



Bridges

A most valued human accomplishment is the ability to build intellectual and material constructions as bridges of our civilization's networking environment.

IT STAR and this newspaper have recognized their responsibilities in this vein and have made modest contributions by

- Connecting ICT professionals in Central, Eastern and Southern Europe (CESE)
- Providing a forum for academia, government and industry to interact within the IT STAR WS series
- Facilitating contacts of the IT STAR community and European and international bodies with a mandate in ICT

This issue of the Newsletter tells several stories of building bridges:

- The story of M-3, the first Hungarian computer, which was used during the construction of the Elisabeth bridge in Budapest
- Control of ground vehicles on the airside of airports that link cities and continents
- The forthcoming NISE 08 workshop in November
- The Web 2.0 European masonry

Take the Journey,

Plamen Nedkov

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Letters to the Editor

Extracts from emails to the Editor with respect to the last issue ... comments and suggestions are always welcome – our coordinates are provided on page 1.

“Your newsletter is always a very pleasant reading.”

Fulvia Sala

AICA, Italy

“I did some browsing at your IT STAR newsletter site – nice.”

Dirk Deschoolmeester

President BFIA, Belgium

“It is SO good to hear from you.”

JAN Lee

Past IEEE CS representative to IFIP, USA

“The NL is great, as usual, especially the piece on Skype.”

Balint Domolki

IT STAR representative, Hungary

“As a consequence of your Skype article I changed my phone to VOIP.”

Mathias Scholze-Simmel

5sinne.at, Austria

“You can imagine that quite a number of papers, journals and publications of all kind cross my desk every week. Some I read as I have to but I cannot think of two more journals that I read with such delight as IT STAR NL for its contents, its style, choice of photos, Editor's keynote address, and appearance. In this issue I was especially pleased to take notice of the account of the World Information Society Day in Poland - it is good to see that the Polish computer society has done much more than a lip service in emphasizing the important Day.”

Niko Schlamberger

CEPIS President, SSI President, Slovenia ■

Joke of the Issue

Software Engineering - Girls and Boys Together

In software engineering there are primarily men involved, the ratio of male to female software engineers being in the order of 15 to 1. This makes it pretty easy for women to find potential partners among their peers and is definitely considered as an attraction for young female professionals. There is, however, a snag to it as software types are known for being, so to say, “particular”.

While discussing the prospect of working in the software industry, a seasoned PR generalist advised a lovely young lady on this particular issue:

“The odds are good, but the goods are odd.” ■

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Ex officio: IT STAR MS representatives (see page 1)

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's 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.

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Special arrangements for the production and circulation 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 editor@starbus.org. ■

Computer History

Poland's First Computers – How It Started

by Stanisław Jaskólski



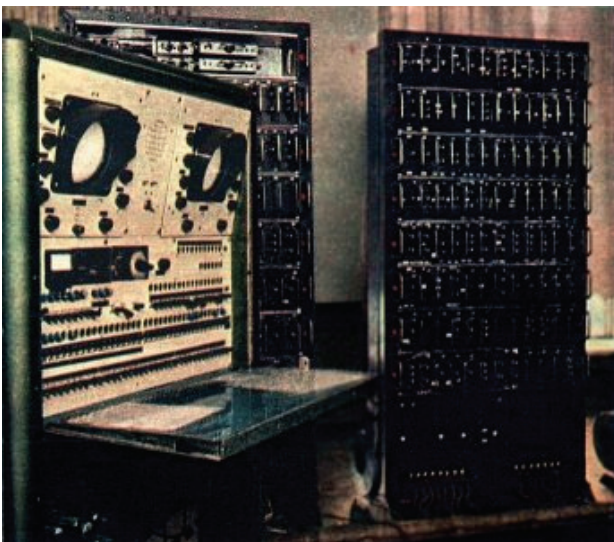
Mr. Stanisław Jaskólski, M.Sc. (E.Eng.), graduated at Warsaw University of Technology and since 1981 is a founding member of the Polish Information Processing Society. During 1966 - 1985 he worked for the Polish Central Statistical Office Data Processing Organization and from 1981 to

1985 served as its General Manager. Later, he was consultant to Qualcomm Inc. (USA), and at present Stanisław consults SELEX Communications S.p.A., a Finmeccanica company.

XYZ – The Polish Premiere

In 1950, the Polish Academy of Sciences established a special unit to study emerging issues of early computers. Originally named “GAM” (*Grupa Aparatów Matematycznych - Mathematical Apparatuses Group*) it evolved to IMM (*Instytut Maszyn Matematycznych – Mathematical Machines Institute*).

The decision to create the first computer in Poland was made at the end of 1955. This task was accomplished in three years – the machine named XYZ, fully designed and built in Poland, began operating in 1958.



XYZ computer front panel, behind – two racks with electronic circuitry

The XYZ computer was a serial, binary computer, built with approximately 400 tubes and 2000 diodes. Programming was in internal binary language and in a symbolic addressing system SAS; after 1960 also by SAKO – algorithmic language compiler (SAS and SAKO were

original Polish software products, developed by IMM, highly appreciated by computing specialists at that time). Input/output equipment was based on standard Hollerith punched card reproducer. The speed of this computer reached up to 1000 arithmetic operations per second.

The XYZ, although an experimental model, was a fully usable digital computing machine. The experience gained by several customers was crucial for further development of the computers in the ZAM, since GAM was temporarily renamed to Zakład Aparatów Matematycznych (*Mathematical Apparatuses Division*). Here, the team of mathematicians and engineers designed and built the next series of digital computers named ZAM-2, ZAM -21 and ZAM-41. The total number of produced ZAM computers was about 30 units. ZAM 21/41 computers were equipped with line printers, magnetic tape and paper tape input/output units.

The experience Polish scientists, programmers, engineers gained in these early years led to the further development of the computer industry in Poland. The ELWRO factory, located in city of Wrocław, played a leading role since



ZAM 21

1970, where approx. 600 units of the ODRA family of computers were manufactured. The most important products of this family are ODRA 1204 (own design), and ODRA 1305/1325 (fully compatible with British ICL-1900 computer series). The last ODRA 1305 computers were used successfully up to 2005.



ODRA 1305

The short history of M-3, the first Hungarian Electronic Digital Tube Computer

by Győző Kovács



Dr. hc. Győző Kovács' background is in electronic engineering with an extensive experience as a journalist and senior editor in this field. He is Honorary President of the Foundation for the Hungarian Informatics-History Museum and Perpetual Honorary President of the Hungarian Association of Telecottages. In the past, Győző served as Secretary General and Vice-President of the John von Neumann Computer Society

The M-3 computer was constructed by members of the Cybernetics Research Group of the Hungarian Academy of Sciences (Magyar Tudományos Akadémia Kibernetikai Kutató Csoportja, abbr. MTA KKCs) from 1957 until 1959. The Group was established for the sole purpose of constructing the first Hungarian electronic tube computer, the M-3. The M-3 was and still is the symbol for the beginning of the age of computers in Hungary.

The M-3 Story

The Cybernetics Research Group of the Hungarian Academy of Sciences (MTA KKCs) was initially launched in 1955 as a department of the Measurement Industry Research Institute (Műszeripari Kutató Intézet), headed by Dr. Rezső Tarján. He was imprisoned politically and became free during this time, together with his two colleagues: József Hatvány and Dr. László Edelényi. They started to construct an electronic – EDVAC like – serial computer, the B-1.

In 1956 this department became an independent research group of the Hungarian Academy of Sciences under the direction of Mr Sándor Varga. Dr Rezső Tarján was appointed as the Scientific Deputy Director of the Research Group.

The main task of this Research Group was the construction of the first Hungarian electronic computer. The group, the youngest members of which had just finished the University of Sciences and Technology – I belonged to this category too – followed the construction of B-1, but our activities were not really successful.

Since Mr Sándor Varga wanted to construct a computer as soon as possible, he acquired the logic and the constructional designs of a newly developed Soviet (Russian) medium size computer, named M-3. We received the original Soviet design in Budapest which had not yet been constructed, therefore the members of our group had to correct – step by step – about 10-30 % of the logic and constructional design of the electronics.

The result of this work was that our version of the M-3 featured a lot of new solutions, such as, a part of the arithmetic unit, some new instructions of the instruction set, the magnetic drum controller, the input/output devices etc. It is interesting that the M-3 design was also given to research groups in Estonia and of China. They constructed their own M-3 computers, but we did not have any scientific connections, therefore these four M-3 computers – the Soviet, the Estonian, the Chinese and the Hungarian – were not compatible with each-other. We could not exchange any software between us, but – during this time – we believed it was not necessary.. We did not recognise the importance of the compatibility and the exchange of software.

In the first version of M-3 we used Russian tubes and kuprox diodes, later - around 1960 - the Group decided to rebuild a part of the logic circuits – first the drum controller, then other parts of M-3, Hungarian long-life tubes made by the Tungfram factory were used.

The developing group was headed by Dr Bálint Dömölki, a young mathematician, and I was appointed as his deputy. I was responsible to instruct the electronic engineering activities.

The acceptance test of M-3 was conducted and successfully concluded on January 21, 1959, in the presence of Mr. G. P. Lopato, chief constructor of the Soviet M-3.

After the successful acceptance tests, our mathematicians and economists solved several problems on the new computer, not only in the scientific domain, but also in technical and economic areas, as engineers, economists, mathematicians, linguists and many others started to study computer programming using the machine in their own fields of study. Already in the first few months of M-3 operations, calculations were carried out for some sections of the so important 5 year economic plans of the socialist planned economy, important operations research tasks, lingual statistics analyses, static calculations for a number of large building constructions, like the Elisabeth Bridge over the Danube, and many other tasks.

Our research group organised the first programming courses in Hungary, we published the first computer periodical, it's title was: "Tájékoztató" (Informatory). Our mathematicians proposed the organisation of a new computer programming faculty at the University of Sciences.

Our colleague Dr Béla Kreko proposed and started another new faculty at the University of Economics: "Planing and Economics", where the students began to study economics, mathematics and computer science for the first time in the history of Hungarian universities (1960). I was invited to organise and teach this subject matter. I wrote the first university learning book about computers. Dr Kreko and I also organised the first university-computer centre – using an URAL 2 computer - at this university (1965).

When M-3 was successfully tested and accepted by the Hungarian Academy of Sciences (1959), Mr Varga or-

dered to set up within the framework of MTA KKC's the first Computer Centre in Hungary. This Centre had a Computer Operations Department which was headed by me. We started to work very soon in three shifts, the running of programs was interrupted every 8 hours, only for maintenance purposes. Because of the relatively short lifetime of the tubes, they needed to be changed every two-four weeks.

The members of the different research institutions and universities – coming to our Computer Centre - solved a lot of mathematical, economic and technical tasks on our computer, it was the first opportunity for the scientific researchers to use an electronic computer in Hungary.

M-3 operated at the Hungarian Academy of Sciences' Computer Centre till 1965. Then, the M-3 computer was transferred to the Cybernetics Laboratory of the József Attila University of Sciences, Szeged, which was headed by Academician László Kalmár, Professor of Mathematics and Logic in the University. This was the first Computer Centre outside of Budapest. The head of the University's Computer Centre was Dr Dániel Muszka.

In 1968 the M-3 became outdated, the computer was disassembled and the parts of the M-3 were then distributed among the various institutes of the university.

The greatest consequence of the development of M-3 was the very early introduction of a computer culture to the Hungarian scientific and research community. (See [1] – [9]). The M-3 was and still is the symbol for the beginning of the age of computers in Hungary.

Technical characteristics of M-3

Arithmetic unit

- 31 bits/word,
- parallel computing,
- four registers,
- operational speed:
 - o addition: 60 microsec,
 - o subtraction: 70-120 microsec,
 - o multiplication: 1,9 millisecc,
 - o division: 2,0 millisecc.

Input/output device

- Siemens T-100 teletype, tape reader and puncher, 5 position telex code,
 - o input/output speed: 7 chrs/sec.
 - o later: a Ferranti photoelectric tape-reader, 8 position code, speed: 300 chrs/sec
- Creed puncher, 8 position code, speed: 100 chrs/sec.

Memory

- First a magnetic drum, 1 kWord (later: 1,6 kWord) capacity,
- later two - simultaneously - running drums as back ground memory) were operating together (2x1600 Words),
- then: ferrit memory, its capacity was: 1 kWord.

Control Unit

- two address code,
 - o 31 bits instructions
 - 1 sign bit,
 - 6 bits for operational code,
 - 12 bits first address,
 - 12 bits second address

Power supply

- total power dissipation: about 10-15 kW

Parts used (approximate numbers)

- about 500 logic units,
- about 1000 vacuum tubes,
- about 5000 cuprox diodes,
- about 4000 resistors,
- about 3000 capacitors

First Hungarian Computer-related Export

Two colleagues from the University of Timisoara (Romania), Viliam Loewenfeld and Joseph Kaufmann, were working on a tube computer (MECIPT 1) but were not able to acquire or purchase a memory device. I had some drum-memories for our computer and our director, Istvan Aczel, permitted me to deliver free-of-charge to Timisoara a drum-memory as well as the technical design of the memory controller. They built the controller, we delivered the memory and the second Romanian computer - the MECIPT 1 - became operational soon. This friendly support was the first Hungarian computer-like 'export'.

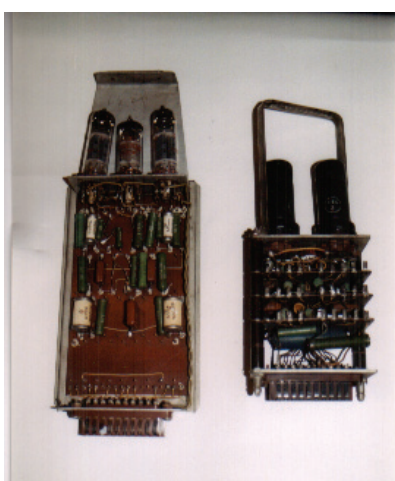
Original photos of the M-3 computer



The engineering Group of the M-3: From left to right: Pohradzky S., – later: Röhrich, A. – Ábrahám I., Molnár I., Szanyi L., Kovács Gy., Várkonyi Zs., Dömölki B.



I. MOLNÁR and Gy. KOVÁCS with the M-3 drum memory.



The new (l) – constructed by me - and the old, originally (r) logic units of the M-3 computer:

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Airports – ICT Control

Control of Ground Vehicles in the Airside of an Airport

by Augusto Casaca and Isabel Rebelo



Augusto Casaca graduated in Electrical Engineering at the Instituto Superior Técnico, Lisboa, Portugal. He got his M.Sc. in Digital Electronics and Ph.D. in Computer Science at the University of Manchester, UK. Presently he is Full Professor at the Instituto Superior Técnico, Technical University of Lisbon, Portugal, and Leader of the Research Group on "Network Architecture" at INOV and INESC-ID in Lisbon. He has participated in several Eurescom and European Commission joint research projects in the areas of Broadband Communications and Networking and in standardization activities at ITU-T and ETSI, has published about 100 scientific papers in journals and conferences, and has chaired or co-chaired five conferences on Networking. He was Chairman of IFIP Technical Committee 6 (Communication Systems) from 1998 to 2004 and is a Senior Member of IEEE.



Isabel Rebelo graduated in Electrical and Telecommunication Engineering at the Technical University of Lisbon in 1974 and qualified in Business Management in 1994. In 1974, she joined the Civil Aviation Authority and in 1978 ANA, EP, where she was Navais Project Leader, Director Deputy of the Lisbon Air Traffic Control Center, Chief of Data Processing and Visualization Service, Chief of the Maintenance Division of Lisbon & Sta. Maria Flight Information Regions and Chief of the Telecommunications and IT Projects Division. She interacted in several international groups in

Eurocontrol, ICAO and European Commission. Currently Isabel is coordinating the Innovation & Special Technological Projects Department of ANA, SA.

1. Introduction

The current situation of aircraft and vehicle ground movements in European airports raises a number of issues that have led Eurocontrol to define a strategy for the implementation of a system to control and guide those aircraft and vehicle movements on the ground. The system is a component of the Advanced Surface Movement Guidance and Control System (A-SMGCS) [1] and its main objective is to ensure the safety and efficiency of airport surface traffic with the increasing density of traffic and in all weather conditions.

Currently, most airports still rely on the former concept of SMGCS as defined by the International Civil Aviation Organization (ICAO). The SMGCS procedures are mainly based on the “see and be seen” principle. These procedures apply for control, guidance and low visibility conditions.

Despite the implementation of SMGCS procedures the continuous growth of air traffic, the complexity of aerodrome layouts and operations in low visibility conditions are leading to an escalating number of incidents and accidents on ground movements. This originated the need to define A-SMGCS, which improves on SMGCS procedures. A-SMGCS looks for the application of state-of-the-art information and communication technologies to improve the safety of the ground movements in the aerodromes. Namely, it intends to maintain the airport throughput in low visibility conditions, to allow controllers to issue clearances and instructions on the basis of surveillance data and to better coordinate the airport activities.

The implementation of this strategy implies the existence of advanced localization techniques, state-of-the-art wireless communication networks operating in the airside of the airport, low cost performing embedded systems for installation in vehicles and the use of advanced geographical information systems (GIS) for airport cartography.

Although the A-SMGCS strategy has already been proposed about five years ago, only recently the right technological systems, which are able to efficiently implement A-SMGCS, started being available. The availability of the European Geostationary Navigation Overlay Service (EGNOS) [2] was a key factor for achieving a relatively precise localization of the vehicles. Also the availability of high bit rate wireless communication technologies like Wi-Fi [3] and WiMAX[4] and the possibility of their deployment in the airside facilitated the communications based on IP between the vehicles and a central station used for control of the ground movements. Together with the present availability of low cost embedded systems and performing GIS, all these components are the basis for the efficient implementations of A-SMGCS, which start appearing in Europe.

The operational implementation of A-SMGCS includes four main functions: surveillance, routing, guidance and control. Surveillance provides controllers, and eventually pilots and vehicle drivers, with the situational awareness in the movement area. Through the routing functionality a more efficient route is designated for each aircraft or vehicle. Guidance gives to pilots and drivers indications to enable them to follow an assigned route. The control functionality allows preventing conflicts and collisions by providing alerts for incursions in runways and activating protection devices.

2. An Approach for A-SMGCS Implementation

Figure 1 shows the architecture of a platform, which corresponds to an A-SMGCS solution [5].

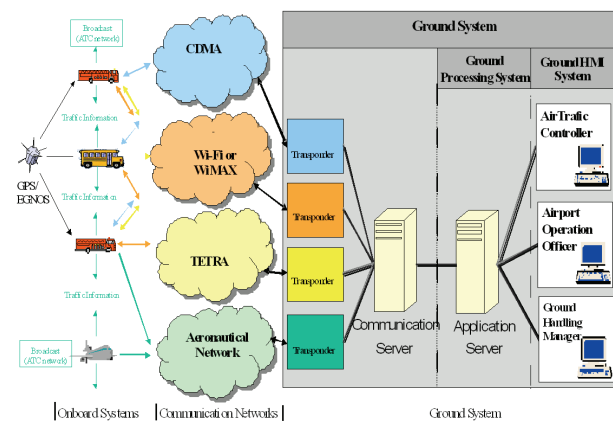


Figure 1. Architecture of an A-SMGCS platform

There is one embedded system installed in each vehicle. The system consists of a Communication and Navigation Unit (CNU) and an on-board display for the vehicle driver. The CNU includes a GPS/EGNOS receiver, the wireless communication network transponders and a PC board. The software modules that implement the A-SMGCS functionalities in the vehicle run in the PC board. The ground system consists of the application server, communication server with the network transponders and a set of displays for the platform users. Software modules equivalent to the ones running in the CNU are also running in the application server for the symmetrical implementation of the A-SMGCS functionalities at the central site, which communicate with the applications in the CNUs. The Air Traffic Controller, Airport Operation Officer and Ground Handling Manager interact with the platform via the displays, known as Ground Human-Machine Interface (GHMI), connected to the application server in a client-server model. The communication server contains all the software tasks concerned with the management of the communication links to the CNUs.

The communication networks allow the exchange of data between the CNUs and the ground system. They cover the whole airside area. Four distinct networks are considered for this purpose: Wi-Fi, WiMAX, TETRA and CDMA. The main emphasis should be on the use of the

(contd. on p. 10)

Harmonise Outcomes

The Harmonise project has been officially approved by the European Commission and received a highly positive rating. The purpose of the Harmonise project was to review the existing qualification and certification schemes for ICT professionals in Europe, and to clarify the underlying schemes, profiles, terminology and curricula with a view to defining the principle structures of a harmonised IT Certification market in Europe. The project outcomes were recognised by the Commission as an exemplum for other sectors facing similar challenges. We are pleased to present this extract from the Executive Summary which includes the results of the survey and summarises the main findings of the analysis.

1 Introduction

The Harmonise project examined vocational ICT qualifications in Europe, with a view to establishing a common basis for assessing and comparing the ICT professional qualifications offered in each country. The project started by gathering information on the current situation, and then examined the need for harmonisation and the feasibility of achieving it. It proposes a number of concrete measures designed to achieve convergence between the existing approaches to ICT skills certification in different countries and provides recommendations on the way in which these differences in various countries and institutions might be made more transparent, with obvious benefits for users and employers.

The project concentrated on certification arrangements and related training offerings, and on career development services offered to ICT professionals in Europe and beyond. This report analyses four thematic areas:

- ICT Professional Labour Market.
- ICT Skills Certification System.
- ICT Skills Certification Market.
- ICT Professional Certification Quality.

An overview of the key findings is presented in Figure 1.

2 ICT Professional Certification

Since the 1990s, ICT certification has become an integral part of the education and training landscape. While the growth of ICT vendor-specific certification appears to be slowing, vendor-independent offerings

are still in the initial phase of their lifecycle. There is also an observable shift towards profile-based certification. These developments are driven mainly by vendor-neutral and vendor-independent certification providers.

3 Need for Harmonisation

The continued development of the ICT industry (and ultimately the success of the economy as a whole) depends on the availability of sufficient numbers of qualified people with the required skills and competences.

The annual cost of software failures in Europe is estimated at almost €100 billion. Adequate training of staff would result in improved project success rates and better innovation capability. Thus, ensuring that ICT practitioners are able to perform to professional standards is a matter of vital importance for the economy and for society.

Our survey revealed 62 certification suppliers, delivering 617 types of certification. This proliferation is an obstacle to the achievement of global standards for the ICT profession. It also

hampers the development of ICT as a professional discipline, and makes it less likely that employers will recognise ICT as a serious profession adhering to higher principles and clearly defined, international standards.

Our research suggests that employers do not place much value on ICT professional certification. This deserves further examination, as it strongly influences the demand by ICT practitioners for training and certification. We believe that certification should not itself be a priority, but that the obvious need is to establish ICT professionalism and international professional standards

4 Defining Harmonisation

If ICT professional certification schemes are successfully harmonised, the certifications will be more widely recognised, employers and job-seekers will be more aware of them and their value, and it will be clear to all stakeholders what they are and what they mean. This would be of considerable value in establishing ICT as a professional discipline.

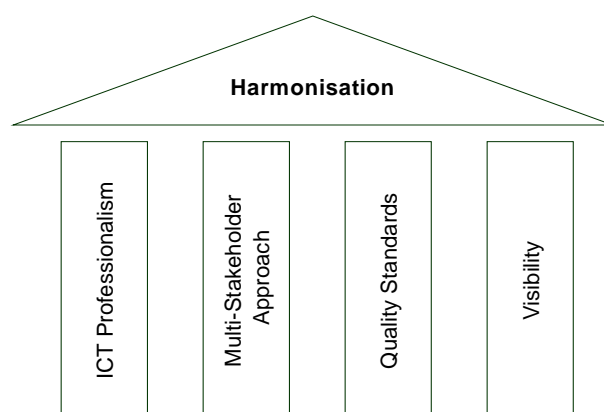


Figure 1: Identified basic pillars of the Harmonisation process

In this project, harmonisation was defined in the following terms: the achievement of broader recognition and transparency of ICT professional certification, higher awareness of what is available in the market, and the promotion of the benefits arising from a consistent, international ICT profession, based on clearly defined standards.

From the start, it was clear to the project team that this was an ambitious and challenging task. A number of pivotal questions were explored with experts and the wider community:

- What are the specific complexities of the ICT certification market?
- How do we expect this market to evolve and change?
- What do we need to do to harmonise this market?

5 Towards Harmonisation

The Harmonise project sets out a roadmap for harmonising ICT professional certification, along with concrete recommendations for action. It draws on the EUCIP¹ experience to suggest a path towards how IT Professional Certification harmonisation can be implemented.

The proposed harmonisation approach is built on ICT professionalism, a multi-stakeholder approach, quality standards, and visibility. It attempted to address the following key questions: Why harmonisation? For whom? and How?

The proposed approach is market-driven; we do not recommend a top-down regulatory approach to the existing market for ICT certification.

6 Recommendations²

- Harmonisation activities need to be carefully planned, and must involve all stakeholders. The successful implementation of quality standards will require commitment from all involved and affected parties, and in particular from professional associ-

ations, industry, and educational institutions.

- Harmonisation of ICT professional certification must be seen in the broader context of ICT professionalism. The ICT professional associations play a pivotal role in setting, developing and promoting standards in ICT certification; their desire to develop ICT as a professional discipline is the single most important driver of harmonisation.

- A sustainable solution to the harmonisation of ICT professional certification must be based on an umbrella approach that allows different certification systems to co-exist and to be cross-referenced in a reference framework. This requires:

- a common language for describing professional skills and competences;
- a standard means of measurement for professional skills and competences;
- a mechanism for independent recognition and quality assurance of those professional skills and competences

- Quality standards and accreditation are among the most important aspects of a harmonised European approach to certification. The harmonisation process should review existing quality approaches, and record their scope and objectives, and how they are applied.

- The contents of certification programmes must be made more transparent. An important step in this direction is the forthcoming European e-Competence Framework, currently under development by the CEN/ISSS Workshop in ICT Skills.

- A harmonised system should be aligned with European frameworks such as the EQF (European Qualifications Framework) and ECTS (European Credit Transfer System).

7 Network of Interest

The Harmonise project has succeeded in establishing a network of interest and links with the major ICT vendors. This

has already raised awareness among stakeholders and promoted the need for harmonisation of ICT professional certification.

The project established links to other projects and existing European groups working in related areas that had the potential to support the work of the project. It participated actively in a number of European working groups, such as the CEN/ISSS Workshop on ICT-Skills³, and the European e-Skills Forum and its current follow-up activities, as well as liaising with the e-Skills Industry Leadership Board. The aim was to influence ongoing developments, to inform stakeholders and the expert community about the project and its potential outcome, and to acquire inputs needed for the performance of the project's tasks. This network of interest will be used to sustain the work of the project and to implement the required changes in the area of ICT professional certification.

8 The Harmonise Project Consortium

The Harmonise project was carried out by a consortium of nine partners led by CEPIS, and including CEPIS member societies from Estonia, Germany, Hungary, Italy, and the United Kingdom, as well as the ECDL Foundation and education and research partners from both German and Austrian institutes. The Harmonise project is one of many activities that CEPIS conducts in the area of professional skills. For example, in its recently completed *eSkills Foresight Scenarios for the ICT Industry*⁴, CEPIS took an in-depth look at the core issues affecting the supply of and demand for IT practitioners and professionals. In that study, CEPIS predicted a significant shortfall in the supply of IT graduates over the coming years.

The Harmonise Reference Material website is www.cepis-harmonise.org/harmonise/php/index.php. The full report will be posted shortly.

³ <http://www.cen.eu/CENORM/Sectors/sectors/iss/activity/wsict-skills.asp>.

⁴ Report to the European Commission's Directorate General for Enterprise & Industry <http://www.cepis.org/index.jsp?b=0-636-638&pID=648&nID=717>.

¹ European Certification for Informatics Professionals. <http://www.eucip.com/>.

² Please, refer to the project for the full version.

Wi-Fi or WiMAX networks, which are novel and high bit rate approaches for an airport airside environment. However, the platform can also work, although with a lower quality of service, with lower bit-rate communication technologies like CDMA or TETRA. These last two networks are sometimes found in an airport environment and that is the main reason of their choice as alternative technologies. It should also be noted that CDMA and TETRA are networks run by telecommunication operators whereas Wi-Fi and WiMAX might be networks operated by the airport authorities, which is preferable in this case. Finally, the aeronautical network, e.g. VDL-4 or MODE-S, shown in figure 1, is used to interconnect the platform with an aeronautical network.

3. Platform implementation

The platform shown in figure 1 has first been implemented as a result of an R&D European project named Ainet [6] and later on, it was refined and made more robust for a more extensive deployment at the airport of Porto in Portugal. A similar platform is being implemented at the airport of Lisbon.

3.1 EGNOS

EGNOS augments the two satellite navigation systems presently operating, GPS and GLONASS, and makes them suitable for safety critical applications. It consists of three geostationary satellites and a network of more than 30 ground stations [6]. The EGNOS receiver located in the CNU decodes the signal to give a more accurate position than is possible with GPS or GLONASS alone, and an accurate estimate of the errors. It allows users to determine their position to within 2 meters. EGNOS is a joint project of the European Space Agency, the European Commission and Eurocontrol. It is in operation since 2006 and it might be considered as a precursor to Galileo, the global satellite navigation system under development in Europe.

3.2 A-SMGCS Services

The primary objective of this platform is to be able to satisfy the functionalities defined for A-SMGCS in a phased approach. For this purpose the following services have already been defined and implemented in the platform: surveillance, control, guidance and decision support.

The surveillance service is dedicated to the Air Traffic Controller and provides continuous surveillance data for the maneuvering area. The data consists of traffic information about all the vehicles in the area and also of the traffic context, which is the airport map representation. The same service is provided also to the Airport Operation Officer and Ground Handling Manager.

The control service is dedicated to the Air Traffic Controller and aims to provide conflict/infringement alerts for the maneuvering area. It detects conflicts/infringements on runway caused by vehicles, on

taxiway when a vehicle crosses a taxiway while an aircraft is taxiing and by incursions in restricted areas. The same service is provided also to the Airport Operation Officer and Ground Handling Manager.

The guidance service is dedicated to vehicle drivers. This service allows drivers to visualize their own positions on a moving map of the airport, which is displayed on a display in the vehicle.

The decision support service is dedicated to the drivers, Airport Operation Officer and Ground Handling Manager. It aims to provide situation assessment and solutions to optimize the use of vehicles. The decision support service, in concrete, provides real time information about aircraft, text messages with instructions for the drivers, historical data of the airport and vehicle status information.

Figure 2 exemplifies one airport view that can be seen at the GHMI. In the area of the airport detailed in the figure we can observe an aircraft and two vehicles. The geographical information is displayed in superposed layers, which are identified on the left side of the screen.

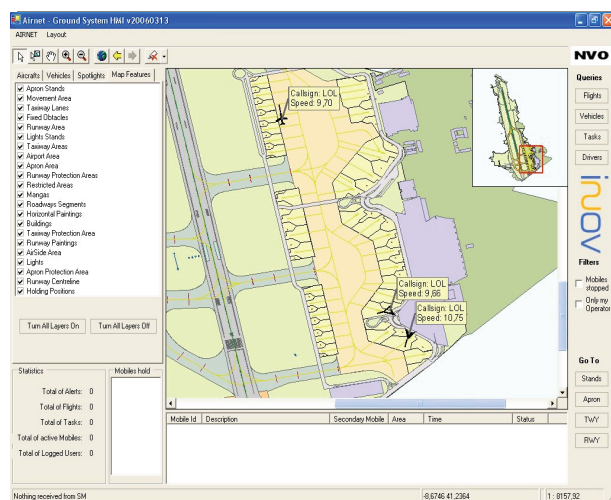


Figure 2. View of an area of the airport in the GHMI

3.3 Wireless Communication Networks

A first implementation of the platform was done in the airport of Porto. There, a Wi-Fi network was deployed in the airside. In this deployment about 20 access points were used along the airport. At the time, WiMAX was not a realistic option yet. Nowadays, WiMAX products are widely available and the implementation of the platform that is being installed at the airport of Lisbon will use WiMAX. It has the advantage of using a much smaller number of antennas to cover the aerodrome compared to Wi-Fi. However, WiMAX operates in licensed frequencies, which implies the need for the airport authority to get a license from the country telecommunication regulator.

The optional use of CDMA and TETRA is justified because these two communication technologies are deployed in many airports. Both technologies have data

rates smaller than Wi-Fi and WiMAX, but they can be used as back-up to the other networks. The quality of service is significantly degraded in TETRA because TETRA operates with a few tens of kbps only, which means that TETRA will be always the last option to consider. CDMA might reach 2 Mbps in some deployments and at this speed most A-SMGCS services might operate satisfactorily.

4. Conclusion

The A-SMGCS vehicle management component defined by Eurocontrol can be already implemented with the available information and communication technologies. By using EGNOS, embedded computer systems with EGNOS receivers, performing servers for running the A-SMGCS services, advanced GIS software and IP-based communications on wireless communication networks covering the airside, an A-SMGCS platform can be implemented.

An experimental A-SMGCS platform for control of vehicle navigation is deployed at the Porto airport and another one is being deployed at the Lisbon airport. One of the main differences between both platforms resides in the wireless data communication technology used for the aerodrome. Whereas in Porto a Wi-Fi network has been used with good results, in Lisbon, WiMax is being deployed for the same purpose.

The use of EGNOS is an aspect that we should strongly underline. EGNOS is a precursor of Galileo and the positioning accuracy that we have obtained with EGNOS has been well within the 2 meter precision announced in the EGNOS specifications. One of the applications foreseen for EGNOS is for aviation and airports and the A-SMGCS implementations can take a great advantage of its existence.

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<http://www.esa.int/esaNA/egnos.html>
- [3] "IEEE Standard for Telecommunications and Information Exchange Between Systems - LAN/MAN Specific Requirements - Part 11: Wireless Medium Access Control (MAC) and physical layer (PHY) specifications: High Speed Physical Layer in the 5 GHz band", IEEE 802.11a standard, IEEE.
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Member Societies News

John von Neumann Computer Society

by Balint Domolki

NJSZT representative to IT STAR

The leading professional civil organization of the IT field in Hungary, the *John von Neumann Computer Society* (by Hungarian acronym: **NJSZT**) is celebrating its **40th Anniversary** this year! Established in 1968, it has a membership of about 2300 individuals and over 100 companies. It has territorial organizations in 15 counties and 5 cities all over Hungary. The 19 professional communities cover most areas of the computer field.

The aims and goals of the Society can be summarized as follows:

- Studying computer technology
- Informing computer specialists about the development of theory, about useful practical results and experiences made by users
- Disseminating practical applications and results, helping to solve current problems
- Spreading the culture of computing, providing regular further education for computer professionals
- Pronouncing the views and representing the professional interests of the computer community

The Program for 2007-2009 has the motto: "*Saving traditions, fitting in with the present and influencing the future*" with the main emphasis on

- advancing digital equal-opportunities, promoting computer literacy
- spreading IT culture and professional knowledge
- preserving heritages of the IT profession and culture, and, last but not least,
- assisting talented youth

In 2007 NJSZT launched the **Digital Equal-opportunities (DE!)** program, dealing with issues like e-inclusion, digital literacy, assisted living etc., resulting in enhancing the quality of life of the population. These activities are connected to the Hungarian e-Inclusion program, being part of a similar initiative of the European Union and coherent with the Lisbon principles and the i2010 strategy.

The main activity of NJSZT here is running the ECDL program in Hungary, having celebrated its 10th anniversary this year. This is an international program for digital literacy, highly contributing to the i2010 goals of a competitive knowledge-based European society and economy. The development of ECDL in Hungary can be characterized by the following figures: around 400

accredited Test Centers and over 330.000 registrants and 170.000 diplomas.

Other DE! programs include training courses for e-government and supporting the development of assisted living tools within the eVITA National Technology Platform (associated to the AAL initiative of the EU), coordinated by NJSZT.

As one of the leading professional civil organizations of the IT field, NJSZT is actively participating in the coordination of professional and political initiatives for promoting digital equal opportunities in the country, by creating an action plan based on an wide-scale national cooperation. One of the significant results is the issuing of a declaration with the consensus of all the five main political parties, being hopefully followed by the creation of a Parliamentary Committee later in 2008. The 2.DE! Conference in November 2008 will summarize the results and – based on a wide political and professional consensus – define the plans of future activities.

A successful initiative of the John von Neumann Computer Society is the **Software Technology Forum**. Started in mid 2002, this is a quarterly event under the scientific leadership of *Les Belady*, one of the leading personalities of the international software engineering field. At each event there is a talk from a renowned expert on an actual software technology topic, followed by a local presentation describing related activities in Hungary. In spring 2008 the 25th event was celebrated, together with the 80th birthday of Les Belady. More details can be found at www.inf.u-szeged.hu/stf

NJSZT is organizing important international conferences in Hungary. An important example are the European Joint Conferences on Theory and Practice of Software (ETAPS) being the primary European forum for academic and industrial researchers working on topics related to Software Science. ETAPS, established in 1998, is a confederation of five main annual conferences, accompanied by satellite workshops and other events. ETAPS 2008 is the eleventh event in the series, and was organized on 29 March – 6 April in Budapest with more than 700 participants (<http://etaps08.mit.bme.hu/>).

As an active member of IFIP, NJSZT has representatives in all but one Technical Committees. Among elected TC officers Hungary has one Vice-Chair (TC5), one honorary TC member (TC6) and one WG Chair and WG Vice-Chair (TC3).

Participation in other international organizations includes CEPIS and the ECDL Foundation, EFMI (European Federation for Medical Informatics), ECCAI (European Coordinating Committee for Artificial Intelligence), IMIA (International Medical Informatics Association) and IAPR (International Association for Pattern Recognition).

Being one of the founders of IT STAR, the NJSZT representative has attended most IT STAR meetings and hosted the meeting in October 2003 (connected to the celebration of the 100th anniversary of John von Neumann's birth).

In November 2008, the **3rd IT STAR Workshop on National Information Society Experiences – NISE 08** and the annual IT STAR Business meeting are scheduled to be held in Godollo near Budapest. ■

Institute for Prospective Technological Studies

Assessing the European Web 2.0 Landscape

by Marc Bogdanowicz

"Web 2.0" is not only another buzzword, it also becomes an important market! It is defined as a set of applications, which enables interaction and collaboration. Such applications include blogs, wikis, social tagging, social gaming etc., even though it may not always be fully clear whether a specific application is Web 2.0 or not. These applications are based on creative combinations of a number of recent web-related technologies, including AJAX, syndication feeds, mash-ups, and wiki engines. Perhaps the most pertinent characteristic of Web 2.0, as compared to the previous "version" of the Web, is that it enables users to do more than just retrieve information. Although the possibility to do so is not entirely new to Web 2.0, the magnitude and ease is new: the user can become, with little effort, an integral part and co-provider of most or all of the elements of a service delivered through the Web, including as content provider, quality manager, technology tester, and contributor to collective intelligence.

The available figures about recent Web 2.0 diffusion deliver two messages. Firstly, that its spread is extremely rapid by any standards, although not uniform for all its applications. The most diffused applications, including wikis, blogs and online social networks have, in a few years only, been adopted by 20-40% of enterprise and private Internet users. Secondly, users' participatory intensity differs a lot. It can be estimated that about 3 % of the European Internet users generate content based on their own creative efforts, about 10% of them provide feedback, comment and review existing content, and 40% are passive consumers of Web 2.0.

The rapid diffusion of Web 2.0 has been enabled by a number of factors. First, Web 2.0 builds on a number of technological innovations and improvements, which enable users to easily create and distribute content and to interact with other users. At the same time, general price reductions and performance improvement in network and terminal equipment combined with improving broadband availability have been crucial for the take-up of Web 2.0 applications. In addition, the rise of the Internet version Web 1.0 had created a generation of young people with little reluctance to share personal data online. The influence from the open source community has also been important, partly through developing technology, but also by setting the stage for collaborative communities.

Europe's current position in the supply and development of Web 2.0 applications is rather weak. Although usage is almost as high in Europe as in Asia and the US, Web 2.0 applications are largely provided by US companies, while Europe, as well all other regions, is left behind. About two thirds of the major Web 2.0 applications are provided by US companies, with similar shares for revenues, employees, and even higher shares for innovation indicators such as patents, venture capital and R&D expenditures. The corresponding shares for the EU hover around 10%.

Nevertheless, there are some parts of the Web 2.0 landscape where Europe is potentially better positioned. This report has investigated three such segments: Social gaming, Social networking, and Mobile 2.0. European industry appears to be more competitive in online social gaming, as in the computer gaming industry at large, than in other parts of Web 2.0. In online social networking, there seem to be niches in the form of locally adapted or in other way differentiated social networks, in which European firms can become competitive. Finally, the EU has several strengths to draw on in establishing leadership in Mobile 2.0, including a very strong presence among mobile communications operators and suppliers.

The major conclusions of this study can be seen as follows:

1. The WEB 2.0 trend is "another" Silicon Valley success story - with all the usual ingredients already largely described in the relevant literature on Silicon Valley and more broadly on clustering, spillovers, venture capital, entrepreneurship, etc, etc. In that sense, it signals "another" failure of the European innovation dynamics to generate global and new providers in emerging segments of the economy.
2. Nevertheless, European entrepreneurs in WEB 2.0 do exist. And seem to survive (or move...to Silicon Valley). It is essential to understand at best the history and contextual conditions of those companies, as to identify where policy can help... or at least avoid them flying away to the US.
3. Also, traditional European incumbent "majors" are active in WEB 2.0 applications. Namely for example SAP and NOKIA. It will be interesting to observe which share of their future portfolio (of R&D, of products, of market, etc.) will encompass WEB 2.0 applications.
4. Last but not least, the absence of viral take-up of WEB 2.0 applications in both the public and the private sector, as back office tools or front office delivery/communication channels is another surprise. Very important (and costly) efforts are deployed by MS governments at national and regional level in such areas as e-Government or e-Health while those opportunities offered by WEB 2.0 seem to be disregarded.

A similar observation goes for the private sector, in particular in the domain of corporate knowledge management. This again raises serious questions related to the conditions set for take-up of IST, as well as the mid-term consequences of such "time-lag" on the adaptive-

ness/efficiency of European public services or the competitiveness of European companies.

An IPTS report (forthcoming) provides a techno-economic analysis of Web 2.0 as well as an assessment of Europe's position in Web 2.0 applications. It should be available at <http://ipts.jrc.ec.europa.eu/publications/index.cfm> before the end of 2008. ■

People

Editor meets Sendov



As this newsletter was getting ready for publication, the Editor had the pleasant occasion to meet Academician Blagovest Sendov, Bulgaria's Ambassador to Japan and the Philippines and member of the NL Advisory Board.

Said Mr. Sendov, "... until 1989, the choice of international institutions including NGOs with which Eastern European ICT professionals interacted was rather limited. Now, the variety is much greater, leading to new priorities for international partners and cooperation. The interest and orientation of the new EU member states and other countries in Eastern Europe is largely determined within the institutions and programs of the EU. Naturally, their ICT communities also prioritize their international collaboration within the EU context. IT STAR and the Newsletter are useful instruments in this process and could play an increasingly important role". ■

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SNAPSHOT

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Type of organization

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

Web-site

www.itstar.eu

Date and place of establishment

18 April **2001**, Portoroz, Slovenia

Membership

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

- Austria (2001) V. Risak, G. Kotsis
- Bulgaria (2003) K. Boyanov
- Croatia (2002) M. Frkovic, M. Glasenhart
- 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. Rovani
- Slovenia (2001) N. Schlamberger

Statutes

IT STAR Charter <http://www.starbus.org/download/charter.pdf> adopted on 23 October 2004 by the IT STAR Business Meeting in Prague, the Czech Republic.

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:

- 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

- 2006 –** Giulio Occhini
- 2003 – 2006** Niko Schlamberger
- 2001 – 2003** Plamen Nedkov
(currently Chief Executive)

Major Activities

- 2nd IT STAR WS and publication on Universities and the ICT Industry http://www.starbus.org/r_d_ws2/r_d_ws2.htm
- 1st IT STAR WS and publication on R&D in ICT http://www.starbus.org/r_d_ws1/r_d_ws1.htm
- IT Professional Pool Database (in progress)
- 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 <http://fistera.jrc.es/pages/roadshows/prague%2004/FINAL%20REPORTrevised.pdf>
- Support to Member Society initiatives and events

Periodicals

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



Final Announcement
3rd IT STAR Workshop
National Information Society Experiences – NISE 08
November 8, 2008, Budapest (Godollo), Hungary

Venue: St. Stephen's University at Godollo, 30 km from Budapest.

Mission: *To investigate the current state, problems and challenges in the development and application of National Information Society Strategies so as to identify best practices and key issues of common interest and facilitate policymaking in the Region and the EU.*

The one-day event based on **keynotes, national and institutional reports** will gather senior representatives of academia, government and industry.

Program

Opening speaker: Representative of the local authorities

Keynote speakers:

- **Giulio Occhini** (Italy), CEO of AICA, "Strategies in Developing IT Skills: National and International Experiences"
- **Cene Bavec** (Slovenia), University of Primorska, "Stimulus for the Use of Public Information Services in the EU"
- **Institute for Prospective Technological Studies, EC JRC-IPTS, Seville**

National reports and speakers:

- **Albania:** N. Frasheri & G. Beqiraj, Center for R&D on IT, Faculty of Information Technology, Polytechnical University of Tirana, Albania
- **Bulgaria:** (tba)
- **Hungary:** G. Bodi, State Secretary of the Prime Minister's Office
- **Italy:** M. Sorrentino, Milano University
- **Lithuania:** S. Maskeliunas & A. Otas, Lithuanian Computer Society-LIKS
- **Poland:** (tba)
- **Romania:** V. Baltac, President, Romanian Association for ICT
- **Slovakia:** P. Tarina, Plenipotentiary of the Government of the Slovak Republic for Information Society Development, & I Privara, SSCS

Panel on ICT-Skills & Policies

Speakers:

- **Johannes Frederik**, President, Dutch Foundation on ICT Education (NIOC)
- **Elsbieta de Pavia Leite**, COMPTIA Policy Advisor for CEE

Other National reports and panel contributions are expected.

The local WS-related costs of the invited speakers and 2 participants (incl. speakers) from each IT STAR member society will be covered by the hosting society. There is no WS registration fee but other participants are expected to cover their related costs.

All presentations (of max. 6,000 words) for the Workshop publication should be sent to [<nedkov@utanet.at>](mailto:nedkov@utanet.at) by 30 September. Further details will follow.

Contacts

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Plamen Nedkov [<nedkov@utanet.at>](mailto:nedkov@utanet.at) (international coordination, program)

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