Global
Communications
Newsletter
September 2009

EUROCON 2009 – Technology and History

18-23 May 2009, St. Petersburg, Russia

By Jacob Baal-Schem, Israel, and Dmitry Tkachenko, Russia

EUROCON Conferences are a series of Conferences held every second year by IEEE Region 8 in one of the countries of Central Europe. The first EUROCON was held in 1971 in Lausanne, Switzerland. After a 12-year break, the "renovated" EUROCON conferences started in 2001:

- EUROCON 2001 — July 2001, Bratislava, Slovakia
- EUROCON 2003 — September 2003, Ljubljana, Slovenia
- EUROCON 2005 — November 2005, Belgrade, Serbia & Montenegro
- EUROCON 2007 — September 2007, Warsaw, Poland

Since EUROCON 2007, in addition to the technical program, sessions on "The History of Electrical Engineering" are included in the Program.

EUROCON 2009, held in St. Petersburg, Russia, on 18–23 May, 2009, was devoted to the 150th anniversary of Alexander S. Popov, the famous Russian scientist and engineer who made the first public demonstration of radio signal transmission and reception on May 7, 1895. The main conference venue was Saint Petersburg Electrotechnical University, "LETI," where Alexander Popov was the first elected Director. Another conference venue was the A. S.Popov Central Museum of Communications, and the third venue was St. Petersburg University of Communications. The program included four sessions on the History of Electrical Engineering, mainly dealing with the History of Telecommunications.

The conference started on Monday 18 May with a plenary session at LETI. At this session IEEE Communications Society President Doug Zuckerman made a presentation on "The Communications Society in the Modern World." In the second part of the day the IEEE Milestone Plaque was unveiled at the Central Museum of Communications in recognition of the pioneering contribution of Russian scientist P. L. Shilling to practical telegraphy in 1828–1837. As mentioned on the plaque, "P. L. Shilling, a Russian scientist, successfully transmitted messages over different distances by means of an electric current's effect on a magnetic needle, using two signs and a telegraph dictionary for transferring letters and digits."

Technical topics of the conference included 17 TPC tracks, three special sessions, and three poster sessions. More than 540 papers were submitted to the conference. In accordance with the recommendations of more than 150 reviewers, the Program Committee selected 471 papers for presentation and publication. The topics of the conference relevant to the field of communications included : TPC-16 Communications, TPC-17 Networking, TPC-11 Broadcast and Consumer Systems, and Special Session-1 Wireless Networks: Protocols and Standards.

Figure 1. *IEEE Communications Society President Doug Zuckerman gives his presentation on "The Communications Society in the Modern World."*

The Central Museum of Communications, where the Shilling plaque is located, is the building of the former Central Post-Telegraphy Department of the Russian Empire. This was also the site where the History Sessions were held, in which 18 papers were presented.

The opening History presentation dealt, as did several of the following papers, with the activities of Professor Popov and was presented by Prof. O. G. Vendik of St. Petersburg Electrotechnical University. Additional papers were presented by authors from the United States, Israel, Nigeria, Bosnia and Herzegovina, and Russia. Professional translation from Russian to English enabled all participants to follow the lectures, in addition to the English paper.

The series of History Sessions highlighted the importance of including the theme of the History of Electrotechnology in technical conferences. It shed light on the processes of technological innovation, in Russia and in other countries, and on the role of inventors and industrial companies in the development of our society.

The social program of EUROCON 2009 included an evening reception at the A. S.Popov Museum (after the plaque unveiling) as well as visits to the Hermitage and Peterhof Palace, and a bus sightseeing tour of St. Petersburg, the "Venice of the North," with its canals and bridges, during the period of the white nights. At these events participants had a lot of opportunities to talk with colleagues as well as to relax.

Some Trends in Russian Telecommunications

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Typical problems in world telecommunications development also take place in Russia. Nevertheless, there are some differences. These differences are caused by a variety of reasons that can be divided into two groups. The first group of reasons are caused by decisions made many years ago. Basically, the main problems are peculiar to the public switched telephone network (PSTN). The second group of reasons are generated by the features of Russian telecommunications development in recent years. It is reasonable to contemplate four tendencies.

Long-Distance and International Communications

Under development of the PSTN in the former USSR, long-distance and international traffic were serviced only by a single operator. After dialing a prefix for toll exchange, the following procedures were carried out:

- The central office established a connection to the toll exchange.
- The toll exchange accumulated the digits of the called subscriber number.
- After analysis of the number, the toll exchange established a needed connection.

Therefore, installed central offices could not carry out a choice of operator providing long-distance and international services without necessary changes. Making the necessary changes in analog central offices was quite a difficult task. This problem constrained the emergence of competition in the long-distance and international telecommunications markets.

Nevertheless, in 2006 the national Administration of Communications made a decision related to the possibility of operator choice. Calls can be served out in two modes: hot-choice and preselect. In the first case the subscriber dials two additional digits after the prefix for toll exchange access.

Up to the present about 20 licenses have been issued. However, only five operators are really working. At present there is a small decrease in tariffs for long-distance and international traffic services.

Digitalization of the PSTN

In the Russian long-distance network, all switches are digital. The process of analog equipment replacement was completed in the last century. The replacement of analog central offices in cities and rural area is still going on. The process of digitalization has a number of interesting features. First, the telephone networks of two "capitals," Moscow and St. Petersburg, have unexpectedly become the outsiders. Second, the difference in digitalization levels of city and rural telephone networks is very significant. Third, there is a difference in the digitalization rates among the regions of Russia. On average the level of digitalization of the Russian PSTN is about 80 percent, while that in the northwest region at the present moment is 67 percent.

Mobile Communication

The creation of cellular communications in Russia began later than, for example, in Western Europe. The first cellular network under an analog standard appeared in 1991, and the first GSM network was put into operation in 1993. However, rates of development of mobile cellular networks in Russia were very high. From 2000 to 2005 the quantity of cellular networks' subscribers doubled. By March 2009 the quantity of users had reached 191 million, which is more than 1.35 times the population of Russia, which is one of the highest indicators in the world. On the other hand, this indicator does not coincide with the results of polls.

It is interesting to consider the dynamics of incomes of mobile operators. At the beginning of the current century the revenues from business and residential users were approximately equal. By 2007 the share of revenue from residential users had reached 87 percent of total income. At the beginning of the century the share of revenue received in Moscow was more than 50 percent of the total amount of cellular income, whereas now this value is below 30 percent. The peculiarity of development of the mobile communications market is the rather low average revenue per unit (ARPU): on the order of $7–10.

In a number of Russian cities, operation of 3G networks has begun. Operators of mobile communications have initiated an investigation of solutions based on the Long Term Evolution (LTE) concept.

Internet and Broadband Access

The quantity of Internet users in Russia is estimated at around 50 million by the majority of experts. The quantity of users annually increases by more than one third. It is expected that such rates will remain at least through 2009. Experts suppose that the domain zone "ru" is among the top three world leaders in number of domains. Internet development in Russia is characterized by a "digital divide." According to a study by the Russian IT company Yandex, in Moscow and St. Petersburg the average access speed is around 7 Mb/s, while in large Siberian cities this indicator is practically seven times slower.

In Russia, several networks were specifically created for scientific research and educational system development. One of the important problems in the development of such networks is the creation of a powerful information infrastructure that will promote the development of national lifeware. For realization of this project, it is assumed taht the core network with up to 40 Gb/s bandwidth will be used. The throughput of each data center is estimated at about 300 TFLOPS.

Introduction of telecommunication services demanding high bit rates was limited by the possibilities of access networks created by PSTN operators. At the beginning of this century the access networks with high bit rates were created on the base of digital subscriber line (xDSL), Ethernet technologies, and cable networks. Since 2008, realization of triple play projects based on Gigabit passive optical network (PON) and WiMAX technologies has started in large Russian cities. At the end of 2008, broadband access systems covered 7 million households, which corresponds to approximately 15 percent of Russian households.

Conclusion

Recently the problems of national telecommunications system development that are not connected with technologies has become the main theme of publications. As a rule, the greatest attention is given to the possible consequences of a world crisis in telecommunications, although this sector is less sensitive to crisis than others. As predicted by Russian experts, growth of the Russian telecommunications market in 2009 is expected to be up to 25 percent. The analysis of overcoming the crisis in Russian communications could become the subject of a follow-up article.

Activities of the Malaysia Chapter

Borhanuddin Mohd Ali, Past Malaysia Chapter Chair and MICC Co-Founder, Malaysia

ComSoc Chapter Malaysia is not the oldest chapter of IEEE Malaysia, but it is certainly the largest. It was only set up in 1995, seven years after the formation of the Malaysia Section. For a long time, it was the second largest chapter with about 200 members consistently, but last year, while other chapters were struggling to keep their members, the membership of ComSoc mysteriously shot up to about 600. This may be a temporary glitch, but it is enough to motivate us to work harder to keep the members happy and retain them as members in the future.

ComSoc Malaysia has been putting together a series of activities to fulfill this objective. We have been holding regular technical meetings such as talks, conferences, and seminars (more about this later). Together with the Section and other chapters, we also organize social events, such as the IEEE Annual Dinner and Appreciation Night 2004, which about 200 people, members as well as friends of the IEEE, attended, and appreciation awards for volunteers and high performing chapters were handed over by our VIP. Apart from that we also participate in sports events organized by other units, such as the bowling competition of GOLD. This serves as a good platform to get our members to meet in a cordial environment. ComSoc has regularly won some of the coveted prizes too. We also participate in membership drives at various universities and give career talks in schools.

As a flagship event, ComSoc Malaysia sponsors the biennial Malaysia International Conference on Communications (MICC). As a matter of fact, MICC actually predates the Chapter by a couple of years. The maiden event was held in Kuala Lumpur, the vibrant capital city, in 1993. Thereupon, the conference venues alternated between Kuala Lumpur and other exciting locations around the country: the enchanting legendary island of Langkawi in 1995, then back in Kuala Lumpur in 1997 (jointly held with ISSPA, a Signal Processing Conference); next the historic city of Malacca in 1999 (with the International Symposium on Consumer Electronics, ISCE); Kuala Lumpur in 2001 (with an optical network conference); Penang, dubbed the Pearl of the Orient, in 2003 (with the Asia Pacific Conference on Communications, APCC); Kuala Lumpur in 2005 (with the International Conference on Networks, ICON), and back to Penang in 2007 (with the International Conference on Telecommunications, ICT). Following this sequence, the coming conference will be held in Kuala Lumpur in mid-December 2009 with iWDTV, a workshop on digital TV content. We have also planned that the following one in 2011 will be held in one of the East Malaysian cities of Sabah and Sarawak where many attractions of ecotourism are beckoning; again possibly to be held together with another major international event.

The practice of holding MICC with one other conference, besides killing two birds with one stone, helps to minimize the financial risk associated with organizing such a big event. So far, we have not experienced any loss even though the surplus may not be as handsome as we would like it to be; in fact, this conference has been a reliable source of income that lasts till the next conference. As for the organizing committee, even though it is composed of members from various organizations, the conference secretariat, as much as possible, is rotated among various other organizations whose members belong for a fee agreed to from the outset. The idea is to give member organizations the experience of organizing such an event and

(Continued on Newsletter page 4)

The New Technologies Cathedral: A Vanguard Center for the Research and Knowledge Exchange in New Technologies

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Last April, the Mayor of Madrid, Alberto Ruiz-Gallardón, and the Spanish Minister of Industry, Miguel Sebastián, presented the New Technologies Cathedral (http://www.lacatedraldelasnuevastecnologias.es/). The objective of this project is to educate citizens and companies in the field of new technologies and innovation, turning the city of Madrid into the capital of innovation and creativity. With a budget of €34 million, the New Technologies Cathedral will be located in an old lift factory, Boetticher & Navarro, and financed by the Spanish government. This project will turn the old lift factory into an innovation factory, providing Madrid and Spain with a global reference center.

The technological complex, with an area of 19,000 m^2, will have a building suitability of 15,000 m^2, plus another area of 8000 m^2 for new public spaces. The new technologies are the means to overcoming the problem of Spain's low productivity, which creates a gap between this country's economy and others'. In order to fill it, Spain needs what this project provides: infrastructures, wideband, asymmetric DSL (ADSL), wireless networks; in short, everything that can be considered necessary to consolidate Madrid as the hub of Spain's technology, which attracts the most innovative companies. The fact that a city like Madrid has been given the opportunity to develop such an important project is due to the dynamism in its growth, and the growth of its citizens, its companies, and its innovative business. In fact, Madrid is the city that has had the biggest growth in the number of Internet users, more than 150 percent between 2005 and 2008.

The New Technologies Cathedral is divided into three parts: a New Technologies Innovation and Expression Center, an online version of the project, and a Reference Center in free software technologies (open source). An objective of the New Technologies Innovation and Expression Center is to create a place for the exhibition of, and training and development in, new information technologies and communications. Also, the expectation is that it will act as a generator of value in the digital world. It will be used to turn Madrid into a model city, the type of city that provides citizens and companies with digital services, a paradigm of the effective establishment of the information society. The New Technologies Cathedral will be an intelligent building, ahead of its time, thanks to its big functionality. It will be totally accessible for disabled people, and there will be advanced access control. Renewable energies will be used to ensure the sustainability of the building, and measures will be taken to reduce energy consumption in the installations and boost recycling in different fields.

(Continued on Newsletter page 4)

MALAYSIA CHAPTER/*continued from page 3*

earn some money too, besides relieving the main committee of the arduous task of managing the grueling tasks of running the conference. In our case, the first secretariat (1993) was based at Universiti Teknologi Malaysia (UTM); the next one at Celcom R&D (the R&D division of a local cell service operator); next at a local conference service provider; Universiti Kebangsaan Malaysia (UKM) in 1997; jointly between UKM and Universiti Putra Malaysia (UPM) in 1999; UKM again in 2001; UPM again in 2003; Telekom R&D in 2005; UTM in 2007; and back to UPM in 2009, after experiencing an aborted experience with another institution. As we stabilize, this pattern may not have to be followed in the future for the sake of continuity and reliability.

MICC has managed to attract much enthusiasm, mainly from the research community, and to a lesser degree communications professionals from the telecoms industry, a significant proportion of whom (about 30 percent) hailed from other countries, which reflects the internationalization of this event. MICC has also projected IEEE and ComSoc as a vibrant community of professionals who are taking a central role in promoting learning and research in the field of communications. This augurs well with the country's ambitious endeavor into the future by embracing information and communications technologies (ICT) in all walks of life, and going for a new knowledge based economy. The Multimedia Supercorridor initiatives, for example, with all their facilitations and incentives for companies to set up R&D centers, has attracted overwhelming response from companies worldwide, both small and large, and has grown many startups.

ComSoc Malaysia also organizes a national level conference called the National Conference on Telecommunications Technology, held in even numbered years, alternating with MICC. We also actively organize technical talks given by speakers from local industry and academia, not to mention the continuous stream of international speakers under the Distinguished Lecture Program, courtesy of the Communications Society. Among the more recent ones were Abbas Jamalipour and Roch Glitho (2009), Tony Ephremides (2008), Javan Erfanian (2004), Lajos Hanzo (2003), Ezio Biglieri, Justin Chuang, Vijay Bhargava, Celia Desmond, and Nelson Sollenberger, in addition to a few more who came in other capacities, such as Roberto Saracco and Curtis Siller, among others.

Looking further forward, we believe that Malaysia now has all the important ingredients to host a major event such as those sponsored by the IEEE Communications Society, possibly in the not too distant future.

For further information, please visit http://www.micc.org.my

TECHNOLOGIES CATHEDRAL/*continued from page 3*

The online version of the project will be configured as a virtual space on the Internet that will offer citizens and companies digital contents and services allowing them to improve their access to new information technologies and communications. These services will also enable them to acquire the qualification needed for the use of the technology, and to encourage their welcoming the opportunities that they offer. Finally, the Reference Center in free software technologies (open source) intends to promote the sector by means of the periodic creation of pilot projects based on these technologies. Also, collaboration with universities and other qualifying centers will be promoted through the Center, and advice will be given to companies with innovative projects that use these technologies. Courses and informative events will also be developed for citizens and companies.

Some countries, pioneers in the use of the new technologies, already have similar centers with a great prestige. Among them, we can find the Digital Hub (http://www.thedigitalhub.com/) in Ireland; the Ars Electronica (http://www.aec.at/) in Austria; and the Center for Art and Media (http://www.zkm.de/) in Germany. All these projects have proven their important role in technological progress and innovation. The Irish government promoted the Digital Hub to develop a center of knowledge, innovation, and creativity focused on digital contents and technological enterprises. The project is composed of a community of artists, researchers, teachers, businessmen, and consumers who work together to develop innovative and effective digital products. Ars Electronica is an internationally unique platform for digital art and media culture consisting of the following four divisions: Ars Electronica — Festival for Art, Technology and Society; Prix Ars Electronica — International Competition for CyberArts; Ars Electronica Center — Museum of the Future; Ars Electronica Futurelab — Laboratory for Future Innovations. Finally, the Center for Art and Media Technology (ZKM) in Karlsruhe, Germany, is an interdisciplinary research institution focused on new media. Opened in 1997, the ZKM acts as a center for the production and exhibition of contemporary arts and emergent media technologies.

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