Plamen Nedkov, Balint Domolki & Giulio Occhini (Editors)

History of Computing

History of Computing

Plamen Nedkov, Balint Domolki & Giulio Occhini (Editors)

History of Computing

Proceedings of the **8th IT STAR Workshop**
on History of Computing

19 September 2014
Szeged, Hungary

CONTENTS

1.   Introduction

1.1.   Introduction and Executive Summary

At the invitation of the John von Neumann Computer Society of Hungary, IT STAR confirmed during its Business meeting in May 2013 its intention to convene the 8th IT STAR Workshop on History of Computing in September 2014 in Szeged, Hungary.

The Museum on Computer History and the permanent exhibition it features on "The Past of the Future" were the primary reasons for selecting Szeged as venue.

A.   The Organizers

NJSZT – the John von Neumann Computer Society, is an independent professional society engaged to assist in

• Disseminating practical applications and results of IT, helping to solve current problems
• Conserving and increasing the prestige, the standards and the ethics of the profession
• Informing computer specialists about the development of theory, about useful practical results and experiences made by users
• Pronouncing the views and representing the professional interests of the computer community
• Spreading the culture of computing, providing regular further education for computer professionals
• A wide-ranging participation in the international professional exchange of experience and information to IT professionals.

IT STAR as a regional information technology association of 15 leading national computer societies in Central, Eastern and Southern Europe has the mission to augment the activities of its members by providing a forum for debate within a regional and international context. It organizes conferences, publications and projects related to education, research, development and applications within the IS agenda, and disseminates information and results internationally.

Following the decision to convene the 8th IT STAR WS in Szeged, a Program and Organizing Committee was set with co-Chairs – Balint Domolki, Honorary President of NJSZT and its representative to IT STAR, and Istvan Alfoldi, Managing director of NJSZT and local OC Chair, and Plamen Nedkov, IT STAR Chief Executive and Moderator of the WS on History of Computing.

An Editorial Board for the post-conference proceedings was established with Messrs Nedkov, Domolki and Occhini (AICA CEO) as editors.

B.   Mission, program and participants

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 conference proceedings are video recorded and available on DVD.

C.   Executive Summary of Presentations

C.1.   The Broader Scene

Blagovest Sendov 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's presentation was on 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 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.

C.2.   <u>National Developments</u>

<u>Bulgaria</u> – *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-working 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

<u>Czechoslovakia</u> – *Alena Šolcová* traced the first ideas of computer construction starting in the 1935 when Antonin Svoboda and Vladimir 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.

<u>Hungary</u> – *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.

<u>Italy</u> – *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 Date 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.

C.3.   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 Alfoldi 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.

D.   Conference Documentation

Slide presentations and other conference documentation are available at the 8th IT STAR WS website – www.starbus.org/ws8. Further recommended literature is available at the IT STAR Newsletter website – http://nl.starbus.org, and specifically in the 2014 NL issues – Vol. 12, nos. 1 and 2, as follows:

Vol. 12. No. 1, Spring 2014 pp.6-13
Vitosha, the 1st Bulgarian Computer	*Kiril Boyanov*
Antonin Svoboda and the 1st Czechoslovak Computer	*Julius Stuller*
The Short History of M-3, the 1st Hungarian Electronic Digital Tube Computer	*Győző Kovács*
MECIPT 1 – The 1st University Project and the 2nd Computing Machine of Romania	*Vasile Baltac*
ELEA, the 1st Italian Computer	*Giulio Occhini*
The 1st Lithuanian Accounting Machine	*Gintautas Grigas*
Poland's First Computers – How It Started	*Stanisław Jaskólski*
CER-10 – The First Digital Electronic Computer in Serbia	*Dusan Hristovic*

Vol. 12. No.2, Summer 2014 pp.3-8
Development and Use of the First Three Soviet Computers	*Vladimir Kitov*
Datatron 205 comes to Vienna	*Walter Grafendorfer*
First Real Computers in Slovenia	*Franci Pivec*

Plamen Nedkov
Chief Executive and Conference Moderator
IT STAR

PROGRAM
8th IT STAR Workshop on History of Computing
Friday, 19 September 2014
Albert Szent-Gyorgyi Agora, Szeged, Kalvaria sgt. 23, Hungary

09.00
Welcome on behalf of the John v. Neumann Computer Society - *István Alföldi, Managing Director*
Welcome on behalf of the Hungarian National Council for Telecommunication and Informatics - *Albert Biro, Chairman of the Advisory Board*

Opening and Setting the Scene
Plamen Nedkov, Conference Moderator
Keynote: **60s and Early 70s – Eastern European Cooperation in Computing**
Blagovest Sendov, Keynote Speaker

09.30 – 10:30
Soviet Union: **First Computers and Evolution of Cybernetics**
Vladimir Kitov
Yugoslavia: **History of Computing in the West Balkan Countries**
Marijan Frković, Niko Schlamberger & Franci Pivec

10.30 Coffee break

11:00 – 13:00
The Museum of Computer History - Teaching Support for Computer Organization Subjects
Ana Pont Sanjuán, Antonio Robles Martínez, Xavier Molero Prieto, Milagros Martínez Díaz
History and Highlights of a Computer Museum
István Alföldi, Mihály Bohus, Dániel Muszka, Gábor Miltényi

[*Guided tour, Szeged Museum*]

13.00 Lunch break

14.00 – 14.30
IBM and Eastern Europe
Petri Paju

14. 30 – 16.00
Bulgaria: **History of Computing in Bulgaria**
Kiril Boyanov
Italy: **The Early Approach to the Computer Era**
Corrado Bonfanti
Czechoslovakia: **History of Computing in the Czech and Slovak Republics**
Alena Šolcová

16.00 Coffee break

16.30 – 18.30
Poland: **Early Computing in Poland**
Marek Holynski
Romania: **History of Computing in Romania**
Vasile Baltac, Horia Gligor
Hungary: **Computing in Hungary – Through the History of Five Institutions**
Balint Domolki

18.30 Conference Wrap-up

1.3.   Moderator, Speakers and co-Authors

Plamen Nedkov (*Moderator*) is Chief Executive of IT STAR and Steering Committee member of CEN's WS on ICT Skills. He was Head of Department at the Bulgarian Academy of Sciences, Executive Director of IFIP and elected member of UNESCO's NGO Liaison Committee.

Blagovest Sendov (*Keynote Speaker*) was Rector of Sofia University, President of the Bulgarian Academy of Sciences, President of the International Association of Universities (IAU) and the International Federation for Information Processing (IFIP). He was Chairman of the Bulgarian Parliament and Bulgarian Ambassador to Japan.

István Alföldi is Managing Director of the John von Neumann Computer Society (NJSZT). He was the editor of the book "The Past of the Future" and has significantly contributed to enhancing the prestige of NJSZT. He is a member of the Quality Assurance Committee of ECDL Foundation since its beginning.

Vasile Baltac is a computer pioneer and has made significant contributions to the development of the computer industry in Romania. He served as President of CEPIS and is currently President of ATIC, the Romanian ICT Association member of IT STAR, CEO of the SoftNet Group and university professor of information systems.

Mihály Bohus is a senior lecturer of networking at University of Szeged. The topic of his university doctoral thesis was the protocol specification and testing. He is responsible for the programs of computer history Collection and Exhibition of ITMA foundation.

Corrado Bonfanti was involved in technical and managerial assignments in computer-related industries and taught history of informatics and computing instruments at several Italian universities. He is a frequent conference speaker and authored over thirty papers.

Kiril Boyanov is Member of the Bulgarian Academy of Sciences and Bulgarian representative to IT STAR. He has provided leadership within the Bulgarian ICT industry and in ICT R&D, notably as Director of the Institute of Parallel Processing at BAS.

Milagros Martínez Díaz is Associate Professor of Computer Architecture at the Universitat Politècnica de València (UPV), Spain. She has taught several courses on computer organization and structure and her current research interest includes web and internet architecture.

Balint Domolki participated in the building of the first electronic computer in Hungary, held several leading positions in the software industry and represented Hungary in various IFIP bodies. He is Honorary Chairman of the John von Neumann Computer Society and its representative to IT STAR.

Marijan Frković is President of the Croatian IT Association and National ECDL coordinator. He held leading informatics-related positions in a large industrial company and served as Director of the Center for Informatics of the Croatian Chamber of Commerce.

Horia Gligor is Head of the Institute for Computer Technology - Timisoara Branch. He is also vice president of ATIC – Association for the Information Technology and Communications of Romania and head of IDG Group Banat Area. He managed the project of MECIPT-1 restoration and set-up of a Computer Branch of the Banat Museum.

Marek Holynski is Director of the Institute of Mathematical Machines in Warsaw and Vice-President of the Polish Information Processing Society.

Vladimir Kitov is Professor of Applied Mathematics at the Plekhanov Russian University of Economics. He is author of 70 publications, including 3 monographs on real-time systems and computer networks and a textbook on System Programming.

Antonio Robles Martínez is full Professor of Computer Architecture at the Universitat Politècnica de València (UPV), Spain. He has taught several courses on computer organization and architecture. His current research interest includes high-performance interconnection networks and scalable cache coherence protocols.

Gábor Miltényi is Deputy Chief Executive of John von Neumann Computer Society (NJSZT) and Program Manager of the Past of the Future – Exhibition on the History of Information Technology. As such, he has contributed to the maintaining the prestige of NJSZT.

Dániel Muszka is technical director of Laboratory of Cybernetics founded by professor Kalmar at the University of Szeged. He designed the Ladybird robot of the 50s. His research work was vehicle cybernetics and he is university doctor. His main dream is the making of a computer museum, the idea of Gyozo Kovacs in the 70s.

Petri Paju is a Postdoctoral Researcher at the University of Turku, Finland, in the department of Cultural History. His doctoral dissertation in 2008 concerned information technology and nationalism in the 1950s Finland. Recently he has studied IBM's European history in the post-war period.

Franci Pivec is Chairperson of the Chapter of History of the Slovenian Society INFORMATIKA and a former Vice President of the Society.

Xavier Molero Prieto is Associate Professor of Computer Architecture at the Universitat Politècnica de València (UPV), Spain. He has taught several courses on computer organization and performance modeling and evaluation. Currently he is Director of the Museum of Computer History at the UPV.

Ana Pont Sanjuán is full Professor of Computer Architecture at the Universitat Politècnica de València (UPV), Spain. Her current research interest includes web and internet architecture. Currently she is the Spanish representative to IFIP's Technical Committee 6.

Niko Schlamberger is President of the Slovenian Society INFORMATIKA. He has served the International ICT Community in various functions including as IT STAR Coordinator, IFIP Vice-President and CEPIS President.

Alena Šolcová is Associate Professor at the Department of Applied Mathematics of the Faculty of Information Technology, Czech Technical University in Prague, the Czech Republic.