSKI (Czech Society for Cybernetics and Informatics) & ICS AS CR (Institute of Computer Science, Academy of Sciences of the Czech Republic)
Website and contact person:
www.sofsem.cz
stuller@cs.cas.cz

The 42th SOFSEM, an established international conference on Current Trends in the Theory and Practice of Computer Science, aims to foster cooperation between theoretical and problem oriented researches and will focus on Foundations of Computer Science, Software Engineering and Data, Information and Knowledge Engineering.

Slovenia

13th Int. Symposium on Operations Research in Slovenia (SOR '15), 23-25 September 2015, Bled, Slovenia - http://sor15.fov.uni-mb.si/
Organizers: SSI and University of Maribor ■

IOI 2015 in Kazakhstan

The 27th International Olympiad in Informatics was held from 26 July to 2 August 2015 in Almaty, Kazakhstan with 84 participating teams and an overall number of 324 contestants.

The overall winner is *Jeehak Yoon* (**Rep. of Korea**) with a score of 600 out of 600 possible points, followed by *Mikhail Ipatov* (**Russia**) and *Andrew He* (**USA**).

The best five performers from the 28 EU member states are:

Hristo Venev (**Bulgaria**) - 14th place (Gold)
Aleksejs Zajakins (**Latvia**) – 17th place (Gold)
Jaroslav Kwiecien (**Poland**) – 20th place (Gold)
Rares Darius Buhai (**Romania**) – 21st place (Gold)
Eduard Batmendijn (**Slovakia**) – 26th place (Gold)

In view of the results, we are reminiscent of the AICA-IT STAR Survey on Young Talent in Informatics , which was carried out on the occasion of the 24th IOI'2012 in Italy. The well-motivated findings of this survey are based on the experience of six EU members with remarkable results in IOI competitions, and remain actual and important with wide implications within education and beyond.

The European Commission is dedicating significant effort in addressing new skills, new competences and new forms of education to strengthen the EU as a Knowledge Society. Perhaps it is time for the EC to have a second look at the AICA-IT STAR survey and consider how best this wealth of experience could be used. ■

A Tribute to Clementina Marinoni

CEN WS on ICT Skills

Our CEN ICT Skills Workshop community has sadly lost one of its most committed and influential members, Clementina Marinoni.

Clementina was a person of great expertise, dedication, vision, courage and humanity. She is an inordinate loss to her family, her colleagues and to all of us.

Clementina was a consistent attendee of workshop Plenary meetings where she passionately displayed her innovative spirit and dedication for the promotion of e-skills professional development. Clementina exemplified the meaning of professionalism by her brave fighting spirit; she consistently overcame personal challenges to focus upon her passion for shared European understanding and competence articulation. Clementina acted with dedication and urgency and as a key contributor to many European initiatives she never tired of seeking innovative ways to adequately express and enhance the skills of ICT professionals across Europe.

As the e-CF methodology lead she was at the forefront of the European e-Competence Framework development and recognized by her colleagues as a visionary and the structural architect of this widely adopted competence framework. Clementina was a strong yet unassuming leader with incorruptible principles. She was a great listener, evaluating ideas from many sources and objectively combining the best to underpin the principles of the e-CF.

We will sadly miss her charming, competent, professional, polite yet determined presence. However, we, and the entire European ICT sector, have inherited from Clementina, a permanent ICT competence identification and articulation legacy. Her spirit and ideals remain with us through her vision, inspiration and achievements.

Ciao Clementina, e grazie. ■

The European e-Competence Framework for ICT Professional Competences

Jutta Breyer

***Jutta Breyer** is Director of Breyer Publico Consulting and independent consultant with a special focus on Human Resources, multi-stakeholder collaboration and ICT Professionalism in an international environment. As CEN nominated European e-Competence Framework project and expert team leader she has been responsible for the e-CF initiative in a variety of contexts. Among Jutta's key competence areas are HR strategy and policy consultancy, project and program management, and e-CF and ICT Profiles implementation support.*

The European e-Competence Framework (e-CF) is a broadly recognised ICT competences identification, planning and development tool that benefits a broad range of users from private and public sectors across the EU and abroad. ICT user and supply companies, multinationals, SME's, educational institutions, including higher education and private certification providers, social partners, policy makers and individuals use the e-CF to meet their specific purposes and needs. HR planning, curricula development, job role definitions and job posting, ICT Professional competences assessment, CV editing and self promotion, market scenarios and e-skills policy and strategy definition, are a few examples of how the e-CF is used from multiple perspectives as a shared European language to close the e-skills gap.[1]

Key principles of the e-CF

The e-CF is based upon a set of basic principles, including an EU shared workplace oriented definition of competence[2], five e-CF levels with consistent relationship to the European Qualifications Framework (EQF), and a four-dimensional structure. The current e-CF version 3.0 provides 40 competence definitions for EU-wide reference as needed and applied at the ICT related workplace.

It cannot be overstressed that the e-CF is the result of an intensive multi-stakeholder cooperation. It is an outstanding example of what can be achieved by combining creative thinking and resources across the EU. The simplicity of the e-CF structure, its value, contemporary content, breadth and flexibility are the synthesis of multiple contributions over several years.

1 Extract of the e-CF reference user list: EuroDisney, CIGREF, Poste Italiane, EDF, CompTIA, LPI, APMG, kpn, pôle emploi, Safran, ie Business School, CapGemini, Poste Italiane, AICA, Government of the Netherlands, jobnomads, Fondazione Politecnico Milan, Mapfre, Airbus, CISCO, Barcelona Activa, Kutsekoda, CEPIS, EXIN, AirFrance

2 Within the e-CF, competence is defined as „demonstrated ability to apply knowledge, skills and attitudes to achieve observable results". Source: CWA 16234-1:2014

A short look back

At the end of 2005, the CEN ICT Skills Workshop community agreed, further to the recommendations of the European e-Skills Forum, to jointly develop a common European language for ICT professional competences. The objective was to achieve more transparency and efficiency in the development and application of European digital competences through improved descriptors and a clearer articulation.

The first practical steps towards the e-CF were initiated in 2006 by Airbus, BITKOM, CIGREF, e-Skills UK, Fondazione Politecnico di Milano, IG Metall and Michelin, in the Berlin headquarters of BITKOM, the German ICT employer association. With encouragement from the European Commission and backed by the CEN ICT Skills Workshop Community, the meeting participants designed a work program directed towards an European e-Competence Framework under the umbrella of the CEN ICT Skills Workshop.

Multi-stakeholder contribution as key to success

From multiple market perspectives, roles and expertise, representatives of many organisations and also individuals have subsequently contributed to the e-CF initiative. Each has contributed to the development of the e-CF from varied viewpoints, bringing together technical expertise, political awareness and constructive feedback.

Combining these voices together and listening to all contributions, whilst pursuing the strategic aim of achieving a consistent, high quality, broadly accepted structure was a challenging task. There were three e-CF development phases, commencing with pioneering work towards version 1.0, publishing the first fully developed framework with version 2.0, and finally the delivery of e-CF version 3.0 marked by overall framework maturity and broad application experience in practise. The technical draft development phases were entrusted to a CEN nominated internationally composed e-CF expert team committed to achieving maximum quality, transparency and neutrality and to making the framework as effective and valuable as possible.

Methodology soundness

Making the best of all types of stakeholder contributions required a sound methodology basis. The framework needed to be consistent and cohesive but also open and flexible. Nobody knew this better than our highly appreciated Italian e-CF methodology leader **Clementina Marinoni** who guided the framework through all decisive development phases – from basic methodology decisions discussed in the now historical first expert meeting in London 2006, kindly hosted by e-Skills UK, until the recent transferring of the e-CF 3.0 CEN Workshop Agreement (CWA) 16234-1:2014 into the European Norm (EN) 16234-1:2016 document. It was my personal honour to share with Clementina this final important task, as always enjoying with her innovative spirit and unrelenting capacity to listen.

Looking to the future

The e-CF presented as a European Norm is anticipated in the first half of next year. Identical in its structure and content to the e-CF 3.0 CWA, the new EN format will provide opportunities for further dissemination and continued adoption of the framework EU-wide. The National Standardisation mechanisms can facilitate, amongst others, the provision of e-CF translations into all national languages. As usual, a new environment implies new opportunities and also new challenges. Transparency, neutrality and maximum e-CF user community engagement backed by strong policy support and competent CEN nominated expert teamwork are the secret of the e-CF's success. Given the current acceptance and large use of the framework, the CEN Project Committee (PC) 428 that is in charge of the e-CF Norm must reflect and contribute to continuing the e-CF success story. The large ICT sector audience committed to the e-CF today, from business, politics and education EU-wide, make me more than confident that the story will continue.

e-CF website: www.ecompetences.eu

You can join the e-CFinitiative by contacting your National Standardization Body asking for PC428! ■

Passau – the Drei-Flüsse-Stadt

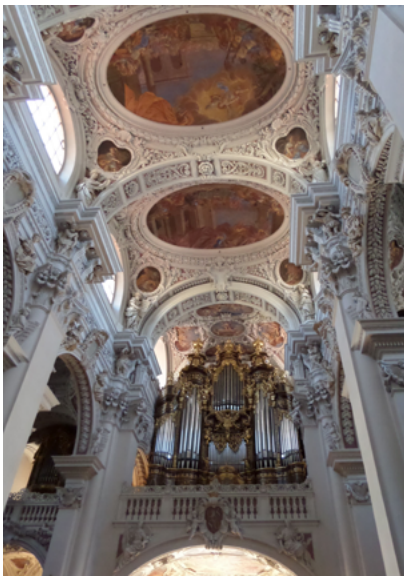
Dorothy Hayden

I'm pleased to take you to Passau, where the Danube is joined by Inn and Ilz to become one of the mighty European waterways, flowing through eight states to the Black Sea.

This picturesque town is just across the Austrian border: if you choose to reach it via motorway # 3 you would be surprised by the many cars and trucks from Bulgaria, Czech Rep., Italy, Poland, Romania and other Central, Eastern and Southern European states, but you could also reach it by ship (Passau is a hub for river-cruises), and it is on the famous Danube bicycle route to Linz, the Wachau[1], and Vienna.

Out of its 50,000 inhabitants some 12,000 are students at the University of Passau, with four Faculties - Arts and Humanities, Law, Computer Science and Mathematics, and Business Administration and Economics, with a unique modern campus situated on a single street along the Inn. Among the associated institutes and research centers are the Institute of Information Systems and Software Engineering, Institute of IT Security and Security Law, Institute of Software Systems in Technical Applications of Computer Science, the Research Center for IT Law and Internet Policy and the Mathematics and Informatics Education Unit.

St. Stephen's Cathedral dominates the Old Town. It is a masterpiece of Italian Baroque and houses the second largest church pipe organ in the world with 17,774 pipes and 233 registers. A stroll along the narrow streets of the Altstadt is an unforgettable experience. The Veste Oberhaus with the former Bishop's fortress on the Danube and Ilz side offers breathtaking views. Another vantage point for great sights is Mariahilf on the Inn side, also a place of pilgrimage.



With the student community and the river-cruise enthusiasts and cyclists, Passau caters for many diverse restaurants and locales.

Not sure where to have a meal when you are next in Passau? Try "Zum Alten Bräuhaus" right next to the Prinzregent Luitpold hanging bridge over the Danube - the "Zanderfilet vom Grill" was superb last time I was there.

■

1 See article in NL Vol. 7, no.2, Summer 2009

SNAPSHOT

REGIONAL ICT ASSOCIATION IN CENTRAL, EASTERN & SOUTHERN EUROPE

Type of organization

Regional non-governmental and non-profit professional association in the ICT field.

Date and place of establishment

18 April **2001**, Portoroz, Slovenia

Membership

Countries represented (*see next page for societies*), year of accession, representatives

- Austria (2001) G. Kotsis, E. Mühlvenzl, R. Bieber
- Bulgaria (2003) K. Boyanov
- Croatia (2002) M. Frkovic
- Cyprus (2009) P. Masouras
- Czech Republic (2001) O. Stepankova, J. Stuller
- Greece (2003) S. Katsikas
- Hungary (2001) B. Domolki
- Italy (2001) G. Occhini
- Lithuania (2003) E. Telesius
- Macedonia (2003) P. Indovski
- Poland (2007) M. Holynski
- Romania (2003) V. Baltac
- Serbia (2003) G. Dukic
- Slovakia (2001) I. Privara, B. Rovan
- Slovenia (2001) N. Schlamberger

Mission

"To be the leading regional information and communication technology organization in Central, Eastern and Southern Europe which promotes, assists and increases the activities of its members and encourages and promotes regional and international cooperation for the benefit of its constituency, the region and the international ICT community."

Governance

IT STAR is governed according to the letter of its Charter by the Business Meeting of MS representatives:

2014 Szeged, **Hungary** (September)
2013 Bari, **Italy** (May)
2012 Bratislava, **Slovakia** (April)
2011 Portoroz, **Slovenia** (April)
2010 Zagreb, **Croatia** (November)
2009 Rome, **Italy** (November)
2008 Godollo, **Hungary** (November)
2007 Genzano di Roma, **Italy** (May)
Timisoara, **Romania** (October)
2006 Ljubljana, **Slovenia** (May)
Bratislava, **Slovakia** (November)
2005 Herceg Novi, **Serbia & Montenegro** (June)
Vienna, **Austria** (November)
2004 Chioggia, **Italy** (May)
Prague, **the Czech Republic** (October)
2003 Opatija, **Croatia** (June)
Budapest, **Hungary** (October)
2002 Portoroz, **Slovenia** (April)
Bratislava, **Slovakia** (November)
2001 Portoroz, **Slovenia** (April)
Como, **Italy** (September)

Coordinators

2010 – Igor Privara
2006 – 2010 Giulio Occhini
2003 – 2006 Niko Schlamberger
2001 – 2003 Plamen Nedkov (cur. Chief Executive)

Major Activities

- 8th IT STAR WS on History of Computing http://www.starbus.org/ws8
- 7th IT STAR WS on eBusiness - http://www.starbus.org/ws7
- 6th IT STAR WS on Digital Security - http://www.starbus.org/ws6
- IPTS - IT STAR Conference on R&D in EEMS - http://eems.starbus.org
- 5th IT STAR WS and publication on Electronic Business - http://starbus.org/ws5/ws5.htm
- 4th IT STAR WS and publication on Skills Education and Certification - http://starbus.org/ws4/ws4.htm
- 3rd IT STAR WS and publication on National Information Society Experiences – NISE 08 http://www.starbus.org/ws3/ws3.htm
- 2nd IT STAR WS and publication on Universities and the ICT Industry http://www.starbus.org/ws2/ws2.htm
- 1st IT STAR WS and publication on R&D in ICT http://www.starbus.org/ws1/ws1.htm
- Workshop and publication on National Experiences related to the EU's 5th and 6th FP http://www.starbus.org/download/supplement.pdf
- Joint IT STAR – FISTERA Workshop on ICT and the Eastern European Dimension

Periodicals & Web-site

The IT STAR Newsletter (nl.starbus.org) published quarterly.
www.itstar.eu ■

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