



Open Source in telecommunications

In focus

Deutsche Telekom Laboratories

Events

CELTIC Event 2006 in Dublin

Tutorial

IMS – IP Multimedia Subsystem



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Dear readers,

Open Source has become a major trend in the ICT domain. Everyone knows Open Source software for PCs like, for example, the operating system Linux, the office suite OpenOffice or the Firefox browser, which have become serious competition for commercial products. Less known is the fact that Open Source software is also of growing importance for the telecommunications sector. Middleware products that are distributed under the GNU Public License have reached a level of maturity, which makes them an interesting alternative to proprietary products.

The increasing importance of Open Source in telecoms has motivated us to dedicate the *Eurescom mess@ge* issue at hand to this subject. In his opening article, *Eurescom mess@ge* editor Anastasius Gavras takes a closer look at business models and legal issues of Open Source in telecoms. Nuno Silva from Portugal Telecom explores the challenges of Open Source for Next Generation Operation Support Systems. Interviews with Sacha Labourey from Open Source middleware provider JBoss and with Valère Robin from France Télécom's Middleware and Advanced Platforms R&D Center add first-hand information on the business aspects to the picture.

Our section "In focus" this time features an exclusive inside report on Deutsche Telekom Laboratories in Berlin by its managing director, Peter Möckel.

As most of our readers may already know, Eurescom – including, of course, the *Eurescom mess@ge* editorial team – moved to new offices within Heidelberg in February. Read more about our new premises under "Internal". Several people from the Eurescom community asked, if we would regret leaving our former premises. After several weeks in the new offices, we can honestly say that the advantages of our new facilities outweigh some of the amenities which we had in the old place.

Another important news item under "Internal" is the Eurescom Study Programme. There has been an important change in this area: Anastasius Gavras is now managing the Eurescom Study Programme. He has inherited one of Eurescom's assets from long-term Study Programme manager Harald Johansen, who retired in December last year.

There are many more topics covered in this issue, and we hope you will find some of the articles interesting and useful. We would appreciate your feedback on any of the articles. If you would like to suggest a topic or offer a contribution to *Eurescom mess@ge*, this is equally welcome.

Enjoy reading this issue.

**Your
mess@ge editorial team**
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debian



OpenOffice

Events calendar

24 March 2006

ALIPRO Workshop
European visions for research
programmes on mobile communications
in the New Member States and Acceding
and Candidate Countries

Brussels, Belgium
<http://alipro.eurescom.de/workshop>

5 April 2006

IST ePerSpace Workshop
Madrid, Spain
<http://www.ist-eperspace.org>

23 – 29 April 2006

Infocom 2006
Barcelona, Spain
<http://www.ieee-infocom.org/2006>

9 – 12 May 2006

**ICT 2006 – 13th International Conference
on Telecommunications**
Funchal, Madeira island, Portugal
www.ict2006.org

29 May – 1 June 2006

**ICIN 2006 – Convergence in Services,
Media and Networks**
Bordeaux, France
www.icin-conference.com

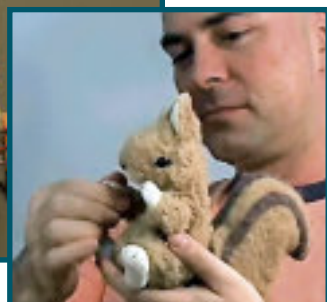
4 – 6 June 2006

**IST Mobile & Wireless
Communications Summit 2006**
Mykonos, Greece
<http://mobilesummit2006.org>

19 – 23 June 2006

Euro-Southeast Asia ICT Forum
Singapore
<http://www.eusea2006.org>

Sn@pshot Talk to your squirrel



If you see someone talking to a squirrel, he is not necessarily a veterinary or a madman, but he could be an MIT researcher. The Cellular Squirrel is the latest prototype of an Autonomous Interactive Intermediary, a software and robotic agent which helps users manage their mobile communication channels. This embodiment is able to use human-like, non-verbal cues to get our attention and interrupt us like humans would do, instead of ringing or vibration. The user can communicate via the squirrel by whispering into its ear and touching its hand. The Cellular Squirrel is a dissertation project by Stefan Marti done at MIT Media Lab.

Further information is available at

<http://web.media.mit.edu/~stefanm/phd/cellularsquirrel>

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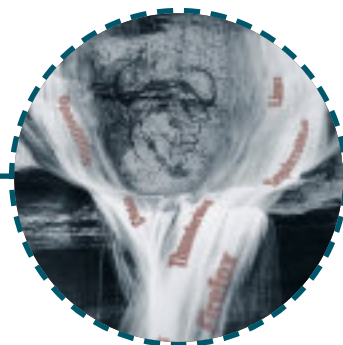
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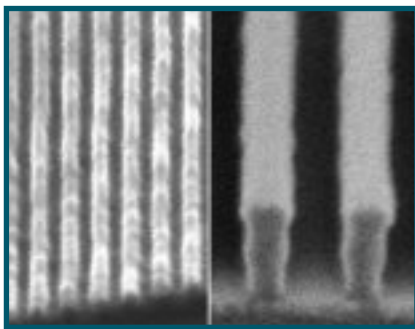
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+++ News in brief +++ News in brief +++

IBM compresses more circuits on a chip

Researchers at IBM have developed a method for etching more circuits on silicon wafers by reducing the width of each circuit by one third compared to current standards. The technique could lead to smaller and higher-capacity microchips.

IBM claims that the new production technique for smaller and higher-capacity microchips could extend "Moore's Law". According to this guiding principle of the computer industry stated by Intel founder Gordon Moore in the late 1960s, the processing power of integrated circuits would double every 18 months.



29.9 nanometer wide lines created by IBM (left), and currently produced 90 nanometer lines.

Using deep-ultraviolet optical lithography, a technology currently used to "print" circuits on chips, the scientists at IBM's Almaden Research Center have created line patterns, which are only 29.9 nanometers wide. This is less than one-third the size of the 90-nanometer features now in mass production and below the 32 nanometers that industry consensus held as the limit for optical lithography techniques. Each 29.9 nanometer line is about 3,000 times smaller than a human hair.

IBM's goal is to push optical lithography as far as possible in order to postpone the conversion to more expensive alternatives. According to Dr. Robert D. Allen, manager of lithography materials at IBM's Almaden Research Center, "this result is the strongest evidence to date that the industry may have at least seven years of breathing room before any radical changes in chip-making techniques would be needed."

Further information is available at <http://www.research.ibm.com/>

Aho-Report calls for European innovation pact

In January, an independent Expert Group on R&D and Innovation chaired by former Finnish prime minister Esko Aho presented their final report on the creation of an innovative Europe. In order to secure Europe's prosperity, the experts recom-

mend a "Pact for Research and Innovation" which would cover three areas:

1. an innovation-friendly market,
2. increased funding and productivity of R&D, and
3. more mobility of employees, organisations, knowledge, and capital.

According to the report, the creation of an innovation-friendly market requires actions on regulation, standards, public procurement, intellectual property and fostering an innovation-friendly culture. For a number of targeted areas, like e-Health, Security, and Digital Content, an independent High Level Coordinator should



Esko Aho, former Finnish prime minister.

be appointed to orchestrate European action in each area. In order to boost R&D, the proportion of structural funds spent on research and innovation should be trebled. The report points out that in addition to better funding the productivity of R&D must be measured and increased.

The report suggests an independent monitoring panel with support from the European Commission, which should report annually on progress in relation to the Innovation Pact.

The Aho report is available at <http://europa.eu.int/invest-in-research/>

Commission proposes European Institute of Technology

On 22 February, the European Commission officially proposed to set up a European Institute of Technology (EIT) as a new flagship for excellence in higher education, research and innovation. The proposed EIT is part of the Commission's efforts to revamp the Lisbon strategy for growth and jobs, including the ambitious goal that Europe should become the world's leading knowledge economy.

The EIT's structure would consist of a Governing Board with a small supporting administration and a set of Knowledge Communities, distributed all over Europe, who carry out trans-disciplinary research and training activities. The Commission expects that funding for the EIT would be provided from a variety of sources includ-

ing the EU, the Member States, and the business community.

The Commission does not intend to create a new university on a single site, but a new, multi-site, legal entity which brings together the best teams and university departments in strategic fields across Europe.

The background for the proposal by the EC is that over the last 50 years, Europe's share in knowledge creation has slowly declined. The Commission argues that Europeans have been less effective than their competitors in the USA and Asia in using the results of their research work to develop commercially-viable products and processes. The main reason for this, accord-



European Commission presents EIT plans.

ing to a Commission paper, is that European research results have not been transferred effectively, and cooperation with industry is less well-developed.

The EIT is meant to complement the activities of EU Networks of Excellence, European Technology Platforms, and the European Research Council.

The EIT plan will now be considered by the European Council. Before the end of 2006, the Commission will present a formal proposal. The Commission has envisaged the following schedule: in 2008, the legal basis for creating the EIT will be adopted; in early 2009, the Governing Board would be appointed, along with the first staff; the identification of the Knowledge Communities should start in 2009.

The Commission's EIT plans have been criticised by the League of European Research Universities, who argue that the EIT would be an inappropriate response to the challenges facing European research, as it would only lead to an ineffective diversion of resources.

What the Commission and their critics seem to have overlooked in the discussion is that there is already a European Institute of Technology in Rimini, Italy – see <http://www.eit-uniu.net>. So the name EIT is already assigned.

Further information on the EIT plans of the Commission is available at http://europa.eu.int/comm/education/eit/index_en.html

Open Source in telecoms

Business models and legal issues



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Open Source has established itself as part of the ecosystem in the software development market. Much of the communication through the Internet today is run by Open Source software. Countless articles in the media have extensively covered the pros and cons of Open Source from a technological point of view. The free availability of Open Source software without paying any licence fees represents a paradigm shift and is a strong motivation for many to examine the phenomenon closer. How do people make a living, if they do not ask money for their work? And what do all these legal clauses in the licence agreement mean in practice?

At first glance a network operator or service provider seems to be only indirectly affected by the phenomenon, when seen from a pure business perspective. For example, the fact that no licence fees are paid could mean that deployment of systems is much cheaper. This is not necessarily true, because deployment is only the first phase in the life cycle of systems. The so-called Total Cost of Ownership (TCO) has to be considered as well. From a legal point of view, questions of responsibilities and liabilities come into view. The picture becomes more complicated, if you consider combinations of proprietary systems and Open Source systems.

Economic and practical realities

Among the most significant practical differences between proprietary and open source systems are the ways in which they are developed, licensed, distributed, and the TCO.

Open Source is typically developed by individuals or small groups of programmers who try to solve a technical problem they encounter. As they are only interested in the solution to the problem, they see no problem in freely sharing the solution with the rest of the world. In contrast, proprietary systems are developed in response to a perceived market demand.

Developers of proprietary systems licence their work in a way that they can exploit their intellectual property in order to pay for their investment, to limit the scope of use and the transferability, and in most cases also to limit warranties and liabilities. Developers of Open Source systems also licence their work, but in a

very different way. Two principal licensing models are most frequently used. The BSD (Berkeley Software Distribution) licence allows you to do pretty much everything you want with the software. You can, for example, modify and distribute free or proprietary derivatives of the software. The only requirement is to include a copyright notice as well as a disclaimer of warranties and liabilities. The GNU Public License (GPL) and the Lesser GPL (LGPL) allow you also to modify and distribute the modified work, but does not allow you to create proprietary systems.

When considering the cost of software, you have not only to consider the acquisition fee, which is effectively zero in the case of Open Source, but you also need to include the cost for customisation of the software to your needs or the needs of your customers. Furthermore, you have to include also the cost of maintenance, the cost of user instruction and technical documentation as well as the cost of quality assurance and training of users.

The interviews with Sacha Labourey from JBoss and Valère Robin from France Télécom in this issue give a deep insight into the business and economic realities from both angles. JBoss is a software provider of Open Source middleware, France Télécom is a large telecommunications network operator and user of Open Source software.

Legal issues

As long as a software system is completely proprietary, the rules are clear and set out by the owner of the intellectual property rights. The same is true for an Open Source software system which observes the same

licence, for example the GPL. The rules are in this case clear as well.

However, matters get very complicated and cause the responsible managers sleepless nights, when source code or software components subject to different licensing models are mixed. For undisciplined developers it is always easier to copy a piece of Open Source code which provides some basic functionality into a proprietary system. The effect of this action, if discovered, could be that the whole proprietary system is rendered Open Source.

In addition, many popular development tools, which are distributed under the contagious GPL or LGPL license, literally infect the system under development by injecting pieces of themselves into the software for which they are used in the development process.

Finally, it has been argued in Linux forum discussions that it is enough, if a proprietary system is just cooperating with a GPL system, with the consequence for the proprietary system to be rendered subject to the GPL license (see the discussion at <http://kerneltrap.org/node/1735>).

Many of the legal questions that are raised by the different Open Source license models will remain unanswered for some time until several court rulings will have taken position on the interpretations of the license terms. The Open Source community has been trying for some years to proscribe GPL violations, which are well documented at <http://gpl-violations.org>.

Open Source is not only software

The trend to make copyrighted work available to the public can also be observed in other technology domains, although



some may question the practical feasibility of some projects, such as, for example, the OScar project (see <http://www.theoscarproject.org/>).

The open cores project (<http://www.open-cores.org>) has the objective to make core chip designs freely available under the LGPL license. The project has lived more or less silently for some years. Recently a big bang announcement by Sun Microsystems to make the hardware design specifications of the UltraSPARC T1 processor available to the community brought significant movement into this area. The last press release from Sun Microsystems on the subject (<http://www.sun.com/smil/Press/sun-flash/2006-02/sunflash.20060214.7.html>) suggests that the T1 processor will be put under the more restrictive GPL license.

The Creative Commons (CC) licenses (<http://creativecommons.org/>) provide a range of protection and freedom provisions for authors, artists, and educators. The licensing model is shaped to the needs of the content industry, allowing content creators to release their works under a specific license. The allegedly first complete movie which has been released under a CC

license is "Chocolate City" by "Dropping Knowledge" (<http://www.droppingknowledge.org/>).



"Chocolate City" by Dropping Knowledge

Consequences

Only a few years ago, Open Source was banned from the vocabulary of many large organisations in the ICT domain. The telecoms business, being a horizontal sector in the value chain, has to increasingly answer questions which have never been asked before. Distributing copyrighted work under some license, without asking for direct financial compensation, was long considered a niche phenomenon. Many of these issues have been addressed in an early Eurescom study (P1044), and although many things have changed in the meantime, the fundamental working principles did not. Today, this phenomenon has started to infect other sectors as well, and telecom network operators have already started to act as educated users of Open Source. A remarkable indication of this trend is the use of Open Source for Next Generation Operation Support Systems, which are essential for the smooth operation of Next Generation Networks. See the article in this cover theme on the results of the Eurescom study P1552 on this subject.

Open Source for Next Generation Operation Support Systems – Eurescom study P1552



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The current software methodology for Operation Support Systems (OSS) is based on a wholly proprietary software model with, in some cases, interfaces based on open standards. There is no evidence that this approach will be able to develop the scope of Next Generation OSS applications in a timely, flexible and cost efficient manner.

In other parts of the software industry, Open Source has dramatically changed the dynamics of developing code and product iteration life cycles. Open Source software has the potential to offer a business model that delivers standards-compliant component implementations in the OSS area.

The Eurescom study P1552 investigated where Open Source can help from an inte-

gration point of view, and has developed a proof-of-concept of Next Generation OSS, using Open Source components.

Next Generation OSS Framework

The OSS of the telecom service providers hold the key to their ability to deliver differentiated services. Today, these support systems do not meet the requirements of service providers. Lack of process management facilities results in inefficient and inflexible processes. Furthermore, there are inherent limitations in the point-to-point integration of support systems, given the dynamic business environment and ever changing requirements.

To address these drawbacks, the Tele-Management Forum is working on specifications for New Generation Operation Support Systems (NGOSS) aiming at providing a blueprint for the scalable and flexible infrastructure that is required for the rapid deployment of new services.

The NGOSS integrates the industry's best-practice principles into a coherent architecture for the development of management systems. Two important principles are described in the NGOSS Technology Neutral Architecture:

- An NGOSS system is characterized by the separation of the hard-coded behaviour of components from the software that automates business processes across components.
- An NGOSS system is characterized by the existence of some common communication mechanism.

To date, solutions demonstrated within the TeleManagement Forum are typically based on commercial off-the-shelf components.

Reference scenario for DSL provisioning

Today, Open Source software cannot replace all components used in the OSS area, thus it is important to understand where Open Source software can have an impact.

As a means to evaluate Open Source usage at the OSS infrastructure level, a DSL provisioning scenario (see figure 1) has been chosen, composed of:

- A messaging bus of XML based messages over JMS (Java Message Service), which resides at the centre of the reference scenario, representing the integration layer.

- An orchestration layer implemented by a Process Engine, which controls the business logic necessary to provide DSL services. It regulates orders coming from an order manager simulator and interacts with the service activation simulators, which in turn activate DSLAM (Digital Subscriber Line Access Multiplexer) and BBRAS (Broadband Remote Access Server) equipment.
- A management layer, which provides functions for monitoring and controlling the system, using a combination of JMX (Java Management Extensions) and SNMP (Simple Network Management Protocol).

Business readiness rating model

Commercial software selection focuses on defining the right relationship with the chosen vendor. It includes processes such as contract negotiations, price discounts, service level agreements, maintenance and support commitments. Such processes are not fully applicable to Open Source software. Furthermore, there is no commonly accepted and widely used model for evaluation of Open Source software. This raises some barriers to the adoption of Open Source software in larger organisations.

The Business Readiness Rating™ (BRR) has been proposed as a new standard model for rating Open Source software. It is intended to enable the entire community, including adopters from enterprises and developers, to rate software in an open and standardized way.

The BRR model has been used to determine which packages can be used to build the integration and orchestration layers in the scenario. It includes four phases for software assessment (see figure 2):

- During the Quick Assessment Filter phase, the most likely candidates for implementing the DSL provisioning scenario are selected, using a questionnaire, in which a set of classical runtime

characteristics, such as performance, scalability, high availability, and interoperability are used. JBossMQ and jBPM from JBoss have been selected in this phase.

- During the Target Usage Assessment phase, a ranking and weighting of the various characteristics defined in the previous phase is executed.
- During the Data Collection & Processing phase, vital information is gathered for the analysis process. This information represents the score of JBossMQ and jBPM, which assists in the final phase of the assessment.
- During the Data Translation phase the BRR score is calculated and normalized according to a template and concluded as being excellent, very good, acceptable, poor or unacceptable for the given purpose.

Conclusions

The BRR model has been used in the selection and evaluation process of the Open Source packages integrated in a DSL provisioning scenario and has proved to be an excellent proposal for software assessment. It is an open proposed standard and a very customizable proposal, as it can be applied to any usage requirements.

The experience from applying the BRR model and integrating the chosen scenario suggests that Open Source software is mature for many areas relevant to telecom service providers. It is advisable that Eurescom members integrate the Open Source software concept in their business strategies.

Further information on Eurescom study P1552 is available at <http://www.eurescom.de/public/projects/P1500-series/P1552>.

The study reports are confidential and only available to the Eurescom Study Programme subscribers.

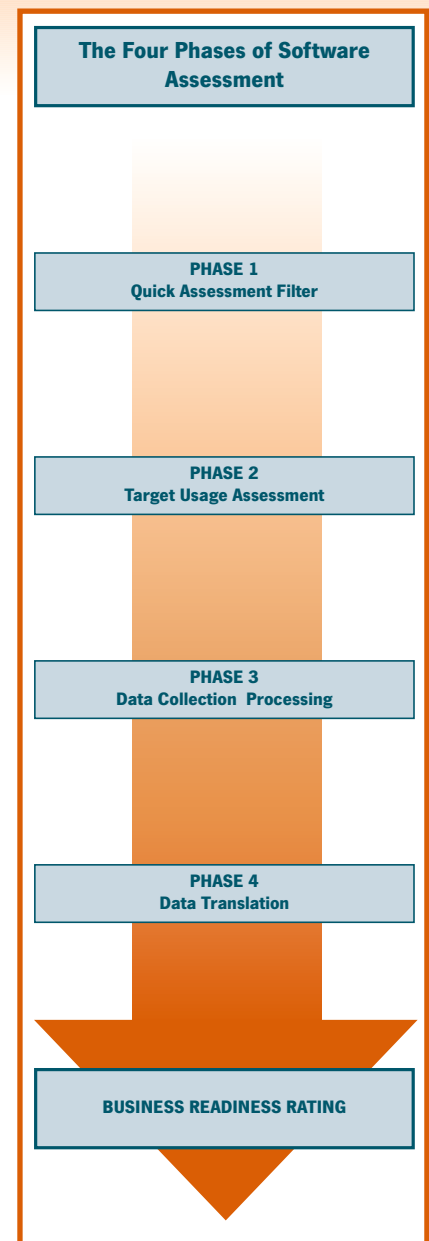


Figure 2: Four phases of software assessment

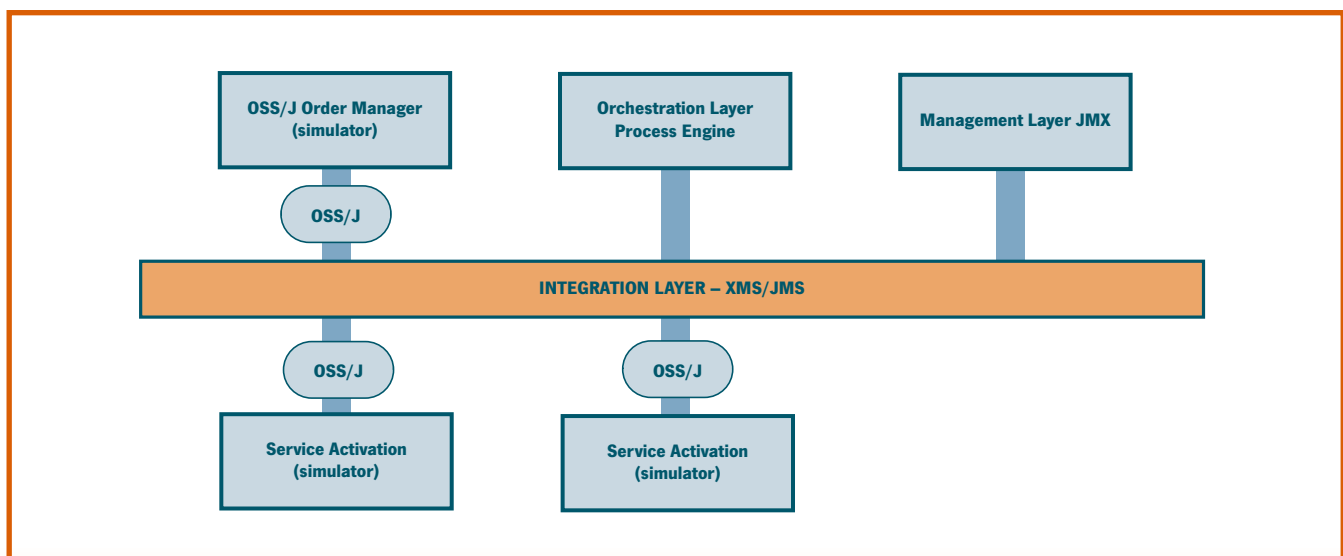


Figure 1: OSS infrastructure level

Big market for Open Source services

Interview on the business opportunities of Open Source with Sacha Labourey, JBoss General Manager EMEA



Sacha Labourey

Eurescom mess@ge wanted to get an inside view on the business opportunities of Open Source and talked to Sacha Labourey, General Manager at JBoss, a major Open Source middleware supplier. The trained engineer from Switzerland oversees the company's business in Europe, Middle East, and Africa.

What motivated you to release an Open Source middleware product?

Labourey: We started in 1999 as a group of developers in a joint Open Source project on middleware. The JBoss Group was only founded later in 2001. So, first was Open Source, and then came the company. Our motivation with this step was to earn money and to ensure the existence of our middleware product in the future. We started to offer consulting, training and other services. In 2003 we received 10 million dollars of venture capital in order to expand our activities. By then, we already had 50 people in R&D.

The software quality process for Open Source is not well defined. How do you assure the quality of the product?

Labourey: The process of quality assurance in Open Source is different from proprietary software, but not worse. In Open Source, you have frequent releases and a lot of extremely valuable feedback from users. However, this is not enough. What we do is combine the advantages of Open Source with a professional software development process, which we call Professional Open Source. This includes testing, training, and other development steps as you know them from proprietary software design.

There are four ways how we acquire projects: the first is to take an existing project. We do this by hiring the developers, so we can control the quality of the project. The second way is to start a project from scratch in-house. The third is to join an existing project, like we did with Tomcat. The fourth way is to acquire proprietary software and turn it into Open Source. We did this recently by buying distributed-transaction and web-services software from Arjuna Technologies.

How do you assess the quality of contributions from the Open Source community?

Labourey: Our system of quality assessment is mainly built on assessing the contributor in order to ensure the quality of the contributions. For each of our 30 projects we have a leader, who accepts or refuses contributions. Contributors will start by sending patches to our website. After a few accepted patches we will offer them read/write access. The developer who recommended the contributor will follow his activities for some time in order to ensure the quality. Our system is a meritocracy – if you are good, you get more power. The only difference to traditional software companies is that we do not care, if the people we hire have a Ph. D. or not. The only thing that counts is the quality of their contributions.

Which obstacles do you see towards a broader acceptance of Open Source by large companies and government agencies?

Labourey: Although there is also bad proprietary software around, quality assurance is still an issue with a number of Open Source software. More professional Open Source has to happen. You can do this in different ways. You have to reassure customers of the quality of Open Source products. The obstacles will be overcome through the first wave of early adopters. We are on the right track. Just to give you an example, in 2004 JBoss signed a large contract with the French Ministry of Finance, which means that the applications for more than 200,000 people in their administration are running on Open Source middleware.

How can Open Source succeed in B-to-B markets for specialized, complex applications, like telecoms billing systems, CRM, or ERP?

Labourey: The more the market is a mass market, the easier it is to have successful Open Source. In niche markets, success is much more difficult. However, even in specialised markets, a lot of the infrastructure is already based on Open Source. Look at

Internet software. Almost everything in IP stacks is now Open Source. With Sugar CRM, there is already a quite successful Open Source CRM software. Within two to three years, Open Source will also be successful in the area of ERP.

How big do you estimate is the market for Open-Source-related services, such as consultancy, customised integration, training, and maintenance?

Labourey: I am sure that the market is very big, but, in all honesty, I cannot give you a figure. The reason for the growing importance of the market for Open Source services is that the importance of software licences is fading. At JBoss, 80 percent of the revenue comes from support services. At a traditional software vendor, the revenue share of support services amounts to 20 percent. However, the companies selling proprietary software are moving from a licensing system to a subscription-based system, thus increasing the share of support services.

Who are and who will be the main players in the market for Open-Source services?

Labourey: At the moment, there are three main players: the Open Source software vendors, like RedHat, MySQL, and JBoss, the small, specialised providers of Open Source support services, and the traditional software companies who have begun to enter the Open Source market. What we see now on the market is a market concentration, as it happened in the Internet business in the 1990s. Big players like CSC, IBM, and CapGemini will grow their Open Source business by acquiring small providers. At the end, the market will be controlled by a few new and old big players.

The interview was conducted by Milon Gupta.

“All players will win!”

Interview with Valère Robin from France Télécom on the prospects of Open Source



Valère Robin

France Télécom is one of the first network operators who have used Open Source software. *Eurescom mess@ge* talked to Valère Robin, Head of Strategy and Programs at France Télécom's Middleware and Advanced Platforms R&D Center, about the opportunities of Open Source from a telco perspective.

What motivated France Télécom to use products from the Open Source community?

Robin: The first reason was that Open Source software has been a key factor of innovation for more than 25 years! France Telecom has been using Open Source software since the 80s for its R&D activities, because our researchers are part of international communities that are using and building innovative systems and tools. Then, the operational units of France Télécom began in the early 90s to use Open Source to build the software infrastructure necessary to the Internet and Web growth in Europe, for example for our portals and search engines. And now, Open Source software is helping our group to provide up-to-date services like voice and video over IP or TV over ADSL to our clients while mastering our costs and controlling our service and IT software infrastructures. Right now, France Telecom not only uses Open Source, but is also active in communities and contributes software.

The software quality process for Open Source is not well defined. How do you assure the quality of the products France Télécom uses?

Robin: The quality of Open Source software depends on the quality of the different contributors and on the quality of the community. The first step is, thus, to assess the maturity of both the product itself and of its “providers”: consortia like OSDL, Eclipse, Apache or Objectweb really help end users in their choices as they act as professional and trusted entities. The second step is to internally test and qualify the Open Source projects, comparing them to other solutions, benchmarking them for functionalities, quality, performances and using them in production situations. Then they are ready to implement part of the product recommendations that apply to all the divisions of our group.

Which metrics do you use for assessing the quality of contributions from the Open Source community?

Robin: For assessing Open Source we look at functional coverage, conformance to standards, size and quality of the community, development processes and tools, consortia or enterprise involvement, performances and benchmarks, existence of support, and in-house tests.

Which obstacles do you see towards a broader acceptance of Open Source by large companies and government agencies?

Robin: I don't see any technical limitation: Open Source systems are helping us provide integrated and convergent services, both within our networks and servers but also in the customers' equipments, like domestic gateways, set-top boxes and



devices. The main limitations may stem from coexistence with “classical” intellectual property laws: misuses of software patents, DMCA and copyrights laws could have an impact on Open Source existence and acceptance. The different communities have to be careful on their choices of licences and on their process to accept contributions.

How can Open Source succeed in B-to-B markets for specialized, complex applications, like telecoms billing systems, CRM, or ERP?

Robin: Open Source solutions are ready to provide the technical infrastructure of mission-critical systems and of B-to-B exchanges, based, for example, on web

services. They are also ready to provide vertical dedicated solutions, such as e-government systems, educational systems, content management systems, workflows. Regarding enterprise process support for BPM, CRM, ERP, and billing, the solutions need to be scaled-up from solutions suitable for small or medium-sized enterprises to solutions ready to be deployed in large corporations with multiple sites and entities. Everybody needs to concentrate on his core business and maximize the efficiency of support processes. Concerning non-competitive components, Open Source is a good way to share developments, to reduce costs and to provide open solutions inter-working with each other.

How big do you estimate is the market for Open-Source-related services, such as consultancy, customised integration, training, and maintenance?

Robin: Most of the Open Source uses will be based on mainstream components, like OS, databases, middleware, tools, general frameworks, or portals. Services will be provided either by Open Source-focused enterprises, as part of traditional service activities, or even by internal skills centres. On some specific components like, for instance, embedded systems, there will still be room for services provided by specialized companies, whose business model is often to lead an Open Source project and provide consulting, customization, education and additional development for it.

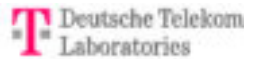
Who are and who will be the main players in the market for Open Source services?

Robin: I am currently visiting the Linux Solutions and Objectweb conferences in Paris. The hall is busy with political activists, technical experts and evangelists, teachers and researchers, associations, small service companies, software editors, big system providers or integrators, government agencies, and users. They are all trying to build a better future, and everybody can find a way to contribute while at the same time achieving his own goals. The beauty of Open Source is that all players will win!

The interview was conducted by Anastasius Gavras.

Deutsche Telekom Laboratories

Linking science and industry for efficient innovation development



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Deutsche Telekom Laboratories are the R&D institute of Deutsche Telekom Group, Europe's largest telecommunications provider. The institute is located in Germany's capital, Berlin, on the TU Berlin (Berlin University of Technology) campus to ensure close collaboration among industry and academia. A laboratory of Deutsche Telekom and an institute of TU Berlin at the same time, Deutsche Telekom Laboratories are bridging the gap between science and industry, in order to transform ideas into marketable innovations as fast as possible.



Working at Deutsche Telekom Laboratories

At the institute, experienced project managers of Deutsche Telekom, post docs, and top scientists from all over the world work hand in hand to initiate and carry out innovative technological projects, scan and evaluate emerging technologies, establish a worldwide partner network, and represent Deutsche Telekom's interests in various standardization bodies. Deutsche Telekom benefits from the knowledge and ideas, while the scientific staff can continue to pursue their university careers and at the same time get to know the internal workings of a big international company.

Of course, there are several other units within Deutsche Telekom Group, where innovation takes place. Especially the Strategic Business Units (SBUs) pursue their own short-term product development activities close to the market. Deutsche Telekom Laboratories do not compete with, but complement these efforts. The institute covers the cross-SBU and the long-term innovation topics with an esti-

mated time-to-market of more than three years. This includes a certain amount of basic research with the aim to position Deutsche Telekom as an innovation leader in the telecommunication industry. At the moment, TU Berlin is assigning four Deutsche Telekom endowed chairs to investigate the strategic research topics "Security in Telecommunications", "Usability", "Intelligent Networks and Management of Distributed Systems", and "Service Centric Networking".

Ambitious in technologies, focused on customer needs

Technology should not be developed just for the sake of it: The projects of the Laboratories are closely geared to the future needs of the customer and in line with Deutsche Telekom's innovation strategy, that is they cover five focus fields of innovation, which have been identified as having a long-term impact on the development of new technologies and business models

face technologies for the interaction with other people or with ICT applications and services. This allows the user to communicate most naturally while keeping the option of staying anonymous.

Integrated Communication

Devices and objects in our surroundings are going to be interconnected in the future. Information can be transmitted without the active participation of the user such as with RFID technology. Deutsche Telekom Laboratories is currently working on a service solution that integrates different sources of information to help the user, for example as a local guide.

Intelligent Access

Intelligent Access focuses on technologies that automatically select the best connection regarding performance and costs. The EU project DAIDALOS for instance is concerned with integrating mobile network and broadcast communications in order to deliver personalized and pervasive end-to-end services like e-mail or digital

Five Focus fields of innovation.
Focus Fields address DT's major innovation opportunities and require a long-term development.

Focus fields (5i)	ICT spectrum	Technology trends	Innovation guidelines
Integrated Communication	Network	<ul style="list-style-type: none"> Addressability of items Home networks Meta languages & protocols 	"Everything talks"
Intuitive Usability	User	<ul style="list-style-type: none"> Automated personalization Multimodal interface Sensor technology 	"Simplify your life"
Intelligent Access	Network	<ul style="list-style-type: none"> AAA Service handover Device adaptation 	"Always best connected"
Infrastructure Development	Network	<ul style="list-style-type: none"> Core network Access network IT infrastructure 	"High quality at reasonable cost"
Inherent Security	Usage	<ul style="list-style-type: none"> Identification Trustworthy regions Network-based security tools 	"Trusted IT networks"

Deutsche Telekom Laboratories

in the ICT area. These focus fields (the so-called five "i"s) are Intuitive Usability, Integrated Communication, Intelligent Access, Inherent Security, and Infrastructure Development. Deutsche Telekom Laboratories run more than 25 projects in these fields.

Five focus fields of innovation

Intuitive Usability

Using a mobile phone should be more than simple, it should be intuitive. While technologies get more complex, using them should get easier. One project in this area is GestAvatars. A GestAvatar is a virtual representative of a person who uses gesture tracking, mimics animation, emotion recognition and other multi-modal inter-

video across heterogeneous technologies. This includes a seamless handover from broadband Internet connections to mobile broadcast services like DVB-H.

Inherent Security

ICT networks and applications need to be protected against unauthorized access and malicious software. To combat this, research has focused on a project carried out together with the Ben Gurion University in Israel. The project is about to replace today's mainly device-based security software packages by self-adjusting protection mechanisms built into the network itself. This way, customers can access communication services without being concerned about the current security level of their devices.

Infrastructure Development

Current and future telecommunications scenarios require high-performance broadband networks as well as extremely powerful computer systems that can process and store large volumes of data. In this area, the innovation projects aim at achieving a balanced cost/benefit ratio, keeping the best quality applications and services affordable for customers in the future.

Summary and outlook

Deutsche Telekom Laboratories complete the research and development activities of Deutsche Telekom. Long-term projects and projects that involve more than one strategic business unit are carried out by Deutsche Telekom Laboratories. Emphasis is put on the transfer of project results in different stages: from the research stage to development and from the develop-

ment stage to a final product. Currently, there are five projects in the end phase, representing Deutsche Telekom Laboratories' goal of guiding the R&D phase through to a market-ready final product or service.

Further information is available on the Deutsche Telekom Laboratories website at www.telekom.de/laboratories

Open broadband access comes at a price

Advocates of Net neutrality neglect economic facts



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The emergence of advanced broadband networks has triggered a controversy in the United States on indiscriminating access to the Internet. The fervent advocates of open access tend to neglect that advanced networks come at a price. Finding a balance between the business interests of network operators and the interests of citizens and service providers for unlimited access requires a comprehensive view on regulatory and economic aspects.

Some enraged bloggers have accused US network operators like AT&T and Bell-South of "cyber-extortion". The reason is that network operators and cable companies in the US want to get an extra charge from content and service providers like Google, Yahoo, or Vonage for the use of their advanced broadband networks.

Beginning of February, this was the issue of a US senate hearing. Internet founding father Vinton Cerf, now vice president at Google, argued that the control of broadband access by the carriers would undermine the basic principles of open Internet access. Walter B. McCormick Jr., president and CEO of the U.S. Telecom Association, defended the extra fees with the argument that the future of the Internet requires a multi-billion-dollar investment in next-generation networks.

Consumer organisations like the Consumer Federation of America (CFA) advocate network-neutrality legislation in order to guarantee open, non-discriminatory

access, accusing the network operators of discriminatory business models, which will finally lead to higher fees for consumers.

Although the debate between the European Commission and the incumbent network operators in Europe has a slightly different focus, the central theme is the same: open access to advanced broadband networks versus business interests of network operators who want to defend their investments.

There is no easy solution to this basic conflict. If regulators force the network operators to open up their advanced broadband networks at a fixed low price, their capability to invest in innovation will be stifled. On the other hand, open access to broadband Internet is essential for the business of a growing number of service providers. Tight regulation in order to achieve open access at low cost is at first sight a great solution: it pleases ISPs and consumers alike. The drawback is that it demotivates network operators to invest, as they know that they cannot fully reap the benefits from their investment. The problem is that only big players, or the public itself, have the money to make the necessary infrastructure investments into next-generation broadband networks. In Europe, most of the big network operators are the former incumbents, which puts them under the general political suspicion of having an unfair competitive advantage due to the tax money they received in the good old times when they were fully state-owned. This view neglects the fact that most of the incumbents still have to carry liabilities from the "good old times": pensions for civil servants and ongoing political influence by governments on management decisions tend to counterbalance the incumbents' strong position towards their competitors.

It would seem like the achievement of the impossible, if open broadband access for citizens and ISPs at low cost as well as

high network quality and high profitability of competing network operators could be achieved at the same time. It is certainly worth trying to achieve it; the only problem is – how? Regulation should certainly include the basic principles of open access to next-generation broadband networks. However, open access should not be confused with free access. Regulating the price of an advanced service, which is based on billion-euro infrastructure investments, is against the principles of free competition in a market economy, which some pundits still regard as a good model for the creation of value and wealth.

The most important alternative is currently not very popular, but should be considered nevertheless: public infrastructure investments into broadband could lead to a number of beneficial effects: open access and fair competition could be guaranteed as well as accelerated growth of a market which is unanimously regarded as vital for a prospering knowledge economy. Broadband Internet access would become a utility like water or electricity. South Korea, the world leader in broadband, has demonstrated that subsidising the infrastructure can be beneficial to everyone – customers, service providers, and network operators.

In summary: regulating the networks in order to guarantee open, indiscriminating access to advanced broadband services is fine, as long as it leaves network operators an opportunity to reap profits from their investments. Regulators in the US and the EU should be aware that a precondition for getting the golden eggs is that the goose is alive and well. If public authorities regard inexpensive broadband Internet as a utility of such crucial importance to all citizens that they cannot leave price formation and the terms for access to the market, they should be ready to support the necessary infrastructure investments in order to speed up and control the process.

CELTIC Event in Dublin



CELTIC declares a new era of telecoms in Europe



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A new era of telecommunications is arising in Europe, according to Jacques Magen, the chairman of EUREKA cluster CELTIC. At the opening of the two-day 'CELTIC Event' in Dublin on 23 February, Mr Magen pointed out that the integrated R&D efforts of the European telecoms industry and the public authorities within CELTIC are providing a major push for innovative communication services in Europe.

Driving force for innovation

"CELTIC has now reached a critical mass, which makes it a driving force for innovation in European telecoms. Since 2003, close to 30 projects have been launched with a total annual effort of about 1,000 person years and an annual budget of 100 million euro," Mr Magen said.

José Jimenez, the new chairman-elect of CELTIC, added that the innovation push from CELTIC will be enhanced through the cooperation between CELTIC and the European Technology Platforms NEM (Networked and Electronic Media), eMobility, and NESSI (Networked European Software and Services Initiative) in the context of the forthcoming 7th EC Framework Programme for Research. For the coordination of the future work of the NEM platform and of CELTIC, a liaison

meeting was organised in Dublin in connection with the CELTIC Event. Similar liaisons are also planned for the eMobility and NESSI platforms.

The 'CELTIC Event' was the first major exhibition of CELTIC projects after the launch of the first CELTIC projects in 2004. On the first day of the event, 18 CELTIC projects presented their achievements to innovate Europe. The scope of topics included a number of next-generation broadband and multimedia and new mobile services, novel solutions for Digital Rights Management, and a range of technologies for enhancing the capabilities of telecommunication networks, including mobile TV. What distinguishes CELTIC projects from other R&D projects in telecommunications is the fact that all of them take the whole telecommunication system, from end to end, into account. The second day was dedicated to discussing visions for the future of telecommunications and the role of CELTIC in the European research landscape.

The event was co-organised with Enterprise Ireland at Dublin Castle. About 200 participants from 30 countries, including numerous decision makers from industry and public administrations, participated in the event. At the exhibition 18 projects demonstrated their current achievements, some of them already under further product development and patenting. Besides the project show cases and presentations, the event also served as an important platform to establish new working relationships and to define new research activities to be carried out as new CELTIC projects in call 4.

About CELTIC

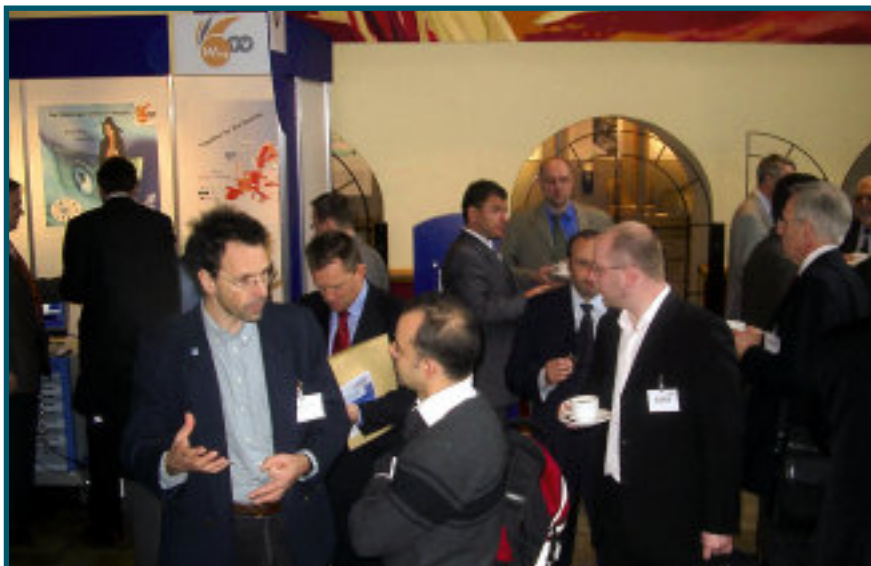
CELTIC is the third-largest EUREKA ICT cluster programme. It initiates and runs privately and publicly funded R&D projects in the field of telecommunications. CELTIC projects are focusing on telecoms networks, applications, and services based on a complete-system approach. CELTIC is the only European R&D programme fully dedicated to complete, system-integrated telecommunications.

For new projects to be started in 2007, CELTIC has launched in January its 4th call for new proposals in which industry, telcos, SMEs and any other organisation can submit a project proposal and ask for public funding. The deadline of the first phase of Call 4 is 4 May 2006.

Information about CELTIC and the new call is available on the CELTIC website at www.celtic-initiative.org.



The outgoing and the new CELTIC chairman in Dublin: Jacques Magen (left) and José Jimenez.



Vivid discussions at the CELTIC exhibition.



Opening session of the CELTIC Event at Dublin Castle.

NM2 seminar on managing complex international projects



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EU project NM2, which develops new media genres, has gained considerable experience in managing complex international projects with geographically distributed partners. In order to share this experience, NM2 organised a training seminar on 25 January 2006 at the Eurescom premises in Heidelberg.

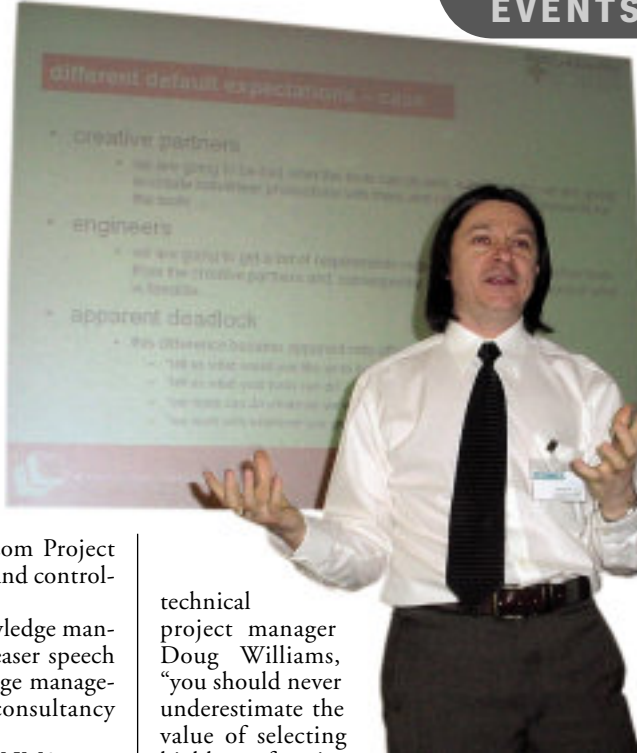
42 managers and experts from all kinds of international projects attended the event and learned about building, running and managing complex projects.

The programme, which was moderated by Milon Gupta from Eurescom, included:

- An outline of the characteristics of projects in EU research programmes by Kai Tullius from the European Commission.
- The different parts of the life cycle of complex projects, and what complexity of a project actually means by Anastasius Gavras from Eurescom.
- A report by NM2's technical project manager, Doug Williams, on his experiences in putting the project team together and running the project.
- Practical experiences of the NM2 coordinator, Peter Stollenmayer, on building effective project management structures and on ensuring the quality of the results.

- Demonstrations of project management tools, including Eurescom's audio-conferencing and mailing-list services, shared workspace based on BSCW, and the Eurescom Project Reporter for EC reporting and controlling.
- A panel discussion on knowledge management, initialised by a teaser speech from Anja Walter, knowledge management expert at German consultancy LearnAct.
- An entertaining speech by NM2 partner Marian Ursu from Goldsmiths College on cultural diversity.
- An overview on the special challenges of IPRs in research projects by TNO's legal advisor, Folkert Teernstra.

The participants were actively involved and contributed to the seminar with many questions and remarks. The participants were particularly pleased with the practical, hands-on approach of the speakers. One of the key messages was that good project management always depends on good project teams. According to NM2's



Marian Ursu at his presentation on cultural diversity.

technical project manager Doug Williams, "you should never underestimate the value of selecting highly performing partners from the beginning". NM2 coordinator Peter Stollenmayer said: "The personal relationships in such projects are extremely important. People who had a beer together can solve problems much easier than people who never met personally".

The event was felt to be an excellent opportunity to learn from each other. Kai Tullius from the European Commission said that such a seminar could easily be used for exchanging "best practices" amongst project managers. The NM2 project is planning to repeat the event in a slightly modified format in about a year's time. Then, we will also put some attention to management issues in the new Framework Programme 7.

Further information is available on the NM2 website at www.ist-nm2.org



Mobile WiMAX Eurescom study WiMAP



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WiMAX – Worldwide Interoperability for Microwave Access – is a new wireless technology for data communications. IEEE standard 802.16-2004 is the basis for WiMAX in fixed or nomadic applications. In December 2005, IEEE approved the 802.16e-2005 standard which extends WiMAX for mobile applications. This standard introduces a range of new features to adapt to the mobile environment, notably handover functionality and a technology called Scalable Orthogonal Frequency Division Multiple Access (S-OFDMA). In order to analyse the new standard and its potential for telecom operators, Eurescom launched study WiMAP – WiMAX for Mobile Applications (P1554). This study was performed in co-operation between Portugal Telecom, Eircom, Iceland Telecom and Telnor.

HSDPA delivers up to 10 Mb/s which is less than expected from mobile WiMAX, and the range of HSDPA is also slightly shorter. Expected data rates of a few mobile data technologies are depicted in figure 1. The long timeframe for the introduction of mobile WiMAX equipment is a major risk factor for its success.

Spectrum issues

In general, there are three relevant frequency bands for WiMAX in Europe. Those are 2.5 GHz (licensed), 3.5 GHz (licensed) and 5,8 GHz (unlicensed). The lower ones are preferred for mobile operations due to more favourable propagation characteristics. 3.5 GHz is normally licensed for fixed wireless applications, although there is a growing trend to allow nomadic operation as well. While there is considerable bandwidth available in the 2.5 GHz band, it is currently designated for IMT-2000. An EC decision on the use of this band on a technology neutral basis is crucial for mobile WiMAX in Europe. Spectrum issues in Europe are currently unpredictable and could impede the introduction of mobile WiMAX.

- Fixed and mobile operator with EDGE/3G who uses mobile WiMAX as a complementary extension for data services
- Mobile only operator with EDGE/3G who uses mobile WiMAX as a complementary extension for data services
- Fixed operator who uses mobile WiMAX to compete with 3G operators for data and voice services
- New entrant who uses mobile WiMAX to move into mobile market – threat to incumbent mobile operator

The study performed a techno-economic analysis of each scenario for urban or sub-urban environments. Detailed results will be published in a project report.

Conclusions

Mobile WiMAX is certainly exciting from the technological point of view. OFDM/OFDMA-based systems have shown superior behaviour in environments characterised by multipath and signal fading. OFDMA even allows to offer a constant QoS level throughout a coverage area despite certain signal strength variations. However, spectrum availability for

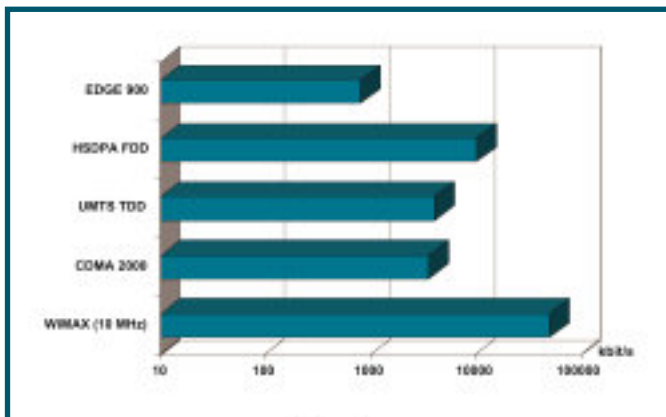


Figure 1: Peak data rate of different mobile technologies

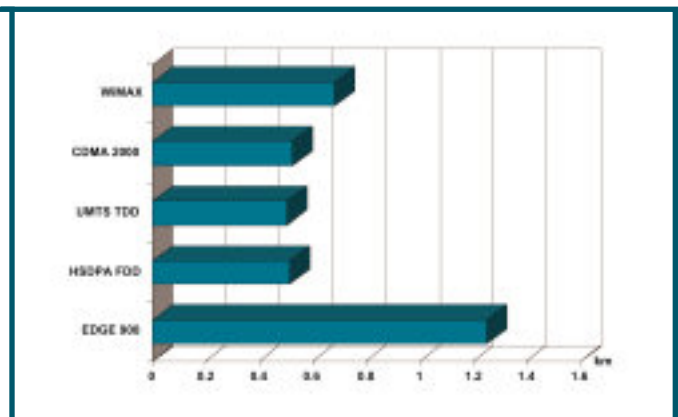


Figure 2: Typical cell radius for mobile data technologies

When a new technology emerges it is natural to ask if this is really needed, and if other aspects like, for instance, regulation and equipment availability will allow for a market success. Judging from prior experience with fixed WiMAX, where it took 20 months from standards approval until certified equipment was available, mobile WiMAX equipment can be expected at around mid 2007. First equipment will probably be PCMCIA cards followed by laptop integration in 2008 and PDAs/handsets in 2009. Following this, multi-modal handsets comprising 2G/3G and mobile WiMAX are likely to be introduced. In comparison, UMTS native High Speed Downlink (and Uplink) Packet Access (HSDPA and HSUPA) technologies will enter the market already in 2006.

Cell dimensioning

Cell dimensioning analysis has shown that in an urban environment a coverage radius of 600 m at 3.5 GHz and 800 m at 2.5 GHz can be expected. Using the power concentration feature of OFDMA this coverage can even be considered for the indoor case if people are prepared to accept a slight service reduction when going from the outdoor to the indoor environment. The typical cell radius for some mobile technologies in a dense urban environment is shown in figure 2.

Deployment scenarios

While there is a large range of possible scenarios for the deployment of mobile WiMAX, the WiMAP study has focused on four main categories, with an emphasis on the European market.

mobile services in Europe must be clarified before mobile WiMAX can be introduced. The timeframe for mobile WiMAX introduction could be too long for it to gain momentum in the market.

More information on study P1554 is available at:

<http://www.eurescom.de/public/projects/P1500-series/p1554>

The study reports are confidential and only available to the Eurescom Study Programme subscribers.

Eurescom study on sensor networks

New business opportunities for telcos



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Traditional network accesses to both fixed and mobile networks are heading towards saturation. But at the same time, new technology enables the possibility of extended access to many kinds of new devices and objects. These objects include appliances, personal objects, vehicles, and even animals, and have previously not been thought of as communicating entities. Eurescom study P1555 explored the possible roles for telcos in the emerging market of sensor networks.

The main questions the study addressed were how telcos can take advantage of their position as traditional network suppliers and what business models and strategies could be applied.

The already apparent slower growth in traditional network accesses puts heavy pressure on the operators' revenue margins, and there is now extensive search for added-value opportunities, as can be seen from telcos taking on roles in, for instance, content provisioning. An alternative, and perhaps equally natural, approach for a network operator is to seek extension of business in the network dimension.

Microprocessors and short-range, wireless technology

Microprocessors are finding their way into all kinds of applications and devices. The number of microprocessors is growing at a rate of more than 7 billion per year. In addition, new, short-range, low-power, wireless technologies, like ZigBee (www.zigbee.com) or UWB (Ultra Wide Band), make highly cost-effective connectivity possible. Unit costs for devices with wireless communication capabilities are now below 3 euro and further dropping. This justifies hooking up objects and devices to the network far beyond what has been previously technically or economically feasible. It paves the way for a new and rapidly growing domain which includes all kinds of sensor network elements, such as electric and electronic appliances, home and energy automation, personal devices, pets and so on as illustrated in figures 1 and 2. In addition, the new technology will open up vast new areas of application in the business sector as well as in the public sphere.

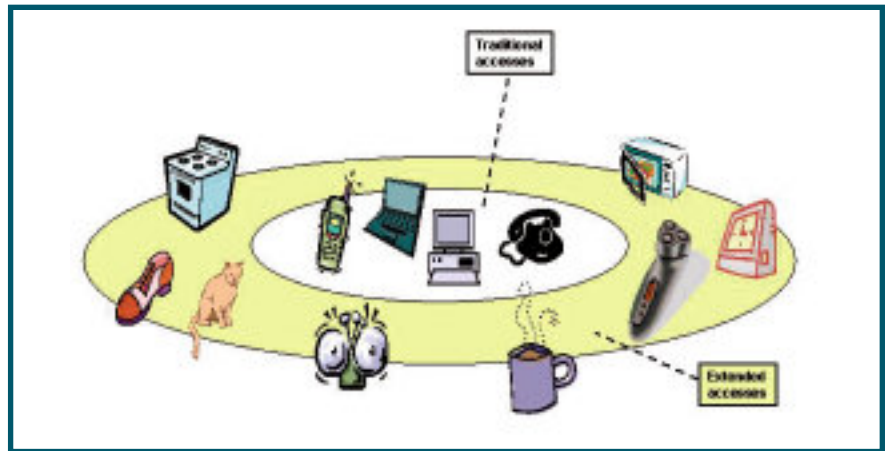


Figure 1: Sensor network for electronic appliances

The telco opportunity

The sensor-network area represents a long-term potential concerning the number of devices in the magnitude of 10 – 100 times the population, perhaps even higher. These devices may very well be connected to the telco infrastructure as “extended accesses”. The ARPU will obviously be considerably lower than for traditional accesses, but the costs will be correspondingly low.

Telcos should not stay outside a market segment of such tremendous potential. However, their involvement raises important strategic issues. The value chain for an operational sensor network service contains a number of roles including communication providers, application providers, hardware manufacturers, installation contractors and system integrators. The telcos will have to decide which positions in the value chain to capture and what roles should be left to partners or other players in the market. The study addresses these challenges and provides alternative telco approaches to the sensor-network market.

The operation of a sensor-network service will require the administration of a huge number of devices and connections. These are tasks telcos are familiar with and have the necessary infrastructure and support systems to handle, and combined with strong market positions, telcos possess important advantages that should be exploited.

Conclusion

The emergence of short-range, low-power, wireless technologies opens up a brand new perspective on the number of devices with connectivity in the future. From a telco point of view, these connected objects represent a huge potential for extension of the existing networks and businesses. Given sound business models, telcos should benefit from their strong positions in the market and generate substantial value from the fast growing sensor network domain.

Further information on the study is available at <http://www.eurescom.de/public/projects/P1500-series/p1555>

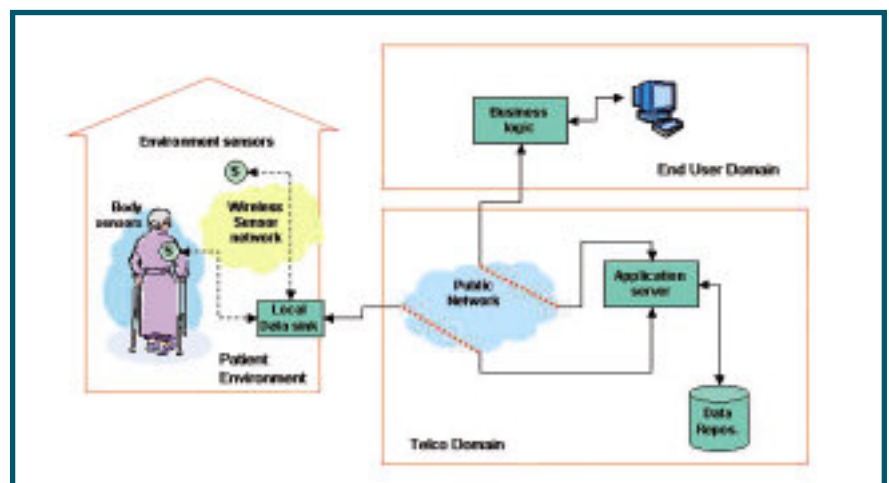


Figure 2: Home sensor network

IMS – IP Multimedia Subsystem

Towards a unified platform for multimedia services



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There is no doubt that the telecommunications world is at crossroads. The Internet is challenging the traditional telecommunications infrastructure. The standardisation of the IP Multimedia Subsystem (IMS) represents the natural consequence in face of this dilemma by combining traditional telecommunications concepts, most notably the Intelligent Network (IN), with emerging VoIP and Internet service technologies. The IMS can be considered as the last chance of the classic telecoms world to compete against an open Internet.

The IMS defines in face of converging networks an overlay control layer on top of IP based fixed and mobile networks, which enables the seamless provision of multimedia services. This has been done by an adoption and extension of the major Internet Engineering Task Force (IETF) protocols for multimedia session control and authentication, authorization & accounting (AAA), such as the Session Initiation Protocol (SIP) and Diameter.

In contrast to plain internet services and as a main value proposition, the IMS aims for providing better security, quality of service and a flexible charging infrastructure combined with single sign-on capabilities by the trusted network operators. In addition to these capabilities, which are sometimes regarded sceptically, the notion of so-called “combinational services” is probably describing best what the IMS can provide. Combinational services represent any combination of existing telecommunication services – like, for instance, voice calls, SMS, MMS, or location-based services – with Internet protocol (IP) based services, such as e-mail, instant messaging, push to talk, video conferencing, web browsing, or shared web space, which are typically combined with presence and group information. This means that the IMS is considered to enhance classic Internet services with traditional telecommunications services plus the above stated value-added attributes. Hence, the IMS provides an evolution path from the existing telecoms infrastructure towards an emerging IP-based Next Generation Network (NGN) in contrast to disruptive NGN introduction strategies.

IMS standardisation

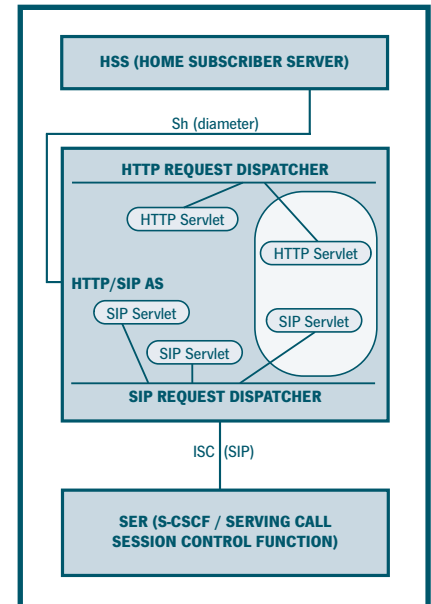
The IMS was initially standardised by the 3rd Generation Partnership Projects (3GPP) as part of its Release 5 (2003) specifications as a new service layer on top of IP-based 3G networks, i.e. the Universal Mobile Telecommunications System (UMTS). Release 6 (2005) specifications have aligned the IMS with real world situations (e.g. IP version 4 deployment, interworking with legacy circuit networks and other IP networks, etc.) as well as harmonisation with emerging Push To Talk over Cellular (PoC) and related so-called service enabler standards defined by the Open Mobile Alliance (OMA).

It is important to understand that the IMS standardisation focuses primarily on the IMS core network for multimedia session control, including real time and messaging services, and as such on the standardized evolution of soft switching and secondary on the controlled SIP- and Diameter-based “docking” of application servers to the core. IMS applications itself are not standardized. In this context, OMA is considered to investigate the applications space by standardizing service enablers on top of IMS.

With the increasing penetration of Wireless Local Area Networks (WLANs) and emerging Wireless Metropolitan Area Networks (WiMax) as access network technologies, the IMS scope is now extended within the ongoing Release 7 standardisation (targeted for 2006/2007) for any IP access network, including fixed access networks, i.e. DSL (Digital Subscriber Line). Particularly the latter aspect has also driven NGN standardisation bodies, such as ETSI (European Telecommunications Standards Institute) and ITU-T (International Telecommunications Union – Telecommunications Sector) to consider the IMS as an important service control platform for their NGN standards. ETSI defined its first NGN Release 1 at the end of 2005, featuring an IMS based PSTN Emulation System (PES) on top of fixed IP networks.

IMS deployment status

Nearly all network equipment providers, system integrators and network operators consider IMS as the most important NGN reference service delivery platform for aligning their product and service roadmaps. Many trials have been performed in the last two years, although real standard-compliant IMS products are not becoming available before the end of 2006. Central focal points of these trials have been to obtain experiences in the IMS service provisioning options, identification of potential IMS services, as well as investi-



gating vendor interoperability. The latter point combined with the challenges of lacking standards for standard “IMS clients” have become potential show stoppers. Nevertheless, press releases of major fixed and mobile carriers committing to IMS provide evidence that the IMS will become real in the next 2 to 5 years. PoC and presence based services, including community based services, will drive IMS deployment in the mobile domain, whereas value added VoIP services, FMC, and triple play offers will drive its deployment in the fixed network domain.

Conclusion

The IMS is currently a buzzword for multimedia service provision for converging networks. Similar to the technical and business case discussions of IN/CAMEL and open Application Programming Interface (API) SDPs in the last decades, the IMS will be a key subject of many strategic and R&D projects for the coming years. Thus open testbeds for bringing together the different players of the emerging NGN value chain are of key importance. The open IMS playground at the Fraunhofer Institute FOKUS in Germany can be currently considered as the first vendor and operator independent IMS testbed providing coaching, consulting and proof of concept implementations as well as interoperability tests for major vendors and fixed and mobile network operators.

For more information visit
www.fokus.fraunhofer.de/ims

Eurescom Study Programme

Three new studies to be launched



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One of the well-known service offerings from Eurescom is the Eurescom Study Programme, which has been very successful in identifying and running a series of relevant studies each year. The Study Programme is also continuing in 2006, and the first three studies that were approved by the Study Management Group will be launched in March 2006.

The first call for 2006 studies was issued in December last year, and although the time until the deadline for proposals was rather short, four high-quality proposals were submitted. The group of experts who evaluated the proposals commented that all submitted proposals were very well elaborated, and the proposers made it very clear that they aim to achieve business-relevant results in a short timeframe.

Three out of four proposals were approved by the Study Management Group, which met on 9th February to discuss the assessments by the experts group and agree on the studies that should be launched. The studies will address the following areas:

- Techno-economic analysis of the alternatives for Fibre to the Home (FTTH) installations in green-field deployments.
- Evaluation of how Service Oriented Architectures (SoA) impact the way new services are created and managed and an investigation of how loosely coupled integration can reduce complexity and hence the cost of integration and management of distributed service platforms.
- Analysis of the current status of machine-to-machine (M2M) communications in order to better understand the new requirements posed by M2M and the pervasiveness paradigms as well as to determine how operators can respond to these new business and technological challenges.

The distinguishing factor of the Eurescom Study Programme is that within this

private, industry-driven framework strategic collaborative studies can be set up fast on demand and deliver results in a short period of time. In many cases, results are available after only three months. It should also be noted that proposals for new studies can be submitted any time, also outside the regular calls for proposals. The purpose of the calls is mainly to structure and better organise the assessment of the proposals. It seems, however, that the calls also have a stimulating effect on experts who propose studies.

Finally a personal remark: from the beginning of 2006, I have been managing the Eurescom Study Programme as the successor of my former colleague Harald Johansen, who had successfully managed the programme until he retired last year. I feel privileged to continue his long-term work for the telecoms R&D community.

Further information on the Eurescom Study Programme is available at <http://www.eurescom.de/public/studyprogrammes>

Eurescom has moved

New offices in Heidelberg



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In February, Eurescom moved to new offices within Heidelberg. The modern building close to the motorway has been specifically designed to meet the company's requirements.

The low-rise building within the Heinsteinwerk office complex in the Wieblingen quarter is Heidelberg's first office building designed as a low-energy construction called "passive house", which does not require active cooling or heating. "Our new premises are fully in line with our philosophy: efficient and innovative," Eurescom's director, David Kennedy, explained.

Apart from office space for the 17 international employees of Eurescom, there are also meeting rooms for up to 40 people. Larger meetings will be held in nearby conference facilities. As the new location is centrally situated, visitors coming from Frankfurt Airport will arrive at Eurescom in much shorter time than before.

The new address of Eurescom is:
Wieblinger Weg 19/4
69123 Heidelberg, Germany

Travel directions are available on the Eurescom website at www.eurescom.de/public/aboutus/location.asp

Eurescom's phone and fax numbers have not changed.



ALIPRO benchmarking results

ICT research programmes in the new EU states



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Cyprus has the best-managed and most effective ICT research programme of all EU New Member States (NMS) and Accessing and Candidate Countries (ACC). In a benchmarking study by EU project ALIPRO on programmes related to mobile communications, the Cypriot Programme for Research and Technological Development emerged as the top performer among 32 programmes from 13 New Member States and Accessing and Candidate Countries.

In the comparative analysis, the Cypriot programme scored the highest average value (3.75 out of 4), followed by ten programmes from Hungary, Estonia, Bulgaria, Lithuania and Poland. All of them are in the same league as the reference programmes: the FP6 IST programme, EUREKA cluster programme CELTIC, and three German programmes. However, the average quality of the programmes in one country varies in some cases considerably, as the Polish example shows: one programme ranks among the top ten, while two are performing significantly lower.

Quality criteria

The ALIPRO researchers measured a set of eleven quality criteria in regard to the analysed programmes, including the efficiency of the application process, financial capacity, management quality, transparency, and impact. On the positive side, 75 percent of all programmes have an efficient application process and 65 percent have a high impact.

Weak points of the analysed programmes are openness, management quality, and financial capacity. There are significant disproportions in R&D intensity between New Member States, Accessing/Candidate Countries and some old Member States like Germany. The annual financial volume of the Bavarian Information and Communications Technology programme, for example, is 34 times bigger than the budget of the Bulgarian National Scientific Programme on Information Society.

Positive reforms

In general, there is evidence that reforming R&D programmes can have a positive influence on performance. The ALIPRO researchers found out that recently estab-

lished or reformed programmes are more efficient and effective than old, non-reformed programmes.

The focus of the benchmarking study was on programmes which support mobile communications, but only two programmes are explicitly funding research on mobile technologies, applications, and services. In addition, 4 ICT programmes

and 26 general programmes offer funding for research on mobile communications.

About ALIPRO

ALIPRO is a Specific Support Action within EU Framework Programme 6. The project is performed by a consortium of 14 organisations from all New Member States and the Accessing and Candidate Coun-

Table 1: Benchmark ranking of ICT-related programmes in the New Member States and Accession Candidate Countries

Rank	Programme	Country/Region	Average value*
1-2	RPF's FP 2003-05	Cyprus	3.73
1-2	FP6 IST Priority	Europe	3.73
3	NKFP 2004	Hungary	3.55
4-5	DFG Programme	Germany	3.27
4-5	ICT Bavaria	Germany	3.27
6-7	Enterprise Estonia	Estonia	3.18
6-7	Estonian Science Fund	Estonia	3.18
8	Mobil 2004	Hungary	3.09
9-12	Nat. Prg. Information Society	Bulgaria	2.91
9-12	AKF 2004	Hungary	2.91
9-12	High Tech. Development	Lithuania	2.91
9-12	TECHNE	Poland	2.91
13-16	IT Research 2006	Germany	2.82
13-16	CELTIC	Europe	2.82
13-16	TST 2004	Hungary	2.82
13-16	PriorityResearch&Dev.Trends	Lithuania	2.82
17-21	ASCR Grant Agency	Czech Republic	2.73
17-21	Czech Science Foundation	Czech Republic	2.73
17-21	Market-oriented research	Latvia	2.73
17-21	TIDEB R&D Support	Turkey	2.73
17-21	TTGVP Tech. Development	Turkey	2.73
22-23	Information Society	Germany	2.64
22-23	Nat. Research & Innovation	Romania	2.64
24-27	KKV 2004	Hungary	2.55
24-27	Fundamental/Applied Res.	Latvia	2.55
24-27	APVT (Agency for support of science and technology)	Slovak Republic	2.55
24-27	National Research Prg.	Slovenia	2.55
28-31	OSKAR	Czech Republic	2.45
28-31	Research Supporting Lv. Informatics Industry	Latvia	2.45
28-31	Applied Research	Slovak Republic	2.45
28-31	MVTS Internat. Research	Slovak Republic	2.45
32-33	Univers. Dev. Foundation	Czech Republic	2.36
32-33	INFRA	Hungary	2.36
34	National RTD	Malta	2.30
35	VEGA Grant Agency	Slovak Republic	2.27
36-38	CTU internal grants	Czech Republic	2.18
36-38	Peer-Rev. Research Grants	Poland	2.18
36-38	R&D proj. of nat. importance	Poland	2.18

Recently reformed

Reference programme

* Average value of dominance analysis based on 11 benchmarking criteria; value: 1 = low, 4 = high

tries Romania, Bulgaria, and Turkey as well as old member state Germany. The project started in March 2005 and has a duration of 13 months.

Workshop in Brussels

The benchmarking study and other results from ALIPRO will be presented at a workshop in Brussels on 24 March 2006 under the title "European visions for research programmes on mobile communications in the New Member States and Acceding and Candidate Countries".

Further information about the workshop and the benchmarking study is available on the ALIPRO website at <http://alipro.eurescom.del>

Table 2: Benchmarking attributes of programmes related to ICT/mobile communications in the New Member States and Acceding/Candidate Countries. * 1 = low, 4 = high

Benchmarking attribute	Average value*
Goals and validity of rationale	3.13
Application process efficiency	3.08
Financial efficiency	2.95
Communication quality	2.92
Administrative complexity	2.92
Comprehensiveness	2.89
Transparency	2.71
Impact	2.71
Management quality	2.42
Financial capacity	2.34
Openness	2.24

The importance of ICT for the quality of life EU project SOCQUIT



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One of the main reasons for public investments in ICT is to increase people's quality of life. Information and communication technologies (ICT) are assumed to make life easier, support social cohesion and cultural diversity. The European Framework Programme 6 project SOCQUIT (Social Capital, Quality of Life and ICT) looked into the evidence for the impact of ICT on quality of life and social relationships. It concludes that the most important opportunities for ICT to increase people's well-being are through their impact on citizens' social life. As a social network and communication technology, ICT could increase the quality of people's lives by supporting and enabling social contact.

Social networking and communication technology

Quality of life is a multi-faceted concept. It refers to people's well-being in many ways, like happiness, health, education and socio-economic position. Research has shown that being socially active is crucial for a high quality of life. Sociologists often refer to social capital, as people rely on their social relationships as resources to

improve their socio-economic positions and the quality of their lives. Several SOCQUIT case studies showed social activity as a key factor for healthy ageing, for unemployed people finding a job, or for migrants finding their place in society. The positive contribution of ICT in these cases depended on whether it supported or enabled social relationships.

Access to other people is increasingly considered to be the key characteristic of the information society, in addition to access to knowledge or information. With social applications or peer-to-peer services ICT provides opportunities to build, maintain and exploit social capital and improve the quality of our lives.

Taking advantage of the information society

A participant at the SOCQUIT conference in Paris on 29-30 September 2005 said: "When we offered Internet access to a group of homeless men, the first things to explore were porn and gambling. Does this improve quality of life?" Despite the opportunities to support social interaction, the actual impact of ICT on quality of life is ambiguous. The technology as such does not improve or diminish people's quality of life; it depends on how people use it. ICT provides tools that could be used in everyday life for many purposes, like education, relaxation, finding a job, medical consultation, flexible work, making and sustaining friendships, but also for preparing criminal activities or exchanging extremist views.

Policy makers have a responsibility to create the conditions in which ICT makes a positive contribution. SOCQUIT shows that the social environment plays a key role in the take-up of ICT. Family, friends or colleagues often support and guide new users through the opportunities of the technology. Furthermore, people experiment with ICT by interacting with others and invent their own, sometimes innovative, uses. This is why socially active and well-educated people benefit the most from the information society. This means that not only ICT access and skills are required, also social support and peers are needed to take advantage of the information society.

Conclusion

For its actual impact on quality of life it is not so much the availability of ICT that matters, but people's ability and attitude to take advantage of the technology. As the social environment shapes the way people use ICT, quality of life in the knowledge society seems to be more of a social issue than a technical one. Without social policy Europe is risking that mainly people who are better educated and socially more active will benefit from the new technology.

Partners in the SOCQUIT project are TNO (coordinator), Telenor, University of Essex, Eurescom, and FTR.

You can find more information about the project and the SOCQUIT conference mentioned above at <http://www.socquit.net>

From pixels to riches

The Million Dollar Homepage



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For more than a decade, legions of entrepreneurs and marketing wizards have wrecked their brains to find a way for making big money on the Internet. Most of them just ended up with a big headache. The few who succeeded required a long breath until they cashed in on their e-business ideas. A British student has now demonstrated that you can make a million dollars on the Web within four months.

The stunning success story commenced in Cricklade, Wiltshire, on a mild August night, when 21-year-old student-to-be Alex Tew considered the significant cost of studying business management at Nottingham University, which he had decided to begin in October. Appalled by the prospect of finishing his studies with a huge debt, Alex started to brainstorm on how to make plenty of money in the shortest-possible time. "I was up late with my notepad, and I wrote down the question 'How could I become a millionaire?', and 20 minutes later I had the answer," Alex Tew remembered.

The answer he found was simple and ingenious: set up a website called "The Million Dollar Homepage", which contains exactly one million pixels, and sell the pixels for one dollar each to anyone who wants them. Advertisers must buy at least 100 pixels in order to have a tiny 10x10 pixel icon, which they can then use to display an image linked to their website.

On 23 August 2005, www.milliondollarhomepage.com went online. Alex Tew sold the first pixel blocks to some friends. Once sales had topped 1,000 dollar, he used the money to pay for a press release, which was picked up by the BBC in September. From there, word on the Million

Dollar Homepage spread with the speed of light through the Internet. Within the first four weeks, Alex sold more than 300,000 pixels. The number of unique visitors rose to 150,000 and 200,000 per week. By 27 December, 904,000 pixels were sold, and on 1 January, Alex announced that the last 1,000 pixels would be auctioned via e-Bay. On 13 January, the auction was closed. A businessman from Brooklyn, NY, who runs an online store selling diet-related products, won the last pixels at the respectable price of 38,100 dollar.

Why would anybody in his right mind spend a five-digit dollar amount for pixels on a web page plastered with tiny advertising banners? Here is the explanation by Alex Tew: "Things that are unique and novel naturally get talked about, if they're



interesting. My crazy idea to make money seems to have caught people's imagination." The explanation by Professor Martin Binks, director of the Nottingham University Institute for Entrepreneurial Innovation, is in line with Alex's view: "I think advertisers have been attracted to it by its novelty and by the curiosity factor. Those that are buying space have realised that the site has become a phenomenon, and people are flocking to have a look at it; that makes the advertising good value for money."

The testimonials on the Million Dollar Homepage confirm that a number of advertisers have gained a considerable increase of page visits and online sales from

buying pixels. The statement by Will Marston, Managing Director of Lollipop Animation in the UK, is representative for the enthusiastic feedback from advertisers who bought pixels: "Our hits have quadrupled, and our sales have gone through the roof. We only bought pixel space for a bit of fun, but now it's as though we're a part of Internet history."

Apart from paying advertisers, the success of the Million Dollar Homepage attracted also less welcome forms of appreciation. On 12 January, the Million Dollar Homepage became the target of a Distributed Denial of Service (DDoS) attack by malicious hackers, causing the site to be extremely slow loading or completely unavailable for several days.

Alex Tew claims that this hacker attack was accompanied by an extortionist

demand for 50,000 dollar ransom. Although he did not have a business customer package from his web provider, he managed to get out of this attack without paying. Some sceptical bloggers suspect that the whole story was made up in order to fuel public interest.

Less nasty than hacker attacks are the hundreds of copycat websites who want to cash in on the same idea. Alex Tew has only mild contempt for his imitators. In an interview, he said: "All the imitator sites mostly miss the point, though. They don't see that mine has only been successful because it was the first, it was unique. People

take notice of things that are new and interesting, but why would anyone check out some of the 600 plus imitator sites? They probably won't make much money, but good luck to them!"

It is indeed very unlikely that any of the free-riders will earn anything close to the million Alex made with his website. There remains the question what a 21-year-old does with so much money, apart from paying his tuition fees. His answer: "The first thing I bought was some new socks!" His favourite socks have a Space Invaders logo on them, which is made of the stuff his fortune is built on – pixels.

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