Issue 1/2004

# EURESCOM mess@ge

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## Digital Media Project – general assembly


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# Personalisation of telecom services

European issues

## Eureka cluster CELTIC – Call 2

# The age of personalisation

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**Telecommunications has entered a new era – the age of personalisation. It started with the customisation of mobile ringtones some years ago. However, this was only a small taste of what is emerging now. The personalisation of voice and data communication in fixed and mobile networks has just begun. It includes a large variety of services from location-based services to personalised smart home applications.**

Sceptics might argue that personalisation has been an integral part of telecommunications since Bell designed the first operable telephone. What is more personal than a phone talk? However, until recently technology did not add much to this personal character of telecommunications. Even a mobile ringtone, downloaded by thousands of other people, is not really personal. It is just a customised setting, provided you have not created the mobile ringtone yourself. Real personalisation of communication technology requires something that has been largely missing so far: intelligent man-machine interaction.

Up to now, communications technology has been relatively dumb. Your phone, mobile or fixed, does not know much about you and your communication and information needs in relation to the time-space context you are in. This will change with the next generation of communications devices. Your phone or the network will know, what clothes you like, where you can find the best offer in the vicinity to buy those clothes, what the price limit should be and what kind of garment ads you would like to receive.

Intelligent personalisation offers a lot of opportunities for customers and service providers alike. Customers will get personalised information when they need it, and they will be able to treat their communication partners in a more differentiated, personalised way, which can really make life for everyone easier. Personalised settings for call handling will allow you to talk to the people when you are willing to do so without ignoring and embarrassing the others. Service providers, and I am especially talking about telcos here, will be able to sell more advanced services to their customers without increasing the complexity the customer has to face.

On the contrary, personalised services serve the goal to make life easier for the user while at the same time increasing his or her information and communication options. Just think of navigation systems on your PDA. When you are in your car, you would prefer to have audio input and audio-visual output. When you get out of your car having a walk through the city, you might prefer some other combination of multimodal input and output, for example voice and pointer for input. The personalisation concept is an important milestone on the way to more user-friendly communications services that allow everyone to intuitively use the features her or she needs without having to do a degree in engineering.

The only cloud in this bright picture could be the customer acceptance. To enable personalisation, services and devices have to store personal information about the user. As customers, especially in Europe, have grown very sensitive about privacy issues, customer acceptance of personalised services is nothing which service providers should take for granted. What is needed are solutions which enable customers to stay in control of their user data. Customers should be able to know, which user profiles are stored on the provider's server and how long. I have no doubt that this is technically feasible, but the technical solution will not be enough to dispel the concerns of critical customers. What is needed in addition are marketing strategies which also cover informational self-determination and transparency of data collection besides the plentiful advantages personalised services offer.

Personalisation will then be a driver of the telecoms market. Who will be the driver of personalisation? I believe the telcos. They have the customers and the infrastructure to do it, but most important, they have the need for innovative services in order to increase their revenues. The era of mass production is long gone. Let us embrace the age of personalisation and benefit from personalised communication services!

# Dear readers,

Please don't take it personal that we don't address you personally by your name in this editorial remark. As our cover theme for this issue is focused on personalisation, you might have expected this. In addition, we could have selected only the topics and articles you are really interested in for your personal issue of *Eurescom mess@ge*.

Why didn't we do it then? At least the first part, addressing you personally, would have been technically feasible. We know this from the book club mailings that are clogging our mailboxes. The other part regarding your personal preferences would have been slightly more difficult, because we don't have sufficient reader profiles for that – not to speak of the question, if you would consent to us having such reader profiles.

This already shows you the potential opportunities and challenges which personalisation offers in the telecoms domain. For this issue we invited some of the key experts on personalisation in European telecoms to present their achievements and views in this area. Personalisation of telecoms services has many technological and socio-economic facets. Some of them will be highlighted in this issue.

In addition to our cover theme, we have plenty of other topics which might be relevant to you. Since our December issue, a number of FP6 projects have started their work. We will report about some of those where Eurescom is involved. Another hot topic for European R&D in telecoms is the one-billion-euro Eureka cluster project CELTIC. We inform you about the current status after the 1st call.

In our events section, David Kennedy presents his opinion on the IPv6 service launch event, which took place in January, and his view on the relevance of IPv6 for telcos in general. Another important event we feature is the first General Assembly of the Digital Media Project, which took place in February.

In addition you will find a profile of Eurescom's new member Bezeq, a report about the ERNIE project on Broadband via DSL, and a Tutorial on Grids. If your mind needs to be refreshed after digesting all this, then explore under 'A bit beyond' the good vibrations mobile devices can offer to stimulate your mind.

Though the content of *Eurescom mess@ge* is not yet personalised, we hope that you will find some content of interest in this issue. In order to shape our magazine even more to your personal information needs, we would appreciate your feedback.

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## Sn@pshot

# "I like personalisation"

Eurescom's programme manager Valérie Blavette with the 'latest development' in personalised mobile devices.

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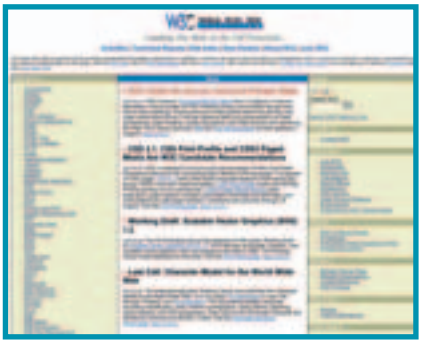
# +++ News in brief +++ News in brief +++



## Voice to the Web – W3C issues VoiceXML 2.0

Cambridge, MA, 3 February 2004 – The World Wide Web Consortium (W3C) has published VoiceXML 2.0 as a W3C Proposed Recommendation. This is the final review before it becomes a W3C Recommendation. The goal of VoiceXML 2.0 is to bring the advantages of Web-based development and content delivery to interactive voice response applications. "VoiceXML 2.0 creates opportunities for people with visual impairments or those needing Web access while keeping their hands and eyes free for other things, such as getting directions while driving", explained Dave Raggett, W3C Voice Browser Activity Leader.

VoiceXML 2.0 allows developers to create audio dialogs that feature synthesised speech, digitised audio, recognition of spoken and DTMF (touch-tone) key input, recording of spoken input, telephony, and mixed-initiative conversations. In the W3C Speech Interface Framework, VoiceXML controls how the application interacts with the user, while the Speech Synthesis Markup Language (SSML) is used for spoken prompts and the Speech Recognition Grammar Specification (SRGS) for guiding the speech recognizers via grammars that describe the expected user responses.

Since 1999, W3C has been working on its Speech Interface Framework to expand access to the Web to allow people to interact via key pads, spoken commands, listening to pre-recorded speech, synthetic speech and music. With the number of telephone lines and mobile phones exceeding one billion units world-wide, the specifications of W3C's Speech Interface Framework will allow an unprecedented number of people to use any telephone to access appropriately designed Web-based services.

**W3C website: www.w3.org**

## BT wins NHS broadband contract

London, 19 February 2004 – BT has won a 530-million-pound contract to provide a broadband Internet network for the National Health Service (NHS) in the UK. The seven-year contract aims to provide and manage a fast and reliable network to run new information technology systems being rolled out by the state-funded health service. The deal is the first significant public sector investment in broadband.

The network will now serve all 18,000 NHS locations and sites. The current NHSnet contract only reaches 10,000. Dubbed 'N3' the New National Network means faster transfer of all clinical data between NHS organisations. It will support electronic booking and the NHS Care Records Service, and will let doctors exchange visual data – such as video and x-rays – much more quickly.


The contract requires BT to act as an integrator, rather than providing a broadband service itself. In this capacity, BT will buy the broadband connectivity through the Regional Aggregation Bodies, a set of national and local telecoms companies which have competed to provide the service. NHS IT says that this will mean savings of up to £900 million over the period of the contract, compared with the cost of existing NHSnet contracts.

If all goes according to plan, frontline NHS staff will begin to see improvements in connectivity later this year.

**NHS website: www.nhs.uk/**

## EITO Report 2004

Brussels, 19 February 2004 – The 2004 edition of the EITO points to strengthening signs of recovery of the ICT market. According to EITO, the European Information Technology Observatory, the Western European ICT market is expected to reach a growth of 3.1% in 2004, well above the limited growth of 0.8% in 2003. France and Germany continue to perform below the Western European average, whereas the strongest growth is predicted


for Spain. "Europe must not lose momentum at the beginning of a new ICT cycle, represented by the emerging digital world, which otherwise will be driven by North America and increasingly by China and Eastern Asia," said EITO Chairman Bruno Lamborghini.

Worldwide ICT expenditure is expected to reach € 2,160 billion in 2004, 4.3% up compared to the € 2,071 billion spent in 2003. Carrier services account for 42% of the overall market, followed by software and IT services with a combined share of 29% and computer hardware with 15%. Looking at the worldwide market structure, the European market represents 30% of total ICT spending, the United States account for 32% and Japan has a share of 12%.

The most dynamic regions in terms of ICT spending are Eastern Asia, in particular China, and Central and Eastern Europe. EITO experts forecast that the ICT market in Central and Eastern Europe (CEE) will increase by 8.1% in 2004 to € 42 billion or 6.4% of the total European market. Among the new EU member countries Poland, the Czech Republic and Hungary are the countries with the strongest ICT market development.

Demand for ICT is driven in particular by the increasing diffusion of integrated networks and systems for enhanced Web-based applications like e-government, Internet commerce and e-business. Especially e-business is proving to be a key driver of productivity growth and increasing competitiveness.

However, at present there are a number of constraints that inhibit ICT investment, especially of SMEs. They include a still weak economic recovery, tight budget restrictions, the tendency to leverage on existing investment, and a lack of skills and technology culture. Mr Lamborghini emphasised that "neither the business sector nor the public sector are at present seizing the full benefits of ICT in Europe."

**EITO website: www.eito.com**

# Personalisation of telecom services – Why and how personalised services will flourish

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**Personalisation has become fashionable in telecoms. One of the major enablers for this recent trend in communication services is the mobile phone. Its success largely stems from the fact that a mobile phone is a very personal device, much different from a normal fixed-line phone. When your mobile phone rings, you know the call is almost certainly for you, and not for your spouse, children, or colleagues. Most people carry it with them the whole day and store personal contact information on it.**

The need for personalisation has grown due to the fact that life is getting more and more complex, and people have more and more different roles within one day.

People do not want to mix all spheres but like to be recognised in their current role: employee, husband, father, football player, or member of a political party. These roles belong to the same person, but you usually contact the person through a different interface according to the subject.

Personalisation is also part of the solution to information overload: it will help you to get the information you are interested in at the right time.

Telecom users would like more personalised services and at the same time are more and more mobile. If the telecom service providers offer conditions where the customers feels at home wherever they are, the service boundaries will disappear and the usage of telecom services will drastically rise.

All considered, there is no doubt that next-generation services will be characterised by the provision of the user's personal preferences as well as the combination of different types of media on multimodal user interfaces. The successful i-mode service in Japan already demonstrated the appeal of services suited to the taste of the user.

## Enabling technologies

The virtues and business potential of personalised telecom and information services are known. However, European telcos are still facing some technological challenges to implement the vision of trusted personal services.

Among the factors to be integrated are: user profile; location information and user context; content management and adaptation, service presentation; data mining and knowledge management.

## Profiles and authentication

At the core of personalised services is the user profile or personal profile, which gathers the user preferences and data. It is important to remember that a large part of information stored in a user profile is dynamic, meaning it could change quickly with context including the location.

There is an identified need for integrating the distributed aspects of personal profiles. The newly kicked-off FP6 IST project ePerSpace, 'Towards the era of personal services at home and everywhere', will develop solutions in this area.

Some mechanisms enabling seamless login and authentication are also missing. The new Eurescom study P1441 "Identity Management enabling AAA services" will explore some important aspects of this issue.

## Mobile Presence

Location-aware services will probably be the first step towards more personalised services. However the technology in this area is not yet mature. Among others, there is a need for integrating user context data from terminals, networks, and gateways. One of the latest Eurescom studies, P1348 SPEED about 'Strengthening Telco's Position in the Mobile Presence and Location aware services European Interoperability for new market opportunities', shows roadmaps for the provision of services based on location awareness and Mobile Presence.

## Adaptable content and multimodality

Personalisation means, among other things, addressing the user in his or her preferred language. Experts are working on the integration of multilingual information technologies.

Personalisation also means adapting the content to the user device, using the best user interface as well as making the best use of multimodality. Many Internet services have been designed with desktop computers in mind. Therefore, a lot of work is necessary to achieve the user-friendly adaptation of those services and the creation of new services on different terminals with multimodal interfaces.

In order to offer advanced services supporting a user and context centric presentation, new mechanisms allowing for a flexible handling of content in different environments need to be introduced. In particular and in order to satisfy the user looking for rich media content, advanced services have to exploit the semantics of the media content. This could be solved by content-related indexing, which supplies and uses metadata telling "what is to be found where" in large content assemblies.

In order to create personalised services, metadata have to be introduced into the workflow of telecommunication services, actually not only on the content, but also on the service context and the user's preferences. Therefore new mechanisms for creating, using and linking media-related metadata need to be integrated.

Eurescom project FRAPESA, 'Framework for personalisation of services and applications in next generation mobile services' (P1308), recently concluded that the main components for the generation of new services combining several media and giving interactivity to the user are already available as separate components or will be available within the next two years. However, it will be a challenging task for service and network providers to combine, adapt and re-configure these components in such a way that they can be used as building blocks for next generation personalised services.

You can find more information on Eurescom project FRAPESA P1308 at: www.eurescom.de/public/projects/P1300-series/P1308

## Conclusion

Providing personalised services will eventually place the individual user at the centre of the service conception and development.

We should bear in mind, though, that the provision of personalised services could be conflicting in some ways with the protection of user privacy. There should be privacy settings for the individual user.

Besides the privacy issue, telcos should be aware when defining their personalised services that the line between personalisation / ambient intelligence and annoying and nagging features is sometimes very thin.

This issue of *Eurescom mess@ge* presents a selection of exclusive articles covering different aspects of personalisation for telecom and information services.

You will find a vision of personalisation from Telenor, get some concrete elements of personalised communication from software provider Destination Moon, and get the opinion of a personalisation expert from Telecom Italia Lab.

# Personalisation in telecom business

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**Personalisation of services in data and telecommunications is not a new problem. However, the explosive usage of Internet and Web in the last 5-10 years has indeed emphasised the problem. Even if the value of the services on the Internet in civil and public life has become better and better, the lack of intelligent personalisation often harms the intended benefits.**

The user will, for example, not be satisfied with a slow service response due to networks with low transmission rate, or a service presentation layout that does not fit the display of the user terminal, or get thousands of document titles as a result of an information search. From the service provider's side it is not possible and economical to make different versions of a service for every different terminal type and network. In the case of information search the provider usually does know enough about the individual user to do a more proper filtering of the information. The solution for the service provider should be to make only one basic service, obtain data about each individual person's preferences and the capabilities of the devices and access networks used by her/him, and finally adapt the presentation and content of the service accordingly.

Telenor R&D has together with telecom operators worked on the personalisation problem for quite some time based on work and recommendations done in larger consortiums like W3C and 3GPP. So far without success when it comes to products, probably because of insufficient standards. Telenor R&D is therefore involved in EU IST FP 6 projects (e.g. ePerSpace, DAIDALOS) in addition to several internal projects where personalisation is the main objective.

## World Wide Web Consortium (W3C)

The most known and perhaps the oldest work in the field of personalisation is the W3C initiative developing a protocol standard for Composite Capability/Preference Profile (CC/PP). This protocol is developed and used in cooperation with OMA (earlier WAP forum) to create a User Agent Profile (UAPROF), which defines a robust, extensible framework for describing and transmitting Capability and Preference Information (CPI) about the client, user, and network. Those standards are still far from being mature enough to solve the personalisation problem related to the changing environments and needs that the nomadic and mobile user encounters when moving around. W3C has therefore started a new activity called Device Independence Activity Working Group (DIWG) that substitutes CC/PP WG. Even though DIWG look at personalisation from a broader perspective, it is still too limited to embrace the whole problem with personalisation.

The bottom-up approach taken by W3C and others will only solve particular subsets of the problem, e.g. how to make services device independent (DIWG). Common to those initiatives is the lack of a proper definition of the term "personalisation" as is required by a top-down approach. However, this work has clarified many concepts and even specified protocols that may be used in a more comprehensive standardisation.

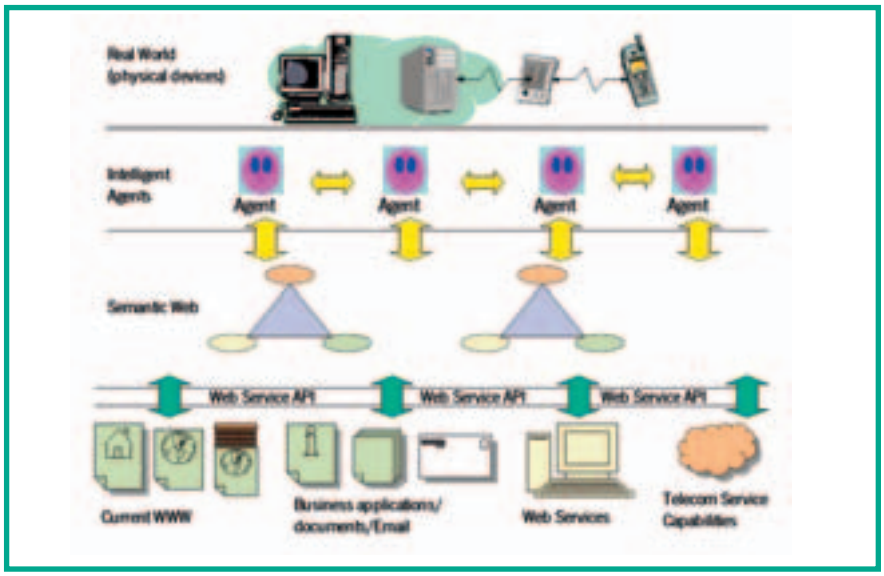


**Figure 1: Personalisation on the Web**

## Wireless World Research Forum (WWRF)

The WWRF is a body that looks at personalisation from a totaly different and more revolutionary perspective called the I-centric or user centric approach. In the WWRF reference service architecture personalisation is one of the basic concepts, together with context awareness and adaptation. As this approach focuses on the user and thus supports telecom objectives, we will give it more room in this paper.

## Personalisation

Personalisation is the concept of adapting services to the context, such as user preferences, user location, network and terminal capabilities, etc. It is considered to be a key factor for success or failure of future information and communication services, i.e. the information and services should become tailored to individual user preferences and characteristics as far as possible.

The main goal behind personalisation is to make usage more valuable, i.e. easier to use and more adaptive. It is believed that solving the problem of personalisation, e.g. to enable personalised filtering of the enormous amount of data available on the Web and make the perception of the information services more pleasant to users, will increase the perceived value of the services offered.

## Context and Context Awareness

Services become personalised when they are tailored to the context a user is in at the moment. Whenever the context is changing, the services will adapt to the situation. The context in this sense consists of many aspects, like the needs, preferences, history, and behaviour of the user, location-related aspects like physical coordinates and velocity, but also technical aspects (bandwidth of the access network and capabilities of the terminal), business rules that apply, etc. Context information can thus be defined as any information that can be used to characterise the situation of an entity representing the user in the computer system.

## Adaptability

The basic principle of adaptability is simple. When the context changes, then the behaviour of an application changes according to the desires and benefits of the user, or more precisely according to profiles ascribed to her/him. In the future, IT-Services and context information should be dynamically adapted to the context by the use of some kind of automated learning functionality.

Fully automated learning seems to be a utopia. Starting from an empty set of knowledge would take a lot of time and the learning path would necessarily contain a lot of malfunctions that upset the user who will be ready to discard the functionality. Thus, learning applications have to take into account the current knowledge level to be accepted by the user.

User wishes are almost always inaccurate, incomplete and sometimes contradictory. To translate them into a set of rules precise enough for automated processing is difficult, but might be the most suitable approach to follow.

## State of the art

The first thing to do in the standardisation work is to agree upon a common way of categorising personalisation in factors. WWRF propose the following personalisation factors:

- **User factors:** those factors that are about the interests of users, their preferences, usage behaviour, user and task characteristics. The user factors determine how the information should be personalised.
- **Information or content factors:** those factors that are about the properties of the information, e.g. the media type and whether there is content and/or associated meta-data. The information factors determine how the information can be personalised, and these factors are more technology based.
- **Context factors:** all factors in the surrounding of the personalised information system and the user (e.g. current location, hardware, software, application domain, etc).

The personalisation factors are stored in profiles. Due to the nature of mobile services and use, the profile is gathered by multiple parties, stored in multiple places and used and managed by multiple stakeholders. The distributed nature of profiles must be supported by the architecture. Furthermore, both globalisation and virtualisation of society have contributed to a greater privacy risk. With the perceived privacy being a mobile business enabler, protection of profile data and trust cannot be neglected in designing the service architecture for the next generation mobile systems.

The implementation of the concept of personalisation is partly done by means of using profiles. All this profile data means you have to store and manage this data in a user-acceptable way, i.e. perceiving privacy is important. At the same time, profile-data exchange and accessibility must not be restricted too much in order to enable attractive and personalised mobile services. Thus, we need solutions for profile data with respect to storage, format, coding, exchange, standards, and interoperability.

Furthermore, gathering of profile data and keeping it up-to-date with the changing needs and context of the user is an important issue. Thus, another profile learning functionality is needed for profile gathering, updating profile data, and dynamically adapting the profile data to new situations (location, time, user needs, and network capabilities).

## Implementing personalised services

To implement personalisation we need "intelligent" software technology that allows creation of components that represent the personal needs and wishes of every individual user. Many apparently different technologies have popped up recently claiming to solve the personalisation issue, e.g. Semantic Web, Service Grid, Peer-to-Peer, etc. However, the most mature candidate of those enabling technologies is agent technology. In order to try this out, Telenor R&D has taken an initiative to establish a Norwegian Network of Excellence among the most advanced R&D institutions and universities in Norway. The experimental environment will hopefully be as seen on the figure below, where a 3rd party service provider (My Company) builds new applications and services based on existing Web services and others accessed by some Server Access Protocol (SAP) offered by "Support Companies". Telecom operators provide several service capabilities such as user location, user terminal and network profile, user presence, etc. All component functions and capabilities are glued together by an Agent Based Service Platform offering a personalised end-user service adapted to the temporary situation.

## Agent technology

Intelligent software agent technology is one of the most important emerging ICT technologies of the last years. It plays the role of an important enabler for highly distributed and complex solutions, self-organising and collaborative systems and services. In particular agent technology is predestined for the integration of Web-Services (e.g. Microsoft's .NET or Sun's J2EE) being supported by many suppliers. Agent technology has the ability to communicate, co-ordinate and associate the usage of learning, do scheduling and other advanced techniques like matchmaking and even move agents to other platforms. All these features make agents and agent based systems a valuable metaphor in computing and make them attractive when it comes to implementing requirements like personalisation, context awareness and adaptation in next-generation telecommunications services.

Agent-Based does not mean pure agent technology, but a mix of agent and today's service provisioning technologies such as existing and new Web services, but also other open interface technologies like 3GPP's OSA APIs that may be converted to Web Service APIs.

Telenor is involved in a number of projects dealing with personalisation, both through IST, Eurescom, national and corporate activities. The main focus is currently on the adaptation of content to the user device, so that the Eurescom P1203 vision: "It works, it is simple, and it is personalised" will become true.

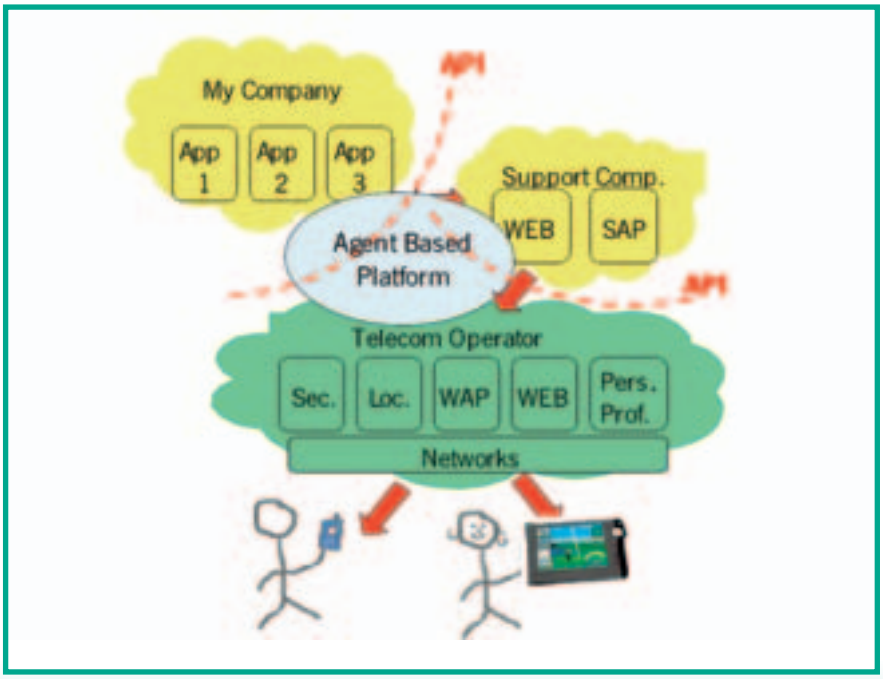


**Figure 2: Structure of an Agent Based Service Platform**

# "Telcos are in a good position to be the drivers"

## Interview with personalisation expert Maria Lorenza Demarie from Telecom Italia Lab

**Maria Lorenza Demarie from Telecom Italia Lab is one of the leading European experts on personalisation in telecoms. In an exclusive interview with *Eurescom mess@ge*, Ms Demarie explains the challenges and opportunities, and why the telcos could be driving the market for personalised services.**

### What does personalisation of services mean in the context of telecommunications?

Personalisation technologies represent a very important response to the requirements of next-generation telecoms services. These services will provide the user ubiquitous reachability, easy navigation through voluminous content, and device-independent services, which exploit the multimedia capabilities and the bandwidth of advanced networks.

The importance of personalisation is based on three current trends in telecoms technology.

Firstly, content has become context- and location-sensitive and interactive. Then, devices are becoming smaller and more powerful. And finally, the different kinds of networks – telecommunication, Internet, TV and local area networks – are converging. The user is always connected to services and content, like in GPRS, UMTS and beyond the third generation.

These trends characterise the increased mobility in our global society. Personalised services are a promising area for realising the potential created by new communications technologies.

Personalisation permits to adapt a service in a specific context and to individual goals by providing a user a high quality product or service that he or she really needs and can use at best.

In the context of telecommunications, service providers can be quite sure they are reaching specific users, they have also access to rich user profiles, and can leverage positioning information; these are important prerequisites to be able to personalise the offered services.

In the long run personalisation in telecommunication means that users are constantly presented with the same personalised features, user interface customisation and services in whatever network and whatever terminal they may be located. The users must have the control over one or more user profiles, each connected to a specific context enabling the management of communications according to different situations or needs, being at work, in the car, or at home. General personalisation settings and service specific settings must be managed and the user must have the feeling that he is the reference point in the communication environment. Users do not like to tell telecoms systems their personal information several times. Users also don't like that much of the information is not really used by the system, which often still tries to adapt the needs of the users to its predefined categories, instead of behaving exactly in the opposite way.

A particular category of personalised services are content-based services where the telecommunication system selects content tailored to specific user preferences and needs. In this context, the demand for personalisation is high. This is due to three main factors. Firstly, services are mainly accessed through devices that have limited interfaces. Secondly, the content the services convey to the user is very rich and diverse and, thus, needs to be filtered. Finally, the amount of time the user wants to spend dealing with a service can be very limited.

### What are the possible new personalised services?

There are two main service areas: content-based services and communication services.

Let me start with the content based services. Imagine you ask for a map of the surrounding area near your position along with an indication of the open restaurants; if you are in the centre of a big city, you will probably end up with a map fully covered by restaurants. If you are vegetarian or you like only the local cuisine or you tend to prefer inexpensive dishes, most of the restaurants displayed tend to waste your navigation time. You have to go through the details of all the restaurants in the list in order to find what you like. A personalised map would show only the restaurants tailored to your habits and possibly a way to show/hide all the other restaurants or to explicitly filter them.

Imagine a tourist information service and you visiting an arts museum in Paris. At the museum you want to consult an electronic museum guide, and the guide is enabled to communicate with your personal profile manager that you always carry with you in your mobile phone. The guide discovers that you are Italian and configures its language to Italian. The guide also discovers your interest in impressionism and provides you with a list of exhibited impressionist art at the museum. Discovering the impressive collection, you check with your mobile phone to see if your husband/wife is available. You call him/her and asks him/her to join you through an audio/video connection. The service discovers the bandwidth demand of the desired connection and maximises the use of the available bandwidth thanks to the museum WLAN.

Here is an example for communication services. The service is a sort of virtual workshop among different participants on a network of distributed and quite different machines – fixed and mobile terminals. Each participant should be able to personalise the way he or she employs for interaction, depending on the terminal he or she uses and the user preferences. Every participant will have a different experience of the workshop, but anyone could participate independently of the terminal and the subscribed services.

### How will the market for personalised services develop?

There are two main factors that will influence the market development of personalised services. The first factor is demand. Does the interaction context require personalisation? The second factor is information. Are there sufficient data available about the user, the service context and the content, which will allow successful personalisation?

Providing an answer to both these questions is not easy. Explicit personalisation can be an acceptable solution for many communication services, like the virtual workshop example I mentioned, but can have limited effect in other cases, like in push information services, where the system has to select the right information among different possible choices all acceptable using explicit information available.

In other situations the use of explicit information is not applicable because of the bandwidth, terminal settings, technicalities involved. Moreover, explicit information has the drawback of requiring the user to state what personalisation has to do, and the user interface has to be more complex in order to allow entering the additional inputs needed by explicit personalisation.

Against these limitations it can be expected that, at least in the beginning, new services will proliferate in the market without automatic personalisation or with very limited and proven personalisation

features. What will distinguish a service from another will be the ease of use, the usefulness of the service with respect to the context in which it is proposed, the value of the content and the price. In a second phase, personalised services will be able to leverage the past usage data to devise personalisation features, which will improve the user's experience. Users will then have to spend less time to find the content they want, with less additional inputs.

**Who will be the main driver of personalisation services – the telcos, the software providers, or the manufacturers?**
Software providers tried to be the driver of personalisation services in the internet world, but this position led to many failures. In personalisation, technology is only an enabler, not at all the solution, and if overestimated it could create real problems, due to unfulfilled expectations. Telcos are in a good position to be the drivers because they own the user profiles, interaction histories and permissions to use them all. Telcos have also a privileged relationship with their customers who usually contact them for any need and problem they experience with the services. Having data and the possibility to understand customer needs is a very good starting point to design and deploy successful personalised services, so I think that only telcos could be the drivers of them.

**What services is your company planning to offer its customers in the area of personalisation?**
At the research division of Telecom Italia we are studying the exploitation of the potential of new mobile communication technologies and devices for the benefit of new mobile services. I am not in the position to give precise information on new services, which will be marketed by the fixed and mobile operators. However, I know that a lot of interest is focused on location-based services and push information services in the mobile area and on broadband and TV services in the fixed network area.

**How are socio-political issues, like privacy, to be considered in order to reach mass market acceptance for new personalised services?**
The main important issue is privacy considered in a quite broad sense. Users should trust their telecommunication service providers. In order to achieve this goal it is important that customers always know, which information the service provider has collected about them. Moreover, customers must always perceive the benefits of the data they give to the service provider in terms of the personalisation they obtain in return. It is frustrating for them to see that the information they give is transformed in poor personalisation or in nothing at all. Users have to exercise a complete control of their profile in any moment and should be able to change attributes, "reset" all their interaction histories, revoke permissions, confirm or not a user model, etc.

Several studies demonstrate that under these conditions the majority of users, around 80-90 percent, are happy to give their personal data to service providers.

**Which personalised services would you yourself like to have in the near future?**
I would definitely be a good consumer of personalised services, mainly because I am lazy and usually I run easily out of time.

In general, I would like push information services, carefully selected according to my profile and my dynamically changing interests, devices and context. I would like this kind of service to recognise when I am in the car and use the appropriate conversion, for example text to speech. I would also like to share my navigation profile between the fixed Internet and the mobile Internet in order to avoid entering my preferences, bookmarks several times. I would like to have push and pull location-based services. What I would especially appreciate is to be notified about special offers of my preferred goods in the vicinity.

*The interview was conducted by Milon Gupta.*

# Integrated Project ePerSpace launched

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**At the beginning of February, ePerSpace, a new Integrated Project in the IST area under EU Framework Programme 6, was launched in Paris. The project brings together 19 telecom operators, research institutes, universities and technology providers to address personalised services at home and everywhere. The project is co-ordinated by France Telecom. Eurescom is responsible for the dissemination and training activities.**

The motivation for ePerSpace is that European citizens own a large number of devices with different capabilities ranging from TV to smart phones and PCs to set-top boxes. The ability to exchange data and access external services from these devices is limited which severely hampers the effectiveness of personalisation. This, in turn, affects the usability and thus mass-market adoption of advanced audiovisual networked services.

The ePerSpace project addresses the major challenge how to "make it happen". ePerSpace aims at significantly increasing the user acceptance of networked audiovisual systems and applications at home and virtually anywhere by developing innovative, personalised value-added networked services.

Through the integration of global telecoms networks and the home audiovisual and networking sectors, ePerSpace will solve existing interoperability problems in personalisation data exchange, services, context adaptation and management of service platforms.

From a social and business perspective, ePerSpace will develop user adoption and business models focussing on mass market services enabling seamless cooperation of multimedia user platforms and devices to access personalised services anywhere. Dissemination activities including trials and user surveys will be instrumental for that purpose.

The objectives of ePerSpace will be realised through four major work areas:

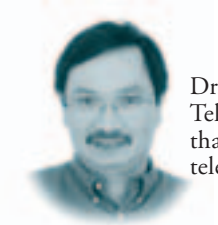
- The Home Platform providing the means to exchange audiovisual content between user terminals and home equipment;
- Global Network Integration & Interoperability offering innovative seamless access by sharing user profiles in a secure manner;
- Home and Personal Devices building unified personal environments;
- Rich Media Object Management supplying the tools for content creators to make optimal use of the infrastructure.

ePerSpace will build on existing results and experiences gained in past European projects (@HOME and YOUNGSTER) and is expected to boost the usage of personalised services.

**www.ist-eperspace.org**

# Personalised service delivery on multiple devices

## The vision of Eurescom project MultiDeli



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**The number of devices which a typical user of telecommunication services has at his or her disposition is increasing every day. From the user's point of view it is desirable to access the same services with the same look and feel on any device. The service delivery on multiple devices should be device independent, uniform, co-ordinated, integrated and personalised.**

Although terminals are becoming more and more advanced, a user will make use of an increasing number of devices, like mobile phone, PDA, laptop, and stationary PC. These devices are quite different in terms of functionality as well as capability. Nevertheless, the users want to be able to access the same services independently of the devices used. The service delivery should be device independent.

From the user's point of view it is therefore desirable to handle all devices in a uniform, co-ordinated and integrated way. 'Uniform' means that the user has access to the same applications with the same look and feel through any terminal, and may also move a session from one terminal to another without disruption. 'Co-ordinated' means that the user can decide to receive any service on any device according to different criteria such as the service nature, or the day and time. 'Integrated' means that the user can make use of all the devices simultaneously, but in a managed way. 'Personalised' means that the user can decide how services should be presented on which devices.

From the operator or service provider point of view there are a number of new business opportunities in offering such a user-centred service.

### Service continuity across terminals

The terminal issues regarding the user's expectations for interoperability have also been identified by ETSI, the European Telecommunications Standard Institute.

However, the focus of ETSI is limited to the service interoperability on different terminals. Eurescom project 'MultiDeli – Multi Device Service Delivery' (P1307) has had a broader scope, namely providing service continuity across heterogeneous devices. The specific objectives of MultiDeli:

- Enable delivery of both communication and data services on different terminals, separately and simultaneously.
- Enable transfer of communication and data services from one terminal to another.
- Provide content adaptation to heterogeneous devices.
- Support user profile and devices management.

### Voice session continuity

A user having an ongoing conversation on a PSTN phone or an IP phone would surely want to transfer the communication session to his mobile phone. On the other hand a user arriving at the office would probably want to continue his mobile phone discussion on the office multimedia PC. The MultiDeli service is enabling communication session transfer by using SIP (Session Initiation Protocol) as a unifying and switching technology. This overall architecture is shown in figure 1.

### Data session management across heterogeneous devices

The MultiDeli service maintains a user's state, so that data sessions persist regardless of the device being used and the user is able to seamlessly transfer sessions between devices. As well as having mobile devices, the user now has mobile sessions, which he/she can pick up from wherever a network connection is available. MultiDeli proposes a general-purpose architecture for mobile data sessions and exemplary applications on a range of different device types. To proof this concept, the project implemented the transfer of web sessions between Internet Explorer clients running on multiple heterogeneous devices. This architecture is illustrated in figure 2.

Electronic devices such as notebook size portable computers, pagers, PDAs, and colour mobile phones have considerable variations in processing power and input-output capabilities. Network connectivity may also range from high-bandwidth local area network links to low and variable bandwidth wireless channels. So, providing a suitable and useful content and presentation for different clients in heterogeneous environments is challenging and still very hard to achieve.

In the P1307 project the focus is on providing an architecture that would support the adaptation of content between web or WAP clients running on multiple heterogeneous devices.

### Personalisation of services

To enable personalisation of services, P1307 has identified and studied the following issues:

- Preference setting – the ability for users to set and maintain their user preferences, which will be used by the various MultiDeli services for tailoring and customisation.
- Housekeeping – the provision of a set of features to allow for the maintenance of a Multideli service. These features should

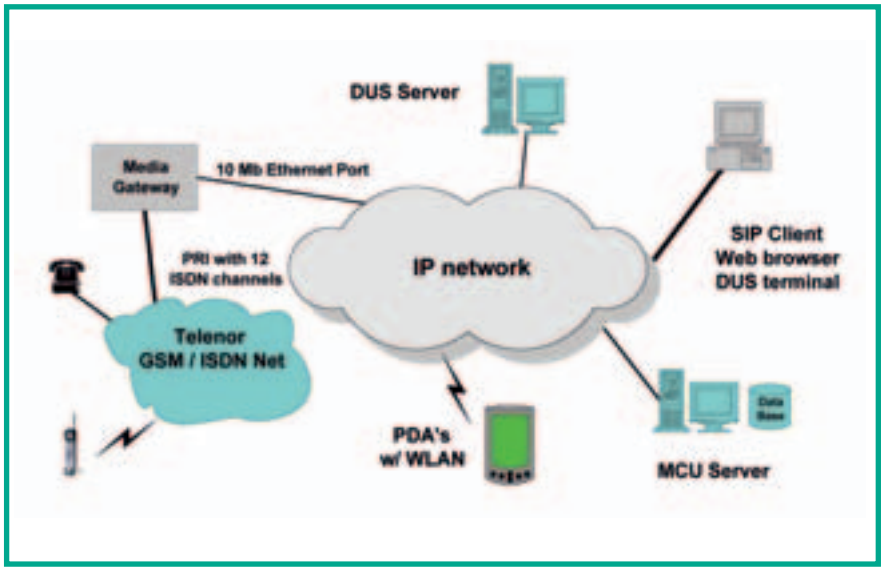


**Figure 1: The MultiDeli architecture for communication service continuity**

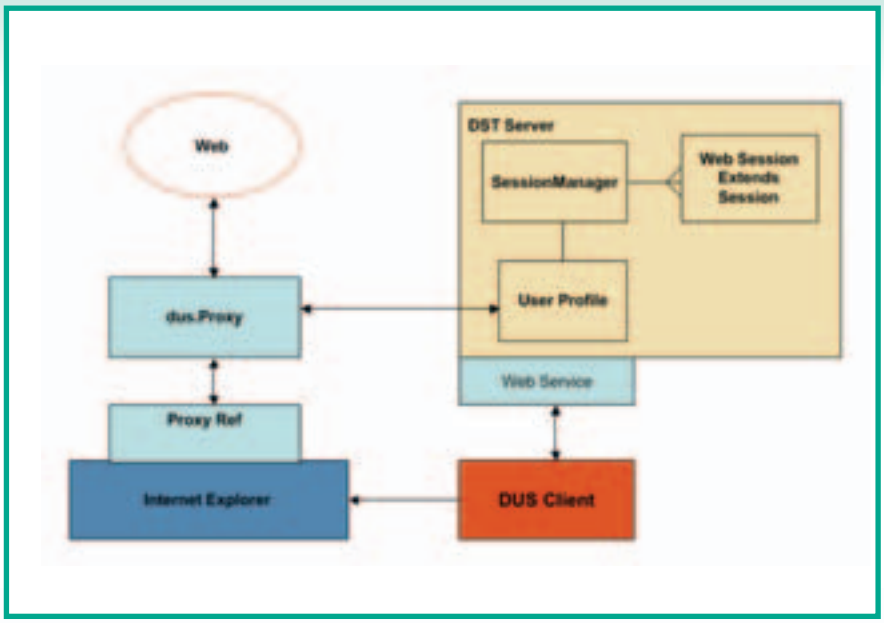


**Figure 2: Web session transfer architecture**

be grouped into different user authorisation levels (e.g. administrator, user, etc).

- Dynamic adaptation of profile – the static preferences created when a new user account is set up, should dynamically change to reflect the ongoing usage of the service and the changing preferences for each user (based on usage logs, click stream analysis, data mining, etc).
- Profile update (by the user) – users should be able to manually update their preferences at any time.
- Usage of templates – a number of user profiles and policies could be pre-defined to represent different user communities and groupings.
- Profile hosting in a mixed environment – there are a number of scenarios for implementing the profile hosting capability. These range from being stored in a centralised server, or a federated database, through to a de-centralised peer-to-peer implementation. However, if a more de-centralised approach is used, this raises other issues to do with searching for profiles and synchronising and maintaining the information in profiles based on possible multiple sources.

## Conclusion

The common assumption is that the communication devices of the future will be integrated devices, integrating several functions into one mobile device. Contrary to this, we expect a trend towards several personal and public devices, both mobile and stationary, each offering different functionality to the end user. These devices might be autonomous in that they are able to function individually and independently of each other, but they might also be co-ordinated so they can act together as one big device – the Virtual Device. Such a concept will be more valid and attractive with the growing market penetration of short-range wireless technologies (WiFi), like Bluetooth, WLAN, UWB (Ultra Wide Band), and IEEE 802.15, which enable local and direct communication between devices. For further work, it would be interesting to explore peer-to-peer solutions for session transfer between devices.

Partners in Eurescom project MultiDeli (P1307), which ended in December 2003, were Telenor, BTexact, Portugal Telecom, and Deustche Telekom. More information about the project is available at **www.eurescom.de/public/projects/P1300-series/p1307**

# Personalised communications in e-marketing

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**Does your grandmother get e-mail offers from 'twenty-something' dating services? The days of mass marketing are over. Today, smart marketing organisations begin to use personalised communications that address the individual needs, interests and preferences of consumers.**

Customers expect you to apply the information you know about them and to continue to learn from the relationship. They don't want their time wasted with irrelevant or inappropriate offers.

Personalisation is all about delivering the appropriate offer to the proper customer. That can lead to stronger and more profitable relationships with customers. By understanding and predicting customer behaviour, companies can create a competitive advantage – but that can be highly dependent on the personalisation technique used.

Dynamic personalisation technology allows companies to provide their customers with an entirely new experience of personalised offers and content. The process requires the collection, analysis and distribution of information about the customer. This technology enables a more precise matching of offers to customer needs, which can improve customer relationships and build loyalty. The real-time capabilities of dynamic personalisation provide greater accuracy and the flexibility to adapt to changing trends.

To realise the true benefits of personalisation, a company must be able to effectively learn from each customer interaction and record the results of that learning. Historically, it required marketing professionals to update the customer data analysis and IT professionals to implement those updates every three to six months to remain current. This approach was a never-ending process that was extremely time-consuming and expensive. Luckily enough, automation of such tasks is now possible with integrated, intelligent e-marketing applications.

There have been three significant generations of personalisation, each building upon the previous.

**1. Rules-based personalisation:** First-generation personalisation efforts were dependent on companies performing a great deal of up-front analysis of customer and sales data. Once this analysis was complete, the project team designed a set of complex business rules that controlled the presentation of personalised content. This approach was effective, but it forced companies to keep business rules simple and relatively static.

**2. Profiling:** Second-generation personalisation efforts became more sophisticated by allowing companies to profile customers into a small number of distinct segments. This approach allowed companies to increase the complexity of the business rules, but was still limited.

**3. Dynamic Profiling:** The latest trend is dynamic personalisation, which replaces fixed business rules with the capabilities of a real-time personalisation engine. This uses learned information to determine which content to present to customers. The engine registers each customer's response and updates his profile. Each time a new content is proposed, the profile is further updated. The marketing team can deploy multiple offers, allowing the real-time engine to arbitrate the best offer for each customer.

## Intelligent combination of Push and Pull

Even the best website is only a passive communication tool, as you have to wait for your customer to take action to visit your site. Of course, if your visitor is actively searching information on the web, good referencing, good navigational features and

## INTELLIGENT E-COMMUNICATION PLATFORM

One of the first personalisation platforms for e-marketing is Destination Moon's Intelligent e-Communication Platform (ICP). It is tailored for major industry segments and offers personalised e-communication services, like e-newsletters, e-magazines, e-leaflets, and e-portals, that can be adapted to specific communication needs. The Java-based ICP can connect to other information sources, like existing client-cards databases, CRM and ERP applications.

**www.destinationmoon.com/technology/technology.htm**


**Figure 1: Intelligent e-Communication Platform**


**Figure 2: Personalised web pages**

his natural intelligence will suffice to help him find what he wants.

On the other hand, if your company thrives on impulse buys (retail, e-tail, etc) or on quickly bringing pertinent information (e-news editors), you might need a more intelligent approach, which asks for a very good knowledge of your customers' needs and preferences. Here the purpose is to regularly propose information that is pertinent to his/her needs or interests, in order to increase the impact of your proposition and 'push' your customer to your website for further information or action. The secret of efficient e-communication lies in the integration of adaptive website content (pull) and recurrent outgoing and pertinent e-mails (push).

## Intelligent personalisation in outgoing e-communication

The outgoing e-mails ideally propose subjects or products that best match the customer's recent interests, but also feature 'prioritised' navigational links to all other information categories. This ensures that your customer never gets uninteresting information but still can access all the new categories he would suddenly be interested in.

## Intelligent personalisation of web content

Once the customer clicks in the e-mail, he/she accesses a personalised website (mywebsite.com), which contains all the information prioritised following his most pertinent categories. Each customer will see different, personalised web pages with personalised navigational links.

## Understand your customer interests in advance

Dynamic profiling, by measuring the reactions of customers, is able to follow their interests or purchase intentions as they evolve in time. Most current mechanisms such as 'collaborative filtering' are based on data mining from expensive CRM or Data Mining systems that can only analyse the past, i.e. after the purchase act. Dynamic Profiling allows proposing the right information or product to the right person at the right time (once a new interest shows up and before the purchase act).

## A versatile communication tool

Besides sending regular information to all your customers, the personalisation engine should also allow you to target news- or promo-flashes to specific qualified subgroups on a one-off basis. Since it is possible to evaluate the number of potential buyers or readers before you issue the information, the content and the editing of the information can be adapted to these specific targets.

## Strategic tool for traditional marketing

Dynamic personalisation has additional benefits as a strategic tool as well. The analytic process can be used strategically to test new offers or content and to build target market profiles that can be carried over into other marketing channels that lack interactive capabilities, such as mass media advertising and traditional direct marketing.

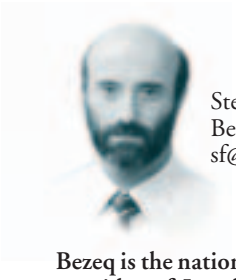
## Conclusion

Most companies doing business today understand the importance of a strong relationship with their customers. Over the past decade, many companies have sought to improve that relationship by implementing the processes and technology of CRM. Personalisation is becoming a critical component for any comprehensive CRM initiative, but historically it has been the most challenging to implement, as no tool existed for personalisation automation and management.

If companies include a personalisation strategy in their CRM initiative, they stand a better chance of delivering on the promise of CRM. Personalisation provides companies with the ability to recognise customers in real time and vary the content or services to those customers based on previous interactions. Rules-based personalisation is too restrictive for all but the simplest scenarios. Taking a more dynamic approach to personalisation offers clear benefits – increased customer loyalty and more profitable marketing.

In a personalised-marketing scenario, your grandmother will no longer be invited to join the 'twenty-something' dating service – instead she might receive an offer fitting her age group.

# Bezeq – Israel's main carrier and Eurescom's latest member



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**Bezeq is the national telecommunications provider of Israel. Established 20 years ago from a governmental entity, the company has led the country into the new era of communications based on advanced technologies and services.**

Bezeq and its subsidiaries offer a comprehensive range of services including local, long distance and international telephone services, mobile communications, Internet and other data communications, satellite services, leased lines and corporate networks.Bezeq's shares are traded on the Tel Aviv Stock Exchange.

## Regulatory aspects

Bezeq is the main carrier in Israel, with 3 million fixed lines (45% penetration). Bezeq's exclusivity in the provision of domestic, fixed line services was recently abolished. New operators were granted market access commencing in September 2004. Regulation involves licensing, tariff supervision, and interconnection issues.

In fixed-line telephony there is already fierce competition from the mobile operators, although not formally acknowledged as such.

International long-distance communications is provided by three operators, one being Bezeq's subsidiary. Additional operators are expected to get licenses by the end of 2004.

Today, Bezeq is a highly diversified telecom group, having promoted constantly new technologies and services. It went through a deep change in corporate culture from a state owned company to a business oriented one. Recently, Bezeq became a mixed company after the State lowered its holdings below 50% with further expected selling of most of its shares in the company.

## Finances

Strong cash flow and reduction of debt in 2002/3 has led to favourable coverage ratios and liquidity. Accordingly Bezeq has been rated by Moody's: A3 and S&P: A-.

In the last couple of years Bezeq has been facing a decrease in revenues derived from fixed-line domestic communications as a result of call price erosion and competition from mobile operators. In parallel, Bezeq has achieved an increase in revenues from ADSL lines and from the subsidiaries' operations.

## Strategy and mission

Bezeq aims to maintain its position as the number one communications supplier in Israel, leading in both infrastructure and services, providing managed solutions to business customers, broadband and interactive services, as well as next generation mobile and wholesale network services.

Recently, Bezeq implemented a number of structural changes. There has been a change in company activities and services from a geographic to a customer-based structure. Bezeq has also enhanced its focus on efficiency and flexibility to meet fierce competition. At the same time Bezeq adopted adequate internal policies to manage the group at a corporate level under changing regulatory constraints.

## Customer-focused marketing and services

Bezeq has launched in 2001 a new corporate image and logo, a marketing move complementing the significant changes in the company. The recently inaugurated Bezeq business unit provides enhanced personal service and communications solutions to the business sector. Bezeq offers business customers its 'Quick Deal' service for fast confirmation of credit transactions. A new-style phone bill was introduced to make it easier for customers to understand their expenses, while a new billing system is being set up. Bezeq has introduced its Onemail service enabling customers to receive multi-type messages anywhere, any time by all media. Bezeq Store, the largest nationwide chain of communications shops, offers diverse equipment and accessories of local and international manufacturers, which can be ordered over the Web. Phone bills can also be paid by credit card over the Web. Bezeq is already able to offer all the facilities needed for the migration of large and small businesses to the e-commerce era.

## Technology

Bezeq is continually looking to diversify its service portfolio with new, innovative and cost-efficient solutions alongside with enhancing its infrastructure. Today, state-of-the-art networks built on ATM, SDH, DWDM, ADSL, and IP infrastructure are enabling the provision of a full range of advanced services.

International surveys consistently show that Bezeq is one of the cheapest communications companies in Europe in terms of telephone calls, fixed monthly fees and Internet access.

## Key projects in 2004:

- Continued deployment of ADSL infrastructure (70% vs. 30% cable access)
- VDSL pilot project
- Deployment of IP network for provision of IP-VPN services in Q1 2004
- Launch of DECT service expected in the second quarter of 2004 (following the release of the spectrum by the regulator).

## Infrastructure

Bezeq's fully digitised network of about three million access lines and 10,000 km of fibre-optic cables allows customers to enjoy the full range of value-added services. An ATM network has been operating since 1999, providing ATM services and used as the backbone of the ADSL services. Approximately 500 kilometres of DWDM ring has been installed as part of the main transmission system, and there is a countrywide deployment of ADSL infrastructure. Bezeq has introduced an IP network for provision of IP-VPN services, and the company is consistently increasing the fibre-optic portion of the access network – including dual fibre-optic access to main office buildings.

## Internet use

Internet minutes already represent over 45% of total land-to-land minutes in Israel. Bezeq provides surfers with affordable Internet access through its computer dialup service. Over 430,000 ADSL lines were installed starting from nothing, less than three years ago. Most of them are 750 kbps downstream lines. In 2003, Israel was ranked number 3 in the world for high-speed Internet penetration in the home (about 1.9 million homes). ADSL is now perceived as almost essential for everyone. The product range is expanding, for exam-

ple ADSLNet for business access, with more developments on the way.

The customer service built on IVR/CTI with advanced management features ensures efficient, fast and reliable service for broadband surfers. More than 6,000 calls per day are served by the service centre.

**Bezeq's IP-VPN service** is one of the flagship products for the business world.

A first major customer is 'Clalit' (= General) health services. Bezeq is responsible for the organisation's internal communications array, which enables about 2,000 independent physicians, 1,000 community clinics and institutes and 14 hospitals to access the up-to-date medical file of any patient at any given moment, for diagnostic or other relevant purposes in real time.

Bezeq offers business customers a one stop shopping with the benefits of the flexibility, durability and expansion options of a public IP network, on the one hand, and the performance and security of a private network on the other hand together with savings for the customers.

## Mobile technology

Bezeq's mobile subsidiary Pelephone (= Wonderphone) has pioneered mobile phone use and cellular technology in Israel. Its first technology was AMPS, then NAMPS and now CDMA. It has facilitated one of the highest levels of mobile phone market penetration worldwide (+ 90%). By upgrading its technological infrastructure, introducing new value-added services, such as Internet and entertainment applications, and focusing on the teenage and younger private market, the company expects to increase the number of subscribers and profitability. Compared with approximately 3 million Bezeq lines, there are at present some 6 million cellular subscribers in Israel served by Pelephone and its three competitors (the same ratio being true for their revenues).

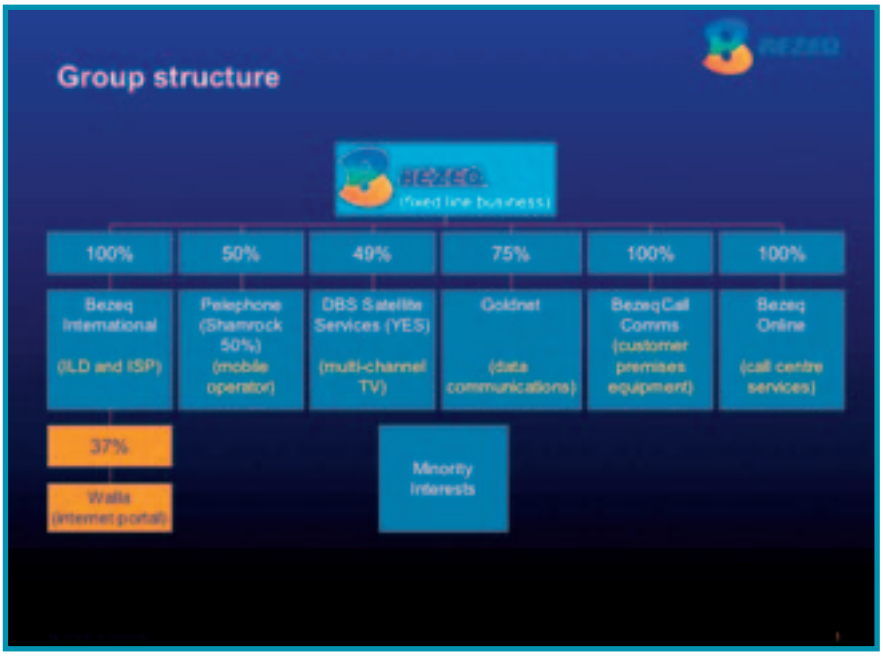

## R&D activities

R&D activities are getting increased support as a means of development, diversification and technology savvy solutions generator – also in difficult times of budget restraints.

The R&D Department's manager, Mr. Ido Sharon, serves as the CTO of Bezeq and on the Advisory Board of several start-ups, also consulting venture capital funds.

The main research activities right now are concentrated in the field of:

- optical network development
- a future "λ" customer service definition
- VoIP and related technologies enhancement
- Layer 2 and 3 VPN models and protocols (peering, policy, multi-level traffic shaping, etc.)
- Digital broadcast pilots (DAB, DVB-T)
- broadband on demand applications




- home networking (HPNA3, DOCSIS, 802.11 over coax, etc.)
- e-commerce solutions (micropayment, security, etc.)
- evaluation and incubation of start-ups in the telecom field
- involvement in consortia, standardisation and (self-)education

## Cooperation

Bezeq has gained a rich experience within national and international consortia and fora – involving operators, manufacturers, academy and user groups – from generic research to applied projects in fields like broadband or multimedia services. It was a member of the European FP4 project JAMES. Through the Eurescom membership, which officially started on 1 January 2004, Bezeq will strengthen its international cooperation even further.

## Standardisation

Bezeq is represented actively in standardisation organisations both at home and abroad, in ISO, ITU-T, ATM Forum, FSAN, The Standards Institution of Israel (SII), etc.

## Investing in start-ups and education

Bezeq has made investments in venture capital funds with global telecom providers and manufacturers. One is Stage One Ventures, a $50 million partnership fund for seed investment in communications start-ups.

Bezeq's 'Havzaka' (= Burst) employee incubator nurtures initiatives by Bezeq employees.

Bezeq also promotes young entrepreneurs from high-schools. Employees, most of them from the managerial levels, act as tutors and advisers through all the stages of the project. Their business experience and love of kids, coupled with the open minds of the youngsters and the shared creative enthusiasm, lead to some very innovative ideas and products. The project covers schools countrywide, offering also grants and cash prizes. Thus it brings young people closer to Bezeq's activities, while for its part, Bezeq might well reap some benefit from the resulting products.

Further information is available at **www.bezeq.co.il**

# E-living: Life in a digital Europe

## Conference in Essen discussed results and impacts

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**The EU IST project e-living has been investigating the relationship between Information and Communication Technologies (ICTs) and changing individual and household behaviour. For that reason it has performed a two-wave longitudinal household panel survey in six European countries. The nine e-living project partners and about 40 experts and managers with ICT background met on 20 and 21 January 2004 in Essen, Germany, to present and discuss the results of the e-living project and its impacts on the information society and industry.**

### The importance of longitudinal data

Ben Anderson, the e-living co-ordinator from Chimera, University of Essex, introduced the project and reminded the audience of the main themes of the project. He stressed the importance of longitudinal data for forecasts and trend analysis. Such longitudinal data can only be obtained by surveying the same panel in several waves, e.g. once a year.

### Internet growth rate is dropping

The first session looked at trends in ICT take-up and usage. The e-living surveys revealed that the growth rate of Internet access has actually dropped last year. During 2002 in Norway more people (8.9%) have stopped using the Internet than new users adopted it (8.1%). Of course we have to take into account that in Norway already the high number of 67% of the population is using the Internet. The example that Israelis are using the Internet per day on average more than 3 times longer (48 minutes per day) than the Norwegians (13 minutes per day) suggests that there are also significant cultural differences in Internet use.


### Is there a gender-related digital divide?

Tal Sofer from the Tel-Aviv University presented the e-living analysis on gender differences. Females in general have a more negative attitude towards computers, whilst males tend to view computers and Internet more positively although this may be due to differences in length of Internet experience. Currently about 40% of the Internet users are female. However, women are catching up: since the year 2000 more women than men have adopted the Internet. Particularly education and e-health are female domains; whilst banking, e-shopping and music downloads seem to be male activities. Prof. Robert Kraut from Carnegie Melon University, Pittsburgh, expects the gender gaps to disappear during the next few years.

### The significance of the Internet

Guest speaker Prof. William Dutton from the University of Oxford reported from the World Internet Project (WIP), where 23 nations developed a mix of longitudinal and cross-sectional surveys. One of the surprising results is that Internet use at work is in all surveyed nations much lower than Internet use at home (e.g. 24% at work compared to 59% at home in the UK). There is a dramatic effect of life stage on Internet use; nearly all pupils are using Internet, whilst only a small part of retired people uses it. One of the important open questions is the significance of the cross-national consistencies and differences.

### Conclusion

The conference brought together main players in the ICT-related socio-economic area. A comprehensive overview on the e-living results, causing stimulating discussions, was given. E-living will be formally closed end of March 2004, but it will live further: more analysis will be made on the available data, and hopefully more and longer longitudinal studies will be happening. E-living has been surrounded by a series of related projects like the finalised Eurescom project P903 (Cross-cultural Attitudes to ICT in Everyday Life) and the recently started FP6 Specific Support Action SOCQUIT (Social Capital, Quality of Life and Information Society Technologies). Prof. Enid Mante from Utrecht University underlined that all those studies have proven that ICT users and their attitudes are actually changing very little and very slowly.

You can find deliverables, presentation slides and much more information on the e-living project at
**www.eurescom.de/e-living**

# My thoughts on the Global IPv6 Service Launch Event

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On 14th January, the European Commission organised the Global IPv6 Service Launch Event in Brussels. This event turned out to be one of the most confusing events I have attended in many years of work associated with EC projects. Preliminary information had referred to the event as the IPv6 launch. Why was IPv6 being launched? What new and exciting developments were on show? Who was taking an initiative?

These were just some of the questions on my mind as I, along with several hundred other people, approached the venue in the heart of EC office country.

## The real launch

What actually was being launched was the linking of three major IPv6 network projects to form a global IPv6 network for research. The three projects Euro6IX, 6net and GEANT have each established some form of network using IPv6, and these were now being interconnected to form one large network. This network is now being offered to the R&D community to support their work – hence the actual launch was for the 'Global IPv6 Service network'. Where the service offer is for the research initiatives. Don't get me wrong on this – I think it is very good that the research community have a chance to play with the upcoming technologies and to test their strength in operation before using them for commercial services.

## The demonstrations

My colleagues back in Eurescom had the 'pleasure' of watching my presentation over an IPv6 multicast Internet stream via satellite from Brussels. This proved that such connections were possible but the service quality needs to be considerably improved. The delays while buffers refilled were unacceptable, and several times the connection was completely lost.

The other impressive demonstration was the IPv6 car with many desirable services and various types of PC and workstation communications services.

## The discussions

I am disappointed to report that the discussions at this event went along predictable lines and, if I'm totally honest, didn't advance the case for IPv6 very far. Many of the audience and the politicians played the address space card as the overriding reason that we all should adopt IPv6 as soon as possible. It's clear that many of these people don't have a feeling for the realities of network and service provision.

I tried to make the case from the telco viewpoint that, currently, the business case – the cost-benefit analysis – for IPv6 is not clear. That address space is the basic driver for IPv6 is simply not true. What is true is that some of the other features of IPv6 are very desirable, such as auto configuration, advanced security features, and scalability.

Security in IPv6 includes encryption of packets and authentication of the sender, which compares well with today where all security features in the Internet are add-ons that increase the complexity and cost. Auto-configuration or plug-and-play is standard in IPv6, so configuration between devices and the network is automatic. This feature will simplify the overall management of the network and the usage by the user. Scalability and address-space are well known arguments and the problem grows as you move from the US via Europe and Asia to China.

The real point many people were making is that IPv6 could be an enabler for another round of growth and expansion in national economies and the telecoms sector. No one argues with this, but soon we uncovered the real issue: who pays?

## Who's responsible – the industry or the governments?

One of the most frustrating factors in the discussion on both days of this event was the underlying assumption that the telcos were responsible for the introduction of IPv6 in order to stimulate global economic growth and improve everyone's quality of life.

Telcos now – thanks in no small part to the EC policies – are independent commercial organisations who make business decisions based on the business need and economic value of the issue in question. IPv6 has great potential, but it is far from being able to support the service guarantees that telcos give their customers today. In this case migration to IPv6 – if it is left to the industry alone – will be slow and steady.

Governments can influence this. In the US, the Department of Defence has declared that it will spend huge amounts of money on IPv6 products and services. In Korea the government is financing advanced access networks. In other parts of the world government investments are making IPv6 possible in the hope that the availability of such advanced infrastructure will stimulate growth.

Let us be clear: there is no equivalent stimulation in Europe. The EC themselves don't even make IPv6 a requirement in their tenders for communications services today. In fact, if any government would give money to national telcos as part of a national economic growth investment, they would be fined by the EC. We have a system that actively prevents pro-active policies from our governments in the telecoms sector. How is it that roads, drainage and other infrastructure initiatives don't seem to have this problem?

## Conclusion

The event summarised that IPv6 is moving well through the research domain, and sometime in the future it will be ready to take over many of the services that are provided by the circuit and packet switched networks of today. The technology is not mature enough yet, the economic case is not proven, and there is no strategic national or EC initiative providing the money for an early migration to IPv6.

IPv6 will be a major protocol in future networks. It has great potential to make service offerings more economical, more flexible, and more personal. There is much work to be done before it becomes commonplace. The best move for European telcos would be to revert to the old approach of working together to develop the business case for IPv6 and then creating a Memorandum of Understanding (MoU) with their peers on how they can introduce this technology efficiently and effectively. This is where Eurescom can play a role – should we start the work on the IPv6 business case and an MoU today?

Further information about the Global IPv6 Service Launch Event:
**www.global-ipv6.net**

Information about Eurescom project P1113 'The Tsunami IPv6 Project':
**www.eurescom.de/public/projects/P1100-series/P1113/**

# Towards a full digital media experience – First general assembly of the Digital Media Project

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**The Digital Media Project (DMP) concluded its first general assembly meeting in Heidelberg, Germany, on 20 February emphasising better and easier management and protection of digital media rights. After a three-day review of the contributed materials, the delegates agreed on DMP's roadmap, which includes a list of the traditional rights and usages of media users across the value chain, as well as technical specifications for digital rights management (DRM) and media interoperability.**

Pragmatism and a call for action resounded at DMP's first meeting. Domenico Di Martino of Telecom Italia said: "Effective management of intellectual property rights in the digital world is the key to unlock the potential of broadband technologies." DMP plans to complete a full technical specification for an interoperable digital rights management (DRM) over the next two years.

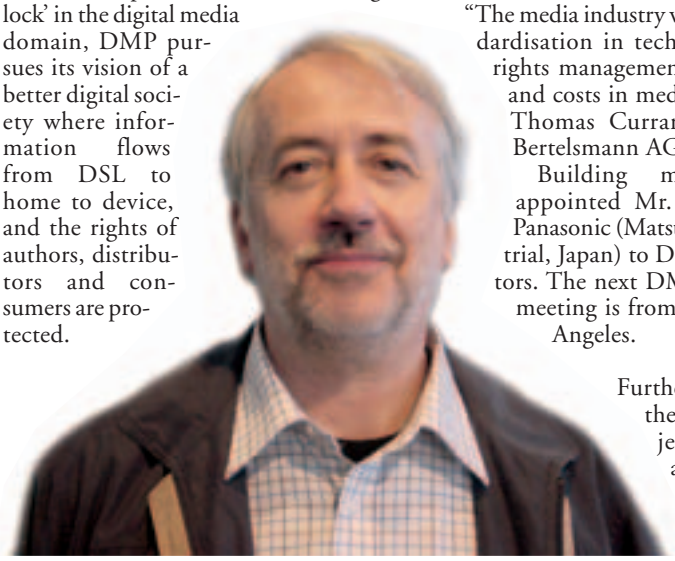
DMP was established in December 2003 as a not-for-profit organisation in Geneva, Switzerland. It promotes the development, deployment and use of digital media that respect the rights of creators and rights holders to exploit their works, the wish of end users to fully enjoy the benefits of digital media, and the interests of various value-chain players to provide products and services. New technologies that manage, control and automate the transmission of and access to digital content affect the global digital media supply chain. In this complex global market DMP aims to provide technical guidance to the marketplace, primarily media, telecoms, consumer electronics, and IT, and improve the consumer experience. To break the 'gridlock' in the digital media domain, DMP pursues its vision of a better digital society where information flows from DSL to home to device, and the rights of authors, distributors and consumers are protected.

Thirty-three delegates from eleven countries attended the "Mapping of traditional rights and usages from the analogue to the digital space" meeting from 18–20 February at the Eurescom Conference Centre in Heidelberg. DMP's president Leonardo Chiariglione said: "This meeting shows the importance of digital media protection and documents how DMP is in tune with the needs of the market."

DMP will speak out to incumbent DRM technology vendors such as Microsoft and Sony that have ambitions of becoming de facto standards for media distribution. "The media industry would like to see standardisation in technologies for digital rights management reducing the risks and costs in media production," said Thomas Curran, former CTO of Bertelsmann AG.

Building momentum, DMP appointed Mr. Ikuo Minakata of Panasonic (Matsushita Electric Industrial, Japan) to DMP's board of directors. The next DMP general assembly meeting is from 28–30 April in Los Angeles.

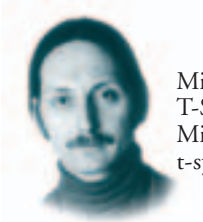
Further information about the Digital Media Project and its roadmap are available at **www.digital-media-project.org**



DMP's president Leonardo Chiariglione

# Entertainment via DSL

## Technical aspects of Eurescom project ERNIE



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**Digital Subscriber Line (DSL) technology offers the capacity needed for delivering broadband entertainment services and opens very attractive market opportunities for telecom operators. Two points are very important for a mid- and long-term success in this area: the right choice of appealing and reliable broadband services and the efficient and cost-effective provision of such services through the existing subscriber line infrastructure.**

The major goals of project ERNIE were the definition of suitable broadband entertainment services, the development of an appropriate overall systems concept and the set-up of a demonstrator in order to investigate technical aspects and to carry out realistic user tests. This article describes a network architecture as part of an overall system concept to meet the various requirements, which was developed during the ERNIE project.

A system concept and the resulting network architecture strongly depend on the different services that have to be offered to the customer. The following major services have been analysed from the functional and technical perspective and are integrated in the ERNIE demonstrator considering the different user aspects:

- **Live Streaming:** From the end-user's point of view, live video streaming is very similar to TV broadcasting – in contrast to on-demand streaming. The same content is distributed simultaneously to a large audience of users. Live video streaming can be seen as a modified replacement of conventional television where the Internet replaces the transmission channel.
- **Video on demand:** The essence of video on demand (VoD) is that users can view the offered content at any time they like. Interactive video on demand (iVoD) is an enhanced version of the VoD service where viewers watching the videos may use functionalities similar to those of video recorders (forward, rewind, pause, slow). An iVoD system consists of three major components: At the customers side the set-top box or PC, containing the video client (software), the distribution network and the (video) server at the provider side. All iVoD connections require bi-directional communication between server and client. A system of an appropriate design must be able to manage several hundred or even thousands of requests simultaneously.
- **Navigation and electronic program guide:** Navigation and electronic program guide (EPG) support the user with an interface to the system. It must be easy to understand and easy to use and should provide all expected functionality to use the available services. Design and 'look and feel' are as critical for successful services as the content itself. Design of presentation pages for the TV screen is different from the design for a PC because of the limited resolution, the larger viewing distance, and the limited control device (remote control instead of mouse and keyboard).

### Network architecture

In order to provide and run the required services, an end-to-end network architecture has to be developed and integrated into the existing telecommunications infrastructure. The figure shows an overview of such an architecture. The various components can be clustered into several functional areas:

- Content network
- Aggregation network
- Access network
- Home network
- Service support infrastructure

### Content network

Beginning from the left on the figure we find the Content Network Area with the

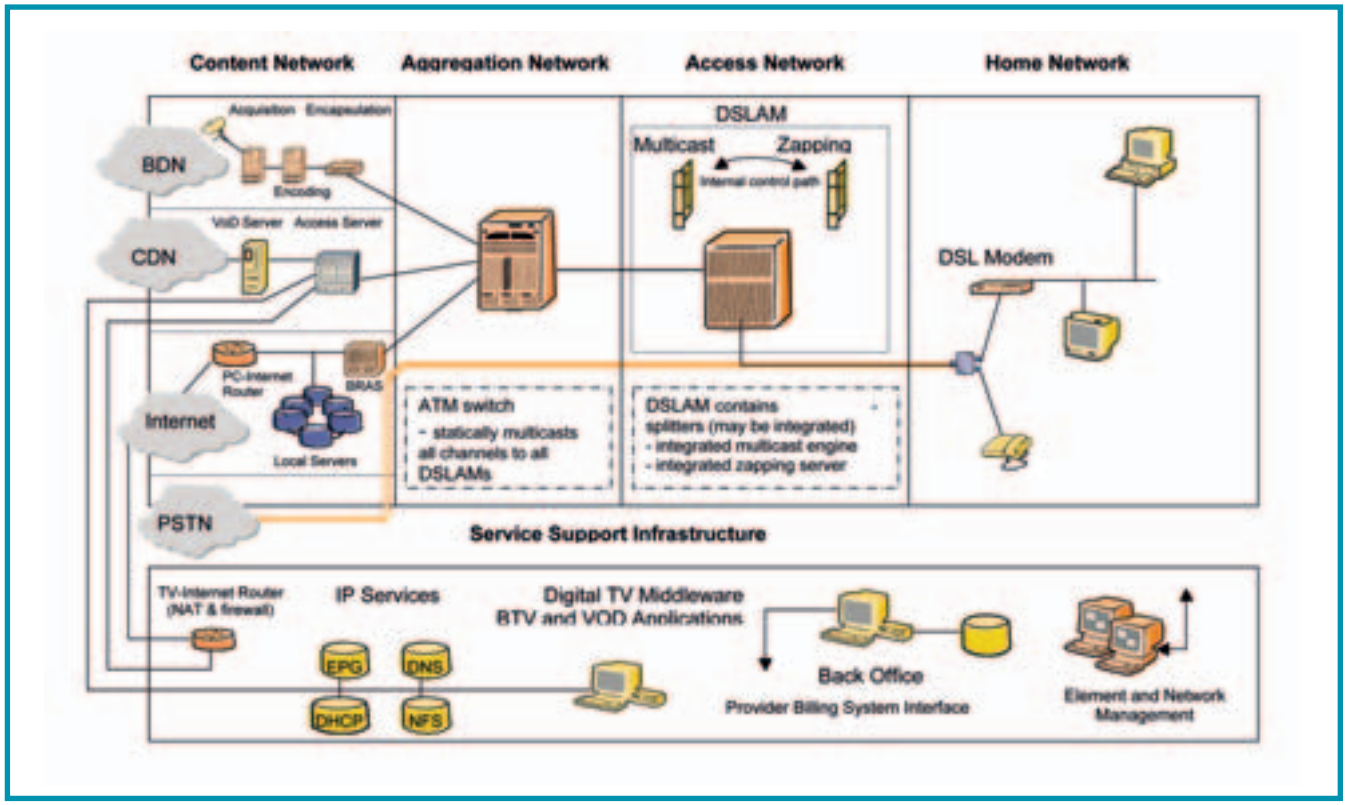


**Figure: ERNIE end-to-end network architecture**

so-called Head End, where the selected TV content (programs) is taken from the Broadband Delivery Network (BDN) by a satellite dish. Depending on the received formats, the content needs to be encrypted and decoded. In a next step the content has to be encoded into the right format and encapsulated into IP packets.

Here we also find the Content Delivery Network (CDN), for the on-demand services. Since the content for VoD is received in various formats including analogue formats such as BetaSP, and digital formats such as DVDs, it needs to be encoded at the right bit rates, suitable for transmission over DSL lines. In case of encryption the content is passed through encrypting devices before being stored on a storage-server. When they are requested by the user the videos are played out by several video-server(s). Each VoD content must be also associated with the related metadata (e.g. rating, pricing policy and price). Broadband access to the Internet and access to the PSTN completes this module.

### Aggregation network

In this module all data coming from the content and services network is aggregated and lead to an ATM switch infrastructure. Moreover this network module transports content and data to the different access networks and their DSL Access multiplexers (DSLAMs). These are usually located in the central offices of the Public Switched Telephone Network (PSTN).

### Access network

The proposed architecture supports conventional analogue POTS (Plain Old Telephone System) and where available digital ISDN service. The voice or telephony service is assumed to exist prior to deployment of the broadband entertainment service. This existing telephony service is not changed in any way by the addition of the overlay broadband entertainment services. The telephony service continues to be provided by the Public Switched Telephone Network (PSTN). The access network is where baseband voice signals and physical layer DSL signals are combined. This is performed by a POTS splitter, which is generally integrated into the DSLAM. Achievable service rates depend largely on the length and the quality of the copper wire from the DSLAM to the customer premises. At the other end of the wire, a POTS splitter within the home network separates the voice signal from the combined DSL and voice signal. From this splitter onward the voice and DSL signals are run on separate wires within the end users' home. The PSTN/ISDN number (account) is transparent to the DSLAM and it still is within the responsibility of the Central Office PSTN/ISDN switch.

### Home network

Here the copper line ends and a device called 'splitter' separates the low-frequency voice signal from the digital broadband signal. The voice signal still goes to the telephone, whereas the digital signal is brought to the DSL-modem, which is interacting with the DSLAM on the central office side. Connected to the DSL-modem are the end devices, usually a set-top box for the TV set and one or more PCs. These network components are connected via Ethernet or – more conveniently – via wireless technologies.

### Service support infrastructure

In order to run the new services from the operator side, some supporting basic functionalities must be provided.

### Service management

For managing the different new services described above, service management must accommodate for the definition, activation and monitoring of the services. The service definition contains definitions of several content packages and association with various offerings e.g. basic package, premium packages, subscription based VoD, promotions, etc. Each package must be combined with a pricing policy, which may imply different paymentmodes (e.g. monthly, per day, per view). Monitoring on one hand involves the monitoring of the state of the services offered, e.g. their availability and their quality. On the other hand monitoring can create useful data concerning the usage of services (e.g. duration, time of day, demand of single content). Service management is done through a central location for the whole platform.

### Subscriber management

The subscriber management system supports the setting up of customer details (several user profiles per household), subscriber inventory, service profiles, and billing information. Billing information should be provided to the user online for the current month. The billing and subscriber management must be linked to the telco's IT database and operation and support systems. Subscriber management also implies search engines through customer records and monitoring of the quality of the service. It also implies the possibility of activation and blocking of different services for different subscribers in order to satisfy their diverse demands.

### Content management

VoD content needs to be managed from the point of receiving a tape or DVD during the whole technical processing and the commercial offering. Content management accommodates for contract obligations, e.g. date of availability, date of retrieval, number of times viewed by subscriber base (audits), etc. Content management also caters for proper encoding, editing, encrypting, attaching metadata, distributing and posting on the system with associated rules for viewing (including age restrictions and pricing policy).

### Billing

All events that should trigger accounting events are to be recorded in the platform's database. Pricing should be done in accordance with the agreed pricing policies for the various types of content and the number of purchases. All accounting information must be passed to the telco's existing billing system. The service provider needs the possibility to query through the billing records in order to trace information to serve customer complaints and apply credits. In addition, online query of billing information should be possible so that each customer can have an instant view of his billing records and outstanding balance. The system may also support micro-payments and setting-up of spending limits per user of the household.

### Conclusion

Despite all promising forecasts for business with entertainment and multimedia content, investment in appropriate systems is and will be an equation with many unknown quantities for telecom operators. Besides attractive content and flexible service offerings, reliable systems and efficient use of expensive components, a satisfying customer support will be crucial for commercial success. The ERNIE demonstrator, developed and set up within this project, was very helpful for gaining a lot of useful information. Experiences with the first deployed systems will show how the customers will accept these new entertainment services.

More information about the Eurescom project ERNIE can be found at:

- Entertainment and new interactive services, by Peter Sommer, Eurescom mess@ge 3/2003
- P1201 web pages at **www.eurescom.de/public/projects/P1200-series/P1201**

# Grid computing

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**Project demands in industry and science often outstrip available computational power. This poses a dilemma for many companies and organisations: they cannot afford to invest in dedicated computing resources. The answer to this lack of resources is Grid computing.**

The Grid concept is based on the fact that most computers are idle most of the time. According to IBM, mainframes are idle 40% of the time. Unix servers are actually serving less than 10% of the time, and most PCs do nothing for 95% of a typical day. To enable better utilisation of these unused computing resources, the concept of Grid computing was developed by US scientists. Grids aim at enabling the distribution and remote utilisation of unused computing resources.

## Definition and history of Grids

There are a number of definitions what a Grid exactly is. The Grid Computing Information Centre, for example, defines a Grid as "a type of parallel and distributed system that enables the sharing, selection, and aggregation of geographically distributed autonomous resources dynamically at runtime depending on their availability, capability, performance, cost, and users' quality-of-service requirements."

Generally speaking, Grid computing always describes distributed computing that involves coordinating and sharing computing, application, data, storage, or network resources across dynamic and geographically dispersed administrative domains.

In fact, Grid concepts are not a very new invention, but date back to the earliest days of distributed computing. However, the origin of much of the current Grid R&D lies in the pioneering work conducted on early experimental high-speed networks, such as the gigabit testbeds that were established in the US in the early 1990s. One of the first Grids was the CASA Gigabit Network Testbed, which was connecting Caltech, the Jet Propulsion Laboratory (JPL), Los Alamos National Laboratory (LANL), the San Diego Supercomputer Center (SDSC), and the University of California, Los Angeles (UCLA). The researchers who developed CASA demonstrated applications that coupled massively parallel and vector supercomputers for computational chemistry, climate modelling, and other sciences.

In 1995 the so-called I-WAY experiment, in which high-speed networks were used to connect high-end resources at 17 sites across North America, paved the way for a number of Grid research projects that developed the core technologies for production Grids in various communities and scientific disciplines.

Most of the huge number of Grid computing projects and initiatives are performed by US companies and organisations. Despite this US dominance, a number of high-profile initiatives and projects have also emerged in Europe. Worth mentioning are the UNICORE Forum, the EU DataGrid, the EuroGrid, and the Grid Interoperability projects.

## Standardisation of business Grids

In historical retrospective most Grid initiatives and projects have been developed out of the need for solving massive computational tasks, i.e. for number crunching. Soon companies discovered the potential of Grid computing for business. The simple idea is to offer on-demand resources to companies and organisations that occasionally or permanently need access to massive computing, communications and storage resources. It has been also recognised that standards are essential for broadening the acceptance of Grid computing, thus creating a market.

One of the most influential bodies in this area is the Globus Alliance, a multi-institutional research and development effort for Grid. The Globus Alliance is developing the Open Grid Services Architecture (OGSA), a set of standards and specifications that integrate Web services with Grid computing. A further initiative, the Global Grid Forum, sees its mission in the development of industry standards for Grid computing.

**The Open Grid Services Architecture (OGSA)** represents an evolution towards a Grid system architecture based on Web services concepts and technologies. The central concept in OGSA is that all resources are represented as services, whereas a service is a network-enabled entity which provides some capability. In OGSA, computational resources, storage resources, networks, programs, databases, and the like are all represented as services. The Open Grid Services Infrastructure (OGSI) refers to the base infrastructure supporting the OGSA. At its core is the Grid Service Specification, which defines the standard interfaces and behaviours of a Grid service.

Currently the Globus Project offers an open source implementation of the OGSI Specification. The toolkit includes software for security, information infrastructure, resource management, data management, communication, fault detection, and portability. It is packaged as a set of components that can be used either independently or together to develop applications. Its core services, interfaces and protocols allow users to access remote resources as if they were located within their own administrative domains, while simultaneously preserving local control over who can use resources and when.

In the **Global Grid Forum (GGF)**, efforts are underway to document 'best practices', implementation guidelines, and standards for Grid technologies.

Since OGSA builds on Web services, it is likely to incorporate further specifications defined within the W3C, IETF, OASIS, and other standards organisations.

## The Open Grid Services Architecture

Looking into the details of the technologies such as the OGSA, the OGSI and the Globus Toolkit, one soon discovers that


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they don't provide any fundamentally new concepts and technologies compared to the concepts known from generic distributed object computing developed in the late 1980s. Perhaps the distinguishing element for Grids is the way resources are managed. Grid nodes have their own resource manager and don't aim for providing a single system view.

Early Grid technologies had a number of deficiencies, which include a heterogeneous protocol basis; lack of standard means for invocation, notification, authorisation, error propagation; missing functionality with respect to databases and workflows, and missing overall system properties considerations, such as end-to-end QoS.

Eliminating the identified deficiencies of early Grid technologies and combining their strengths with the strengths of Web services, the OGSA integrates Web-service mechanisms to create a distributed system framework based on the Open Grid Services Infrastructure (OGSI). Web services address mostly persistent services, while a Grid environment must also support transient service instances that are created and destroyed dynamically.

### Grids in practice

In practice deployment of a Grid means installing a piece of software on the workstations and PCs that will become Grid nodes, offering idle processing power to demanding applications running on the Grid. Grids are designed to be seamless and transparent, which means that workstation and PC users will not experience negative performance effects. The Grid runs in the background utilising the computing resources when they become available. If the workstation user decides to run an application that requires more processing power, the work currently being processed on that node will be dynamically reallocated to another machine in the Grid with available processing power.

The business case for Grids has yet to be proven. Even if companies like IBM and Sun Microsystems are already offering commercial solutions for Grids, it is still not very clear who the key stakeholders are and how the value chain in the grid market looks like.

Eurescom is currently conducting a study on Business Opportunities for Telecom Operators in the Grid market (Study P1349). Among others, the results of this study include the identification of key players, the description of major development trends, the identification of underlying driving factors, and most importantly, a realistic assessment of the potential role telecom operators can play in the emerging Grid market.

A selected collection of Web references to Grid computing is available in the online edition of *Eurescom mess@ge* at **www.eurescom.de/message**

# New Eurescom projects

**The first two projects of the Eurescom project programme 2004 have started. In due course several Eurescom studies will start.**

### OSIAN – Operators Strategy, business models and demonstrations for using Innovative home services to increase the ARPU in the fixed Network (P1401)

OSIAN aims to support telecommunications network operators in their effort to increase revenue from the fixed network through the introduction of new services to the private homes.

Examples of smart houses have been established across the world. Remote control of home devices is available by now, and advanced energy management has reached the market, whilst wireless technology is sufficiently mature to support the interoperation of home equipment without the need to install new wires. Time has come for operators to define their role: "Up to the door or under the blanket? To which extent shall we involve ourselves in the private homes?"

The focus of the work will be on finding "the best way" for service delivery into the private homes by analysing different strategies and the results of previous field trials and identifying best practices.

The project will provide:

- A systematic analysis of user requirements for services in the future home, including various user-groups;
- A state-of-the-art overview of the potential infrastructures to supply home services;
- A summary of experiences and results from future-home trials;
- Guidelines for operators how to approach the different home market segments.

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### TIMES – The Inter-operator IM and Mobile IM service (P1402)

Instant Messaging (IM), which has already been a success on PCs, is now starting to migrate into the mobile world. Unfortunately the major players, like AOL, Microsoft, and Yahoo, are using proprietary protocols. Specific mediator software is available, but still users often have to choose carefully which client software to use, often ending up in installing half a dozen clients with their own user names and passwords. P1402 has set off to investigate technical aspects and the business potential of Mobile IM and to validate interoperability in a testbed.

The technical part will prepare an overview of the current IM standards and perform a detailed analysis of the most relevant ones – mainly in terms of interoperability and identification of users in another mobile network. The business part will investigate on what the benefit of interoperable solutions to the end user and the level of willingness to pay for this extra feature would be. The testbed will finally evaluate the interoperability of the selected technologies.

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## Call 2 of Eureka cluster

# CELTIC is open

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**Eureka cluster project CELTIC has launched its second call for new project proposals. The deadline for submission of proposal outlines is 28 April 2004. In the second phase from 21 June to 6 October 2004, full project proposals of the selected project outlines will be submitted.**

The start of the projects is envisaged for early 2005. The overall budget for projects in 2005 is expected to be about € 200 million. 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.

As in Call 1, proposals for Call 2 must adhere to the main CELTIC objectives. Proposals shall contribute to the CELTIC approach of integrated telecommunications systems and to promoting the CELTIC Pan-European Laboratory with suitable platforms and test vehicles.

In addition, the objectives of the proposals must fit into one or more of the following CELTIC areas:

- Services & Applications
- Management of Services and Networks, including QoS
- Multimedia
- Custom Premises Equipment, Home Networks and Terminals
- Broadband Access Networks
- Mobile & Wireless Networks
- Broadband Transport Networks (Metropolitan NW and Core/Backbone NW)
- Components
- Security

CELTIC started work in November 2003 by launching Call 1. The acronym stands for 'Cooperation for a sustained European Leadership in Telecommunications'. The initiative is supported by most of the major


European players in communication technologies. The main goal of CELTIC is to maintain European competitiveness in telecommunications through collaborative R&D. CELTIC projects are characterised by a holistic approach to telecoms networks, applications, and services. Like all Eureka cluster projects, CELTIC is open to any kind of project participants from all Eureka countries.

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 results of CELTIC's first call were already very encouraging. 43 proposals were submitted with a total value of more than € 300 million, which relates to a total effort of about 2,700 person years. Based on the results of the assessments by expert groups and National Authorities, 30 proposals received the CELTIC label of approval, and most of them have a good chance of achieving public funding on national level.

On 23 March, CELTIC will organise an Information Day for all experts who intend to prepare a proposal and who want to present their idea to other interested people or potential project partners. The information day will be held at the Eurescom Conference Centre in Heidelberg, Germany.

For more information, please visit the CELTIC website at
**www.celtic-initiative.org**
or contact the CELTIC Office, which is hosted by Eurescom in Heidelberg, at
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CELTIC
Telecommunication Solutions

# Open network architecture for personalised access

## EU project Daidalos

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**A new EU project has started to lift mobile communication to new heights. Under the name Daidalos 46 partners from industry and academia will develop an open network architecture for personalised access to feature-rich services and applications.**

The Daidalos vision is to seamlessly integrate the heterogeneous network technologies, and to enable users to access a wide range of personalised communication services whenever and wherever they need them. Users will then, for example, be able to automatically receive personalised flight table updates on their mobile device through intelligent context-awareness.

Eurescom shareholders are strongly involved in Daidalos: Deutsche Telekom as the project co-ordinator, Portugal Telecom and Telenor as work package leaders, and also France Telecom and OTE. Eurescom is involved in project management and dissemination of results. All technical support tools, e.g. email lists, webpage, the audio conference system, a Groupware server, and the online reporting system, are provided by Eurescom. Eurescom has the role of the Exploitation manager.


**A multitude of technologies – confusing for the user**

### Less complexity for the benefit of the user

Daidalos stands for 'Designing Advanced network Interfaces for the Delivery and Administration of Location independent, Optimised personal Services'. In this context, Daidalos will tackle the problem that the increasing number and complexity of access technologies is hardly manageable by average users. The project is developing a solution called Intelligent Interface Selection. This will enable users to benefit from the comprehensive features of several telecom networks without having to choose between UMTS, WLAN, or broadcast access technologies each time they use a voice, data or multimedia service. The communication device automatically selects the optimal network interface and access technology according to the user preferences, such as cost, speed, or device capabilities.

"Daidalos has the potential to revolutionise mobile communication. The project results will enable European citizens to shape personal mobile services to their individual needs," says professor Rui L. Aguiar from the Telecommunications Institute at the University of Aveiro, a leading expert on heterogeneous networking.

### Daidalos roadmap

The interoperable, open network architecture of Daidalos will be based on the mobile version of Internet Protocol IPv6, which is widely accepted as the common basis for Beyond 3G (3rd Generation) mobile technologies. For ensuring that the network architecture will be usable in real-life services, Daidalos will implement a trial and verify the developed components in two user scenarios: the Mobile University scenario and the Automotive Mobility scenario.

In the 2.5 years of its duration, Daidalos will present a number of innovations that will provide users with a new quality of mobile communication. The planned innovations include the integration of heterogeneous networks, a seamless real IPv6 infrastructure which will also allow for broadcasting, and pervasive systems that include intelligent context-aware applications in combination with extended personalisation of mobile services. The project budget of Daidalos amounts to € 25.7 million, € 14.7 million of which is funded by the European Commission.

More information is available at
**www.ist-daidalos.org**

# EU research project WINNER

## New radio technologies for improved mobile communications

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**In January 2004 a large EU research project started, which will make mobile communication systems more adaptable to user needs. Under the name WINNER, which stands for Wireless World Initiative New Radio, a consortium of 38 partners, co-ordinated by Siemens, are working towards enhancing the performance of mobile communication systems. The improvements of radio transmission to be explored by WINNER are crucial for enabling new mobile services and applications anytime and anywhere.**

A total of more than 80 person years per year will be dedicated to the WINNER project. The consortium includes manufacturers, network operators, academia, and research centres, mainly from Europe, but also from Asia and North America.

### Trend towards high speed data applications

Future growth of mobile and wireless communications is expected mainly from data-oriented applications. User expectations are ever-increasing with regard to the variety of ubiquitous services and applications across a range of devices. There will be a corresponding change from predominantly circuit-switched to packet-based delivery to allow more efficient delivery of services and 'always on' without high cost. Many future services will require higher data rates and therefore higher bandwidth. For this reason more powerful radio access technologies will be needed. In addition, there is an ongoing paradigm shift driven by the user who expects ubiquitous communication providing higher performance at a suitable cost-benefit ratio without having to take care of the underlying technology.

### The ITU-R vision for systems beyond 3G

The International Telecommunications Union-Radio (ITU-R) describes in its recommendation ITU-R M.1645 the 'Framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000'. This document from June 2003 is the basis for ITU-R's future activities (see figure).

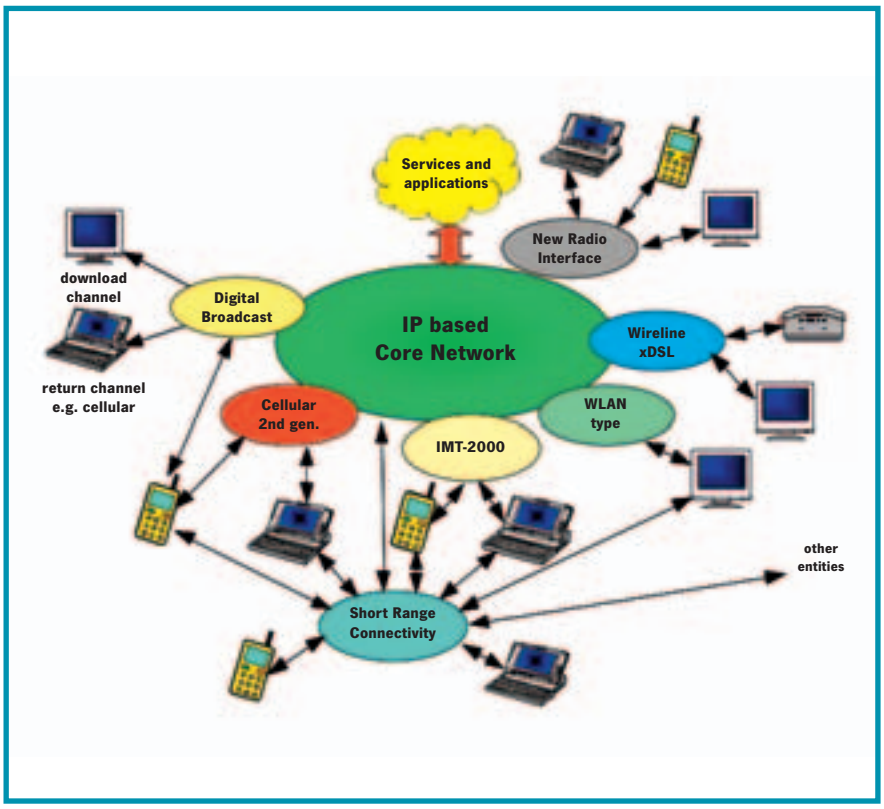


**Figure: ITU-R's vision for systems beyond 3G**

### Interworking platform and new radio

On the one hand existing and evolving access systems will be integrated on a packet-based platform which will enable an easy interworking of a variety of such systems. This will enable the user to be "optimally connected anywhere, anytime".

On the other hand a radio access system for new mobile access and new nomadic/local area wireless access will have to offer a significantly improved performance compared to today's systems. ITU-R has set ambitious targets for peak user data rates which are:

- up to 100 Mbps for the new mobile access, and
- up to approximately 1 Gbps for new nomadic / local area wireless access.

### WINNER goals

The major goal and challenge for WINNER will be the implementation of the two aspects of the ITU-R vision explained above.

One work item will therefore be the development of a unique radio concept. This radio concept will meet requirements ranging from wide-area systems to hot-spot and short-range scenarios, rather than developing specialised radio interfaces for each individual scenario. It will also consider requirements with respect to compatibility, power consumption, radiation, etc. The development of such a ubiquitous radio system will take advantage of leading edge research ongoing at partners being suppliers, operators, and academia.

Another key issue for WINNER will be the definition of an architecture for future mobile, wireless communications which is able to integrate legacy and new systems. The WINNER participants are ready to exploit the results of the project based on the jointly developed vision and architecture.

More information is available at **www.ist-winner.org**

# EU project for better IST decisions

## SOCQUIT explores how information technology influences the quality of life

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**How does information technology influence the quality of life in Europe? In December 2003 a consortium of five European partners with a telecoms background started the EU project SOCQUIT to answer this and other questions.**

The project acronym SOCQUIT stands for 'Social Capital, Quality of Life and Information Society Technologies'. SOCQUIT is a Specific Support Action under Framework Programme 6 with a duration of 20 months. The consortium partners are TNO (co-ordinator), Telenor, University of Essex, Eurescom, and FTR. SOCQUIT will support policy making as well as research and technology development (RTD) in the area of Information Society Technology (IST) and thus help optimising the positive effect of IST development on social capital and quality of life.

For this purpose a decision-support software tool will be developed that shows the two-way effects of the use of IST and the development of social capital and quality of life. The project will first analyse the current knowledge about relationships between IST, social capital and quality of life by reviewing relevant literature and datasets. Based on the results a system-dynamic model will be constructed and internally validated by analysing available datasets. An external validation will be carried out by working out the implications of the model for topics selected by a Special Interest Group (SIG) composed of experts with different backgrounds in policy, RTD, other FP6 projects, and IST industry. The resulting decision-support software tool will be open-source and freely available on the project website (www.eurescom.de/socquit).

### Strategic objectives

SOCQUIT has two key strategic objectives:

- Provide support for policy, research and industry giving indications of the effects of new IST services on social capital and quality of life.
- Initiate expert networks and activities, which will form the basis for a range of future, integrated RTD activities in this subject area.

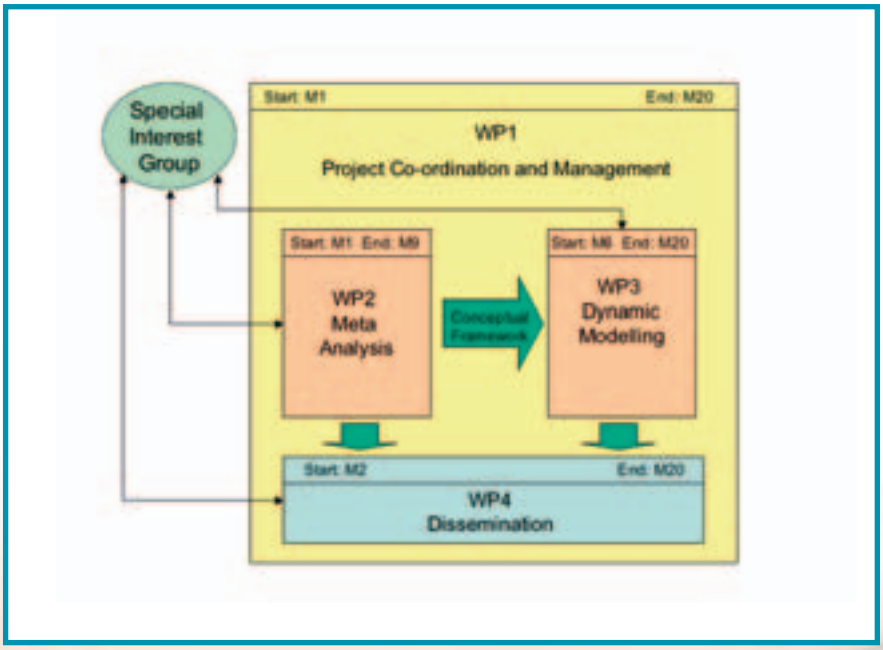
### Interactive seminars

In three seminars the results of the meta-analysis, the tool and the analyses on the selected topics will be presented to the Special Interest Group and other stakeholders. The interactive set-up of the seminars will provide feedback enabling the project to deliver a usable and useful decision-support software tool (MS-Excel application) that can immediately be used in the working practice of specialists in policy, RTD or IST industry. In the last seminar a policy and RTD agenda will be discussed with recommended actions to optimise the positive effect of IST development on the actualisation of social capital and quality of life, and to evolve the Special Interest Group into an expert working group that will continue to cooperate after the end of the project.

### Conclusion

The central focus of the SOCQUIT project is to examine and model the relationship between IST use and users' social capital and perceived quality of life. In this way, SOCQUIT is a very important milestone on Europe's way towards the Information Society. There will be many interesting results and recommendations coming from SOCQUIT for stakeholders in IST industry, policy and R&D.

You can find more information on SOCQUIT at **www.eurescom.de/socquit**




**The SOCQUIT project structure**

# new project results

## EURESCOM STUDIES

**P1342** Risk Management for Uncertain Demand and Price of Bandwidth · Deliverable 2
Risk Management for Uncertain Demand and Price of Bandwidth · Eurescom Study Programme confidential

**P1344** Concepts for generic Telco Application Servers in the various Sub-domains of Telco industries · Deliverable 1
Telecom Business Enabled Application Server · Eurescom Study Programme confidential

**P1344** Concepts for generic Telco Application Servers in the various Sub-domains of Telco industries · Technical Information 1
Standards and existing solutions · Eurescom Study Programme confidential

**P1344** Concepts for generic Telco Application Servers in the various Sub-domains of Telco industries · Technical Information 2
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RFID technology, applications, and telcos' business opportunities · Eurescom Study Programme confidential

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**P1201** ERNIE – Entertainment and new interactive services via DSL · Deliverable 4
Acceptability study and business models · Eurescom confidential

**P1206** Broadband Services in the Intelligent Wireless Home · Deliverable 3
Demonstration Description · Eurescom confidential

**P1206** Broadband Services in the Intelligent Wireless Home · Deliverable 4
Web-Deliverable: Demonstration Description · Eurescom confidential

**P1207** OPERA – Interoperability of Digital Rights Management (DRM) Technologies · Deliverable 3
Prototype description of an open DRM architecture · For full publication

**P1301** Electronic Trading of Connectivity Services (E-TRACS) · Deliverable 2
Exploration and Analysis of Innovative E-Market Scenarios · Eurescom confidential

**P1301** Electronic Trading of Connectivity Services (E-TRACS) · Deliverable 3
Identification and specification of new functionalities for e-market platforms to facilitate connectivity service trading
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**P1301** Electronic Trading of Connectivity Services (E-TRACS) · Deliverable 4
E-Tracs Showcase (Flash demo of a potential e-Marketplace platform for the trading of Connectivity Services)
For full publication

**P1303** ANFINA: Access Networks control Functions and Interfaces in NGN Architectures · Deliverable 1
New Generation Services, Generic Functional Requirements and Architectures · Eurescom confidential

**P1303** ANFINA: Access Networks control Functions and Interfaces in NGN Architectures · Deliverable 2
NGN access Architecture and Interfaces for support of new generation services – Development scenario and strategy
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**P1307** MultiDeli architecture and feasibility studies · Deliverable 1
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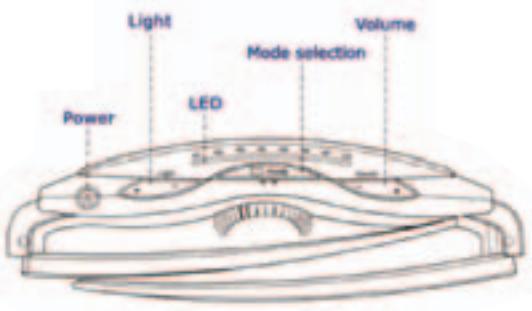
EMCE-literature data extraction tool handbook · Eurescom confidential

**P1309** Health risk assessment of the effects of radio-frequency electromagnetic fields · Deliverable 2
Verification of the data search tool on the topics 'subjective symptoms' and 'cancer' · Eurescom confidential

# Good vibrations
## Mobile devices for stimulating your mind

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**Everyone knows that PDAs and smart phones are allrounders. But can they improve your memory? South Korean start-up DreamFree says "Yes". They designed a peripheral for PDAs and mobile phones called PEEG, which stands for 'personal electroencephalogram' and is supposed to stimulate brain activity.**

PEEG consists of a software application for Microsoft Pocket PC, headphones and a set of silver eyeglasses with lenses made of opaque plastic. The PDA version was introduced at the COMDEX in November 2003.

### Feel-good mobile phone

Since January this year, PEEG is also available on LG Telecom's mobile phone 'Aladdin'. "It changes your brain waves and makes you feel better," summarised Joonon Moon, a director in DreamFree's planning department, the benefits of the application. Seoul-based DreamFree was founded in 2000 by members of Mensa Korea, who have an IQ of 158 or higher.

DreamFree claims that PEEG improves memorisation and induces relaxation, sleep, vitality and jet-lag recovery. PEEG offers the following functions: 'Concentration', 'Learning', 'Language', 'Rest', 'Meditation', and 'Vitality'.

When the application is set on 'Concentration', rhythmic pinging sounds are heard in the earphones while lights flash off and on inside the glasses. The frequency of the pings and the lights are synchronised, so that they induce brain waves of the same frequency. At first, the sounds and light are said to be cacophonous, but then a pleasant massage effect begins to seize you in about a minute. Even with closed eyes, one can sense the pattern of the light pulses. Sometimes the pulsing comes from the side of the glasses, while at other times it comes from the top and bottom. The pulsing tone is largely monotonic, but seems to change slightly.

Good vibes from the mobile phone

By altering brain wave frequencies, PEEG can alter moods, Mr Moon claimed. According to DreamFree, users can wear it as long as they want, though 5 to 10 minutes of wearing PEEG would already induce beneficial brain waves. The device makes use of different waves and their supposedly beneficial effect they have on your mind. Gamma waves are used against anxiety, beta waves for keeping you awake, alpha waves to stimulate concentration, theta waves for facilitating a nap, and delta waves to induce a deep sleep.

Sweet dreams with PEEG

Users compared the experience to taking a nap while playing an album with synthesizer music. There is no final proof yet, if PEEG can really achieve more than an album by Jean Michel Jarre while you are resting on your sofa.

### History of mind machines

So-called mind machines, which aim to induce relaxation and an altered state of consciousness through optical-acoustic and electrical stimulation, are not new. For a number of years, commercial devices with names like Proteus, Orion, and InnerPulse have been available. They promise the user to alter his state of mind according to his wishes. Especially the so-called hypnagogic state of consciousness, which is characterised by the perception of vibrant colours and radiant light, has been cherished throughout history as the source of creative thought.

In the mid-30s scientists discovered that brain rhythms tended to mimic the rhythm of a flashing light. In the 1940s British neuroscientist W. Gray Walter investigated what he called 'flicker phenomena', the trance-like states of deep relaxation and vivid mental imagery. In the 60s and 70s scientists discovered that flicker effects at certain frequencies seemed to have amazing beneficiary effects, including increased IQ scores, enhanced intellect, and greater synchronisation between the creative and analytical parts of the brain. They also found out that adding auditory stimulation increased the effect of rhythmic light. In 1974, Seymour Charas, a New York scientist, obtained the first patent on a combined light and sound stimulation. However, the first mind machines were not produced before the 1980s, enabled by technological advances in micro electronics. Today, there are over 20 light-and-sound machines in commercial production.

### Effects on well-being

The question remains, if mind machines can keep their promise of achieving the desired states of consciousness by just pushing a button. In a study on the effects of electromagnetic and optical-acoustic stimulation on general well-being (Behavioral Medicine, Fall, 1998), the researchers Harald Walach and Eduard Kaseberg investigated and compared the effects of mind machines with pure rest and a placebo. Thirty participants underwent four conditions in random sequence: rest, placebo stimulation, optical-acoustic and electrical stimulation. The result: optical-acoustic and electrical stimulation produced significantly more visionary experiences and fear of ego dissolution than rest and placebo. Apart from this, no specific effects of mind machines on general well-being and physiological relaxation could be noted.

The bottom-line is that there may be certain mind-altering effects of mind machines, but not necessarily the effects you would like to obtain. Listening to good music might still be the better and safer way to relax.

Further information about the PEEG is available at
**www.dreamfree.com/english/index.htm**

## Conference Announcement

## Eurescom Summit 2005

# Ubiquitous Services and Applications Exploiting the Potential

### 27 – 29 April 2005 · Heidelberg, Germany · www.eurescom.de/summit2005

### CONFERENCE SCOPE

The continuing evolution of telecommunications and information services is delivering the technology to fulfil the promise of omnipresent services and applications, which facilitate the users' everyday activities. Pervasive computing and ubiquitous services have been an intense research issue over the last years. In order to exploit the potential of ubiquitous services and applications it is necessary to consider them from an end-to-end perspective. Today, many technologies are available that can be combined to exploit the business potentials of services and applications which work anytime and anywhere in a seamless and intuitive way.

The fourth Eurescom Summit focuses on 'Ubiquitous Services and Applications'. It aims at capturing a snapshot of ongoing activities in the related technological and business areas, providing value to executives, business professionals and technical experts of network operators, service providers, equipment manufacturers, content providers as well as to the research community. The conference aims at investigating technical issues of ubiquitous services, showing how the advances in enabling technologies can support the exploitation of ubiquity. The conference will consider the exploitation opportunities, usability and user acceptance, and will evaluate their business relevance.

A major objective of the conference is to explore business challenges, threats and opportunities in this area by covering the whole value chain. Furthermore, it aims at identifying new ways to bridge the gap between a purely technology-driven and a more market-oriented service evolution.
The conference will provide a platform for the discussion of innovative and marketable solutions, strategies for the promotion of ubiquitous services and applications. It will also identify open issues for further research.

The event will cover the following topics from a technology-, user- and business point of view:

- Evolution of ubiquitous services and applications
- Service platforms, systems & architecture aspects
- Business aspects, opportunities and threats
- User aspects, acceptance, privacy
- Technology aspects, devices
- Content related aspects
- Self-organisation/ self-configuration of networks
- Security aspects

### TARGET AUDIENCE

Experts, executives, researchers, business and product planners, strategists, service developers from telecom operators and IT vendors, content providers, manufacturers of ICT software and hardware, application service providers, telecom service providers, and consultants.

### TUTORIALS

A number of tutorials are planned to complement the regular conference sessions.

Experts interested in proposing/presenting a tutorial, even if not listed above, should contact the conference chair via e-mail to inquire details (summit2005@eurescom.de).

### PAPER SUBMISSION

All papers shall be submitted via the conference website:
www.eurescom.de/summit2005/submission

### IMPORTANT DATES

- Submission of 800-1500 words abstracts (2 to 3 pages)
  15 October 2004
- Notification of authors
  15 December 2004
- Final camera ready papers (max 8 pages or 4000 words)
  21 January 2005

### INSTRUCTIONS FOR AUTHORS

Submissions should be 800-1500 words abstracts summarising original work. All manuscripts must be written in English.

The first page of each paper should contain: the title of the paper, the name(s) and affiliation of the author(s) as well as full address, e-mail and phone number of the author responsible for correspondence. In addition, the first page should include a list of keywords and main categories from the above list as well as a summary of up to 100 words on the main achievements presented in the contribution and the novelty of the work. It must be clear from the abstract how it is going to be extended to a full paper. It is recommended to have a paragraph outlining this at the end of the abstract.

Papers must be submitted in electronic format via the conference website:
www.eurescom.de/summit2005/submission

Acceptable formats are Word 97 or later and PDF. Please use 11-pt font size (preferably Times New Roman) and A4 paper format for your submission.

The selected papers will be published in printed proceedings with an ISBN.

A document template and further instructions for paper submissions can be found on the Eurescom Summit website at www.eurescom.de/summit2005.

### FURTHER INFORMATION

Further information can be found on the Eurescom Summit 2005 website:
www.eurescom.de/summit2005

or through the following contacts:
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