



Welcome 2015

This Issue is special as it is intended to take you within a spectrum of several decades of ICT development. Our story starts in the late 40s with the **8th IT STAR Workshop on History of Computing**, which brings to the forefront national and regional processes in Central, Eastern and Southern Europe as important contributions to the history of computing worldwide.

It will then lead you on to current hot topics, such as

- **China's trends in the ICT Sector**, by *Prof. Li Wenzheng*, Beijing University of Technology and *PhD Candidate Yan Zhenbin*, Institute of Information Engineering - CAS
- **Mobile empowerment**, by *Prof. Dr. Martin Przewloka*, Senior Vice President of SAP
- **Prospective insights on R&D in ICT**, by *Dr. Giuditta De Prato* and *Dr. Ibrahim Rohman*, IPTS - Seville

We take this occasion to thank you for being with us in 2014 and to wish you and your loved ones the best for the Season and the New Year.

Stay with us for the 2015 Journey!

The Editor

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Letters to the Editor

[Extracts from mails concerning the Autumn NL issue]

I have been reading the latest IT Star with great interest. The contributions by former IFIP Presidents is an excellent idea for publication, and especially as they are all answering the same important questions. It is especially interesting for me to learn of their perspectives about IFIP and its role in the international context over the long term.

Judy Hammond (Australia)

Past Chairperson, IFIP Technical Committee 13 on Human-Computer Interaction

With thanks and acclaims for the last issue of IT STAR's NL bringing so many nice memories of remarkable personalities ... the photos are wonderful and help a lot in providing an idea how stimulating it was to work in the environment of this organization.

Jenny Sendova (Bulgaria)

Member, IFIP TC 3.5 WG "Informatics and Digital Technologies in Elementary Education" ■



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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 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 info@starbus.org.

8th IT STAR Workshop on History of Computing



At the invitation of the John von Neumann Computer Society of Hungary, IT STAR held its 8th IT STAR Workshop on History of Computing on 19 September 2014 in Szeged, Hungary. The conference venue was the Museum on Computer History featuring a permanent exhibition on “The Past of the Future”.

The 8th IT STAR Workshop focused on computer and informatics related developments in Central, Eastern and Southern Europe - projects, processes, interactions and results - within a period of four decades beginning in the 50s of last century.

National and regional programs and processes leading to the construction of the first computers and their applications came to the forefront. The social impact of this activity was examined with emphasis on research, education and economics. The computer pioneers – constructors, policy makers and managers – were spotlighted, with recollections of their achievement and their motivation as role models to current and future generations.

Computing History museums in the region and their role and approach in documenting and preserving IT History, so as to help understand the technological processes and the driving forces of innovation, were discussed.

The program allowed a debate in three distinct areas:

- The broader scene of early computing in Central, Eastern and Southern Europe
- National ICT developments
- Museums of computer history and their role

Twelve presentations were delivered during four consecutive sessions, with speakers from Bulgaria, Croatia, Czech Republic, Finland, Hungary, Italy, Poland, Romania, Russia and Spain.

The Broader Scene

Blagovest Sendov (Bulgaria) in his keynote on Eastern European cooperation in the 60s talked about the influence of the International Federation for Information Processing (IFIP), established in 1960 within the framework of UNESCO, on developments and cooperation of the academies of sciences in the computing field. He provided specific examples with the establishment of the Commission for Scientific Problems in Computing in 1962 and the establishment of the Group for Automatic Programming of Middle-Class Machines, which produced an algorithmic language named ALGAMS.

Vladimir Kitov (Russia) presented the first computers and the evolution of cybernetics in the Soviet Union. Work on the first computers “MESM” and “M -1” started in 1949. The first computer produced in industrial series was created in 1953. The first computer centers were established in the 50s. Cybernetics in the USSR, after the initial period during which it was considered “bourgeois pseudo-science” took its rightful place as one of the major sciences. University courses on computers and programming were organized, and during the second part of the 1950s there were projects proposing to extend the use of computers from scientific calculation tasks to tasks related to the Soviet economy and military.

Petri Paju (Finland) offered an overview of IBM’s business in Central and Eastern Europe from pre-WW II times to the collapse of the Soviet Union in 1991. Light was shed on new information about this little known western computer business in Central and Eastern Europe - when and how IBM entered Central Europe, and how it managed, despite the difficulties of the cold war, to increase its business.

National Developments

Bulgaria – *Kiril Boyanov* reported that use of mechanical calculating machines dates back to 1937 and the first electronic computers were imported at the beginning of the 1960s. The first Bulgarian computer “Vitosha” and the organization of R&D and educational activities were described. The cooperation within the Council for Mutual Economic Assistance in electronics and computing had given a significant push to the creation of a solid research and production base in Bulgaria. The country developed and produced mid-class computer systems, hard disc and magnetic tapes, I/O devices for tele-work and data processing, computer systems, mini and personal computers. The presentation offered a comprehensive overview of the production parameters of computer-related equipment for the period 1971-1990

Czechoslovakia – *Alena Šolcová* traced the first ideas of computer construction starting in the 1935 when Antonin Svoboda and Vladimír Vand began work at the Skoda Works. In 1947, a sophisticated semi-automatic punch card computer was designed by Svoboda, who was also running a course on “Mathematical Machines” at the Czech Technical University in Prague. During the period 1950-1956 the first fully automatic digital computer in Eastern Europe – SAPO was designed and constructed, followed by the automatic digital computer EPOS 1.

Hungary – *Balint Domolki* traced computing developments based on the history of five organizations:

- The first computer in Hungary was built in the late 50s from Soviet documentation in an academic group preceding the Computer and Automation Institute of the HAS (SZTAKI).
- Market oriented application development started in the mid 60s at INFELOR, later forming the Computer Application Company (SZAMALK).
- A PDP-compatible family of minicomputers was developed and manufactured at the computer department of the Central Research Institute of Physics (KFKI).
- For the co-ordination of the Hungarian activities in the Unified System of Computers (ES EVM) the Computer Research Institute (SZKI) was created, later becoming an important R&D center for hardware, software and applications.
- Manufacturing of computing equipment, mainly under French license was done in the VIDEOTON Computer Factory, with considerable export of (mini)computers and peripherals to neighboring countries.

Italy – *Corrado Bonfanti* offered a concise account of the origin, course and aftermath of four far-reaching initiatives in Italy at almost the same time, in a few months encompassing 1954 and 1955. The Polytechnic of Milano and INAC (an Institute of the National Research Council located in Rome), urged by the need of hard computations, embraced the “buy” approach by purchasing an American CRC 102-A at Milano and a British Ferranti Mark I* at Rome. The University of Pisa and the Olivetti

multinational company, preferred the “make” approach and launched two projects that succeeded in setting-up a computer entirely designed and built in Italy: the CEP at Pisa (a single powerful scientific machine) and the Olivetti ELEA 9000 (a business-oriented and fully transistorized computer). These efforts complemented each other, and several kinds of collaborations arose since the beginning. Computing centers in Milan and Rome, together with Pisa’s and Olivetti’s laboratories, have become the incubators for the first generation of Italian informaticians.

Poland – *Marek Holynski* reported that the beginning of computing in Poland dates back to December 1948 with the organization of the first seminar on electronic calculating machines organized by Prof. Kuratowski, Director of the Institute of Mathematics at the Polish Academy of Sciences. As a result, a research team was set up. The first working machine (Differential Equations Analyzer) was completed in 1953, followed by the Electronic Machine for Automatic Calculations in 1955. In 1957 an independent Mathematical Apparatuses Division (ZAM) was established at the Academy and in 1958 the first Polish electronic digital machine named XYZ was launched, followed by the improved and suitable for mass production ZAM-2 in 1960. The ZAM division was transformed in 1962 into the Institute of Mathematical Machines. In the late 60s various other centers were established.

Romania – on the backdrop on international developments, *Vasile Baltac* presented the first Romanian computers - CIFA-1 (1957) in Bucharest, MECIPT-1 (1961) in Timisoara, DACICC-1 (1962) in Cluj-Napoca, and the role of Academician Grigore C. Moisil, as a mentor to all teams. The first generation computers were followed by a series of second generation transistorized computers CET-500 (Victor Toma-1963), MECIPT-2 (Lowenfeld, Kaufman, Baltac – 1963), DACICC-200 (Muntean, Farkas, Bocu -1964). In 1965-1966, a powerful R&D institute for computers was established to respond to the needs for a computer industry. A license from CII-France for the production of IRIS-50 led to the birth of the computer industry in the 1970s. A joint venture with Control Data Corporation – USA, was set up in Bucharest, manufacturing modern peripherals. The software industry emerged. Romania’s attitude to the Ryad computer series and the Mini EVM project within the East European cooperation was recalled. The presentation reviewed the link between political decisions and computer industry development and traced the roots of the present IT development in the past. A case of professional restoration (MECIPT-1) was presented.

Yugoslavia – *Marijan Frković* provided an outline of development in the former Yugoslavia primarily through the prism of the history of computing in Croatia and Slovenia. The history could be roughly divided into three periods: before 1965, 1965 to 1975, and after 1975. Before 1965 the deployment of computers was limited to purchase of computers and their use mostly in universities. After 1965, computers have been imported also for commercial purposes, training centers have been established, and the first faculties of computing and informatics have been found.

In the seventies the country had developed an ambition to produce its own computers. The start was license production of computer peripherals in Croatia and Serbia and after that also license production of computers. This effort culminated with “eigen”-production of minicomputers in Slovenia. Parallel to hardware production also a noticeable development of software could be registered, starting with general usage application software. After 1975, the achievement of Suad Alagić related to his DBMS concept was probably one of the world’s best at the time.

Museums of Computer History

Ana Pont Sanjuán presented how a group of teachers of the Universitat Politècnica de València (UPV) has included the visit to the Museum of Computer History as an additional activity of the Computer Organization subject with the main objective of increasing the student motivation and spreading the history of computers among young people. The Museum of Computer History of the UPV is an official museum recognized by the government of the autonomous region of Valencia, and can be an interesting tool to help educational challenge. The presentation explained the

organization of this experience, traced the links between museum collections and the topics of the studied subjects, and showed evaluation concerning the satisfaction level of students and the degree of achievement of the set objectives.

Istvan Alföldi traced the efforts in setting up a collection of computer related artifacts in the Szeged Exhibit. Since the mid-seventies, an intensive collection was organized to preserve used equipment of computing centers in Hungary. The work of a handful of volunteers, mainly from the University of Szeged, has been helped by the expertise and financial support of the John von Neumann Computer Society, resulting in one of the largest collections in Europe of computing equipment. Full configurations and equipment in operating condition are available. A carefully selected part of this large collection is exhibited in the newly built Szent-Gyorgyi Albert Agora in downtown Szeged, under the motto “The Past of the Future”, providing an overview of the history of computing from the abacus to the internet, also including valuable relics from the life of John von Neumann. The Ladybird of Szeged has been chosen as the symbol of the exhibition. ■

Awarding Ceremony

At the start of the afternoon session an Award ceremony was held in honor of *Plamen Nedkov*, Conference Moderator and IT STAR Chief Executive.



Academician Blagovest Sendov presented the Bulgarian Academy of Sciences President’s Medal and Diploma, and said that this is an outstanding Award, which the President of the Bulgarian Academy of Sciences has requested him to deliver to Mr. Nedkov during this important event, in recognition of his long-standing contribution to the development of the Academy’s international relations, and on the occasion of his forthcoming sixtieth Anniversary.

In his acceptance speech, *Mr. Nedkov* recalled that he had joined the Academy in 1982 with responsibilities for projects, programs and activities with international organizations. At that time, the Vice-President & Secretary General, overseeing this activity, was very active in this field himself and they had made a great team.

He was chosen as IFIP Contracts Officer in 1989, and in 1994 he was invited to take responsibility for transferring the IFIP Headquarters and Secretariat from Switzerland to Austria and setting-up the offices in Laxenburg, near Vienna. In 1996 he was named IFIP Executive Director and also had continued as Contracts and UNESCO Liaison Officer, a position he has held until 2003. In 2000, together with *Mr. Niko Schlamberger*, President of the Slovenian member society of IFIP, he had facilitated the process to establish a more structured regional cooperation in the IT field. This had resulted in the establishment of IT STAR, on 18 April 2001 in Portoroz, of which he is one of its founding fathers. The computer societies of Austria, Hungary, Italy and Slovenia were founding members. He had served as the Association’s first Coordinator, and, since 2006 as IT

STAR's Chief Executive.

During these years, he had kept close contact with the Bulgarian Academy of Sciences on IFIP and IT STAR activities and is grateful and proud to receive this outstanding Award.

Post-conference book

The book with the revised and edited conference proceedings is now published (see p. 8). ■

ICT Developments in China

Li Wenzheng, Yan Zhenbin



Li Wenzheng is Council Member of China's Institute of Communications, IEEE Member, and Professor of Internet and Communications at the Beijing University of Technology



Yan Zhenbin is a candidate for Ph.D. at the Institute of Information Engineering at the Chinese Academy of Sciences

Introduction

With the rapid development of China's economy, by the end of December 2013 the total number of China's fixed broadband Internet users reached 189 million, the 4M+ broadband users accounted for 78.8%, the proportion of non-voice revenue reached 53.2%, the mobile data and the mobile Internet business developed rapidly, revenue grew 59.6%. Based on the rapid development of the Internet and various services, the e-Commerce market reached 10.67 trillion Yuan, an increase of 33.5%. In 2014, China's 4G user optimistic estimates are expected to surpass Japan and South Korea to become the world's second largest, after the US, in the LTE market. Moreover, the Ministry of Industry and Information Technology has announced this year 300,000 new 4G base stations and an increase of 4G users to 30 million.

I. National Information Industry Public Service Platform

At the beginning of 2004, China Electronic Information Industry Development Institute started to establish a "national

information industry public service platform" in order to accelerate the development of China's ICT industry. It starts from the height of national strategy, combined with the development of information industry needs, then establishes this public service platform system of information industry. The platform through the most authoritative industry policy and service content guides the healthy development of the industry, provides the most comprehensive and professional services industries for government or companies.

The Platform consists of two major centers, five platforms, including the industrial centers, economy center, information technology platforms, networking platform, software platform, ecological platform, cultural and creative learning platform and supermarkets. The platform provides decision support services for China's normalization construction fields, such as industrial policy dissemination and interpretation, policy recommendations seek, policy impact assessment, major projects decision support, industry information consultation, industry planning consultation and other forms of industrial planning services, etc.

II. ICT In Mobile Virtual network Operators

On December 26, 2013 the Ministry of Industry and Information Technology officially issued the first licenses for mobile virtual network operators, allowing domestic private companies to offer packaged mobile services to users. 11 Chinese companies received the first licenses and now the number has reached 33. The Ministry published draft proposals on allowing Chinese private companies to buy mobile network resources from three Telecom operators: Mobile, Telecom and China Unicom. License-holding companies will be allowed to run basic telecom businesses by renting infrastructure from telecom operators and providing services through network access they have leased at wholesale rates from another mobile operator. Today, there are more than 1100 virtual operators around the world, in overseas mature markets - the virtual operator share accounts around 10% of the market share. The Virtual operators and three Telecomm operators both compete and cooperate and could bring more vitality to the entire market in the national regulatory and guidance.

III. 2014 - China'S Top 10 Trends In The ICT Sector

- **Accelerate the construction of broadband cities - more 4M broadband users to move round**

In 2013 China's 4M+ broadband users have reached 80%. In 2014, this proportion will continue to increase to 8M+, the users will migrate to a higher broadband service.

- **China is expected to jump in the world's second-largest 4G market**

Currently, the United States, Japan and South Korea account for 87% of the total global LTE market. Although China's 4G started late there are great opportunities ahead. The data show that in 2014 Japan's LTE subscribers are around 50 million, South Korea is expected to reach 40 million, the number of users currently the United States has is more than 100 million, and the number of 4G users is expected to reach 60 million in China.

- **Internet service revenues approaching half of information and communication services market**

The momentum of the Chinese ICT industry has been completely turned to the Internet field. The total income of all Chinese Internet companies, value-added services business and the three carriers, will reach 1.8 trillion Yuan, an increase of about 14%, including Internet-related service revenue will be close to 900 billion Yuan, which is nearly half of industry revenues.

- **Internet comprehensive transformation of traditional industries, information technology and Industrialization accelerate the depth of integration**

2013 was the first year of Internet banking, while in 2014 the impact of the Internet on the financial industry will become more apparent. Internet transformation of business services has changed to the transformation of the manufacturing sector.

- **Mobile virtual network operators will accelerate competition and cooperation**

Private capital into the industry, especially the virtual operator licenses issued, will bring new changes and new perspectives to the whole industry.

- **Rapid development of the global pan-intelligent terminals, Tablet PC shipments exceed PC**

The brand and quality of Chinese smart phones are significantly improved; China will upgrade the terminal industry. On the other hand, the international terminal business will move to the low-end market, expand market share, competition between the two sectors will be more intense.

- **Intelligent terminal chip to accelerate the development of multi-mode multi-band multi-core; 64-bit processing chip has become a hot issue**

China is already in the terminal chips with great breakthroughs. 2011 China mobile chip industry in the global market share of only 1% in 2012 to reach 10%, while in 2013 it broke through the 20%, Chinese 28-nanometer chips will move mass production in 2014.

- **Cloud computing applications focus vertical industry, Big data spread to traditional fields**

The Cloud services market is to move from the Internet sector to the vertical market and will become a major issue for telecom operators. Big Data is from an academic concept a reality and it begins to be applied to many fields.

- **Internet of Things to accelerate the expansion of industrial applications and public applications**

Internet of things market is showing two trends, one is a combination of industrial applications and the industrial revolution, and the other is to expand the public networking application market. With the implementation of related policies on the Internet of Things, the networking industry in China is expected to maintain a 30% growth rate.

- **Unprecedented rise in the importance of network and information security: A national security strategic focus**

After the explosion of the "Prism" incident, each country will adjust information security strategy: China's information security will stand at a new starting point, China will strengthen the network information security from different angles, which include strategy, organization, laws, regulations, key technology, industrial development and so on.

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Partner Publication



<http://mondodigitale.aicanet.net/ultimo/index.xml> ■

New IT STAR book

Plamen Nedkov, Balint Domolki & Giulio Occhini (Editors)



History of Computing



IT STAR Series

This volume contains the revised and edited proceedings of the 8th IT STAR Workshop on History of Computing, held on 19 September 2014 in Szeged, Hungary.

It brings to the forefront national and regional programs and processes in Central, Eastern and Southern Europe leading to the construction of the first computers and their applications. The social impact of this activity is examined with emphasis on research, education and economics. The computer pioneers, constructors, policy makers and managers are spotlighted, with recollections of their achievement and their motivation as role models to current and future generations. The role of ICT History museums to help understand the technological processes and the driving forces of innovation is considered.

The book offers a unique contribution to history of computing worldwide.

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Mobile Empowerment: How the use of modern ICT leads to new business models – focus eBusiness

Martin Przewloka, SAP AG



Prof. Dr. Martin Przewloka serves as Senior Vice President at SAP and is worldwide responsible for the Global Program of Mobile Empowerment.

During his tenure with SAP, Martin Przewloka held various management roles. Previously, he was Global Head of SAP Research Future Internet Applications and before Senior Vice President of Showroom & Trial Solutions as part of SAP Marketing, responsible worldwide for all SAP demo and presentation solutions, infrastructures, and services. Formerly, he was responsible for several SAP industry solutions as well as for SAP ERP, the SAP flagship product. Martin is based at the SAP headquarters in Walldorf/Germany.

Introduction

Accelerated expansion and ubiquity of ICT infrastructures, the ‘post-PC device generation’ (such as, smartphones, tablets, Smart TV’s) and the increasing and changing demands for mobility lead to a change in economic processes, noticeable in all areas of our lives. Especially manufacturing and related businesses will look very different in the future and will be virtually unrecognizable from the visible world today. Over the next 15 years, 1.8 billion people will enter the global consuming class, and worldwide consumption will nearly double to \$64 trillion [Kins12]. Established/Advanced, emerging and developing countries will come closer together in all economic sectors while using these ICT technologies.

Moreover, the human / civil society develops from consumers of products and services to a provider, co-designer, developer, etc. of disruptive innovations. The ‘mobile’ Internet will become the central platform (in ‘old’ economies as well as in emerging and developing countries) in order to network, actively build and influence these new economic structures. In addition, this fact will be even accelerated by the seamless and increased usage of modern ICT and the requirements on secure, high-performance ICT infrastructures will increase dramatically.

The way towards an ‘Unwired Enterprise’ as the basis for new type of digital services

Integrated value chains, understood as a pooling of individual value-adding processes are indispensable in today’s industry. However, the modern ICT now allows the transition from highly optimized supply chains - building mass products in the most efficient way - towards so-called value-added networks building mass customized

products. This includes, for example, cooperation between companies from successive value chains as well as the flexible formation and use of partnerships in development, sales, marketing and services. The result is the formation of decentralized (organizational) formations, reinforced by the opportunity to work on the move in these structures. As a direct consequence, new forms of eBusiness regarding new products and services can be generated, such as a product development process that actively involves the innovation power of the community instead of just specialists of the respective enterprise (‘crowd sourcing’).

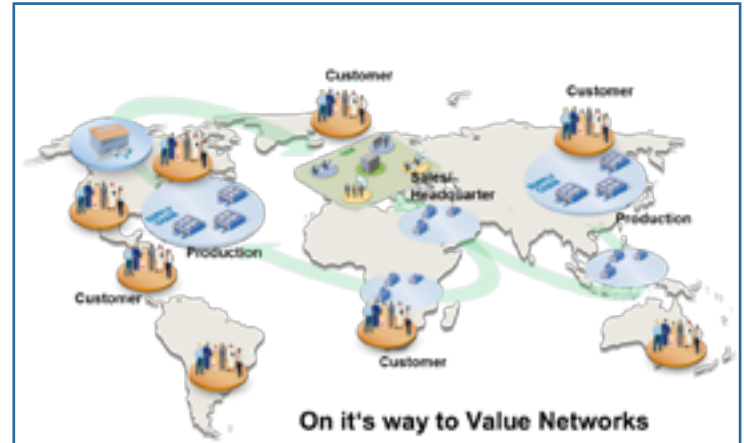


Figure 1: Mobile empowerment supports and promotes the formation of flexible and dynamic value networks

Two concrete at SAP implemented use cases to the concept of Mobile Empowerment are briefly described as examples.

Use case #1: ‘Business in Your Pocket (BiYP)’

The solution presented hereby, ‘Business in Your Pocket’ has been successfully tested in several field trials by SAP SE and is currently being investigated in terms of future market opportunities.

The BiYP solution is based on the core idea that an entrepreneur or a small team wants to start a new business. The type and/or industry of business is not limited: for example it can be a ‘classic’ business (e.g. repair services, the opening of a shop), a ‘digital’ business (e.g. content related services) or any combination of ‘analogue’ and ‘digital’ business. In any case, to develop and to establish this new business, a fully integrated ICT solution is needed, which is directly applicable and moreover inexpensive. Both back-end functions (such as billing, enterprise resource planning) and front-end functions (such as scheduling, call center functions) have to be dynamically and flexibly adapted to the requirements of the entrepreneur. All business processes have to be accessible by a mobile in the most secure and persistent way.

The solution, Business in Your Pocket can be understood as a library of business applications, accessible using a ‘Business Applications Store’. Following this concept, the entrepreneur has the unique opportunity to constantly develop his enterprise by adding and implementing additional services helping him to transition from a

traditional business towards new forms of eBusiness. However, this approach will even further scale from another perspective: the Business Application Store as the container for services can be complemented by new services/solutions built from the ecosystem. This exactly will lead to another source of new eBusiness innovations that can be later ordered by everyone. Examples for new services are data driven services (e.g. ‘sensor data as a service’) or quality management services (e.g. ‘crowd testing’).



Figure 2: ‘Business in your Pocket’ solution implemented on a smartphone

Use case #2: ‘Smart Vending’:

Vending machine are quite known and everywhere used in the world allowing people to get their food and drinks whenever they want. Already today, those machines are not just positioned in public buildings/areas or on street, canteens, schools etc. use them as well to offer and sell products in a very efficient way.

Simply connecting a vending machine with the internet by using state-of-the-art technology has now the potential to revolutionize the vending business: from the operator perspective, from the customer perspective and from vending machine service provider perspectives. By using mobile and cloud based services, immediately new forms of eBusiness can be applied:

- Transfer of funds to a (virtual) bank/vending account: whenever a customer wants to purchase products, he is using his smartphone to connect in front of the machine to order a certain product and to pay for it
- New business forms of maintenance, e.g. predictive maintenance: instead of performing regular, expensive maintenance checks, the vending machine itself can order/call the maintenance service depending on the level of usage, potentially upcoming technical problems etc.
- New business forms of stock management: similar as maintenance, the smart vending machine takes control about refilling of goods and orders new products automatically based on current stock situation and/or stock predictions.
- New forms of customer centric services such as the implementation of electronic vending vouchers:

customers can order electronic vending products voucher and send to their friends. Those vouchers can be used next time in front of a vending machine to collect this product or a product of choice again using the smartphone. In a similar way, retailers can run marketing/advertising campaigns providing their customers with vouchers to test new products etc.

The list of new services or forms of eBusiness is not complete, but the adoption of modern ICT combined with mobility is the main driver to develop and implement this new type of services and can be seen as the unlimited source to build new solutions on top of it.

Conclusion

The author has outlined some key parts of the basic concept and the potential of mobile empowered environments. In addition, two concrete use cases have been described, both already proved successful in field trials by SAP SE. However, next to today’s technology problems, such as limited bandwidths, latency issues, data security problems, etc., the impact on the lives of people can be fundamental. The risk of further mixing the private and professional life is threatening, as well as the fundamental question of future employment models. The immense possibilities of creating new business models and jobs supported by a mobile internet will further increase global competition and has to be carefully investigated. Furthermore, another key element will be of central importance: the future concepts of usability and human computer interfaces. [Badu12]. Applications must be operated in a simple manner and ideally without training or expensive learning activities. Today’s heterogeneity of devices, cloud services, operating systems, etc. still causes significant challenges to develop universal applications supporting and driving new forms of eBusiness.

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Prospective Insights on R&D in ICT (PREDICT): What messages can we learn?

Giuditta De Prato, Ibrahim Kholilul Rohman



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 at the University of Bologna, where she also lectured on macroeconomics and environmental economics.



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) aims 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 progress of ICT sector by its two sub-sector categories, ICT manufacturing and service. It also assesses the progress between the EU Member States, and compares the EU's achievement with other non-EU economies that are currently taking the lead in the world ICT economy, including both developed and emerging economies. The other main objectives of the study are to provide an analysis of private and public R&D investments in the EU ICT sector and to analyse ICT R&D performance through a worldwide analysis of patenting in ICT.

The collection of PREDICT data is based on the latest available information from official sources such as Statistical Office of the European Communities (Eurostat), the Organisation for Economic Co-operation and Development (OECD), the University of Groningen's EU KLEMS and national statistics. The most recent edition in 2014 covers the period 2006-2011, and as such includes the analysis of the consequences for the EU ICT sector and its R&D of the deep recession in the region. One of the most important strength of PREDICT study is the detailed definition on ICT sector following the NACE Rev 2 classification by OECD (2007). Thus, according to this definition, the ICT sector is composed of several sectors described in Table 1.

The pervious report of PREDICT 2013 has contributed significantly as the source for policy inputs. It directly provided indicators to the Digital Agenda for Europe Scoreboard, especially related to the EU ICT Sector and its R&D performance 2014.

The recent study in 2014 brought several important messages:

- The EU ICT sector continued losing share in total value added from 4.10% in 2006 to 4.02% in 2010

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

Table 1 The ICT sector (2007 OECD definition)

and 3.99% in 2011. But, the EU ICT sector share in terms of employment increased from 2.66% in 2010 to 2.72% in 2011, as job creation in the ICT sector has been stronger.

- ICT sector Business Enterprise Expenditure on R&D (BERD) intensity (as measured by the ratio of ICT BERD/ICT value added) has experienced an increase between 2010 (5.30%) and 2011 (5.50%).
- The ICT R&D public funding intensity, measured as the ratio of ICT GBAORD, (Government Budget Appropriations or Outlays on R&D) of total GBAORD also increased in these two years from 6.52% in 2010 to 6.63% in 2011, although the intensity on GDP has decreased slightly.
- While the intensity of public ICT R&D keeps improving, the region should have achieved bigger. The gap of cumulative growth rates between the estimated ICT GBAORD and the DAE targets increased from only 1% in 2008 to 12% in 2011. Based on the DAE target, the EU should have achieved €5.8 billion in 2008 with the actual spending of €5.7 billion and €6.8 billion in 2011 with the actual spending of €6.1 billion as shown in Figure 1. Note that the DAE, in its R&D-related pillar, mandates Member States to double their annual public spending on ICT research and development. In Action 55, the DAE states that “Member States should, by 2020, double annual total public spending on ICT R&D from €5.5 billion to €11 billion (which includes EU programmes), in ways that leverage an equivalent increase in private spending from €35 billion to €70 billion.

- In 2011, for the first time since the onset of the crisis, the EU ICT manufacturing sector showed a positive employment growth rate (1.03%), BERD (3.76%) and R&D personnel (3.62%) but not in labour productivity (-6.70%) because of the slowdown in ICT value added (-5.75%). In other indicators, the comparison between ICT sub sector can be seen in the following Figure 2
- The performance of ICT sector varies considerably between member States. In 2011, for instance, the ICT sector value added was highly concentrated in the five largest EU countries: Germany (17.03%), the United Kingdom (UK) (16.95%), France (15.95%), Italy (11.26%) and Spain (7.16%). These five countries together generated 68.35% of total EU ICT VA, and 64.66% of total ICT sector employment. The comparison for other variables is shown in Figure 3.
- Comparing the EU with other economies shows that the region should accelerate the pace of its ICT development progress. For instance, the US keeps their lead in terms of VA in 2011. Additionally, in terms of BERD, four Asian countries are currently better progressing: Japan, China, Korea and Taiwan. The comparison with other economies on several indicators is shown in the following Figure 4

In the close future, PREDICT is expected to provide further insights from several different angles: on one hand, developing a more detailed analysis of R&D at sector level both in terms of BERD and GBAORD, together with spatial analysis, on the other, some scenario analysis are being developed about ICT R&D both public and private, with and without fulfilment of the DAE target, investigating the impacts on sectors and on other macroeconomic indicators (employment, growth, inflation). ■

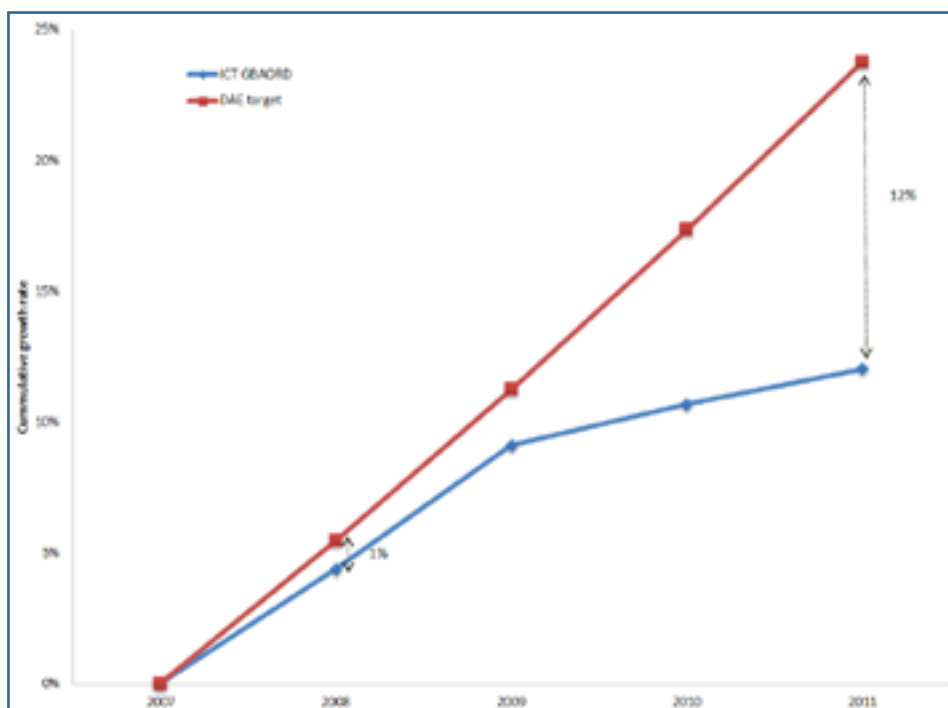


Figure 1: EU ICT GBAORD and DAE target evolution (2007-2011)

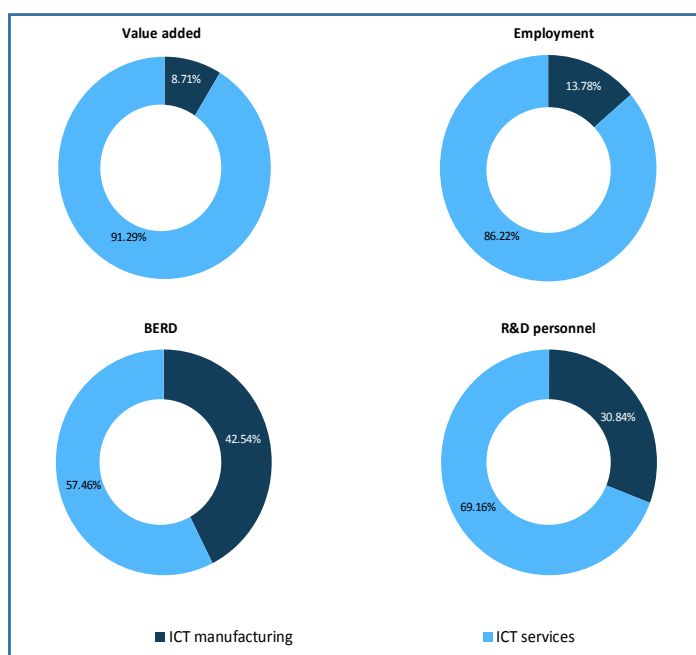


Figure 2: Comparison between ICT manufacturing and services on value added, employment, BERD and R&D personnel in 2011

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



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

Note: The ICT GBAORD refers 2008 value for Poland. Newer MS are Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia. Other old MS comprise Austria, Belgium, Denmark, Greece, Ireland, Luxembourg and Portugal.

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

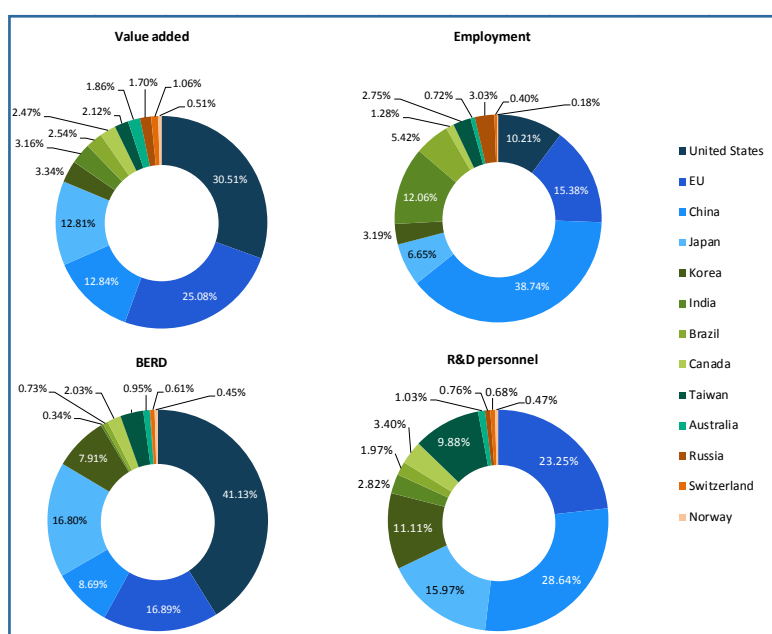


Figure 4: Comparison of ICT sector value added, employment, R&D personnel and BERD for other economies and the EU (2011)

Note: ICT totals correspond to the operational definition of ICT sector.

Value added: Value added refers to 2010 for Canada and Japan. Employment refers to 2009 for India. R&D personnel and BERD refer to 2008 for Switzerland. The R&D personnel for the United States is not available.

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

Member Society News & Events

Austria

The Austrian Computer Society (OCG), founded by Heinz Zemanek in 1975, is preparing a small anthology of personal recollections *"In memoriam Heinz Zemanek"* by companions and colleagues of Prof. Zemanek in which encounters, shared activities and experiences will be presented. These recollections are aimed at reflecting particularly the personality of Heinz Zemanek.

Lithuania

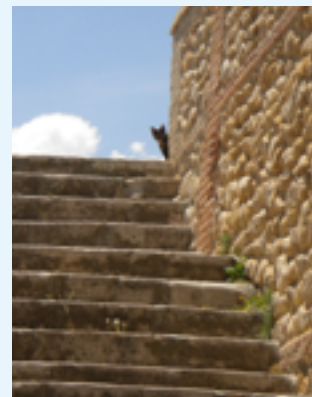
The Lithuanian Computer Society will hold its traditional biennial multi-event "Computer Days – 2015" (www.liks.lt/kodi_en) on September 17–19, 2015 at the KUT Panevėžys Faculty of Technologies and Business in Panevėžys, Lithuania. The following events are included in the format:

- 17th International Scientific Conference (MKK)
- 12th Conference on Informatics in School Education (MIK)
- 2nd Conference on Distance and E–Learning (DMK)
- 7th Conference of Lithuanian Young Scientists "Operation Research and Applications"
- Workshop on Information Society Development Issues
- Tutorials for IT teachers, doctoral, post- and undergraduate students
- 14th Congress of the Lithuanian Computer Society
- Conference of Lithuanian Association of Informatics Teachers
- Workshop on ECDL implementation activities in Lithuania

Poland

The Polish Information Processing Society (PIPS) has kindly extended an invitation to IT STAR to hold its next 9th Workshop in October 2015 in Poland. Details concerning the program and the exact dates and venue will be announced in early 2015.

Within the possible topics for future events that were recently considered by IT STAR are e-Business, Green IT, Emerging Technologies, IT STAR's Members and the Digital Agenda 2020, Net neutrality, 3D scenery construction, and other. ■



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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
- 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. Rován
- 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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