



The Evolution of Broadband Services

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Call for Papers

FIRST EUROPEAN WORKSHOP ON



Model Driven Architecture with Emphasis on Industrial Application

MARCH 17-18, 2004

UNIVERSITY OF TWENTE, ENSCHEDE, THE NETHERLANDS

The Model Driven Architecture (MDA) is an approach to IT systems development fostered by the Object Management Group (OMG) based on the separation between the specification of the systems essential functionality and the implementation of these systems using specific implementation platforms. MASTER and MODA-TEL are two European-funded research projects with the goal of further developing the concepts of MDA to apply them to industrial sectors such as Air Traffic Management and Telecommunications.

The MASTER project aims at performing an early experimental validation of the MDA, by developing the technology and validating it on an industrial application in the Air Traffic Management (ATM) domain. MASTER aims at implementing the MDA concepts of separation of concerns to achieve independence from specific platform technologies and therefore enabling the specialisation of resources. Furthermore it aims at developing variability management tools and at applying them to the ATM domain in order to reduce the gap between end-user needs and how they are mapped into requirements and then into variations of models and products. Finally it will provide the mechanisms to derive and analyse the development process activities and project management parameters by using the architecture model as the basis for reasoning.

The MODA-TEL project is a joint effort of European stakeholders with business interest in component architectures to develop a sound methodology and tools to support the application of MDA in the telecommunication domain. MODA-TEL aims at developing technology that allows organisations to model, construct, integrate, deploy, manage, operate and evolve software in telecommunications systems more efficiently. This is being achieved by providing clear guidelines, methodologies and tools for the application of MDA principles in telecommunications information management and telecommunication component-based software construction.

MASTER and MODA-TEL are jointly organising a workshop with the purpose of exchanging experience with the use of MDA by the industry and creating new ideas to improve MDA and spread its use. This workshop is open to users of the MDA technology and developers of MDA support (technology, methodologies and tools), focusing on areas such as telecommunications, air traffic management, and enterprise modelling.

Papers and presentations

Proposed papers should be submitted to mastermodatel@esi.es by January 15, 2004. Paper submissions should be in English and should include title, abstract (200 words approx.), name, company and address of the author, and short description of author's CV. Concerning the text, two types of papers are accepted: either 1 to 2 pages of an extended abstract or longer full papers of 6 to 8 pages.

Author guidelines can be found at
http://modeldrivenarchitecture.esi.es/mda_workshop.html

Suggested areas of interest include, but are not restricted to:

- The OMG Model Driven Architecture: specification of Platform Independent Models (PIMs), specification of Platform Specific Models (PSMs), and PIM to PSM transformations.
- Model driven software engineering processes.
- Managing the model driven approach.
- Model driven specification of Quality of Service.
- Verification and testing in a model driven context.
- Applications of MDA in an industrial context. Case studies.
- Costs and benefits of model-based software engineering.
- Barriers for MDA adoption. Existing and necessary solutions.
- Tool support for model driven software engineering.

Authors will be notified by February 10, 2004 if their paper is accepted and will then receive further information about final paper/presentation format.

All accepted submissions will be included in the workshop proceedings.

Location

The workshop will be held at the University of Twente, Enschede, the Netherlands, on March 17-18, 2004.

Important dates

Submission deadline for papers: January 15, 2004

Notification of acceptance: February 10, 2004

Final camera-ready version: February 28, 2004

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How to satisfy customers and markets



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Satisfying the customer is a never-ending challenge for any business. This is especially true for the telecoms business, because it is the key for the development of other business sectors and a sector that is driving and reflecting the change of human communication.

Business customers in particular want to have their business needs solved for less money and are normally not satisfied with the communication tools and services they have. Their typical attitude is: "We need what we have, but we don't have what we need." Example: They need a fast Internet connection, which they already have and won't miss, but they want a faster one for the future communication services they don't have yet. Private customers are more worried how communication technology can support their lifestyle. They don't care for technology, but for service packages that are easy to understand, easy to use, easy to alter, and easy to buy.

There are a number of inter-related factors that have to be well balanced in order to satisfy the customer. This includes reliable and powerful technology, services that support the user's efficiency and quality of life, content that users really like, interfaces for easy use of the service, and prices that match the subjective feelings of the users on the value of the service and thus their actual willingness to pay for it.

This sounds pretty simple, but in practice, it is very hard to find the right mix. One of the few successful service examples of recent years is certainly i-mode in Japan, but experience and the discussion at the Eurescom Summit 2003 showed that this model has not been transferable to Europe, because there are too many factors to be balanced in the right way. Change one small factor, and a successful service turns into a failure.

How hard it is to satisfy customers can be seen in the area of broadband. The business case for broadband looks quite straightforward: thinking of all the bandwidth-greedy devices and services customers like, it seems to be only a matter of years until we have reached broadband penetration in the range of GSM penetration. In 2002, over 20 million digital cameras were sold. With the image resolution approaching 10 Megapixel and file sizes of up to 3 MByte, they require a lot of bandwidth if you want to send your holiday pictures to relatives and friends. CPU clock rates of PCs have exceeded 3 GHz, hard disk capacity is well above 100 GBytes now, and LAN speed beyond 100 Mbit/s. In this context, it is hardly imaginable how the majority of users could still stick to 56 Kbit/s modems.

And indeed, there are positive signs that customers are adopting broadband. Over 70 million households world-wide have already broadband access. In South Korea, broadband penetration has reached over 60 percent of all households. Europe, however, is still lagging behind Asia and the USA. In 2002, 8 percent of European households had broadband Internet access. Does this mean European customers require less transmission capacity than Korean customers? The assumption underlying this question that there are stable needs that have to be satisfied is wrong. It is the available capacity and the associated services that will create the need and boost the use. A survey by Goldman Sachs

showed that broadband access led to a 30 percent increase of e-commerce usage. Is it the push of technology and the creation of a broadband infrastructure that will drive the adoption of broadband? Are the customer needs and their demand for bandwidth-consuming services going to boost broadband? Or is it the provisioning of multimedia content that will push both services and broadband? This is a chicken-and-egg problem to which I can see only one possible solution: we need to push technology, services, and content in parallel.

Currently, the inter-relationship between technology, services, and content is not balanced. Broadband technology is far more developed than the corresponding services, which are making use of broadband capacities. The online availability of content is hampered by the immature stage of services and the unsolved issues of digital rights management. Another challenging issue is pricing. The cost of a service is related to the network complexity to deliver it, but its price must be related to the perceived value the service has for the customer. To understand the difference, we have to understand the different behaviour of networks and eyes. You may need a minute to download a picture, consuming a lot of bandwidth and requiring a complex network, but it takes your eyes only the fraction of a second to grasp the picture. This difference makes pricing of potentially profitable services like music and video download, photo transmission, video conferencing, and Location Based Services quite difficult.

The bottom-line is: we have to get the balance between technology, services and content right to give the customer what he is going to want if he knows it is there.

Dr. Claudio Carrelli

Dear readers,

This issue of *Eurescom mess@ge* was inspired by the Eurescom Summit 2003. Beyond featuring this important event, we decided to make the evolution of broadband services our cover theme. We had some internal discussions, if the term 'broadband services' is appropriate, because services are not necessarily linked to broadband technology. In the perception of the customers, it certainly does not matter, if it is broadband or narrowband, as long as they get a good service. However, as we focus on services that make use of the high bandwidth provided by broadband technologies, we kept this term, although we know its limitations. The cover theme sheds light on broadband services from various angles. Our authors explore mobile broadband scenarios, service concepts for Next Generation Networks, and the economic benefits, which emerged from broadband roll-out so far. In addition, we have an exclusive interview with Deutsche Telekom's Chief Innovation Officer, Hans Albert Aukes, on broadband strategies.

Another focus of this issue is on new collaborative R&D activities in Europe. Under 'European issues' we feature an article on the new Eureka telecoms R&D programme CELTIC and an exclusive interview with EU commissioner Erkki Liikinen about the future of the information society in Europe. In addition, we report under 'Events' about the joint ETSI-Eurescom workshop at the IST 2003 conference, which reflected the close links between collaborative R&D and standardisation.

There are many more articles in this issue, and we hope you will find them interesting. In any case, we would highly appreciate your feedback, which will help us continuously shape the magazine according to your interests.

Though you may have read this before, we would like to remind you of an organisational issue: Please remember to use our fax and online form for updating your address details. It is quite important for us to be informed about your address changes.

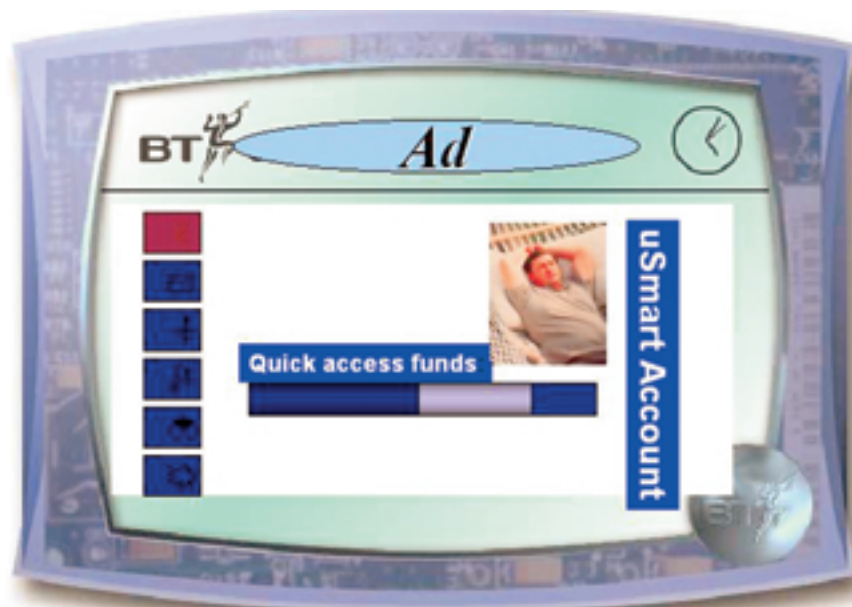
This will help us deliver the printed issue correctly with the least amount of misdirected mail. The Web form can be used both for address updates and for new subscriptions at www.eurescom.de/message/subscribe.asp

At the end of a busy year, we would like to thank all our authors, whose contributions have sustained *Eurescom mess@ge* as the leading magazine for collaborative R&D in telecoms, and we would like to thank our readers in Europe and other parts of the world, whose interest and feedback we regard as rewarding and encouraging.

Wishing you a peaceful festive season and a great 2004.

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Sn@pshot Mobile broadband



Bad news for daddy – his offspring will soon be able to squeeze ePocket money out of his eWallet from anywhere.

Read more about broadband user scenarios on page 8.

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



Bluetooth Version 1.2 adopted

On 5 November, the Bluetooth Special Interest Group (SIG), the trade association responsible for Bluetooth wireless technology, announced the adoption of Bluetooth Specification Version 1.2. The updated version of the core specification includes new features, which provide, according to Bluetooth SIG, a more reliable and robust user experience. The new features include Adaptive Frequency Hopping (AFH), enhanced voice processing, faster connection setup, and backward compatibility.

The current specification is included in over 1,000 products as diverse as computer mice and mobile phones to automobiles and various computing products. Version 1.2 is intended to set the stage for the development of a growing number of mainstream products such as more feature rich mobile phones, headsets, PDAs, digital music players, cameras and laptops in a consumer's Personal Area Network. Shipping of consumer products, which incorporate the new version of the specification, is expected to start in the first quarter of 2004.

www.bluetooth.com

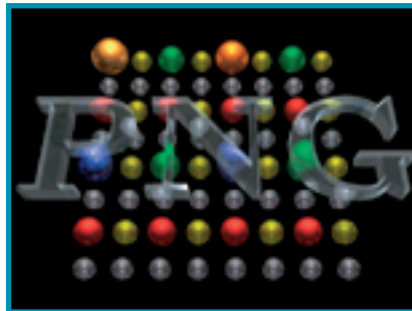


T-Online starts rollout of video on demand in Germany

T-Online, the largest Internet provider in Europe, in November started the rollout of its online video-on-demand service via the broadband portal T-Online Vision. T-DSL users can call up the films in stream-

ing mode and view them for a fee. Prices of this PC cinema fun range from three to four euros for 24 hours, plus applicable access fees. For flat rate users, no additional time or volume fees are charged. The portal offers movies from various genres, such as action, comedy, and thrillers, including blockbusters like "Catch Me If You Can" and "Minority Report". Payment is handled via MicroMoney, the T-Pay charge card, or, for T-Online customers, through the Deutsche Telekom phone bill.

www.t-online-vision.de



W3C revises PNG image format

On 10 November, the World Wide Web Consortium (W3C) issued a revised recommendation for the royalty-free Portable Network Graphics (PNG) image format. The document was also adopted by the International Standardization Organization (ISO) and the International Electrotechnical Commission (IEC) as an international standard (ISO/IEC 15948:2003). PNG is a graphics file format for raster images, which supports features like indexed-colour, grey-scale, and true-colour. The royalty-free format was designed in response to the patent for the LZW (Lempel-Ziv-Welch) compression algorithm on which the popular Graphics Interchange Format (GIF) is based. When LZW patent owner Unisys announced its intention to seek royalties for the use of GIF graphics in software applications, free-software developers created PNG as a royalty free alternative.

Despite its added features and royalty-free status, PNG has never reached the widespread adoption of GIF, which is partly due to the low support for the format by Microsoft's Internet Explorer. This year PNG lost part of its original reason for being, when the LZW patent expired in the United States. The LZW patents in Canada, Japan, the UK, Germany, France, and Italy expire in mid-2004.

www.w3.org/TR/2003/REC-PNG-20031110/



Rising cyber-blackmail

The British National Hi-Tech Crime Unit (NHTCU) asked companies in November to report attacks against their Internet businesses after a recent string of cyber-crime incidents. According to a Reuters report, Britain's cyber cops have seen an increase in the number of distributed denial-of-service (DoS) attacks targeting online businesses. In some cases, the attacks, which can cripple a corporate network with a barrage of bogus data requests, are followed by a demand for money. Favourite targets for the extortionists – many suspected to come from Eastern Europe – have been casinos and retailers. But there are high-profile victims from other sectors as well. At the beginning of November, the online payment service WorldPay, owned by the Royal Bank of Scotland, admitted to suffering a major DoS attack that lasted three days. Another high-profile victim was the Port of Houston.

The rapid growth of broadband home computer connections may be inadvertently fuelling what police suspect could be the start of a new crime wave – cyber-blackmail. As more homes connect to faster delivery systems, their computers are becoming vulnerable to hackers and virus writers, who can turn them into 'zombie' machines, ready to carry out any malevolent command. Online casinos appear to be a favorite target as they do brisk business and many are located in the Caribbean where investigators are poorly equipped to tackle such investigations. Police said because of a lack of information from victimized companies, they are unsure whether these are isolated incidents or the start of a new crime wave.

www.nhtcu.org

The evolution of broadband services

Introduction



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According to a recent survey by Forrester Research, 8 percent of European households had broadband Internet access at the end of 2002. Is this good or bad news for Europe on its way towards the knowledge society?

This cover theme explains what it means to have broadband Internet access, presents insights on the current state of the broadband evolution, and features innovative services that have the potential to boost broadband. It also addresses the question whether broadband is on its way to a mass market and what is required to achieve this.

From Broadband-ISDN to Internet access

In order to understand the evolution of broadband in Europe, it is worthwhile to look back. The term 'broadband' has been used quite frequently during the last decades. It began more than ten years ago with the 'Broadband-ISDN' as the logical further development of 'Narrowband-ISDN', and was based on fibre optical cables and ATM (Asynchronous Transfer Mode). Broadband-ISDN was supposed to be the 'all singing, all dancing' answer to any thinkable communication needs. It was designed as the one network for all services, including distribution of radio and television. It never happened.

The main reason is that the telecommunication industry underwent a major change. Network operators became private companies and the Internet Protocol became the dominating communication protocol. Thanks to e-mail and World Wide Web, the Internet became one of the most successful appliances. Mobile services had an incredible growth. The most significant factor, however, was probably that, due to stronger competition, European telecommunication companies adopted more pragmatic approaches. This led to the situation that the great idea of one network for all services was abandoned, and limited broadband solutions were rolled out, such as ADSL, with a reasonable but limited speed for Internet access.



Today, for most people 'broadband' mainly means two things in Europe:

- ADSL access to the Internet with download speeds around 1 Mbit/s and upload speeds in the range of some hundred kbit/s.
- Mobile connection via 2.5 to 3 generation networks, such as GPRS or UMTS with speeds in the range up to several hundred kbit/s.

Internet access and what else?

Looking at private usage, the dominating individual broadband service is currently Internet access. Access to the Internet comprises many different applications, such as e-mail, web-surfing, up- and download of pictures, movies, music and other files, electronic banking, electronic shopping, and many more. Therefore it looks like there is no need for private individual broadband services beyond access to Internet. This estimate is not altered by the fact that there are other means and services for broadband access, like distribution of radio and television through cable and satellite distribution networks, and the specific broadband applications for academic institutions and businesses, such as networking of super computers, closed circuit TV, telemedicine, storage area networking, etc.

On the way to the mass market

According to Forrester Research, broadband in Europe grew by 92 percent during 2002. It is expected that in 2008 about 30 percent of households will use broadband to access the Internet.

Does this mean that broadband access is on its way to a mass-market? Eurescom project P903 and IST project e-living have clearly shown that the uptake of such a service starts with the enthusiasts, the

'freaks'. Later, the large group of 'pragmatic' users follow; they only adopt a service if it is uncomplicated to use and if it brings clear benefits. If a service is very successful, even some of the so-called 'laggards' might follow later. A mass-market can only be achieved if the 'pragmatic' users adopt the service. The Forrester forecast of 30 percent penetration by 2008 suggests that a significant part of the pragmatic users will adopt the service, which means that broadband access to Internet is definitely on its way to a mass market.

In addition, there is a strong push from the European Commission, which became very concerned that Europe needs to invest in broadband to stay competitive with other knowledge societies in the world. If we compare the current European situation with the rest of the world, Europe is lagging behind the United States and some Far-Eastern regions, mainly Japan and South Korea, where the penetration of broadband access is far higher and sometimes already reaches saturation.

Conclusion

Broadband in its limited form, i.e. a certain (ADSL) speed for accessing the Internet, will definitely start to become a mass market during the next few years, driven by the growth of the Internet. The provided speed is already high enough for comfortably accessing the Internet. Whether mass-market broadband will grow out of these limitations remains to be seen and depends very much on economic factors and on the question whether new services and applications emerge, which the users are willing to adopt.

The following articles will shed some more light on these issues.

The look and feel of future services

User scenarios for broadband



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As we move towards next generation multi-channel, multi-service offerings to customers, there is a very obvious question: What will future services look and feel and be like? If we can get a view of how they might appear to the user or customer, we can then perhaps get to grips with the associated technology and business issues.

The attentive observer of Eurescom projects will spot the Cooltown-like Adhoc networks interacting with global telecoms networks, the Next Generations Service concepts such as 'Meetme', in which location based capability is used in diverse ways not only for friends to meet, but for customers to meet businesses, and the Device Unifying Service.

Consumer scenario – Adeline

As the scenario evolves, Adeline is walking down the High Street with her mobile device, interacting with Adhoc networks,

mobile benefiting from a DUS (Device Unifying Service). Pete chooses to read his e-mail, which has been automatically prioritised by his VPA (Virtual Private Assistant). His first visit is to Ipswich Traders Association, who offers finance, marketing and customer care to the city centre shops. Their whereabouts are shown on the location finder. Paul checks the live customer statistics for Ipswich Traders: sales/conversion rates and customer experience. Paul offers an inclusive customer care solution to Ipswich Traders. He rents



In particular, we can ask:

- What are the requirements, as yet unfulfilled to the customer/user, that next generation services will meet?
- What are the business models and revenues associated with these new technologies and services?
- How do we communicate and organise with telcos and potential partners (banks, retailers, media) to unleash the revenue potential associated with new technology?

To do this we have applied an approach based on user-scenario visualisation to a number of projects for customers such as banks, as well as Eurescom projects.

Visualisation of user scenarios

The user scenarios are textual descriptions 'brought to life' by creating visual simulations using PowerPoint. This provides a powerful focal point for both telcos and non-telcos, technical and non-technical people to explore how future services could meet customer and business requirements, and the associated technology issues.

In this example, a dual scenario is presented: a consumer scenario featuring Adeline – a 16 year old schoolgirl, and a business to business scenario featuring her father Pete.

broadcasts from shops and broadband hotspots. A wide range of services are available to her as she leaves school. While she waits for her friend, she chooses a game to play on her device. Adeline receives a call from her friend and gives her location on a map in order to meet up.

As she passes a clothes shop, she sees an advert on her device. The same happens, as she passes a music shop. She receives a message from the service provider giving the location of the service providers' shop with a broadband access point from which the music can be downloaded.

Whilst waiting for the download, LISA observes an associated broadband display with a holiday advert from a third party and a 'student special' finance, telecom and utilities offer. Adeline receives an 'auto-track' location based service message from her father Pete, who just wants to know she is OK. She replies to her father and asks for ePocket money for a taxi. Father downloads the money from his eWallet.

Business scenario – Pete

The scenario then moves to her father Pete who makes use of the Device Unifying Service, Web services and so on. Pete is a customer care expert. He provides an all-inclusive totally outsourced solution to his customers. Leaving home in the morning, his personal profile transfers from PC to

the whole Web service application, a bespoke version for Paul incorporating his speciality which is to break down the customer experience into five key areas, with live customer feedback. The client loves this.

Applications of the approach

This customer and user centric approach has been used in a number of cases. In a study with a major bank, a Family & Home Financial Management Service was developed, and the bank's services were extended from single financial products to home and family management including finance, utilities, home security, tracking for aged parents, and ePocket money for offspring. User scenarios allowed the organisation to examine business opportunities arising from new technology and the role they might wish to play in providing new services. It also allowed them to assess not just when technology will be ready – but when customers will be ready.

The user-scenario approach has been used in various Eurescom projects: In the DUS project, user scenarios were created, and subjects from various countries were asked to undertake a number of tasks using their 'Device Unifying Service'. Doing so produced valuable insights into the viability of this service. In the Eurescom NGN services project, user scenarios were used to examine how a number of generic next



generation service concepts and components might support them, and which so far unfulfilled customer and user requirements they might satisfy.

Most recently, and most remarkably, in the Eurescom Cooltown project the dynamic visualisation of user scenarios demonstrated the huge revenue possibilities for both adhoc local and global telecom networks and service providers that can be fired by initial local activity.

Conclusion

This customer/user centred approach allows us to engage telcos in debate on the business and technology surrounding future services. It has been used on the DUS, Cooltown & NGS projects. But it was first used with a bank. The same approach could be used by Eurescom and others to extend the debate from telcos to reach a wider audience and perhaps develop consortia including, for example, banks, retailers, government, and media who would work together to unleash the revenue potential associated with new technology.

Further information is available at

- www.eurescom.de/public/projects/P1200-series/p1241/ (Cooltown-like architectures)
- www.eurescom.de/public/projects/P1300-series/p1341/ (NGN service concepts)
- www.eurescom.de/public/projects/P1100-series/p1101/ (Device Unifying Service)

Next Generation Service Concepts Guidelines for creating profitable services



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Currently, the major telecommunication players are facing similar challenges due to heavy financial burdens and market instability. New revenues from innovative applications are becoming more critical for the business. A promising area for innovative, profitable services are Next Generation Network (NGN) technologies. Eurescom study P1341 has explored Next Generation Service Concepts, which may only be provided by NGN and Open Service Access (OSA) networks, enabling the emergence of new revenues for service providers.

Next Generation Services will be available over wireless (GSM/GPRS, 3G/4G, WiFi etc.) and wireline (PSTN, ADSL, CATV etc.) networks. Thus, end-users will be able to access subscribed and personalised services from anywhere, transparently and independently of the terminal, the underlying network technology and the access point. Access network transparency powers the emergence of convergent applications. Furthermore, open service components will be a major element, made available to third party service developers that are focused on how to apply creativity on business without caring about networking technologies. Next Generation Service components facilitate the creation and provision of new and innovative services that are as much as possible independent from network technologies.

User requirements

Besides generic requirements that have to be met, the specific service concept will

have to attract the user. Next Generation Services offer a wide range of benefits that could attract users, including cost savings, creation of revenues, time savings, user-friendly, unified procedures and interfaces to facilitate the user's daily life, and emotional services promoting the user's positive feelings. The socio-political aspects should also be taken into account, namely, Next Generation Services should address areas such as: dependability and security, arts and humanities, ageing and childlessness, and sustainable development.

Service concepts and user scenarios

P1341 has studied a number of service concepts including:

- **Meet Me** enables the encounter between two or more persons sharing compatible interests, taking advantage of service components like Context Awareness (including Presence, Status and Localisation) and user profiles. Meet Me facilitates, for instance, the meeting between

Feasibility Analysis	Concept							
	Meet Me	Sweet Home	Fashion, Emotion & Art	Community Cooperation	Give Me Money	Personal Assistance	Virtual Presence	Financial Assistance
Business Opportunities	78%	48%	30%	87%	57%	100%	39%	52%
Technical Challenge	3,0	3,0	4,0	3,0	4,0	5,0	3,0	4,0
Business Challenge	2,9	3,3	4,6	3,7	4,0	5,0	3,6	4,0
Raison d'être (R)/Background (B)	R	R	B	B	R	B	R	R
Global Maturity	1/3	1/3	2/3	1/3	2/3	3/3	2/3	2/3

Table: Service Concepts feasibility analysis

girls and boys; between consumers and merchants; or between employers and employees.

- **Sweet Home** aims to leverage security and confidence feelings about home with home networking technologies (i.e., residential gateways) as an extension of network services including personal data storage, unified mailboxes, and cameras. Parents, for example, may go out for dinner, leaving their child at home, and remotely call cameras installed at home to check their child is well.
- **Fashion, Emotion and Art (FEA)** seeks to make Next Generation Services fashionable by, for example, enabling to reach and maintain a certain social status; an emotional experience introducing unexpected interactions with users causing surprise, raising adrenaline; as objects of art that look attractive to clients, designed in cooperation with artists. One example is PMJ, the Personal Media Jockey, which combines an always-on, personal entertainment channel with interactive music, Web pages, movies, video clips – accessible from all active devices.
- **Community Cooperation** would enhance collaboration between different people for work, for education, for leisure and for inter-social relationships. An example would be musicians located in different places playing together for the composition and recording of songs.
- **Personal Assistance (PA)** is where each subscriber is the owner of a Virtual Entity – the Personal Assistant – living somewhere in the network. Such an assistant is accessible from any terminal, any time, anywhere, always available to satisfy the client needs according to his profile. The same concept may be applied to collective entities including families, enterprises and communities.

Technical and business feasibility

The table provides a summary of the feasibility of service concepts according to the categories Business Opportunities, Technical and Business Challenges, Implementation Type, and Global Maturity. In the short term 'Meet Me' and 'Community Cooperation' are the most promising service concepts. They cover a large portion from identified user and socio-political requirements. The provision of applications focused on the 'Meet Me' concept are possible in the short term, and the 'Community Cooperation' concept is more appropriate to be used at the background in the short term, but some serious business challenges have to be faced. 'Fashion, Emotion and Art' (FEA) is one of the most difficult service concepts to evaluate, and the apparent lower coverage of Business Opportunities may be misleading. The FEA concept use is more adequate at application's background and its contribution to business success is hard to measure. Nevertheless, the provision of applications focused on the FEA concept is hardly feasible in the short term.

The 'Personal Assistance' (including Family and Community Assistance) is the most promising service concept in the long term. It covers all identified user and socio-political requirements, but the provision of applications focused on the Personal Assistance concept are only feasible in the long term. Its use in the short/medium term is more adequate at application's background.

Applicability guidelines

The following guidelines to apply service concepts are suggested:

1. Clearly define the application focus and the main reason why end-users or other involved stakeholders will pay for the application use;
2. Identify service concepts covered by the application. To define user scenarios covering an adequate range of application activities and users and mapping of service concepts onto them.
3. Try to enhance initial service scenarios or to create new service scenarios with background concepts;

4. Evaluate business opportunities by mapping user and socio-political requirements in service scenarios;
5. Evaluate the technical feasibility by identifying service components and technologies needed. Identify service components not technically mature and evaluate the impact of not having these service components in the service scenarios.
6. Evaluate Business Feasibility by identifying Business Requirements to be met by a successful application provision. Identify requirements not feasible and evaluate the impact of not having these service components in the service scenarios.

Conclusions

The business models for Next Generation Services will be a combination of traditional telecommunication models and emerging multimedia and e-commerce business models used on the Internet. The real environment for NGS business will contain many simultaneous products and services with different business models, and cross subsidisation from one service to another. This complex business environment should be handled by appropriate business models, in which the complexity is carefully evaluated and kept manageable, and the requirements to the billing systems are kept feasible. This is a critical issue that needs further research, including the technical feasibility of its implementation by relevant Next Generation technologies, notably the Session Initiation Protocol (SIP), Web Services, and Parlay/OSA technologies. On the other hand, there is an increasing number of aspects to be considered for the pricing of services including service type, media type, QoS, entities involved, and others. This inherent complexity should be hidden making the pricing understandable and controllable by the end-user.

You can find more information on Next Generation Service Concepts at www.eurescom.de/public/projects/P1300-series/P1341

“I strongly believe in user-generated content”

Interview with Hans Albert Aukes, Chief Innovation Officer of Deutsche Telekom, about his broadband vision

‘Broadband for all’ is the political goal of the European Union. But what is the vision of a major European network operator and service provider? *Eurescom mess@ge* asked Hans Albert Aukes, Chief Innovation Officer of Deutsche Telekom, about his view on broadband and the services that will push the market.

One of the major goals of the European Union's eEurope Action Plan is to give all European citizens access to broadband within the next few years. How realistic is this goal?

Aukes: Actually, I think the goal is quite realistic in terms of technology. Just take a look at what we have achieved in Germany: About 90 percent of the residential customers connected via T-Com are TDSL-enabled, the rest can use DSL via satellite. So, from the technological point of view, we can meet this goal; not only in Germany, but also in other European countries. Another question is demand and affordability – respectively willingness to pay. This will depend on products and services offered to the citizens as customers.

Deutsche Telekom almost exclusively provides broadband access through ADSL technology with a download data rate of 768 kbit/s and an upload data rate of 128 kbit/s. When and how will you increase the data rates, especially for upload?

Aukes: We have already a wide range of data rates. T-Com, our fixed-line division, already offers residential customers downstreams up to 1500 kbit/s and business customers downstreams up to 2304 kbit/s or symmetric access up to 2048 kbit/s. Additionally we will offer next year a four-fold turbo for private customers with a bandwidth up to 3000 kbit/s downstream. Another



alternative technology for broadband is Ethernet-over-SDH, which T-Com is offering – also for business customers – with a typical 100 Mbit/s speed. Today, these offers are still too expensive for consumers, but on the other hand there are no applications demanding these bandwidths for private households.

With a broadband penetration of around 10 percent, Europe seems to be still in the early adopter phase. What will be the next step in the evolution of the broadband market?

Aukes: Today, people use broadband access primarily for surfing, convenient access, and peer-to-peer applications. For those services, the relevant target group today is far from those 10 percent we address today. I think, we don't have to talk about broadband early adoption – we are in the early offering phase for broadband enabled products and services. Broadband itself as a pure access has only limited value to most of the customers.

The next step will be the provision of usable and reasonably priced bandwidth-demanding products. Coming from end-customer demands we can identify lots of services and applications which can be substituted by broadband in the future: Gaming, interactive TV and video on demand are only examples of what will come in the area of broadband end-user applications. Music downloads are another good example, which is also driving broadband adoption.

Which services and applications besides Internet access do you regard as promising to boost broadband access?

Aukes: I strongly believe in user-generated content and user-specific content. The innovations in the personal rich-media sector, such as digital camcorders and cameras, are driving the generation of personal content. And people will share this content, will communicate and will exchange it. In this area we will see applications and services which will be built around communities – no matter if it is the family, the school class or just amongst friends.

Other applications we regard as promising are video-on-demand and interactive TV, gaming, e-learning, messaging and audio/video streaming. And of course the convenience of wireless-broadband technologies like Wi-Fi will increase the usage of these broadband offerings additionally.

Is the vision of a single broadband access for all services, including television, still on the agenda? If yes, is it feasible in the mid-term?

Aukes: We as Deutsche Telekom think, seamless access instead of single access is the key. No customer really cares about access. Customer needs are related to specific applications, to individual user situations and circumstances. We can offer different technologies fixed-line and mobile, which enable different services in different environments. We will do so with an optimized quality of service and at suitable cost. That is crucial in terms of fulfilling the customer needs: Bringing an individual access speed of let us say 5 Mbit/s to every bus station might be a cool service for video freaks, but we don't see a relevant business case for it. On the other hand, customers at home don't want to be tied up to wires anymore. This example shows the need for service-specific access: Every customer gets the bandwidth he needs. And if he's accessing through Deutsche Telekom Group, he will be able to switch access depending on his situation and service with one authentication and one bill – that is my vision.

What is your personal vision for broadband? How will your life and the life of your family have changed within five years through new broadband services?

Aukes: My personal vision for broadband doesn't differ too much from the average customer: I think broadband will bring information, communication and entertainment, and all these wireless, if possible. The personal choice, especially in entertainment, will be bigger, and we will have more opportunities for individual leisure time activities. The danger of social isolation can be avoided, since consumers will be independent from broadcasters' programme schedules and may organise their own programmes within their communities. This will enable more communication – particularly because broadband allows parallel consumption and interaction. You will then be able to share, for instance, a match Schalke against Bayern Munich with a friend, even if he is some thousand kilometres away. That is my vision of broadband: Broadband will enable us to share experiences.

The interview was conducted by Milon Gupta.

Economic benefits of broadband in Europe



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The costs of broadband are more or less given, but the benefits remain elusive. National governments and the European Union spend billions of euros on broadband. Is this money well-spent? Will Europe benefit from its efforts?

The global drive for broadband access is inspired by great expectations based on the widely shared assumption that the deployment of broadband will have major economic benefits. The optimism is based on a firm belief in the Laws of Exponential Improvement. If the Laws hold true, the technical possibilities are limitless and investing in broadband is a wise decision. Broadband networks will be necessary to cope with the enormous increase in data flows and processing capacity.

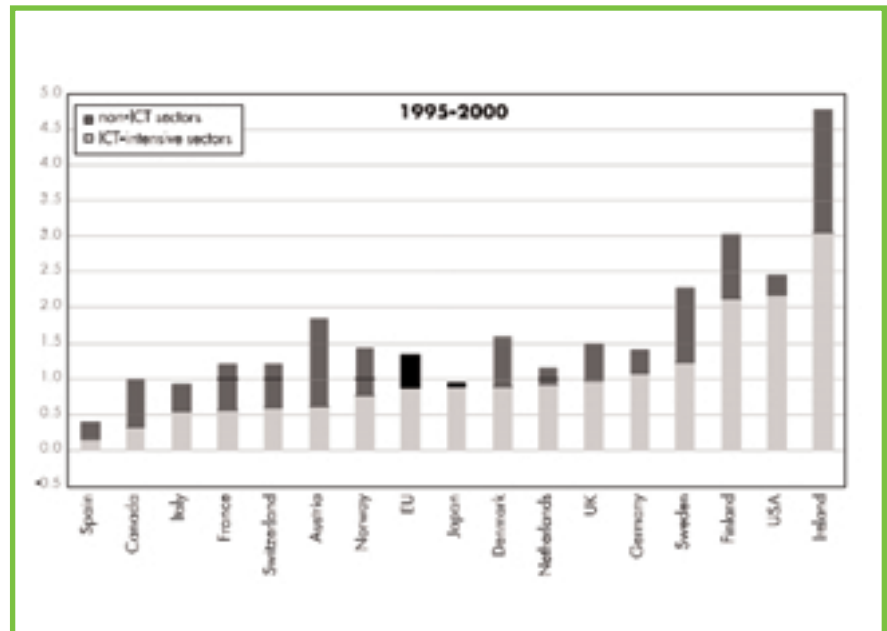
The theoretical benefits

Innovations in ICT have an enormous potential impact on economic development. As an incremental innovation broadband can enhance the current macroeconomic impact of ICT, increase a country's competitive strength, and amplify the network and system effects of ICT.

Broadband's larger capacity, lower costs, and higher speed of data transmission can encourage the further integration of ICTs in economy and society to the extent that they become truly pervasive. It creates the possibility to create new markets and new ways to organise firms. Universal broadband access provides economies of scale and scope. And affordable access to the Internet can result in considerable social savings and a smaller digital divide.

Has ICT helped European growth and competitiveness?

ICTs have been the main driver behind economic growth of most OECD countries since 1990. Their contribution has become more important after 1995 although it appears that the effects of ICT work increasingly via the efficiency gains of network effects rather than increases in the ICT capital stock. Europe still lags behind the US, but the growth effects could appear on a similar scale as in the US somewhere in the next five to ten years.



The contribution of the ICT-intensive and less ICT-intensive sectors of the economy to total labour productivity growth, 1995-2000

The benefits depend on how access is used

Households use their broadband access mainly to stay longer online, to download more and larger music and video files, and to use streaming media. The salient features of broadband encourage the growth of heavy applications but need not lead to commercial uses. More importantly, broadband does not remove the main barrier to the growth of e-commerce: the lack of trust in the security of the Internet.

Firms already use their Internet access for a wide variety of purposes, and commercial applications are rapidly gaining ground. Broadband is not absolutely needed to perform these activities more efficiently. There do appear to be substantial opportunities for the expansion of Internet use among SMEs by making online service provision and e-commerce more efficient and affordable.

e-commerce involves more than ICTs and broadband. Its evolution is technologically more diverse and requires the development of efficient 'virtual' market structures. As connectivity increases and broadband becomes available, the size of the electronic market can expand exponentially. New market structures, financial or other incentives, and government support are needed to jumpstart a broadband-based economy.

Is the drive for broadband justified?

In the absence of hard data, beliefs, perceptions and expectations determine the course of action. Yet, perceptions can have an impact, since they affect consumer confidence and the behaviour of investors and policy makers. The firm belief of governments, consumers and investors in the promises of broadband can turn into a self-fulfilling prophecy.

However, three conclusions can already be drawn: there is going to be broadband, it will most likely have a positive impact on economic growth, and the EU cannot afford to fall behind. How large the effect will be and how rapidly it will be achieved remains as yet unclear, but it seems fairly certain that broadband investments will yield a positive return.

It is, however, vital to note that the full realisation of the potential productivity gains associated with broadband depends on the nature of the market for Internet access and online commercial services and on issues regarding security and trust. Virtual markets will have to mature before they can become a viable alternative to transactions in the real world. Infrastructure alone will not be sufficient.



ECI Telecom Eurescom's first Associate Member from Israel



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ECI Telecom provides leading edge digital telecommunications and data transmission systems to network service providers. It services some of the largest carriers, providing telecommunications solutions in more than 100 countries around the globe.

Cellular networks, data communications, broadband access, the Internet, long distance telephony – for more than 40 years, ECI Telecom has been at the forefront of the development of innovative technologies for these applications.

ECI assists telecommunications service providers to maximise the value of their networks and reduce operating expenses by providing revenue-generating services to their customers. ECI's products and platforms are designed to increase the capacity and efficiency of new and existing local and international communications networks. The company specialises in metro optical networks, broadband access, bandwidth management, and carrier-class Voice-over-IP (VoIP) solutions for voice, data, video and multimedia services.

Beginnings

The company was founded in 1957 and was incorporated in Israel in 1961. Amongst ECI's first products were airport communications control equipment as well as consumer radio and television product sets. It expanded its

lines to telephone circuit multiplication equipment as well as airport and air-traffic control and military communications systems. With its central location and with world wide offices in Europe, Asia, Africa and America, ECI was able to expand its markets and by 1981 became a public company trading on NASDAQ.

Over the years, ECI has gained a reputation for its ingenuity and revolutionary technologies. Amongst its many achievements, in 1988 ECI pioneered the first Digital Circuit Multiplication Equipment (DCME) on a submarine cable and satellite connection. What recently became



Veraz Networks, an ECI-owned company, the high quality voice compression, fax demodulations/remodulation and statistical multiplexing technologies rapidly gained 85 percent of the world market. In 1991, ECI was amongst the first to introduce narrowband DSL technology with its pair gain solutions and later emerged as a leading provider of copper enhancement solutions. In 1992, ECI introduced another revolutionary technology: the world's first working Synchronous Digital Hierarchy or SDH Ring. The impact of SDH was profound, as it soon developed into an international protocol standard for synchronous data transmission over fiber optic cables. ECI again pioneered technology in 1993 with the first operational HDSL, high-bit-rate DSL and the first managed global network in 1995. It expanded its operations, establishing offices in 25 locations around the globe. In addition, the company continued its contribution to technological excellence developing Broadband DSL technology in 1997 with the Hi-FOCuS Platform and designing optical rings with its XDM technology in 2000. Its technological growth continues and in 2002 the company made significant improvements to voice quality in VoIP networks.

The core business today

ECI's core business operates through two primary divisions, the Broadband Access Division and the Optical Networks Division. It boasts a blue chip customer base with clients such as Belgacom, Deutsche Telekom, BT, France Telecom, Telenor, Intelstat, Qwest, Telia, KPN, Korea Telecom, AT&T, BellSouth, Telmex, Bezeq, China Telecom, CNC, Sprint, D2, Vodafone, and many more.

Broadband access

ECI's Broadband Access Division provides a range of solutions for the access network. Its flagship Hi-FOCuS™ technology is a Multi-Service Access Gateway (MSAG) solution. The Hi-FOCuS family provides broadband access over both copper and fiber infrastructures for delivering bandwidth intensive services over any infrastructure to any premises including home, business, curb, campus or any other location. This capability enables service providers to have a network that offers full fledged 'triple play services', namely video, voice and data. With the recent introduction of the Hi-FOCuS 4, its next-generation MSAG, ECI offers an unprecedented and aggregated capacity and connectivity of more than 500Gbps. This allows over 20,000 simultaneous users with multiple connections to enjoy an increased range of broadband services such as video-on-demand and video telephony. This is in addition to value-added services including fast Internet access, TDM voice and VoIP/VoATM applications, video channel streaming, video broadcasting over broadband, Interactive TV, and more. The Hi-FOCuS™ family of products is suited for any network topology and architecture and support both ATM and IP technologies as well as dual homing, allowing operators to benefit from both environments and ease migration between technologies. Furthermore, Hi-FOCuS significantly saves operating costs while also supporting smooth migration from current legacy voice networks to future Voice-over-Broadband and softswitch architectures, in addition to the basic broadband capability.

Optical networks

ECI's Optical Networks Division provides intelligent optical networking and bandwidth management solutions for metro, cellular, regional and global environments. These solutions bridge the gap between technologies such as IP, ATM, Frame Relay, Gigabit Ethernet (GbE), SONET and SDH as well as between different geographical standards. The Optical Network

Division's products are based on advanced synchronic digital hierarchy and optical technologies. Its lead product is the XDMTM, an optical dubbing system based on a new technique of band flattening, which makes extensive use of state-of-the-art technology. The XDM enables the user to choose the initial platform for simple, low-speed, applications and, at a later stage, to expand them as required – simply, efficiently and at low cost. New functionalities, such as ATM aggregation of large numbers of E1 traffic streams, offer significant advantages to cellular operators adopting the leased bandwidth approach to cellular transmission. The additional integration of Layer 2 Ethernet functionality over existing SDH/SONET lines enables providers to offer sophisticated Layer 2 Ethernet services.

The Division offers additional product lines including T::DAX®, Syncom and sophisticated Management Solutions. The T::DAX is an intelligent Digital Bandwidth Management solution that lays the foundation for data-centric services while maintaining current architectures. In addition, Syncom is a family of STM-1/4/16 multiplexers providing versatile solutions for today's fast growing SDH-based transport networks.



ECI product Hi-FOCuS 4

Other business areas

In addition, ECI Telecom has a significant foothold in the carrier-class VoIP market with its strategic holding in Veraz Networks. Veraz Networks was formed at the beginning of 2003 by combining ECI's former DCME division that specialised in legacy voice compression and next generation packet telephony solutions, and NexVerse Networks Inc, specializing in Softswitch technology. Headquartered in San Jose, Veraz is a leading global provider of softswitch-based, toll-quality packet telephony solutions for traditional and next-generation communications networks. Its equipment supports over 21 billion minutes of telephony traffic per month with more than 15,000 of its DCME terminals deployed worldwide.

In addition, ECI has a 59 percent holding in ECTel Ltd. ECTel is a leading developer and global provider of monitoring solutions and revenue assurance applications for present-day and next-generation telecommunications networks. Based on proprietary state-of-the-art hardware and software technologies, ECTel's "one platform – multiple applications" approach allows deployment of uniquely cost-effective law enforcement surveillance, telecom fraud, Quality of Service, and inter-carrier billing systems.

Changing with the times

ECI has developed a reputation for technology excellence by adapting to market needs and maintaining the philosophy to place the customer first. ECI's platforms enable carriers and service providers to easily launch new revenue generating services. This flexibility and adaptability to the customer requirements has given ECI the ability to increase the value of the clients' networks while reducing operating expenses.

Strong management

ECI is headed by a highly-qualified management team of industry specialists. Furthermore, ECI's Board of Directors consists of well-known industry experts. Shlomo Dovrat, Chairman of the Board, is the founder of Tecnomatix Technologies and founding partner in several high-tech venture capital funds including Carmel Software Fund. Krish Prabhu, Vice Chairman of the Board, served as Chief Executive Officer of Alcatel USA from 1997 until 2001 as well as its Chief Operating Officer for three years.



Doron Inbar, President and CEO, has been with the company for 20 years and has held various senior-level positions

Among other industry experts on ECI's Board are: Colin Green, who held senior positions at British Telecom; Richard Liebhaber who served as the Executive Vice President at MCI Telecommunications Corporations and held various senior executive positions at IBM; Casimir Skrypczak, whose telecommunications experience covers senior positions with Cisco, AT&T, Bell Communications and Verizon, among others; and Gerd Tenzer, former Deputy Chairman of the Board at Deutsche Telekom.

Outlook

ECI's success, despite the harsh environment, is a testimony of its leading-edge technology combined with its adaptability and customer-oriented approach. Its solutions facilitate the reduction in operating and capital expenditure while creating technologically advanced next-generation products. ECI Telecom has become a preferred vendor of leading service providers. Looking back at over 40 years since its establishment, the company's impact on the telecommunications industry has been tremendous. The company, with its strong dynamic team, innovative technologies and solid foundation is well-positioned to meet any challenges ahead, and to remain a preferred solution provider of the future.

You can find more information on ECI at www.ecitele.com



Eurescom Summit 2003

Controversial discussions on the future of broadband

The Eurescom Summit 2003 in Heidelberg presented the latest R&D advances in user-focused broadband services. Under the title "Evolution of Broadband Services", 120 participants from major European, Asian, and American ICT companies discussed how broadband services can satisfy user needs and succeed in the market.

Digital Media Manifesto

At the opening of the Eurescom Summit 2003 in Heidelberg on 29 September, keynote speaker Leonardo Chiariglione, the founder of the MPEG standards group for digital audio and video, announced a new initiative for untangling technical, economic and legal issues in customer access to digital media contents.



"The goal is to provide a great user experience, which is respecting the rights of content owners."

Leonardo Chiariglione, the 'father' of MPEG, about the goal of his Digital Media Manifesto.

He explained that the already undertaken technical, legal, and regulatory approaches to protect digital content have not worked, because they are based on the belief that technology or law alone could do the job. His proposal called 'Digital Media Manifesto' includes an action plan for overcoming the stalemate in the use of digital media. The goal of his initiative is to find a solution, which satisfies rights holders, end-users, and value-chain players. "Today, you can have a great digital media experience based on the latest information and communication technologies, but very often it is illegitimate. The goal is to provide a great user experience, which is

respecting the rights of content owners." In this context, he criticised advertisements by telcos which implicitly suggest the use of DSL for legally dubious media downloads from the Internet.

Towards real broadband

What broadband really meant, was also the topic of another keynote by Spyros Konidaris, special adviser in the Directorate-General Information Society of the European Commission. "Broadband means empowerment for the user in the information age", he said. In his view, broadband is a resource for "unlimited creativity". Users should be active creators rather than passive consumers in the information society: "The user is the most important source of content." With the EU research programmes GRID and GÉANT the EU has heavily invested in broadband to achieve the vision of the Lisbon Summit 2001 that Europe should provide widespread access to broadband and become the best knowledge-based economy by 2010. Today, over 60 million users have broadband access worldwide.

New services to enrich life

Two technical presentations showed how new services could enrich the user's life. In the first, Dr. Josef Noll from Telenor R&D presented the results of a recent Eurescom project on a new service called Mobile Instant Messenger, which combines the advantages of the already available instant messaging on the Internet and mobile presence technologies. Selected friends, relatives, and colleagues on the 'Buddy' list of your mobile phone will know where and in which work or leisure context you are. Thus, they will be able to send an instant message to you and others for instantaneous planning of meetings and other private or business purposes. Dr. Noll predicted that Mobile Instant Messaging has the potential to replace a

large percentage of SMS traffic in the next few years.

Mario Becker from Fraunhofer IGD demonstrated results from EU project ARIS on the use of Augmented Reality in e-commerce. On a Pocket PC with a camera extension, you can take a picture of your living room and add a 3-D picture of a sofa or other furniture for planning your interior design. What is new compared to other Augmented-Reality demonstrators is the perfect simulation of light and shadows, which gives an extremely realistic impression of the whole room including the added 3-D object. The project is cooperating with IKEA Greece to explore the e-commerce aspects. Mr Becker estimates that the service could be commercially available within two years.

Recipes for success from Japan

Having interesting services is not enough to make a business case. There are more ingredients needed for a successful service concept. Takeshi Natsuno, the i-mode managing director from NTT Docomo, claims to know the ingredients for mobile multimedia services and the recipe for success. He has good reasons to do so: with 39.7 million subscribers, i-mode is the most successful mobile multimedia service so far. In his keynote speech on the second day of the Summit, Mr Natsuno presented his i-mode value chain strategy. "i-mode is a value-chain co-ordination concept," he said and explained that the success of i-mode is due to the fact that



Presented at the Eurescom Summit by Fraunhofer IGD: a new Augmented Reality application on a Pocket PC with a camera extension.



“Operators should take risks.” Takeshi Natsuno, i-mode managing director from NTT Docomo, spiritedly discussing broadband issues in the panel session.

the whole value chain is in one hand. The i-mode value chain includes content, marketing, servers, the network, and the handsets. According to Mr Natsuno, the simple use of the devices and the monthly subscription model were key to the success of i-mode.

Is the success of i-mode transferable from 2G to 3G? Mr Natsuno thinks that bandwidth is of secondary importance for the success of mobile services. “For end-users, the network speed as such is not relevant. Without useful applications speed means nothing,” he said. Consequently, i-mode offers the same services for 2G and 3G networks. But Mr Natsuno had to admit that 3G was not yet successful in Japan. NTT DoCoMo has only below 900,000 subscribers to its 3G services.

Panel discussion on service and business aspects

In the ensuing panel discussion, controversial views emerged regarding the question, what European telcos could learn

from the example of i-mode. Representatives from European telecoms players were rather sceptical that the i-mode value-chain model could be applied in Europe, arguing that Europe is a culturally and economically a much more diverse market. Mr. Natsuno did not agree that the Japanese market is different. “Everybody loves Mickey Mouse all over the world,” he said. In fact, the creation of i-mode was inspired by Minitel in France and AOL in the USA, he added. The real problem of European telcos, he said provokingly, was that they avoided taking risks. “Operators should take risks,” he said and explained that NTT Docomo took the risk of buying large numbers of customised i-mode handsets from the manufacturers and selling them to the end-customers without knowing how the customers would respond to i-mode.

Roberto Parodi, Vice President Technological Innovation at Telecom Italia Mobile, acknowledged that European operators could learn something from

i-mode for the development of new services. However, he was sure that “there will be no totally new services due to broadband”. According to Mr Parodi, the role of the mobile operator is to bring order in the fragmented market and prevent the confusion of the user. “We have to provide end-to-end operability,” he said.

Chris Wardale from the Open Mobile Alliance said: “The take-up of broadband services very much depends on ease-of-use.” Joachim Claus, Chairman of the Eurescom Board of Governors, brought the discussion to a more fundamental level: “I don’t see a broadband user. I see a user of communication means. Broadband technologies are just enablers. We have to concentrate more on the applications for the end-user,” he said. Eurescom Director Dr. Claudio Carrelli complemented this view, when he recommended: “Operators should stimulate the use of broadband technology, thinking of the quality-of-life of the user.”

Spyros Konidaris, special advisor at DG Information Society of the European Commission, added the social dimension to the discussion. “Let us not lose the goal of serving the user instead of just making him a customer,” he demanded. Giving the passive consumer a lot of choice between games and other services was something different from empowering the active user by technology.

Another important point in the discussion was the role of standards for the success of broadband technologies. “Is de-facto standards the way to go?” moderator David Kennedy asked provokingly. Joachim Claus rejected this suggestion. “At some point you need to have mass-market manufacturing, and then you need standards. Standards are driven by economies of scale.” Roberto Parodi stressed the importance of standards for interoperability: “We have to have standards to guarantee interoperable services across Europe”. Takeshi Natsuno argued that standardisation should not go too far to leave some space to compete.



“The take-up of broadband services very much depends on ease-of-use.”

Chris Wardale from the Open Mobile Alliance.



“There will be no totally new services due to broadband.”

Roberto Parodi, Vice President Technological Innovation at Telecom Italia Mobile.



Conclusions

The presentations and discussions at the Eurescom Summit brought plenty new insights, but a number of issues remained still open, as Heinz Brüggemann, Summit organiser and programme manager at Eurescom, pointed out in his final remarks. "Broadband deployment still needs a lot of effort. The 6th Framework Programme of the European Union alone is certainly not sufficient for Europe to catch up with the US and Japan in broadband provisioning," he said. The other remaining open issue Heinz Brüggemann mentioned is the classic question: "Which services do the users need?" The Summit presented a number of forward-looking answers to this question.

The presentations of the Eurescom Summit 2003 are available on 3 CD-ROMs. They contain the oral presentation of the speakers with the synchronised PowerPoint slides. Information and order form: www.eurescom.de/summit2003



"Broadband means empowerment for the user in the information age."
Spyros Konidaris, special adviser in the Directorate-General Information Society of the European Commission.



"We have to concentrate more on the applications for the end-user."
Joachim Claus, Chairman of the Eurescom Board of Governors.



Pushing the integration of R&D and standardisation

Joint ETSI/Eurescom workshop at the IST 2003 in Milan

ETSI and Eurescom have joined forces to push the integration of collaborative R&D and standardisation. In a jointly organised workshop at the IST 2003 conference in Milan on 4 October, they presented the new business opportunities that will emerge from an integrated approach to collaborative research and standardisation.

“This workshop highlights the profitable synergy to be found between R&D and standardisation strategies,” moderator David Kennedy from Eurescom explained. Josef Noll, senior researcher at Telenor, presented results from a Eurescom project on wireless services in the future home. He demonstrated the business opportunities of personalisation technologies in a home environment, like SIM card authentication and seamless personalised access. Dr. Noll pointed out that the market success of these technologies would depend to a large degree on future standardisation of personalisation technologies.

In the area of broadband networks and multimedia services, Tatiana Kovacicikova, from the University of Zilina (Slovakia), presented the crucial standardisation gaps which need to be closed, like security for e-commerce and specifications of multimedia interoperability to enable the pervasive services era. She added: “A generic definition of broadband multimedia services is still missing”. Ms Kovacicikova



Pushing the integration: Ultan Mulligan, Josef Noll, Tatiana Kovacicikova, and David Kennedy (from left).

informed the audience that ETSI is working on an initial roadmap of multimedia services and applications to address this deficit.

The role of service platforms in creating these new business opportunities was presented by Ultan Mulligan from ETSI, who explained the success of the OSA/Parlay standard. This standardised application interface (API) has opened the telecoms networks to third party service provisioning. There are already 27 OSA/Parlay gateways on the market and 19 application servers in operation. OSA/Parlay can be deployed cost-effectively in few days and enables services like call manager, confer-

encing, billing, customer relationship management, tele-voting, location based services, and unified messaging. Mr Mulligan mentioned the work of Eurescom project P1110 on ‘Open Service Access’ as a prime example of R&D projects contributing to fast and effective standardisation.

Further information on the event is available at

http://europa.eu.int/information_society/istevent/2003/conference/conference_programme/index_en.htm

Mobile Instant Messaging

Enriching the user experience



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After years of large subscription growth rates, European mobile operators are in a situation where they have to find alternative ways to maintain revenue growth. Person-to-person data communication like SMS and now MMS is still growing,

but this will not be sufficient. To decrease churn rates and increase network traffic operators need to build strong customer loyalty through value-added services. Mobile Instant Messaging (IM) could be one opportunity to succeed in this.

Instant Messaging is the well-known chat functionality on the PC. Recently, Mobile Instant Messaging – porting the IM application to the mobile phone – has entered the market. While this is an opportunity

for increased revenue on the one side, there is the risk that it might take substantial income from the SMS/MMS market of mobile operators. Eurescom study P1345 ‘Mobile Internet/Instant Messenger – the way to enrich our customers’ world’ has investigated the technical basis for the implementation of Mobile IM and explored the prospective business opportunities. This article provides an overview on Mobile IM and recommendations on how to introduce Mobile IM services.

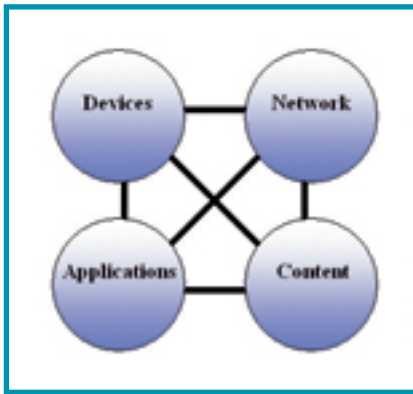


Figure 1: The mobile services ecosystem

IM and the mobile ecosystem

The ecosystem of mobile services can be grouped into four building blocks: networks, applications, devices, and content (see figure 1). In order to have a successful service in this ecosystem, the operator needs all four parts working together. The quality of the service is then determined by the weakest part in the ecosystem.

Devices: There are mobile devices that already support Mobile IM like the SE P800 or the Nokia 7650. The market penetration of such devices, also called smart phones, was only around 12 percent in 2002, but the market share is predicted to increase up to 58 percent by 2006 (figure 2). Although these devices provide a better IM experience and service, also older devices can support IM communication, e.g. via SMS or WAP.

Applications: There are already a wide variety of applications for Mobile IM. These applications provide the basic Mobile IM functionality, allow inter communication between the biggest IM providers like Yahoo, ICQ, MSN and Jabber, and some of them have already location capabilities. There are constantly new applications emerging, which provide Mobile IM, and the services provided are developing

quickly. So, operators can assume that the applications part of the ecosystem is mature enough for a Mobile IM service.

Content: Since the most successful service provided by Mobile IM is basic chat, where each user creates the content of the service, the operator can assume that this part of the ecosystem is also mature enough to provide a Mobile IM service. Although Mobile IM naturally supports many different kinds of content provided by the user like voice and video, there are other kinds of content that can also be provided by content providers or content aggregators. Examples are news tickers, weather forecasts, dictionary services, stock information, and e-mail notification.

Network: The Network part of the ecosystem already allows to download Mobile IM clients to any smart phone and connect to any of the big IM service providers via GPRS.

How to introduce the service?

As shown in the model above, the mobile service ecosystem is complete, although devices have a low market penetration when it comes to advanced terminals. However, operators don't need to wait until penetration increases before they can start offering the service.

Operator branded IM service: By offering an IM service in the PC world, operators can start building the service brand, and the customers will start getting familiar with the operator IM service. This step will encourage users to start building their own communities based on IM services, which will then be easily migrated to the mobile world.

Make the transition through SMS: SMS provides a good bridge between the PC and the mobile world, because users are already familiar with IM in the PC world, and they are also familiar to SMS in the mobile world. Users will be able to send instant messages, which will be translated into SMS messages, from PC to mobile phones and vice versa.

Test in a micro community: IM has not only been a success in the Internet community, but it has slowly entered enterprises and it has since gained a lot of popularity. A community inside the enterprise represents a controlled environment with a larger smart phone penetration perfect for testing new Mobile IM services.

Building 'The Operator Service Brand': IM represents a good opportunity to promote the operator brand by offering a pre-installed Mobile IM service in new mobile phones, which is ready to use and provides the user with remarkably improved person-to-person communication. This is a critical step for operators, because in order to have a good adoption rate, the service must be easy and intuitive. Mobile IM should have a good integration with the new devices before the service is launched. Mobile IM will then form the building block for a wide variety of services that will be offered on top of the IM infrastructure as it is already happening in the PC world.

Marketing: Operators need to market mobile IM aggressively to increase adoption rates and build the operator brand, but they should learn from AOL's e-commerce success, which is based on effective marketing and not on technological prowess. Therefore, no unrealistic expectations should be created by the promotion of the Mobile IM service.

Pricing: Operators could benefit from the example of NTT DoCoMo's i-mode service. They could collect monthly charges for information from content providers, so the users have only one bill and the content providers do not have to worry about billing customers directly.

Mobile IM customers would pay a low monthly fee, which comprises the packet transmission charge, and a smaller fee for the Mobile IM service. In addition, users would pay lower variable packet fees. Each instant message, for example, would represent a very small fee per 40 Roman letters. Other services would represent different fees like checking share prices, weather forecasts, or lotto results. Finally, customers would also pay a monthly flat fee for Mobile IM information, which would vary for each content provider.

Conclusions

Mobile IM enables operators to increase their revenues, strengthen their service portal, promote their own brand, increase network traffic, and build customer loyalty. In addition, operators will be able to leverage complementary services that reside on their home networks, and they will own the billing relationship with the end customer.

More information is available at: www.eurescom.de/public/projects/P1300-series/P1345

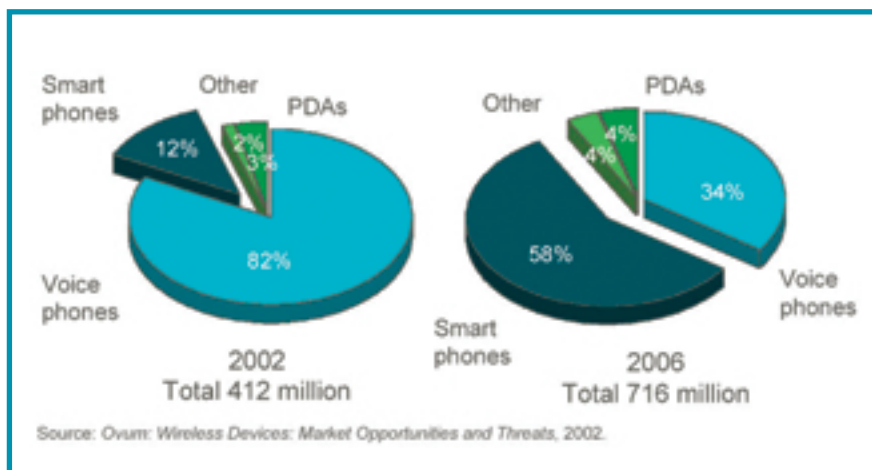


Figure 2: Market share of mobile devices

Broadband access technologies

An overview



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Access is the part of the telecommunications network that connects the user to the service node, or local exchange, of the provider. Lately, this part of the network received much attention, as it is crucial for delivering broadband services to the customers. However, it can be prohibitively expensive to carry out this upgrade. In the following, the different broadband access technology alternatives will be reviewed in broad terms.

We can distinguish between fixed/wireline and wireless access. According to the medium used, wireline access can be further broken down to xDSL technologies, cable, powerline, and fibre optic.

DSL technologies and fibre

Digital Subscriber Loop technologies (xDSL) all use the copper wires of the access infrastructure used in the past for analogue telephony to provide broadband access. They rely on sophisticated digital coding and modulation techniques. Over the years, many DSL varieties have been developed. The basic difference is in the line speed, or in other words the bandwidth they can support. Generally speaking the transmission speed and the line length, i.e. the distance that can be covered, are inversely proportional. The quality of the outside copper plant and parameters such as the diameter of the copper wires are also very important.

From the many DSL varieties ADSL is the most commonly used. ADSL stands for Asymmetric Digital Subscriber Line; 'asymmetric' refers to the fact that the transmission speed (i.e. bandwidth) is different from the service provider to the customer (downstream direction) and from the customer to the service provider (upstream direction). The latter is usually much more restricted. In contrast to ADSL, symmetric DSL, SDSL, is an access technology supporting the same bit rate both downstream and upstream.

ADSL suits well to the needs of an average private user. It supports the usage scenario in which much more information is consumed through browsing and downloading from the Internet than what is actually produced and forwarded, e.g. digital pictures or videos. However, this situation might change with the prevalence of cheap digital devices enabling users to produce own content.

There are other user groups than private users with characteristically different communications requirements to which ADSL does not fit well. Small businesses and teleworkers produce and consume similar amounts of information/content demanding a balance between the upstream and downstream bit rate. Symmetrical DSL (SDSL) is the solution that was developed to meet the needs of this market.

For the time being ADSL is the mainstream broadband access technology in Europe and in Asia, in particular in South Korea and in Japan, where broadband is currently aggressively rolled out. However, the bandwidth ADSL supports varies from country to country. In Europe the speed of ADSL is mostly limited to 1-1.5 Mbit/s in the downstream direction. In contrast, in Japan 8 Mbit/s downstream is also supported.

VDSL, another variety, offers significantly higher transmission speed, up to 52 Mbit/s in the downstream transmission. Such high speeds cannot be supported over copper wires for distances longer than a few hundred meters. In the case of VDSL, copper is therefore only used in the drop part of the access network, and fibre is used between the distribution cabinets or boxes and the local exchange.

The ultimate broadband access network medium is fibre, which can support almost unlimited bandwidth. Similarly to DSL technologies, there exist many fibre optic access network technology variants. The main difference between them is how close the fibre is brought to the customer.

The idea of using optical fibre in the access has been around for more than a decade now, and there have been waves of enthusiasm predicting imminent roll out in large volumes, but for the time being the cost remains prohibitive. Large scale roll out is expected to bring the cost down, but in the current economic climate operators are making incremental upgrades only – as long as they can.

In any case, the fact that other parts of the telecommunications network, especially its core, are already optical is supporting the idea of having the same transmission medium in the access network as well. Heavy research work on cost-effective access technologies is ongoing, among others in Eurescom project P1305 CENTS.

Alternative fixed access technologies

Besides the traditional telecommunications networks, there are at least two other infrastructures connecting almost every home in the developed part of the world, the electric power networks and cable TV. It has to be noted, though, that although cable TV is very common in many coun-

tries, there are a number of countries in which for historical reasons it is far less prevalent. These networks, if appropriately equipped, can also provide broadband connectivity to customers.

Cable TV is ubiquitous in the US and also in some parts of Europe, for example in the Netherlands. In the US most broadband access connections are through cable, although ADSL is gaining momentum. Traditionally, cable TV networks provide one-way communication: the distribution of TV signals. After appropriately modifying these networks, they could also support two-way communication and could become a broadband access platform. Users need to obtain so called set-top boxes that separate the communications signals from the carried TV signals. This upgrade, which makes two-way communication possible, is often quite complex and costly, making this alternative rather expensive. There are two aspects with regard to this technology that are worth noting. First, this solution provides also asymmetric speeds and bandwidths in downstream and upstream, and secondly, it is particularly suited for broadcasting information. The first aspect makes this technology a direct competitor of ADSL in many countries, but the remarks made earlier regarding ADSL's unsuitability for certain scenarios (growing number of digital devices producing content at the edge of the network) and user groups / market segments are equally valid for this technology.

Powerline technology has a big potential, because all homes are already connected to the power network. However, significant technical obstacles need to be overcome, especially with regard to radiation and electromagnetic (radio) interference. Development is still ongoing to solve these issues by using special coding and modulation techniques.

Wireless broadband access

The most commonly known and talked about wireless broadband access technology are 3rd Generation mobile systems (3G), also known as UMTS (Universal Mobile Telecommunication System). However, there are other wireless broadband access technologies: fixed wireless access (i.e. not mobile) and satellite.

Fixed wireless access is more or less a technology to serve a niche market. It is particularly suited to serve demand quickly, because there is no need to extend an infrastructure, or in geographical areas where demand is quite scattered.

Satellite communication is similar to cable TV in the sense that it is particularly suited for broadcasting applications and providing broadband downstream communication to the customer. However, realising

the reverse – upstream – channel poses a challenge. The upstream communication is often provided through conventional means, e.g. dial-up phone, because the cost of realising it through satellite is prohibitive. In any case, broadband access via satellite is particularly attractive in remote areas with very low population density. 3G/UMTS can provide 2 Mbit/s broadband access with the advantage that the

terminal is mobile. Despite the many talks about this technology it still needs to prove itself, as large scale roll-out is still to come.

Conclusions

There is a large variety in access network technologies. They all have their strengths and weaknesses. In addition, there is a high diversity in the geographical distribution and density of demands, making a certain

technology particularly suitable in one part of the world, but prohibiting its use elsewhere.

Despite efforts and much talk about convergence, it is the opinion of the author that many physical layer technologies will flourish and co-exist in the future because of their complementary advantages.

Flagship to success The Eurescom Project Programme 2004



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2003 will be remembered as a prosperous year for collaborative R&D submissions.

During this year we have not only seen two large Calls of the new EU Framework Programme 6, which were launched in spring and autumn this year, we have also seen the implementation of a new collaborative R&D programme for telecommunications in Europe called CELTIC (Co-operation for sustained European Leadership in Telecommunications). All these programmes are partly funded by the European Commission or national authorities. Can Eurescom compete in this environment? The answer is 'Yes'. There are many issues on which telcos see benefits from collaboration in self-defined initiatives like Eurescom projects.

Two avenues to the Project Programme

To ensure that in future the strategic roadmaps of our members are properly taken into account, our Project Programme 2004 consists of two parts:

- We are defining a small number of top-down generated flagship projects in consultation with collaboration enablers at Eurescom Shareholders/Members.
- These flagship projects are complemented by bottom-up generated projects resulting from proposals submitted following an open call as in previous years.

Flagship projects

The following two flagship projects are currently discussed:

'**Interconnection of Multimedia Services Networks**' addresses the problem of inter-connecting networks at the IP/MPLS level with appropriate levels of QoS, security and management across boundaries between different operator domains. A specific instance of the problem will be the case of PSTN services using VoIP. A second stream of work within the project will address issues like ATM over MPLS. The mobility aspects of roaming will be a subset of the problem space.

'**Collaborative Service Delivery**' will address the physical connectivity, billing and management services where multiple suppliers are heavily exploring brokering arrangements between players.

Bottom-up generated projects

Concerning the bottom-up generated projects Eurescom has just received several challenging proposals, amongst which are: **The home environment** is where telecommunications meet IT and entertainment and a variety of new user groups from early adaptors to technology-lost individuals. Approaching the home environment with a collection of service modules for the different domains will provide for an increased ARPU both in fixed and mobile communication.

In the last years, **Instant Messaging (IM)** has been a huge success in the PC world, but due to proprietary protocols IM is not interoperable. Although IM is rapidly moving into the mobile world, the lack of interoperability could slow down market uptake. Since operators are now beginning to plan and deploy their IM infrastructure, it is important to look into the interoperability issues.

Mobile networks are in fact physical broadcast networks that could provide **broadcast services for mobile customers**. Up to now mobile operators have made little use of their installed broadcast capacity. Novel broadcast services consisting of written, audio, video or image information could be a driver for EDGE and UMTS.

Sensor Nets (also termed Sensor Webs or Smart Dust) are self-organising, wireless, ad-hoc networks of small low-cost computers. Different application areas can be envisioned for such a technology which could be highly interesting to telcos like environmental monitoring, building and site security or objects and person tracking via RFID (Radio Frequency Identification).

Grid technology has always been seen as an exclusive IT domain. It is, however, only a matter of time when Grid will also become an issue to the telecommunications industry.

New Eurescom projects are scheduled to start in the beginning of 2004.

Contact persons

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New Eurescom projects & studies

In October, four Eurescom studies were started. This completed the Study Programm 2003, which altogether includes nine studies on issues of strategic importance to network operators.

Online Console Gaming is here – Will TelCos and ISPs be players? (P1347)

The study will investigate how online console gaming can generate new business and revenue opportunities for traditional network operators both at a pan-European and national level. Furthermore it will look into possible roles telcos and ISPs could adopt in this new market and how online console gaming will affect both in the edge and core of our networks and their design. Another important question for investigation is how online gaming consoles could represent an alternative way to provide TV users with other popular Internet based services like messaging and VoIP.

The main objectives of this study are to:

- Explore possible business and revenue models for this new emerging market.
- Explore the different roles that telecom operators can have.
- Indicate the best role for telecom operators and ISPs.
- Study the critical parameters in gaming applications, and how they will affect our view on traditional network design.
- Study the potential for pan-European Online Console Gaming (OCG) through simple experiments with existing applications between the partners in this study.

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SPEED: Strengthening TelCo's Position in the Mobile Presence and Location aware services European Interoperability for new market opportunities (P1348)

Location Based Services (LBS) and person-to-person communication where location and presence awareness is applied have been analysed as a big business opportunity. Telcos, with their strong position in the value chain for location awareness services, should play the major role in defining those services. Nevertheless a lack in standardisation on interoperability has limited so far the development of this business.

SPEED will elaborate a selection of business models for location awareness services as a way to develop European Location Based Services and the corresponding business opportunities. It will propose solutions for interoperability, security, and content management with third parties for mobile presence and location aware services, and at the same time take privacy issues into account. One of its final objectives is also to analyse and describe the necessary work to be followed at European legal and standardisation instances, and propose further activities.

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TelCo Grid – Business Opportunities for Telecom Operators in the Grid market (P1349)

Grids are collections of computer resources owned by multiple organisations that are coordinated to solve a common problem. These resources could be, for example, computers which are collectively running heavily parallelised code – typically used to solve extremely complex scientific or engineering problems, which cannot be solved by a single organisation working in isolation. Grid technology and computing is expected to make its way from scientific applications and find its commercial application in the business world in cross-company collaborations and virtual organisations. The new Eurescom study P1349 TelcoGrid will look at the state of the art of Grid technology, analyse development trends and provide recommendations for telecom operators how to position themselves with regard to the emerging Grid market.

Telecom operators are bound to become key players in a Grid value chain, as they provide connectivity and own computing resources. Moreover, they have established customer relationships and accounting/billing experience, essential for business/commercial Grids. As grids may span several operators' networks, interoperability of solutions and the development of standards are clearly of common interest to operators. Therefore, a close collaboration between telecom operators will be needed to standardise the required platforms and security approach within a European-wide framework.

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MASMO – Multi-application Smart Card Market Opportunities (P1350)

After the terrorist attacks on the US on 11 September 2001, many governments around the world have been seeking for more secure immigration control and increased traveller safety. Entitlement cards are seen as the de-facto candidate for providing bulletproof authentication of citizens in and out of national borders. Furthermore, banks are also suffering from increased credit card fraud – identity fraud is exponentially rising in most European countries. And the number of plastic cards in the consumers' pockets is constantly increasing.

The new generation of multi-application smart cards could aggregate multiple applications and services on a single card and provide custom security and authentication that is hard to forge. Biometrics is used to 'lock' the user with the card and then open the door to various personalised services accessible from the card. In the light of these problems and technology advancement it is time for telcos, who are often considered as trusted and respectful service providers with a good relationship with most public and private service providers, to have a closer look at smart cards. In this context, Eurescom study MASMO will analyse the value chains where smart cards are, or could be, involved and identify potential revenue streams for telcos, who might benefit in this area from their position as trusted service providers.

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“We need efforts on the public and the private side”

Interview with EU Commissioner Erkki Liikanen
on the future of the information society in Europe

The European Union has set itself ambitious goals in the ICT sector. In an exclusive interview, Erkki Liikanen, the European Commissioner for Enterprise and Information Society, told *Eurescom mess@ge* where we stand today and what the challenges on the way to an inclusive information society in Europe are.

The political goal of the European Union is to become the world's most competitive and dynamic economy by 2010, and the widespread availability of information society technologies is a major enabler on this way. How close is Europe to this goal, and what has to be done yet?

Liikanen: There has been a lot of progress in connectivity. We also have achieved the goal of the Lisbon Summit to set up new electronic communication legislation, which is convergence-based. We have made progress in connecting schools. To accelerate the progress, we have the eEurope 2005 action plan, which concentrates on broadband and security on the one hand and legal issues, e-health and e-learning on the other hand.

At the Barcelona Summit in 2000, the EU leaders agreed to spend 3 percent of the EU's GDP in R&D by 2010. To achieve this, about 500,000 more researchers would be required in the EU. What is the European Commission doing to achieve this in the ICT sector?

Liikanen: In the field of research it is quite clear that we need efforts both on the public and the private side. The target is to achieve 1 percent on the public side and 2 percent on the private side. We hope that this commitment will have impact on budgeting in all member states. At the same time, we need to have good environments in the private sector. The two countries that have achieved 3 percent are Sweden and Finland. It is achievable, but it requires really long-term efforts.

In many European countries, there is a brain drain in the ICT sector, especially to the US. What could be done to stop this?

Liikanen: Stopping brain drain in one direction is perhaps not the right way to see it. More important is that we also attract brains from other parts of the world. It is very important that European universities will become more and more open and the research efforts will be more and more exciting. The attractiveness of the European university structure is very important, and also our societies must be open for differences. This general political atmosphere is an important factor.

Where do you see Europe in the development of information and communication technologies compared to the USA and Japan? In which areas is Europe leading and in which lagging behind?

Liikanen: In broadband, the real leader is actually Korea. The United States are ahead of Europe, but not dramatically. If we look at broadband connections, in the US there are 8 out of 100 people connected; in Europe it is 5. The growth has been rather good in the last 12 months. We are behind, but the lag is not dramatic. So, with strong efforts we could be totally equal.



**“It is very important that we invest into research in the medium and long term.”
EU Commissioner Erkki Liikanen**

In the field of mobile communications, we are still clearly ahead of the United States. Compared to Asia, the challenge is very strong. We are clearly leading in GSM, but in the next generations [of mobile technology – the editor] it will be a tough battle.

How should Europe prepare for this “battle”?

Liikanen: It is very important that we invest into research in the medium and long term. We try that with the IST programme. We also hope that our regulatory framework will be properly used, which means that we have encouragement for content creation. Content- and service-creation really matter. Here, we just established a mobile technology platform, where a number of players from the equipment side, operator side, and content side are together and hopefully be able to draft an action plan until early next year, so it will be presentable for the European Summit meeting in spring 2004.

What is the EC's first priority on the way to ‘Broadband for all’ – the network access or the services?

Liikanen: Both. The key issue is, the competitive framework will encourage competition between technology facilities. It is very important in the long term that we have investments in different technologies. Service and content are both critical. Our efforts with the eEurope action plan to invest in e-health, e-learning, and e-government are the public efforts in that area. It is very important that the private sector does its part. What is important here is a proper digital rights management, because if this does not work, it is difficult to get back the investments done.

The EC has been promoting ambient-intelligent technologies, which are meant to make information and communication technologies unobtrusive and user-friendly. How do you address the privacy concerns about a future world of invisible, networked devices?

Liikanen: We have a very strong privacy tradition here in Europe. And, of course, the people must have the right to know what data are collected from them. However, if we can guarantee, for example, by new intelligent tags that my luggage is in the same plane as I am, it protects my privacy and does not destroy it. We must respect privacy concerns, because they are otherwise a major problem for development.

How can information and communications technologies help to overcome socio-economic problems connected to unemployment and ageing societies in Europe, including the problems of disabled people?

Liikanen: In the area of disabilities, information and communication technologies offer enormous possibilities. We have worked a lot to promote the web accessibility guidelines, which means that people who see badly or are blind can get information from the internet. Information technology rightly used with the right applications and well-edited websites can have a major effect for an inclusive society.

For inclusion in general, we must make sure that people in remote areas and with lower incomes have the same possibilities [for access – the editor]. There, the public has a role. It is very important that young people acquire the skills, because that very often brings internet to the homes. We cannot solve all inequality problems by internet, but we can create a generation that has equal possibilities.

How could elderly people get access, who have more problems in acquiring the necessary skills than young people?

Liikanen: That is a big challenge. However, it is more a challenge of attitude than practice. I have seen some training courses for people above 65, and they quickly learned how to use a computer. We must also use other technical platforms, like digital television with a return channel. We need simple solutions, and a TV set is in every home. One day, all TV sets will be digital, because analogue technologies just waste frequencies.

Currently, there are developments at EU level and between ETSI and Eurescom to further integrate collaborative R&D and standardisation activities. What should be the role of standardisation for the development of information society technologies in Europe?

Liikanen: The development of open standards and interoperability are critical issues. Networks, terminals, middleware, services – everything should be interoperable. There, the standardisation organisations have a very important role. Of course, there are areas, where the consensus-based standardisation may be a little slow, but I hope they always stick to the principle of interoperability and open platforms, because that is important for broad coverage. UMTS, DDP, Digital TV, Digital Broadcasting have been standardised in Europe. So, there are many things happening in European standardisation, but more needs to be done.

A large part of Framework Programme 6 is devoted to IST. How do you view the process and the results of the first Call, and what could be improved?

Liikanen: The results are very good. There has been a high level of participation and many Integrated Projects, and the topical coverage is good.

There is one area that will always be a challenge for us: how can we achieve that all the different priorities serve convergence and are horizontally integrated.

In the first Call of Framework Programme 6, participation of Accession States and other Eastern European countries was low. What will you do to make sure these countries are better represented in the European Research Area?

Liikanen: In the third Call we will try to re-balance the issues where we clearly have difficulties. We have two areas, some international aspects and SMEs, where we have to do better. This is under progress. We will firstly have to analyse the results of the second Call.

At the end of 1999, the EC started the eEurope initiative. Four years later, which improvements in information and communication technologies do you personally experience today?

Liikanen: Four years ago, there were less people who replied to my e-mails. There has been a big change. As the mobile internet is becoming reality, I can also work when I am on travel from my mobile handset, access the internet and get to my

e-mails. However, I have been paying via m-commerce already four years ago. I have bought some new services since then, for example news on my mobile terminal. GPRS makes this very simple and very fast. I also watch FSX TV on my mobile; this has become my preferred way to watch TV. I also use MMS messaging to send photos to my family in Finland. The only problem is roaming: not for all European countries there are GPRS roaming agreements, because not all of them have GPRS.

The new EU Directive on Privacy and Electronic Communication will have to become national law in member states by 31 October 2003. What do you expect from this legal measure towards reducing Spam?

Liikanen: The internet service providers have the best opportunities to fight against spam, if their customers agree on this. They also should give the message to spammers that their actions are illegal and they will be prosecuted. But of course, this is only one side. You need also better software and you need to increase the awareness of the citizens. Both, the public sector and the private sector should drive the fight against Spam.

The interview was conducted by Milon Gupta.

EUREKA cluster project CELTIC started A programme for European leadership in telecoms



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CELTIC, the 'Cooperation for a sustained European Leadership in Telecommunications', was officially approved as a EUREKA cluster project on 23 October 2003. It is the first European R&D programme fully dedicated to end-to-end telecommunications systems.

"Telecommunications is already top of the list for investment in innovation as one of Europe's most strategically important sectors and a key business enabler and

employer. The fact that it is battling both a business downturn and a pace of development which could exceed investment capacity has, however, prompted the urgent initiation of this new Eureka cluster project," says Jean-Paul Jacamon, Chairman of the Eureka High-Level Group.

CELTIC projects will allow all players in the European telecommunications sector to collaborate in advanced R&D projects. Founding members include Alcatel, British Telecom, Ericsson, France Telecom, Italtel, Nokia, Telecom Italia, Telefonica, and Thomson. CELTIC is open to other large companies, small and medium-sized enterprises, research institutes, and universities.

Integrated solutions

The unique value of CELTIC lies in the pre-competitive development of comprehensive, integrated communication system solutions, including platforms and test vehicles. This concept is at the core of the CELTIC Pan-European Laboratory and will enable the trial and evaluation of service concepts, technologies and system solutions. The main priorities of CELTIC are services and applications, broadband infrastructures, and security.

The total budget that has been defined for CELTIC between 2004 and 2008 is €1 billion. The costs for CELTIC projects are shared between governments, who contribute up to 50 percent of the project budget, and private investment.

Straightforward business case

CELTIC has a straightforward business case. The European telecommunications sector recorded a turnover of € 236 billion in 2002, employs 1.25 million people and is responsible for 2.5% of the EU's GDP. To keep European telecommunications in the lead, a number of challenges, like the convergence of telephones, televisions and home computers and the development of business models and services that work equally well for companies and their customers, have to be addressed.

If CELTIC can enable Europe to rise to these tremendous technological and commercial challenges of the evolving knowledge society, the associated economic benefits will come to Europe. "Today, Europe leads in areas such as mobile and wireless technology and broadband access," explains Jacques Magen, Chairman of CELTIC. "We want to take advantage of this leadership by focusing on these areas and new trends such as the transmission of audio-visual data over the telecoms network. If we don't do it in Europe, it will be done in the US or Japan."

There are already a number of R&D programmes in Europe, such as the Sixth Framework Programme of the European Commission and some national projects. But they are either not fully dedicated to telecommunications or tend to focus on the medium- to long-term. On the other hand, the current difficult business climate means that R&D efforts within telecommunications companies tend to look more at the next six to 12 months. CELTIC will fill the gap and look at techniques, systems and services in a short- to medium-term perspective. So while it might start in a negative economic climate, as we begin to get the benefits of the first projects' results this will stimulate further private and public investment.

First Call for Proposals

The first CELTIC Call for Proposals is already open with a deadline on 28 November 2003. The first projects are expected to start as soon as March-April 2004, after proposals will have been evaluated by the CELTIC Initiative and further discussions will have happened with the Public Authorities of the countries involved.

CELTIC and Eurescom

Since the work areas of CELTIC are compliant to those of Eurescom, we expect high interest from the Eurescom community to participate in CELTIC projects. CELTIC projects are co-financed up to 50 percent by national funds. In contrast to Eurescom studies or EU projects in the Sixth Framework Programme, there is no central funding of projects. For each CELTIC project, the applicant has to assure public funding by the respective Public Authority. As a EUREKA strategic cluster, CELTIC is looking for projects involving industry, SMEs, academia, and research institutes.

On 1 November, the CELTIC Office started operating at the Eurescom premises in Heidelberg. It assists in all matters related to project proposals, funding, and the CELTIC work programme. The Director of the CELTIC Office, Heinz Brügge-mann from Eurescom, is managing the operational affairs of CELTIC together with staff from within and outside of Eurescom.

Further information is available on the CELTIC website at www.celtic-initiative.org

new project results

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- P1345** Mobile Internet/Instant Messenger – the way to enrich our customers' world · Deliverable 1
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- P1345** Mobile Internet/Instant Messenger – the way to enrich our customers' world · Deliverable 3
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- P1345** Mobile Internet/Instant Messenger – the way to enrich our customers' world · Deliverable 4
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APPLICATIONS AND SERVICES

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- P1208** Location Awareness (LOCAWA) · Technical Information 8 · Preparation and conduction of the field trial · Eurescom confidential
- P1208** Location Awareness (LOCAWA) · Technical Information 9 · Analysis of the field trial · Eurescom confidential
- P1306** BIZCOOL – Business-to-Business Interaction with Web Services and ebXML · Deliverable 1
XML-Based B2B Frameworks and Business Opportunities for Telcos · Eurescom confidential
- P1306** BIZCOOL – Business-to-Business Interaction with Web Services and ebXML · Deliverable 2
XML-Based B2B Frameworks and Business Opportunities for Telcos · Eurescom confidential
- P1308** FRAPESA – Framework for personalisation of services and applications in next generation services · Technical Information 1 · State-of-the-art technology – Concepts, methods and tools for the deployment of personalised services · Eurescom confidential

MIDDLEWARE

- P1207** OPERA – Interoperability of Digital Rights Management (DRM) Technologies · Deliverable 2
An Open DRM Architecture · Eurescom confidential

MULTI-SERVICE NETWORKS

- P1206** Broadband Services in the Intelligent Wireless Home · Deliverable 2 · Operators' view on home networking · Eurescom confidential
- P1305** GENIE – GMPLS and MPLS in Enhanced IP Networks · Deliverable 1 · Status of MPLS and GMPLS · Eurescom confidential

CUSTOMERS AND MARKETS

- P1302** PROFIT: Potential pProfit Opportunities in the future ambient InTelligence world · Deliverable 2 · STEEP Analyses · For full publication

Madonna in the mixer

Novel file format from Hungary is promising a new music experience



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The music industry is stuck in gloom. Worldwide sales of music CDs, records and cassettes fell for the third year in a row, hit largely by rising Internet piracy. The large recording companies are desperately looking for new ideas to revive their business and leave the valley of doom and gloom. Rescue could come from Hungary, the land of the Csárdás dance and a number of famous composers. A modern Csárdás prince from Budapest literally wants to mix up the way music is delivered and heard.

The Hungarian musician Sándor Mester, stage name MS3, developed a novel music file format called Digital Improvisation or DI. It enables the users to listen to one song in endless number of versions. "Imagine Madonna's new releases were recorded in DI format. Whenever you hit the 'Play' button, a different remix of the same song is played back," Mr. Mester explained. Two years ago, he founded the start-up company Digimpro to exploit the DI technology after he had already patented the

DI algorithm in 1998. Now the technology seems to be maturing, though the use of the DI format is still limited to some experimental music groups. Currently, there are just a few DI audio CDs by relatively unknown bands available.

Life isn't static

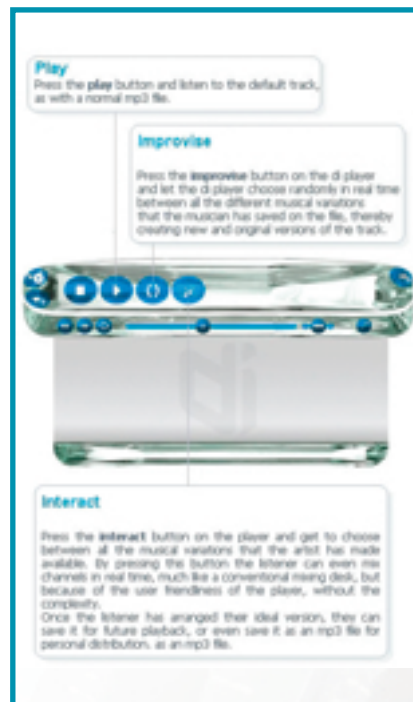
The underlying principle of DI is to enable a multitude of versions of the same piece of music due to the motto "Life isn't static, why should music be?" which is the title of a DI song by Hungarian underground rock group Korai Orom.

Variation and improvisation as such are nothing new in music. Just think of Bach's Goldberg Variations or Free Jazz, not to speak of the sound sampling by today's rap artists. In fact, variation is one of the main elements of life. It drives evolution and prevents boredom. "Variatio delectat", already the old Romans knew, which means: variation pleases. In music, variation is a form based on constant repetition of a simple theme, each new version being elaborated or treated in a different manner. If this happens without planning or preparation it is usually called improvisation.

New music experience

The new aspect of DI is that variation and improvisation of a music piece is no longer limited to the composer and the performer. Now the music consumer can do this as well. This is how it works: The sound samples are bundled within a wrapper file format. During the recording and production process, the artist can explore a whole range of musical possibilities without having to commit to one single cut. In the final mastering, several versions are included in the final mix. DI provides the ability to represent musical variations of the same song encapsulated within a computer format, which then yields a whole spectrum of possible musical renditions.

"But improvisation is just the tip of the iceberg," said Mr. Mester. "DI also provides an intuitive interactive interface to allow the user to choose and control the way the song is played-back." For the first time, Digimpro claims, listeners can actually arrange the song to suit their taste or mood, while at the same time preserving the artistic integrity of the music.



Description of the DI player on the Digimpro website

Business opportunities

Sándor Mester and his partners see DI as a concept, which could be applied to all musical genres and styles. From traditional jazz to electronic dance music, from pop to classical music, they argue that there would always be a way for DI to enhance the artistic and qualitative value of the recorded music. In addition, Digimpro pointed out the business opportunities for the music industry: DI would allow a label to offer more musical content without extending the length of a song. The encryption mechanism of DI would guarantee the protection of intellectual property rights.

So far, it seems the big recording companies have not showed interest in the DI format. Thus, it is rather questionable that DI will be offered the chance to become a widespread music standard beyond the circles of some experimental musicians. However, in the music business you never know who is going to be a star tomorrow. As long as the DI format has not risen to star level, Madonna will have to publish her variations in consecutive order instead of putting them into one song.

Further information:
www.digimpro.com

Wants to mix up music –
DI developer Sándor Mester





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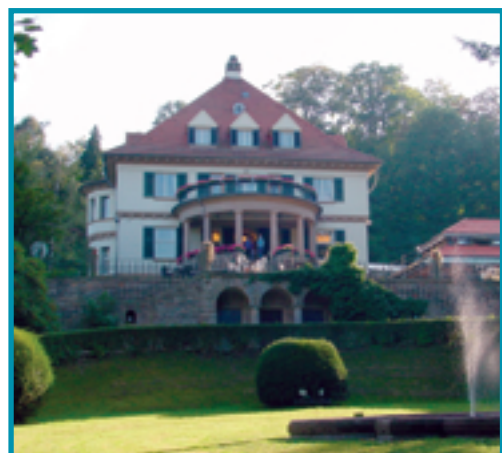
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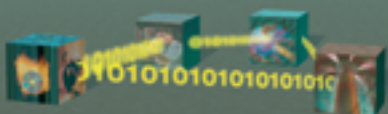


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