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Digital Romania: Broadband for All Romanians? Not Yet!

By Nicolae Oaca, Romania

Romania has one of the poorest broadband penetration levels in the European Union, and there is no "Internet for all Romanians" plan yet. In November 2008, just a few weeks before elections, the ministry of communications presented a plan aimed at covering 40 percent of households (the EU average in 2007!) by 2015 at 2 Mb/s, investing €1.8 billion from the state budget and attracting €383 million from the EU. In March 2009 the new government launched a public debate on a new plan aimed at providing 1 Mb/s access to 80 percent of homes by 2015 and spending only €1.25 billion from the state budget.

Forty-seven percent of Romanians live in rural areas, which does not compare favorably with the EU average of less than 10 percent, while the income in rural areas is very low; most families' incomes come from agriculture based on very small bits of land. In fact, there are two Romanias: an urban one with developed communications networks and a good IT culture, and a rural Romania with a very poor infrastructure and almost without IT culture. Romania's GDP or average wage is one of lowest in the EU; hence, huge efforts are needed to connect all Romanians to broadband.

Digital Romania's Costs

In March 2002, at the last census in Romania, there were 21.6 million citizens and 7.32 million households, out of which 3.36 million were in rural areas. By the end of 2008, 27 percent more households, or 2 million, were connected to the Internet, resulting in about 5.4 million homes connected. In rural areas only 8 percent of houses were connected. To make a cost evaluation, one could consider Greece's or Ireland's costs of €1000/house or Alcatel Lucent estimates for connecting rural houses of €6000/house by optical fiber (the Broadband World Forum Europe, September 30, 2008), resulting in €5.4 billion or €32.4 billion, respectively. The real cost of Digital Romania would lie between these two figures.

Financing Digital Romania

€32.4 or even €5.4 billion is a huge amount of money, if one considers Romania's GDP: about €140 billion in 2008. Financing Digital Romania would be a real problem, and one should take into consideration all the stakeholders: government, local communities, service providers, ministry of communications, the regulatory body, the EU, and so on.

The Romanian government should contribute, first, with telecom revenues: sale of telecom assets (RomTelecom's IPO, telcos privatization: Radiocomunicatii, Telecomunicatii CFR, Teletrans), resulting in about €1 billion, license sales (WiMAX, etc.), and the yearly fees charged by the regulatory body for usage of resources (frequencies, numbers, etc.). In addition, the state budget should provide financing, and Romania should borrow from financial institutions.

An important part of financing should come from the EC. European telecom commissioner Viviane Reding, who launched "Broadband for All Europeans," is fighting to finance it. Accordingly, in January 2009, the EC announced €1 billion investments in broadband for rural areas. Accessing this fund should take into consideration the population to be covered in rural areas rather than the current distribution key for the European Agricultural Fund for Rural Development, as the EC announced. The EC has often highlighted Romania's lack of Internet access, so they should recognize the Romanian reality by allotting an important amount of money to solve the problem.

Service providers should also contribute to Digital Romania: financing, deploying, and operating networks via public-private partnerships. Industry regulations should take into account that these new networks are under the universal service obligation and provide incentives.

In many rural villages there are projects aimed to build roads using EU financing, which alongside roads means ducts for water, residual water, and so on. All these projects should include the communications network too: ducts for/with cables (optical, copper) with output to every house. The extra cost is very low compared to the total cost and could solve the problem in these areas.

Project Length

Digital Romania is the *raison d'etre* of the ministry of communications and could be accomplished during its term (four years) in order for the new government not to pass it on to the next government. A first phase could take into consideration, as in Ireland, 100 percent coverage at 1 Mb/s by 2010 using wireless access building on the existing GSM and CDMA networks. In the longer term the plan should be to cover all households with broadband access (50 or 100 Mb/s) via NGNs.

The Romanian government is considering investments in infrastructures in is fight against the economic crisis, but is not considering telecom infrastructures yet. Digital Romania is a chance for Romania to accelerate economic growth, to fight the economic crisis, and to invest in the country's economic future.

The eBario Project: A Rural ICT Internet Access Initiative in Malaysia

By Alvin Yeo, Poline Bala, Peter Songan and Khairuddin Ab Hamid, Universiti Malaysia Sarawak, Malaysia

Malaysia aspires to be a knowledge-based society by 2020; therefore, the Malaysian government has placed much emphasis in providing access to information via the provisioning of information and communications technologies (ICTs) to both urban and remote communities. The eBario project is one such project that has successfully engaged a remote community to employ ICTs and is sustaining the telecentre through revenue generated from the telecentre's activities.

Bario is a remote rural community in Sarawak, East Malaysia, and is located close to the Malaysia-Indonesia (Kalimantan) border (Fig. 1). The only practical way to get to Bario is a one-hour flight on a 19-seater Twin Otter plane. There are no roads leading to Bario, and a land journey requires a river journey and a 14-day trek across forested mountains.

There are 12 longhouses in Bario that are homes to 1000 people, the majority of whom are Kelabits, one of the smallest ethnic groups in Sarawak. They are mainly farmers, growing the famous fragrant Bario rice. Bario was selected because of its extreme isolation. It has only basic infrastructure and no 24-hour electricity supply; water is available through gravity-fed systems. Communications are conducted using radio calls, and by passing messages to departing passengers and getting messages from passengers arriving at the airport. Hence, if one could successfully implement such a project in Bario, one can do so anywhere.

Figure 1. *Location of Bario.*

Figure 2. *Lodge owners using a computer at the telecentre.*

The eBario Project

The eBario project was conceived in 1999 as a research project by Universiti Malaysia Sarawak, with the goal of exploring how the deployment of ICTs can bring about social and economic development within remote communities in Sarawak.

A distinctive characteristic of this project is its emphasis on people, organization, and processes, rather than technology per se. A steering committee comprising representatives from different groups of the community (e.g., women and youth) was set up. Since major decisions were made in this committee, it captures very closely and addresses the actual needs of the community. In addition, a good rapport was established; the community was engaged and involved throughout the whole project. Computers were introduced at the school, and training was provided for teachers as well as the community. Access to the Internet was then provided through very small aperture terminals (VSATs) as this was (and still is) the most practical means given the region's geography. Lastly, computers and Internet access were made available to the community through the telecentre. Two VSATs were deployed, one for the school and another for the telecentre.

Solar panels were used to power the telecentre because of the prohibitive costs associated with diesel powered generators and the logistics of transporting the diesel to this remote hinterland.

A computer laboratory was established in 2001 in the secondary school with 16 computers and Internet access. A telecentre equipped with 10 computers and Internet access was established in 2002. Computer literacy training was conducted based on the training-of-the-trainer approach. Consequently, there is increased computer literacy among the students, teachers, and community.

The community is now able to communicate with the outside world using telephone and email. This is of immense importance, especially during emergencies. At the telecentre, the main users are the lodge operators who use email to liaise with their potential tourists directly to confirm bookings online (Fig. 2). Some use the Internet to promote their trekking services (http://www.kelabit.net). The senior citizens use emails to keep in touch with their family members living away, albeit with the help of staff members at the telecentre. The telecentre charges for their service as a first step toward sustainability. The telecentre also provides office services such as printing, scanning, and laminating.

A bigger objective of the project is to improve the livelihood and increase the quality of life of the community. More events are being organized to leverage on the strengths of this region. The climate is relatively cool (about 20°C, which can drop to 12–15°C), and the people are some of the most hospitable in Malaysia, if not the world. The Kelabit ethnic community is rich in culture, with rituals such as dances and ornate handicrafts. Thus, the telecentre organizes events like the Annual Slow Food Festival and the eBario Knowledge Fair, a conference whose aim is to provide a network platform for academicians and practitioners in the area of bridging the digital divide. The telecentre also works with government agencies on organizing training and seminars in Bario. As event organizers and providing tourism packages, the telecentre receives funding and a commission for their services (i.e., a consistent income contributing toward sustainability of the telecentre). An unexpected outcome of these events is that an even closer-knit community in Bario has been established, in that more people are now involved in the organization of these events, especially women.

In addition to the increased ICT awareness and usage by the community, another obvious impact has been an increase

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Telecommunications Engineering and the Bologna Declaration in Spain

By Pablo Pavón Mariño,
Vice Dean of Telecommunication Engineering, Polytechnic University of Cartagena, Spain

The realization of the European Higher Education Area (EHEA) is a common aim of 46 countries in Europe. The effort is usually referred to as the Bologna Process, after the Bologna Declaration of June 1999. Its main objective is to provide European universities with the tools for promoting citizens and knowledge mobility, breaking the obstacles caused by historical diversity among the European higher education systems. A central objective is the adoption of easily readable and comparable degrees in a scheme based on two main cycles, undergraduate and graduate. Uniformity is favored by the establishment of a common system of credits to encourage mobility among the European countries. European cooperation is also endorsed for quality assurance with a view to developing comparable criteria and methodologies.

Such noble and high principles must fight against a plethora of particular situations in the different countries. In Spain the Bologna Process is currently going through its most controversial step: the definition of the new catalog of degree plans inside the new Bologna-aware framework ordered by the government. With some exceptions like medicine and architecture, new graduate degrees in Spain are constrained to be four years long (240 ECTS), including a final degree project, and optional time spent in external practices. Postgraduate degrees last one or two years (60 to 120 ECTS). In contrast to the previous framework, no nation-wide closed catalogs of graduate and postgraduate studies exist. Therefore, novel degrees can be designed and proposed by Spanish universities. Then the proposals require the approval of a central evaluating authority (ANECA, Agencia Nacional de Evaluación de la Calidad y la Acreditación), which checks the academic adequacy of the degree plan and its feasibility according to university resources. Also, a control mechanism has been added to penalize unsuccessful ephemeral studies. ANECA is in charge of auditing the degree academic results every six years, with the potential of removing from the catalog any degree in any university.

However, this general ruling of the graduate and postgraduate degree catalog has a singular exception for a set of technical degrees, based on traditional engineering professions in Spain. Telecommunications engineering is one of them, together with others like naval, mining, industrial, aeronautics, and up to eight different traditional engineering academic qualifications. In the pre-Bologna framework, technical studies in those professions are separated into two levels: technical engineers (three years) and engineers (five years). Technical engineering degrees provide a faster introduction into the job market, while Engineering degrees comprise deeper and more generalized studies. The migration of technical studies to the Bologna framework has been designed in a peculiar manner. Each old technical engineering degree (with some exceptions) has been converted into a new regulated graduate degree. Regulated degrees are peculiar as their structure is defined by a degree template, which also enumerates a minimum set of student learning outcomes associated with the degree plan. Universities willing to incorporate a new technical degree "X" into its academic offer must propose a degree plan compliant with the degree template "X". Naturally, ANECA is responsible for validating this compliance. A similar strategy is in place for the old five-year engineering degrees, which are now mapped to the concatenation of a regulated graduate degree in the particular profession and a regulated postgraduate degree, which must also be compliant with a degree template.

The grounds for the existence of degree templates for the

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Highlights from ONDM 2009

By Admela Jukan, General Chair, ONDM 2009, Germany

The 13th IEEE/IFIP International Conference on Optical Network Design and Modelling (ONDM 2009) was held February 18–20, 2009 at the Technische Universität Carolo-Wilhelmina zu Braunschweig, Germany. The conference had the technical sponsorship of the IFIP Photonic Networking Working Group (WG 6.10) and IEEE Communications Society. Moreover, ONDM 2009 received an endorsement of two IEEE Technical Committees: Optical Networking (ONTC), and High Speed Networking (TC-HSN). As is established practice at ONDM events, the 13th instalment focused on cutting-edge state-of-the-art research in optical networking and newly emerging areas. ONDM 2009 not only encouraged submissions of research papers in the area of optical networking but also in areas relating optical networking to other areas and disciplines, such as the role of optical satellite communications and the optical network in future Internet design. Controversial ideas and approaches, and their open discussion were strongly encouraged. Moreover, ONDM 2009 contributed to community strengthening by inciting interactivity among senior and junior participants as well as among industrial and academic participants, in Europe and internationally.

The conference attracted submissions from Asia, Europe, and South and North America. All submitted papers went through a peer review process, and accepted papers were thematically distributed among six technical sessions, ranging from topics in routing and switching to integration and field trials. The keynote speech, "Optical Technology Evolution in Dynamic Market Environments," was given by Dr. Chris Glingener, CTO of ADVA Optical Networking. The Technical Program was further enriched by a number of exciting invited talks given by the most prominent optical networking academics and industrial representatives worldwide. Prof. Biswanath Mukherjee gave a talk on "Future Internet Design." Dr. Nikos Karafolas inspired his audience with a talk on optical communications in space. Andy Hougthon, an EU Officer, gave a talk on future European initiatives, entitled "Building the Future (Inter)Network in Europe: Work in Progress." Further invited speakers included Thomas Michael Bohnert (SAP), Ralf-Peter Braun (T-systems), and Dimitra Simenidou (University of Essex). The conference also presented two panels, one in the area of carrier-grade Ethernet and the other on interoperability of optical networks and the Internet. Most of the presentations and invited talks can be downloaded from the conference Web site, http://www.ida.ing.tu-bs.de/ondm2009/.

The conference social event took place in the beautiful hall of Altes Rathaus in Braunschweig (Dornse), built in the 13th

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century. During the dinner event, the TPC co-chairs, Admela Jukan and Ken-ichi Kitayama, acknowledged the invaluable efforts of all TPC members. An honorable recognition was given to Biswanath Mukherjee (University of California, Davis) for his service relative to IEEE technical co-sponsorship. Special acknowledgments were extended to Josep Sole Pareta and Xavi Masip, both of the University of Catalonia, for their service to organization and coordination with IFIP. The conference awarded two papers and their authors with travel grants, one to Politecnico di Torino, Italy, and the other to Universidad Técnica Federico Santa María, Chile. The conference's best paper award was given to "New Dynamic Network Design and Provisioning Algorithms for Broadband Connection Services Considering Fairness," co-authored by Masahiro Nakagawa, Hiroshi Hasegawa, Ken-Ichi Sato, Ryuta Sugiyama, Tomonori Takeda, Eiji Oki, and Kohei Shiomoto, Japan.

The local organizers of the conference as well as TPC co-chairs sincerely hope that ONDM 2009 was a community event that will be remembered for the technical quality of its papers and the hospitality of the oldest German technical school, Technische Universität Carolo-Wilhelmina zu Braunschweig. The next ONDM event will be in Kyoto, Japan, in February 2010, hosted by the University of Osaka, under the chairmanship of Prof. Ken-ichi Kitayama. The optical networking community looks forward to the event in Japan, and says "See you in Kyoto in 2010!"

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STEFANO BREGNI
Editor

Politecnico di Milano - Dept. of Electronics and Information
Piazza Leonardo da Vinci 32, 20133 MILANO MI, Italy
Ph.: +39-02-2399.3503 - Fax: +39-02-2399.3413
Email: bregni@elet.polimi.it, s.bregni@ieee.org

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REGIONAL CORRESPONDENTS WHO CONTRIBUTED TO THIS ISSUE

THOMAS M. BOHNERT, SWITZERLAND (THOMAS.MICHAEL.BOHNERT@SAP.COM)
JOSÉ MARIA MALGOSA-SANAHUJA, SPAIN (JOSEM.MALGOSA@UPCT.ES)
BORHANUDIN MOHD ALI, MALAYSIA (BORHAN@ENG.UPM.EDU.MY)
NICOLAE OACA, ROMANIA (NICOLAE_OACA@YAHOO.COM)

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technical degrees is the manner in which professional habilitation is granted to engineers in Spain: the professional habilitation of an engineer in a specific field is automatically obtained after the successful completion of the associated engineering degree. This means that on one hand, no licensing exam is needed to obtain the professional habilitation; but on the other hand, the appropriate university degree is the only valid way to achieve it. In every profession the professional habilitation is different for three-year and five-year engineers. Therefore, it seems logical to think of different degree templates for regulated graduate and postgraduate degrees.

In the telecommunications engineering profession, four pre-Bologna three-year degrees existed in Spain: (i) Sistemas de Telecomunicación (RF engineering, signal processing, and signal propagation), (ii) Telemática (telematics and networking), (iii) Electrónico (electronics in the telecommunications field), and (iv) Imagen y Sonido (audio and video). Each one is now mapped into a four-year regulated degree, with its own degree template. One postgraduate degree in telecommunications engineering has also been defined. Currently, a small number of Spanish universities are offering the new degrees in telecommunications. Most of the universities are still preparing their degree proposals, or have their proposals under evaluation by ANECA (a process that can take about half a year). This process is expected to be completed during 2009 or the first half of 2010. In academic year 2010–2011 new students can only be enrolled in the Bologna-aware degrees. Then old and new degrees will coexist for some years, and each university will be involved in managing the required adaptation systems for students willing to move from old to new degrees. But that is another story.

THE eBARIO PROJECT/*continued from page 2*

in the number of tourists, contributing to enhanced employment opportunities and more revenue for the community. Also, more youths and their families are staying in Bario to operate the accommodation and tourist activities, thus stemming rural-urban migration. Today Bario has seven lodges and six homestays.

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For more information

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Repository: http://www.unimas.my/ebario,
http://coeri.unimas.my
Tourism in Bario: http://www.ebario.com
Bario community: http://www.kelabit.net
Contact: Alvin Yeo alvin@fit.unimas.my