EURESCOM mess@ge

Issue 2/2001

THE VALUE OF R&D

EURESCOM ANNIVERSARY EVENT
EXPANDING THE CAKE

IN FOCUS
DEUTSCHE TELEKOM

TUTORIAL
POSITIONING TECHNOLOGIES

Preliminary Conference Announcement

3G Technologies and Applications

Securing the Business Case for 3G

Crowne Plaza, Heidelberg, Germany,
12 November 2001 – Tutorials
13 to 15 November 2001 – Main conference

CONFERENCE SCOPE

The advent of the 3rd generation of mobile technologies, services and applications has stimulated research and development in many areas of information and telecommunication technologies. The first EURESCOM Summit on 3G Technologies and Applications aims at capturing a snapshot of the activities with business relevance, providing value to executives, business professionals and developers at network operators and equipment manufacturers as well as to the research community.

The objective of the conference is to explore the business challenges and the business opportunities of next-generation applications, technologies and services for mobile communications, by covering the whole value chain. Furthermore it aims to identify new ways to bridge the gap between technological advances and their business relevance.

The conference is focusing on 3G technologies and applications; aiming to be a platform for the discussion of marketable solutions, targeted activities for the promotion of technologies and applications, and open issues that need further research. It is a comprehensive industry business and technology event that offers in-depth sessions, covering:

- Applications & Services.
- Devices & Users.
- Platforms, Systems & Architectures, Quality Aspects.
- Business Aspects and Security Issues.

TARGET AUDIENCE

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

CONFERENCE PROGRAMME

The detailed conference programme will be announced by end of August 2001 at http://www.eurescom.de/summit2001.
The programme will include technical and business related presentations and will be complemented by keynote presentations, panel discussions, tutorials, exhibitions, 3G demonstrations and technical visits.

TUTORIALS

On Monday, 12 November 2001, four tutorials focusing on 3G related aspects are planned. Details about the tutorials will be announced by end of August 2001 at http://www.eurescom.de/summit2001.

REGISTRATION

Registration handling is with VDE Conference Department, Stresemannallee 15,
60596 Frankfurt/ Main, Germany.
Registration information can be found at:
http://www.eurescom.de/summit2001/registration.htm
Please download the registration form and return it by fax to VDE Conference Department –
Fax: +49 69 96 31 52 13

ORGANISED BY

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Conference Fees (€)	Registration before August 29, 2001	Registration from August 30, 2001
EURESCOM SH/ member	300 €	380 €
IEEE members	400 €	450 €
Non-members	450 €	500 €
Students	220 €	250 €
Tutorials	180 €	200 €
Additional proceedings	75 €	75 €

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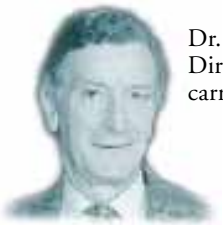
COLLABORATIVE RESEARCH
AND THE VALUE OF INNOVATION



Dr. Claudio Carrelli
Director of EURESCOM
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The EURESCOM Anniversary Event in May was convincing proof for the fact, that direct personal communication is still the most effective way of sharing ideas. The differing approaches of the speakers, EURESCOM had invited, turned out to be a very rich soil for the raising of crucial thoughts. The discussions about innovation versus share value and the role of collaborative research brought important insights and stimulated the thinking of the large audience about the future of telecommunications.

Research provides options

Sometimes, it is not so much the gaining of new information, which makes an event like this so inspiring. It is more that we learn to look at things in a different way and check our basic beliefs. In this respect, I found the contribution by Dr. Robert Lucky especially inspiring. For him, the real value of R&D is not exclusively determined by the results that are directly employed for production and marketing. This is of course an important part of it, even if hard to measure. What gives additional value to R&D is something else that Dr. Lucky calls the 'option value'.

Creating options is an indispensable precondition for choosing the right strategy

Research provides companies with options from which they can choose and which help them to choose the right direction. Creating options is an indispensable precondition for choosing the right strategy and making the business a success. In this respect even the research on a technology which turns out to be a dead end can increase a company's options, because knowing a wrong way increases the probability of finding the right way.

R&D is a medium-term investment

Over the last ten years EURESCOM has produced a lot of results that turned out to be quite profitable and of good immediate use to our shareholders. But it is also true that EURESCOM put some research efforts in technologies that never became a market success. Was this part of our research in vain? Definitely not! These research results helped the decision-makers to better evaluate the alternatives and choose the right direction.

Evaluation is essential to prove the value of R&D

What makes life difficult for us researchers is the inherent problem that you cannot measure the value of options created by R&D, at least not in advance. Talking about options does not mean giving researchers a good argument to justify everything they do. A process of evaluation, in terms of effectiveness, is essential if the value of R&D is to be proven. EURESCOM has been doing this for a long time and has shown that commercial success can occur up to five years after the research is performed. It should be clear that research does not primarily serve short-term profit. R&D is a medium-term investment. R&D is about the future, not the present.

Intensified communication between research and marketing units is needed

To make the best use of R&D requires medium-term and long-term strategies that are not dictated by the ups and downs of the stock exchange. It is therefore extremely important that research and marketing units, in both operators and suppliers, intensify their communication about the options for the future. With our Anniversary Event we have made a contribution to promote this dialogue. The positive resonance showed that there is a large demand for it.

EURESCOM will continue to create options for its shareholders. At the same time EURESCOM is changing and opening up for manufacturers, suppliers and vendors. The constant reconsideration and change of its business model will ensure the future success of EURESCOM and the idea of collaborative research between competitors that was born ten years ago.

EDITORIAL REMARK

Dear readers,
When you read this issue of mess@ge, the summer holidays will have already started in some countries. Summertime at EURESCOM is nearly as busy as the rest of the year. Projects are running, the big EURESCOM Summit in November is under preparation and the articles for the next mess@ge have to be written. And still, even for those poor people who have to stay in their office during summer, there is a different atmosphere – less phone calls, more auto-responder e-mails and birds singing their lovely tunes outside. But, hey, what is that? Is this the mobile phone ringing? No, it is a starling on the tree outside, imitating popular ring-tones. You don't believe it? Then read all about this phenomenon under "A bit beyond". Nature can sometimes be innovative in unexpected ways.

Our focus in this issue are the ways, humans are innovative. The main theme at the EURESCOM Anniversary Event in May was the value of R&D, which is also our cover theme. The importance of this issue for telecommunications cannot be overrated. The positive feedback from the highly distinguished audience on both days made it evident. Apart from the tough discussions on innovation and share value, the Anniversary Event also had an entertaining side. Our report under 'Current events' brings across this atmosphere.

We would also like to draw your attention to the portrait of Deutsche Telekom, which gives some highly interesting insights into how the largest EURESCOM shareholder handles innovation and prepares for the challenges of the future.

We hope, this issue contains some useful information for you. In any case, we would very much appreciate your feedback, which might help us in further shaping this magazine to your needs. We wish you a nice summer and a lot of fresh ideas through reading this issue.

Your mess@ge editorial team
message@eurescom.de

MESS@GE TO THE EDITOR

Dear editor,
The last edition of mess@ge was very interesting, describing the evolution of EURESCOM research. It clearly shows the progress in thinking about relevant themes for research.

I would like to further contribute to this enlarging of the scope.

One of the things that should get more attention is what is actually done with the research products in the telcos. How are they using them, who is using them, but more important, what was done to advertise the results to the telcos concerned? It might help to give shareholders ideas how to profit more from the contribution they pay to EURESCOM.

Maybe some reward for the most innovative ideas for promotion?

Enid Mante,
P903 project leader

Dear editor,
Your EURESCOM mess@ge has become increasingly interesting to read. However, I think it is very important to realise a shift of weight from technical matters to users' and customers' viewpoints.

Technology alone will not conquer the market. It is the user who will decide. Multidisciplinary collaboration between user and technical research should be promoted in a user centric approach that takes into account the different market situations the telcos will have to face. The changes in the market place also increase the pressure for increasing the understanding of the changes in the digital economy converging market place, and in this context especially the changing roles and 'desires' of the players in different traditional sectors of the converging industries of IT, media and telecommunications.

Annakaisa Häyrynen,
project leader of CAMERA (P1144)

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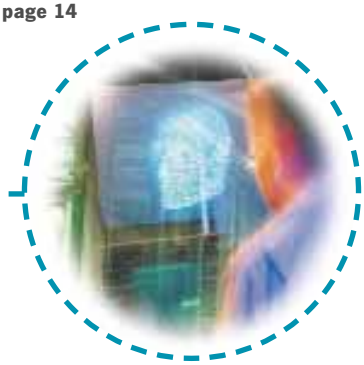

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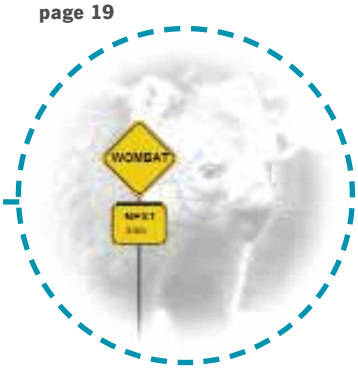

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CHANGING TO EXPAND THE CAKE FURTHER

EURESCOM'S 10TH ANNIVERSARY EVENT OFFERED INSPIRING DISCUSSIONS, OPTIMISTIC OUTLOOKS AND GOOD ENTERTAINMENT

The favourite metaphor of EURESCOM's director, Dr. Claudio Carrelli, is to expand the market cake by collaborative innovation and then compete for the biggest piece. This much effort was not necessary at the EURESCOM Anniversary Event in Heidelberg on 16 May. A huge birthday cake was brought in during the anniversary reception, allowing each of the about 100 guests to take as many big pieces as they liked.

At the reception EURESCOM received a lot of compliments and presents. Heidelberg's deputy mayor, professor Raban von der Malsburg, said that the city is proud of having such a successful R&D institute in the region, thus adding to the city's reputation of being a centre for excellent research.

Collaborative research among competitors

Joachim Claus, chairman of the EURESCOM Board of Governors, pointed out the usefulness of collaborative research among competitors. He made it clear that EURESCOM is in the process of change in order to adapt to the rapidly changing business environment. EURESCOM, he concluded, is on the right path and has a good chance of celebrating its 20th anniversary in 2011.

Dr. Claudio Carrelli underlined that EURESCOM as a highly effective virtual company is well prepared for the challenges of the future and will continue to contribute to the progress of technology in a changing environment.

New members: Siemens intends to join

A proof for the promising process of change, started at EURESCOM, followed en suite. Dr. Werner Mohr, Vice President at the Information and Communication Networks branch of Siemens, declared that "Siemens intends to become a member of EURESCOM". This has been made possible only recently, when the General Assembly agreed to the introduction of a special membership status for manufacturers, suppliers and vendors.

Entertainment in the garden tent

The reception was followed by a high-level panel discussion (see the report in this issue). After this fruitful discussion EURESCOM invited the guests for dinner to the garden tent, which gave shelter from the heavy rain. The bad weather outside could not inhibit the good atmosphere inside. The guests from shareholders and other companies as well as current and former EURESCOM staff members enjoyed lively discussions at their tables and diverse entertainment from the stage.

Harald Johansen, senior manager for strategic studies, gave a good-humoured speech, recollecting personal experiences from the history of EURESCOM, in which he has been involved for almost ten years. Dr. Carrelli led through the evening and incited the discussions at the tables with a thought-provoking dinner speech. The dinner ended far beyond midnight, marking the end of a remarkable day.

The next day had more interesting discussions in store. Read our report on the next pages about the conference "From Innovative Collaboration to Collaborative Innovation".

See also the video documentation of the event at http://www.eurescom.de/10years/.

CREATING VALUE THROUGH

A TOP-LEVEL PANEL ROUND DISCUSSED WAYS TO STRENGTHEN R&D AND GENERATE HIGHER RETURNS THROUGH INNOVATION

For the first day of its Anniversary Event on 16 May 2001, EURESCOM had invited international experts from different branches of the telecom and IT sector to explore the value of R&D in a panel discussion. The different views of the panel participants and of the about 100 guests from research and business made this event a highly enlightening experience.

Several experts expressed their concerns about the decreasing investments in R&D in Europe. "I am concerned about the low demand for research and innovation in Europe," said Dr. Hagen Hultzsch, chairman of the supervisory board of T-Venture, a Deutsche Telekom subsidiary for venture capital.

R&D needs to be considered as an investment rather than a cost

The experts identified several reasons for this negative trend. Business units often consider R&D as a cost rather than an investment. Another reason, according to Telcordia's Vice President of Applied Research, Dr. Robert Lucky, is that researchers have failed to provide hard evidence to prove the return on investment from R&D activities. This contributes to the phenomenon that research results are often not properly valued within a company. Sometimes it looks like research results can only get a real monetary value when a start-up company picks them up and suddenly is worth several million or even billion euro. Other participants criticised the short-term profit expectations raised by analysts. Magnus Madfors, Technology Director at Ericsson: "We must convey the message to the analysts that research takes time."

Dr. Michael J. Mandel, economics editor of Business Week, argued that companies that increase R&D during the 'valley', the tough market times, recovered faster. For him, increased R&D is necessary for the successful introduction of new services. Dr. Mandel stressed the importance of collaborative research to distribute some of the risks involved in R&D investments.

Finding options through R&D

While there is a lot of evidence of the healthy return on investment from research, the experts agreed that improved evaluation methods, showing hard figures, are needed to reinforce the value of collaborative R&D in today's competitive environment. Robert Lucky is convinced that research offers companies a lot of potential success by providing options for the future: "Giving options, this is what research is all about."

The panel speakers (from left): Vicente Parajón Collada, Magnus Madfors, Philip Laven, Dr. Hagen Hultzsch, Dr. Robert Lucky, Dr. Michael Mandel.

OPTIONS

10 YEARS OF INNOVATION THROUGH COLLABORATION

The US spend close to double of their ICT budget for R&D than Europe

The political dimension was represented by Vicente Parajón Collada, Deputy General Director for the Information Society in the European Commission. He explained the Commission's vision that in the long run there should be only competition and no more regulation in the European telecom market. Mr Collada expressed his concern about the low level of R&D expenditure in the EU compared to the US. In the EU only 6 per cent of the ICT budget are allocated to R&D compared to 10 per cent in the US. The Commission wants to continue strengthening R&D in Europe through its 6th framework programme for research and technology development, which is currently under discussion.

Content is crucial

A totally different view on the current issues in the telecom and IT business was delivered by Philip Laven, Technical Director of the European Broadcasting Union. For him the current discussion is too much centred on the choice of delivery technology. He sees content as the crucial factor and believes that broadcasters are in a comfortable position because they own the content and can deliver it via any technology they think appropriate. Currently the service quality of the Internet is not appropriate to replace or converge with broadcast TV, as for example the recent experience with streaming the European song contest has shown.

R&D has different risk profiles

In the ensuing discussion with the audience one major issue was, if out-of-the-box thinking is possible in large companies. Dr. Robert Lucky denied this, quoting his experience from Telcordia, where not a single out-of-the-box research result was produced within the company. Joachim Claus, Deutsche Telekom and chairman of the EURESCOM Board of Governors, presented different experiences from his company, which continuously initiates long-term R&D projects that are not expected to be immediately profitable. Dr. Michael Mandel argued that R&D projects of large companies are heavily under financial constraints and are therefore centred on 'deltas' of technologies that are either known or demanded by the customers. One of the problems is that large companies cannot afford the risk of doing R&D in a non-profitable field. The part of R&D with a high-risk profile can best be left to small companies using venture capital or to collaborative R&D because of the risk-sharing effect.

The discussion raised a lot of questions that have to be explored soon, if the value of R&D is to be fully recognised and used by telecom companies. As Mr Collada said, communication between researchers, business people and analysts has to be improved to make the full value of R&D transparent.

Videos of selected statements from the panel discussion can be viewed on the EURESCOM Web site at: www.eurescom.de/10years/.

WILL TELECOM INNOVATIONS DRIVE THE NEXT BOOM?

THE PANEL DISCUSSION ABOUT THE VALUE AND PROSPECTS OF R&D FROM A BUSINESS PERSPECTIVE

Dr. Michael J. Mandel
Economics editor,
Business Week
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The opening session "Research and Innovation to Increase Share Value" took place against the background of extremely tumultuous times in the telecom industry. On the one hand, there is no doubt that telecom R&D is essential for economic growth in the long run, with very high payoffs. Indeed, it might very well be that the next economic boom will be driven by telecom innovations.

But on the other hand, the industry is under intense financial pressure in the short term which is making it more difficult than ever to justify spending on R&D. High license fees, the cost of constructing new networks, the fall-off in the prices for many telecom services, and the plunge in the demand for telecom equipment — all of these make it harder to fund R&D.

How to pay for R&D?

Thus, the panel focused on the critical question of how to justify and pay for telecom R&D. The members of the panel were evenly divided among those who were concerned about today's R&D effort, and those who felt that the current system was working. On the 'worried' side were Dr. Michael Mandel, economics editor at Business Week; Dr. Robert Lucky, corporate vice president of applied research, Telcordia Technologies; and Mr Philip Laven, technical director for the European Broadcasting Union. More sanguine about the current state of the research effort were Dr. Hagen Hultzsch, formerly on the board of Deutsche Telekom, and now chairman of the supervisory board of T-Venture; Mr Magnus Madfors, director of external research relations at Ericsson; and Mr Vicente Parajón Collada, deputy director general DG "Information Society" European Commission.

Innovative ideas from small companies

Dr. Mandel opened the panel by pointing out the critical role that telecom R&D plays in economic growth. But it is not necessarily done by the large telecom companies and equipment makers. In recent years, it has become clear that many of the most innovative ideas, in telecom and elsewhere, have come from small venture-funded companies.

The reason is not that small companies are better at doing research. Rather, technology is very hard to predict, so that it is necessary to fund a lot of different approaches to find one that works. That is very risky and hard for big companies to do.

Instead, the appropriate role is to allow venture capital to take the role of funding high-risk R&D, and take that cost pressure away from larger companies. Then the larger companies can concentrate on developing and bringing to market those ideas, which have already some proven value.

Relation between R&D and return on investment

Dr. Lucky then addressed the same issues from a different angle. He pointed out there has always been a problem justifying research and development expenditures in the telecom industry. It is necessary to prove the relation between R&D and return on investment, notes Dr. Lucky, and to date telecom R&D executives have failed to do this. As a result, the vendors have done much of the research.

One big problem, notes Dr. Lucky, is that we have never been able to successfully quantify the value of research. Should it just be the value of the new products directly attributable to research? Or should it be the value of all the new products from the whole company? In some cases, the market is able to quantify the value of research, if you spin it off. But that clearly is not workable in all situations. It is necessary to have a deeper understanding of the value of research. Research does not always work out in the way that we expect, and it does not always produce new products directly. Indeed, in many ways research is about creating options for the future, notes Lucky.

Questioning the direction of telecom research

Mr Laven raised a somewhat different set of questions about the direction of telecom research. He observed that R&D engineers often pursue what they see as the best technology. In the end, however, that may not be what the consumer wants, or what is most desirable from the viewpoint of efficiency. For example, it is possible to distribute concerts via the Internet. But Mr Laven pointed out that may not be the best medium, since more users means more costs. Broadcasting may be a better alternative, because the cost of distribution is independent from the number of users.

Indeed, the broadcast industry has a unique perspective on R&D, because it has traditionally been both a content-based and a technology-based industry. But it is now turning out that broadcasters are technology-neutral, noted Mr Laven. They are definitely not anti Internet. After all, broadcasters have some of the most visited Web sites because of content. Rather, they want to pick the appropriate means of distribution.

Search for better quality of life

On the more upbeat side, Dr. Hultzsch discussed how the search for improved productivity and better quality of life drives research. He pointed out that companies such as Deutsche Telekom have contributed important telecom applications. By contrast, some dot.coms failed because they did not look carefully at the whole value chain, including how and why the customer will pay. Indeed, Dr. Hultzsch observed that the automotive industry did not educate us to spend money on cars by giving away free gasoline at the beginning. Unfortunately the telecom industry has trained people to expect free content, making it more difficult to decide what the customer will pay.

Looking at the technologies of 2010

Mr Madfors, director of external research relations at Ericsson, was relatively positive about the R&D process at telecom equipment makers such as Ericsson. These companies have the responsibility of carrying through the long process of innovation and R&D necessary to produce each generation of telecom standards. For example, the evolution of standardisation towards 3G took about 10 years of collaborative research, noted Mr Madfors. As a result, it is necessary now to start looking at the technologies, which would come online in 2010. Nevertheless, observes Mr Madfors, Ericsson provides only sample applications. Real business applications should come from 3rd party application developers.

Deregulating the European telecom market

Finally, Mr Parajón Collada contributed the views of the European Commision, leaving open the question of whether there is sufficient R&D, and whether there is a role for the public sector. He observed that the European Commission wished that in the long run there should be only competition and no regulation in the telecom market in Europe.

Nevertheless, the Commission is open to proposals that respect the sovereignty of the national and regional administrations.

FROM INNOVATIVE COLLABORATION TO COLLABORATIVE INNOVATION

DISCUSSION OF EURESCOM'S EVOLUTION AT THE ANNIVERSARY EVENT

The journey from innovative collaboration started back in 1991 when a number of the then incumbent European telephony operators realised the need for a research community to address the common needs of such operators. In this way EURESCOM was born. On the second day of the EURESCOM Anniversary Event, Dr. Hagen Hultzsch from Deutsche Telekom chaired two sessions that traced this transition and looked to the evolution of EURESCOM in the future.

The audience of over 90 senior executives from the wider telecommunications industry participated enthusiastically in the discussions that linked the presentations and got the chance to vote on the issues presented using an electronic polling system.

EURESCOM's efficient organisation

In the first session, demonstrating the manifestation of innovative collaboration in EURESCOM, David Kennedy, senior programme manager at EURESCOM, talked about the efficient organisation, EURESCOM has developed for the creation and management of a 50 million euro research programme each year. He also gave a quick view of the advanced infrastructure used to facilitate the communication and co-ordination needed to make such a programme effective. He concluded with some information on how EURESCOM were preparing to welcome their first member from the telecommunications vendor and supplier community and how EURESCOM intends to be an active player in the EU 6th Framework Programme.

Creating and applying project results

Dr. Carlo Licciardi, TiLabs, Italy then presented some views from his experience as a project leader of EURESCOM projects and how effective he found the processes and facilities EURESCOM provides. The third presentation in the first session came from Mike Donohoe, Head of R&D, *eircom*, Ireland. Mr Donohoe outlined how his company have been able to use the results of EURESCOM projects they have participated in directly, in the preparation of network evolutions and the preparation of product offerings for the Irish market. One very interesting point Mr Donohoe made was that sometimes it can take up to four years for the results of a research project to be applied in the operational network.

The evolution of collaborative innovation

The second session looked at the evolution of collaborative innovation and how EURESCOM is changing to meet the future challenges. The first speaker, Cesare Mossotto, TiLabs, Italy made the point that it is possible to put a numerical value on the benefits of collaborative research but stressed the need for developing the appropriate community in which like-minded organisations could collaborate. He was followed by Dr. Richard Soley, chairman and CEO of OMG, who used his organisation, which has over 800 member companies, to make the point that collaboration is an effective research tool even in a competitive environment.

Discussing collaborative innovation (from left): David Kennedy, Dr. David Cleevely, Dr. Werner Mohr, Dr. Richard Soley, Cesare Mossotto, Dr. Hagen Hultzsch.

Relationship between R&D investment and share value

Dr. Werner Mohr, Vice President ICM, Siemens presented some examples of his company's collaborative activities and announced Siemens's intention of becoming the first member under EURESCOM's new membership option. The final presentation of the day came from Dr. David Cleevely, Analysys, who made two key points: first he stated that there is a relationship between investment in research and the share value of telcos today. His second key point was that many of the potentially 'disruptive' technologies are being observed by telco research but the organisations are not designed for adopting these disruptive technologies.

The audience responded excitedly to this challenge and a very good discussion followed on how we could reinforce the perceived value of the results of research and how we can better exploit the options research creates. The conclusions reached were that research and researchers must improve the way they sell results both internally and externally. The new trend of comparing research expenditure to venture capital investment has started us on this road of presenting the results of research in terms of how it may be exploited.

Expanding the EURESCOM community

Some of the discussion centred on the changing nature of collaborative research. David Kennedy explained how EURESCOM, based partly on its own procedures and partly on the changes happening in the telco community, was a learning organisation and is continually evolving its processes to make sure we stay at the forefront of telecommunications research. "EURESCOM is currently the most efficient and effective collaborative telecommunications research programme management organisation in Europe, if not the world, and we intend to build on this by expanding the community involved in our research and integrate a number of activities with the EU research programmes," Mr Kennedy declared.

In the context of EURESCOM, the audience voted, with an overwhelming majority, that collaborative research would be a key part of telco strategy for the foreseeable future and that they looked to the 20th anniversary of EURESCOM in 2011.

R&D INVESTMENT AND SHARE VALUE

VIEWS ON A CRUCIAL RELATIONSHIP

The discussions at the EURESCOM Anniversary Event left no doubt that there is a connection between R&D investment and the share value of telecom companies. But what exactly is the relationship and what are the consequences?

In the beginning of May EURESCOM's director, Dr. Claudio Carrelli, alerted the telecom world to the dangers for share value caused by a lack of research (see full press release at: http://www.eurescom.de/news/newsreleases/newsreleases1.asp).

An investment for the future

At the presentation of EURESCOM's annual report in Heidelberg Dr. Carrelli he pointed out his conviction that the general lack of innovative achievements contributed to the downward trend in share value. "R&D investments are an investment for the future. If you don't invest enough in the future, business prospects might become quite uncertain. Thus the trust of analysts and share owners is in danger." Dr. Carrelli sees a conflict between short-term profitability and innovation in this: "Cutting R&D expenses improves profitability for the moment, but reduces it in the future."

A study by Analysys

This view was recently supported by an influential consulting company. In a short study the Cambridge-based Analysys Group established a clear correlation between the percentage of revenue spent on R&D and share price performance of major telecom operators (see diagramme). For Dr. David Cleevely, managing director of Analysys Group, this is more than a casual relationship, allowing only one interpretation: "Telcos, which invest more in R&D, have better share price performance." Dr. Cleevely's major conclusion from this is: "More R&D is needed because R&D is a major driver of value."

Creating options is an indispensable precondition for choosing the right strategy

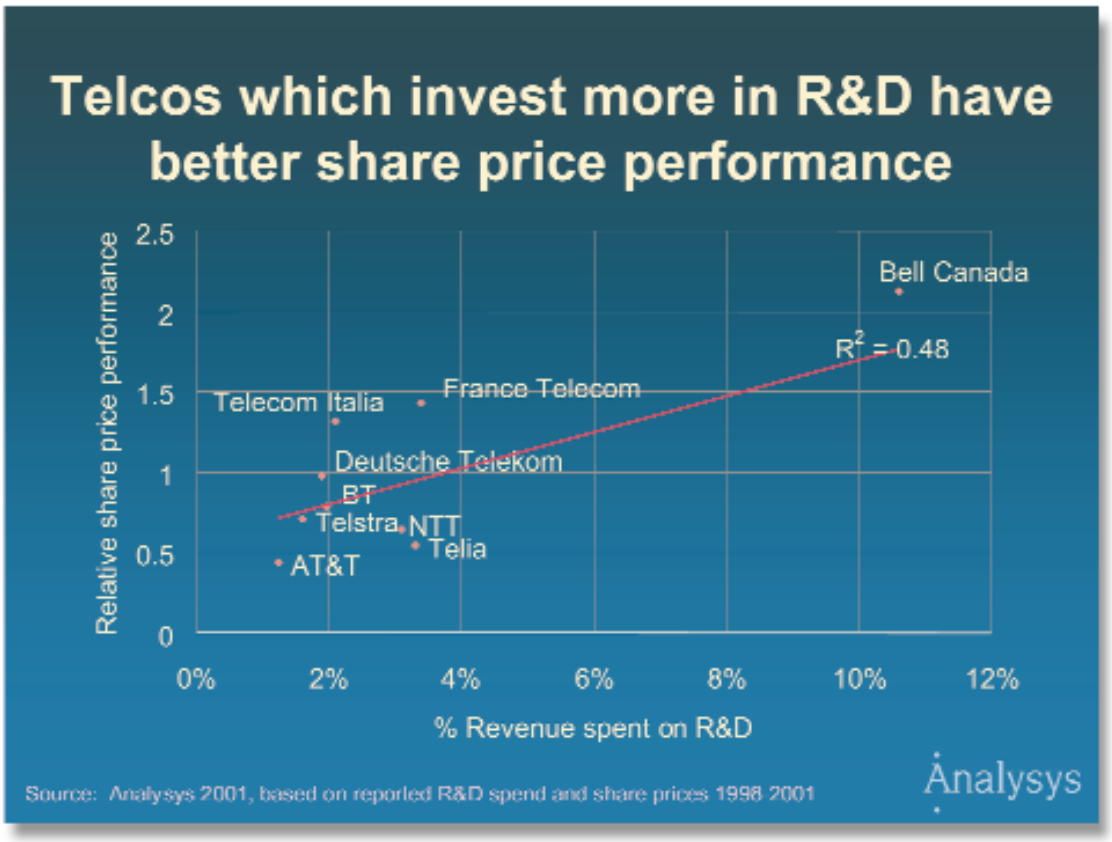
Adapting to change

However, more R&D alone is certainly no guarantee for rising shares, as the editor of the German magazine 'Net' rightly commented (Net, May 2001). What is needed is the ability to cope with rapidly changing market conditions. This is not just a problem of the telecom research domain. All players in telecommunications and other branches have to evolve in response to changing markets, technologies and socio-economic factors, if they want to survive and be successful.

Part of this problem is what an American industry observer described as 'processification'. This new word combines "process" and "ossification", the way something becomes a fossil. Dr. Cleevely pointed out that many of today's big organisations, particularly the incumbent telcos, are not good at recognising the opportunities presented by disruptive technologies. In addition, these companies are inherently slow in responding to these challenges, even if they have recognised them.

Dr. Cleevely is convinced that "new organisations are required to exploit dis-

Dr. David Cleevely: "Telcos, which invest more in R&D, have better share price performance."



ruptive technologies." Performing research in small companies or in a collaborative way can help out of this dilemma.

The role of collaborative research

According to Dr. Cleevely, collaborative research can be the answer to the problem of different risk profiles of research. Big companies do not like to put money in longer-term research areas, which have a high risk, but could also prove to be highly profitable in case of success. Through the investment sharing effect of collaborative research, these companies can participate in high-risk research areas without daring too much, but with the potential of gaining a lot. Collaboration is an effective mechanism for maximising the return on research. Particularly when you have limited amounts of capital or people to dedicate to research.

Opportunities for telcos

Telcos that learn how to respond to change and adapt their behaviour accordingly cannot only survive the current turmoil, but they can turn the circumstances to their benefit and become more effective and profitable. Major telcos like the EURESCOM shareholders have the advantage of being established players with, in most cases, sound financial backing. They already enjoy the benefits of economies of scale and extensive networks. Furthermore, large, established players may soon have the opportunity of acquiring failing competitors' infrastructures at discounted prices, thereby extending their networks and further increasing their competitive advantage.

Collaboration is an effective mechanism for maximising the return on research

The critical issue is the provision of advanced services the users really want, in a good quality and for a price they are willing to accept. This is where research and innovation come in. Collaborative research can play a key role in this. All it takes is the clear recognition that research is an important investment for the future.

DEUTSCHE TELEKOM

TEN YEARS OF COLLABORATIVE RESEARCH WITH EURESCOM

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Deutsche Telekom is Europe's largest telecommunications company and offers comprehensive integrated telecommunications solutions worldwide. It is one of the driving forces in the telecommunications industry. Products and services of Deutsche Telekom set standards not only in Germany, but in many parts of the world.

Deutsche Telekom ensures that its customers have access to state-of-the-art solutions in all areas – be it fixed-network telephony, mobile telephony, Internet or systems solutions. With around 226,000 employees worldwide Deutsche Telekom generates revenues of around 41 billion euro.

The focused four divisions' growth strategy

Deutsche Telekom is one of the few companies in the telecommunications industry, which realises and genuinely integrates offers from a single source. With four core business areas it covers the entire spectrum of modern telecommunications.

T-Systems – second-largest sytems solution provider in Europe

T-Systems is the division in which Deutsche Telekom AG is integrating its IP/data and systems solutions business for key accounts, creating the second-largest systems provider in Europe, whose 37,000 employees generate some 11 billion euro in sales. T-Systems draws its strength from the extensive IT experience of debis Systemhaus – a joint-venture of Deutsche Telekom AG (50.1%) and Daimler-Chrysler Services AG (49.9%) – and Deutsche Telekom's telecommunications expertise. T-Systems is headquartered in Frankfurt/Main, Germany, and currently operates in more than 20 countries.

Focus on R&D: T-Nova

To be able to turn ideas into innovations, an organisation requires innovation capacity, technology and platform competence, target-oriented project management and absolute customer focus in thought and action. Moreover, all these attributes must be effectively woven together. T-Nova, a 100%-owned subsidiary of T-Systems can be seen as a living network of precisely these innovation-fuelling attributes. It is the strategic answer to the challenges of the TIMES markets (Telecommunication, Information technology, Multimedia, Entertainment and Security).

T-Nova, founded in July 1999, is Deutsche Telekom's heart of research and development. You can find development centres at 30 locations in Germany, a subsidiary in Silicon Valley and a facility in Tokio with overall 4,700 employees.

Hand in hand with EURESCOM

In 1991 Deutsche Telekom was one of the founders of EURESCOM. The idea to maximise benefits while saving costs and minimising risks by sharing know-how and resources was fascinating. Deutsche Telekom also saw other advantages such as joint standards and implementing projects that would exceed available funds if performed on their own.

A lot of people at Deutsche Telekom who had participated in the first EURESCOM projects are still involved in EURESCOM business. The co-operation between different people in the virtual company structure of EURESCOM works very well. This kind of international teamwork offers an effective alternative to own projects. Deutsche Telekom uses this possibility, as the following figures impressively show: Over the last ten years Deutsche Telekom has participated in 75.3 per cent of all EURESCOM projects. Because of its function as research and development centre, T-Nova – particularly Berkom in Berlin and the Technology Centre in Darmstadt – participates in the majority of the activities in EURESCOM projects.

Important EURESCOM projects for Deutsche Telekom

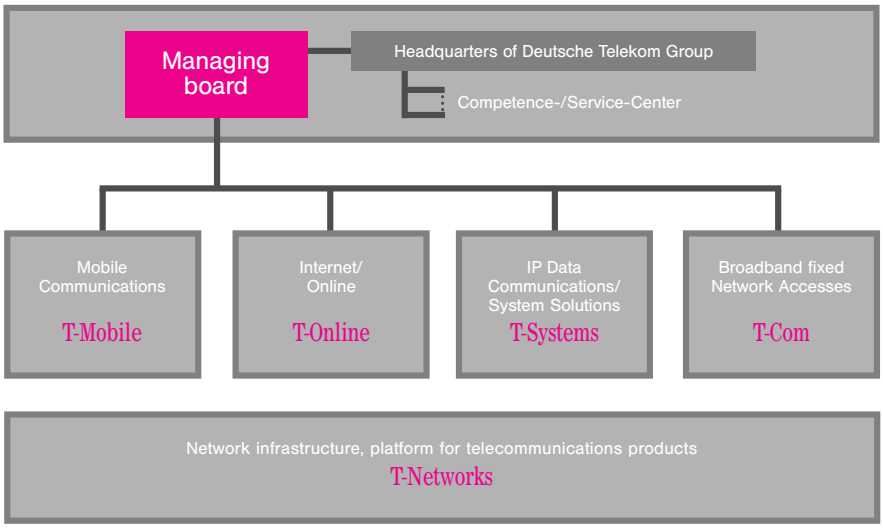
We interviewed some of our colleagues who have participated in EURESCOM projects. Here is a small selection of the EURESCOM projects, which were particularly interesting and important for us:

P111 Overall Strategic Studies

This project defined a framework vision for Pan-European public services, networks and systems by the year 2005. The P111 project team also mapped out evolution paths towards the envisaged framework vision and methods and procedures for performing strategic studies within EURESCOM. The project was finished in July 1993. If you take a closer look at the framework vision today, you will be surprised to see that the participants eight years ago made quite exact forecasts. The

The FutureLab – located at the Technology-Centre of T-Nova in Darmstadt – is a forum for presentations of R&D results. Telecommunications of today and tomorrow can be seen, experienced and understood.

Structure of Deutsche Telekom-Group



results of this project were very helpful for developments at Deutsche Telekom. The project was followed by a series of other strategic projects, such as P311 and P511.

P408 Pan-European TMN – Experiments and Field Trial Support
After earlier EURESCOM TMN work it was recognised that these results should be tested, validated and enriched by experiments in different laboratories. The project started in April 1994 and lasted almost three years. It was followed by various other TMN related projects (e.g. P707, 708 and 710). It yielded eight deliverables starting with a feasibility study report and ending with a long-term security solution – and numerous important results for Deutsche Telekom.

P807 JUPITER-II
"Joint Usability, Performability and Interoperability Trials in Europe" was the follow-on project of P605. It had a holistic approach, integrating a variety of important topics in one project. The main objective was the provision of end-to-end Quality of Service (QoS) for Network-QoS-aware applications over IP networks, where the relation of the users' perception and network performance has been measured. This combination of technical and user-centred aspects has provided Deutsche Telekom with valuable insights and results.

P1006 DISCMAN
The project "Differentiated Services – Network Configuration and Management" has successfully tested and evaluated existing Differentiated Services implementations and developed and proposed a set of services based on the Differentiated Services architecture. It has examined Traffic Engineering mechanisms to provide optimal Differentiated Services management. In the framework of the project, NEC Heidelberg actively participated, and Cisco as well as Telebit/Ericsson supported the project. The project was finished in March 2001 setting up an international trial for IP telephony with QoS support.The area of Differentiated Services is of large interest to T-Nova and Deutsche Telekom, since it is expected that the results can be used for a great spectrum of improved or new services and products in the future.

P 1141 INRA
This strategic study started with a capacity of 11 man months, running from December 2000 to May 2002. P1141 covers issues associated with the implementation of ITU-T Recommendation E.353 (International Routing Addresses) in public networks. The main objective of the project is to answer the question "What are the issues that would exist when changing from ITU-T E.164 routing numbers to ITU-T E.353 International Routing Addresses, and do these issues justify such a change?" The major customer of this study is ETNO, who will use the results to form a European view on the adoption of E.353.

Summing up

From the viewpoint of Deutsche Telekom's interests, over the last ten years EURESCOM has shown that it is an excellent platform for international co-operation in strategic studies and research. The top quality results tell their own tale. Deutsche Telekom wishes that the outstanding co-operation will continue, and is looking forward to interesting future projects.

INTERVIEW WITH JOACHIM CLAUS,
DEUTSCHE TELEKOM,
CHAIRMAN OF THE EURESCOM
BOARD OF GOVENORS SINCE 1996

mess@ge: **What was your personal highlight in the last 10 years with EURESCOM?**
Of the numerous successful achievements, I would particularly like to emphasize the following three:

- The closer interrelationship between the annual work programme and the shareholders' aims by introducing partly funded projects.
- The excellent positioning of the EURESCOM 'brand' among the shareholders and in the international field through events such as the TINA Conference in 1996 or the first Senior Executive Conference in 1998.
- The outstanding results of the ISO 9000 process certification by independent ISO 9000 evaluators.

mess@ge: **How do you estimate the significance of the contribution of Deutsche Telekom AG to EURESCOM with view to R&D?**
Today our company could not imagine R&D without EURESCOM's work.The projects give us the opportunity of minimising risks through collaborative research with our partners. That is how we achieve results that, had we worked on them individually, would have caused multiple costs. Moreover, the exchange of information between experts of the different participating research centres is invaluable. It is this added value that puts us in the position to compare our own situation with that of our partners and to take appropriate measures if necessary.

mess@ge: **What are your requirements for the future of EURESCOM?**
For the future I wish that we can gain the new network operators and service providers active in the ICT market as EURESCOM shareholders, and that we can also include manufacturers and vendors in our project work. The aim must be to establish EURESCOM as the leading European R&D centre in the ICT field.

IP MAKES MOBILE

MAIN 2001 WORKSHOP ON "MOBILITY FOR ALL-IP NETWORKS"

Marc Born of GMD Fokus (above picture, on the left) and Olaf Kath of Humboldt University Berlin (bottom picture, on the left) received certificates from EURESCOM senior manager David Kennedy for being best speaker of the EURESCOM Middleware Workshop which was held in Oslo in March this year.

The EURESCOM MAIN 2001 workshop on "Mobility for All-IP Networks – Mobile IP" took place at the Deutsche Telekom premises in Berlin from 26-27 April 2001. It attracted 125 participants from network operators, manufacturers and universities.

The workshop offered researchers, engineers and academia a forum for exchanging information and discussing the further development of Mobile IP and related technologies, applications and concepts. Additionally, MAIN 2001 showed that the topic was not only interesting to technical people, but also to people from consulting and marketing areas. The workshop programme was organised by EURESCOM project P1013 FIT-MIP 'First Steps Towards UMTS – Mobile IP'. Many vendor and academic presentations were invited in order to get a broader view and to bring many of the leading Mobile IP experts together to discuss the P1013 work.

The Mobile IP protocol is an IETF standard, providing transparent routing solutions for host mobility. This IETF standard is seen as one of the candidates for handling mobility management in the All-IP architectures designed for future 3G/4G mobile networks. The workshop discussed the current hot topics including:

- Challenges for Mobile IP.
- Mobile IP in cellular networks.
- Mobile IP implementations.
- Service Provisioning.
- Mobile IP beyond 3G.

An interesting panel discussion explored the question: "How can telecom companies take advantage of Mobile IP?" Two main opportunities emerged. Firstly, Mobile IP provides the possibility for the provisioning of UMTS-like services in advance of UMTS, and secondly, Mobile IP enables the extension of current corporate networks over public networks (VPN). For the latter, security is a major issue. In the discussion it became obvious that the potential of Mobile IP is currently not exploited enough, and many opportunities are being missed. In this sense the workshop was also a test of the maturity of Mobile IP for commercial use. The presentations on already deployed Mobile IP

products confirmed that Mobile IP is ready to use, and a number of products are available to exploit Mobile IP now.

The best speaker award went to Hesham Soliman from Ericsson for his presentation on 'Hierarchical Mobile IP'.

The presentations from the workshop as well as some photos are available on the EURESCOM Web site at: http://www.eurescom.de/MAIN/.

DISCUSSING AN INTEROPERABLE

EUROPEAN PKI INFRASTRUCTURE

"SECURITY AND FRAUD" WORKSHOP IN HEIDELBERG

Fraud has become a considerable threat to the profitability of telecom operators. It was therefore no surprise that more than 80 experts from EURESCOM shareholders and other companies participated in the "Security and Fraud" workshop on 12 and 13 June.

The workshop on the EURESCOM premises in Heidelberg discussed cutting-edge results of EURESCOM projects focusing on secure service access, the use of Public Key Infrastructure (PKI) and intelligent techniques for fraud detection. Among the speakers were also vendors engaged in security solutions for mobile and electronic commerce, as well as fraud detection.

The experts discussed the latest achievements in re-using current security infrastructures for secure and ubiquitous service access. It was also debated how technologies supporting ubiquitous computing could be made more secure. One of the points especially promoted by EURESCOM has been a European framework for interoperable public key infrastructure (PKI) services. The discussions at the workshop brought this idea a step further. PKI is seen as an enabling technology for m-commerce and offers solutions for GSM and 3G services.

The workshop showed that fast improvements in security technology are essential. The speakers from EURESCOM projects and industry gave an account of the current situation in IP fraud, fraud in GSM roaming and the expected development of fraud in the future as well as an overview on the state-of-the-art in fraud detection. One of the new security challenges for telecom operators consists in the maturing concept of e-voting, as Dr. Friedrich Tönsing from Deutsche Telekom T-Nova pointed out in his keynote.

The programme was complemented by a showcase with exhibitions and interactive technology demonstrations covering different aspects of the use of PKI in telecommunications applications as well as security in ubiquitous service access.

The presentations from the workshop are available on the EURESCOM Web site at:
http://www.eurescom.de/public/events/SecurityFraud2001/WorkshopAgenda.asp.

ICT USERS

IN THE NEW MILLENNIUM
EURESCOM SEMINAR IN THE HAGUE

On 19 June, when this issue of mess@ge went into print, EURESCOM held a seminar on "ICT users in the new millennium" in The Hague, kindly hosted by KPN. EURESCOM's three ICT user-focused projects on "Learning Communities" (P902), "ICT Uses in Everyday Life" (P903) and "Teleworking and Quality of Life" (P904) disseminated their non-public results to the institute's shareholders and members.

More than 80 representatives from our shareholders and members listened to the presentations and discussed the following subjects:

- The future of community learning services.
- Demonstrations of a Web-based community learning demonstrator.
- How telework influences quality of life.
- Products, marketing and implementation of telework.
- The P903 ICT survey where more than 9000 users and non-users in 9 European countries were interviewed.
- Why some people use ICT services and some do not.
- Latest trends in ICT services.

EURESCOM shareholders and members can access the password-protected audio presentations and download the slides on our Web site at:
http://www.eurescom.de/public/events/ICT2001_Hague/WorkshopAgenda.asp.

OPEN PAC MEETING

IN PRAGUE AT ČESKÝ TELECOM

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This year the annual Open PAC meeting was held on 12-13 March in Prague at the kind invitation of ČESKÝ TELECOM. Besides the seven PAC members, six Administrative and Technical Liaison Managers, seven representatives from the host and three EPS members attended the meeting.

An interesting presentation featuring ČESKÝ TELECOM showed that this shareholder has caught up very fast bearing in mind the situation in the 1990s, when ČESKÝ TELECOM became a state-owned enterprise. Milan Schwarzkopf, manager in the Strategy and Quality Management department of ČESKÝ TELECOM, gave an impressive example for this development: "The number of lines installed between 1945 and 1980 was the same as when the telephone came to the Czech Republic and at the beginning of the 2nd World War." The Czech market is characterised by a high penetration of GSM but also ISDN and the Internet. A roll-out of ADSL is now planned.

One of the objectives of the PAC meeting was to clarify the inclusion of members in the Work Programme generation process. According to the Membership Contract, members are supposed to:

- Participate in proposing new directions of the Work Programme.
- Propose new projects and studies.
- Contribute to the prioritisation of project proposals.
- Commit themselves to the execution of projects and studies.

The PAC endorsed a calendar for the generation of the Work Programme 2002 prepared by the Permanent Staff.

A further item for this PAC meeting were first considerations of new theme areas to be reviewed for the Work Programme 2002. From the contributions presented by meeting participants, the following were identified for further consideration:

- Content and content management.
- Mobile and Internet convergence.
- Promotion of IPv6 (QoS, management).
- Customers and markets issues (and data).
- (Network) security and trust.
- Next generation Internet.

The above items have been taken into account while preparing the Call documentation, in particular the Stimulus Paper 2002 (see article on Work Programme 2002 in this issue).

MANAGING TECHNOLOGY AND INNOVATION

DISCUSSION WITH A STUDY MISSION FROM THE NATIONAL TECHNOLOGICAL UNIVERSITY

Most Americans visit Heidelberg because of the castle and the old town. The 13 Americans who came to Heidelberg on 21 May were different. They belonged to a study mission from the National Technological University visiting various companies in Europe.

Their destination on this day was EURESCOM. The study mission's purpose was to gain first-hand understanding of European technology management practices and European economic co-operation. The delegation consisted of young, aspiring managers from major US companies like Hewlett-Packard, IBM and Agilent participating in the NTU Management of Technology Programme. They were accompanied by faculty leader Dr. Todd A. Watkins from Lehigh University, Bethlehem/Pennsylvania.

EURESCOM director Dr. Claudio Carrelli explained the virtual structure of the institute, which has proven highly effective for the management of collaborative research projects in Europe. Dr. Carrelli pointed out that EURESCOM has opened up for co-operation with companies outside Europe and is in fact already collaborating with several US companies in some projects. Senior manager Harald Johansen and project supervisor Peter Stollenmayer gave an overview on how the annual research programme is set up and how the projects are managed.

The mission team members were especially interested in the competitive environment in Europe and the EURESCOM model of increasing the market cake through collaborative innovation and competing for the best piece of the cake at the same time. Another focus point of the discussion was the management of disruptive technologies and their inherent potential to endanger large companies. Mission member Craig White from Hewlett-Packard said that for companies like his it is not really the problem to discover disruptive technologies but to use them in a profitable way.

After lunch the study mission continued their trip and went on to visit BASF in Ludwigshafen. Among the other companies visited by the NTU mission was also EURESCOM shareholder France Télécom. After their return to the States the study mission will issue a report on the insights gained from their trip.

More information on the National Technological University is available on the NTU Web site at: http://www.ntu.edu.

COMMUNICATION ON THE MOVE: WOMBAT ADDRESSING THE LOCATION NEEDS OF THE YOUTH

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Imagine being 16 years of age. You would probably like to arrange to meet your friends while on the move to catch up with them or perhaps to head off to a party or bar. A location-based service (LBS) that supports this kind of 'micro-co-ordination', enabling friends to make arrangements while on the move, might well be a killer application for the youth market.

In the EURESCOM study P1045 WOMBAT (Where are the Other Mobile Buddies Around Town?) we investigated, if there is a potential need for such a service among the youth. Furthermore, the needs were compared with the capabilities of standardised cellular network positioning systems in order to find out if such technologies are presently able to support these and other potential youth market-focused scenarios.

The short study P1045 WOMBAT was kicked off in November 2000 and ended in May 2001. Experts in the areas of social science, GSM and satellite-based positioning and marketing from Elisa Communications Corporation, British Telecommunications, Deutsche Telekom and Portugal Telecom were working on this study.

The youth market

As the first step we concentrated on the investigation of youth cultures and their mobile service needs. Existing data and material on young people were selected from academic journal articles and books on youth culture, market research data, press articles, and data from various ongoing research projects. These sources were combined to form an understanding of young peoples' lifestyles, culture and use of current mobile technology. This understanding was used to derive needs for mobile location-based services. The focus was on the European youth market, but the project was not limited to this.

One finding was that the mobile phone plays a vital role in helping young people arrange and rearrange their social and practical engagements. Their lives are becoming increasingly scheduled. Young people make social arrangements with their peers, who are of greater importance to them than their family from around the age of puberty. 'Micro-co-ordination' refers to flexibility in arranging and rearranging schedules, for example, phoning friends en route to agree on where to meet up as opposed to co-ordinating this beforehand. As this 'scheduling' usage of mobile phones seems to play such an important role in young people's lives, this suggested an opportunity for a location-based service to support this function better.

GSM positioning technologies

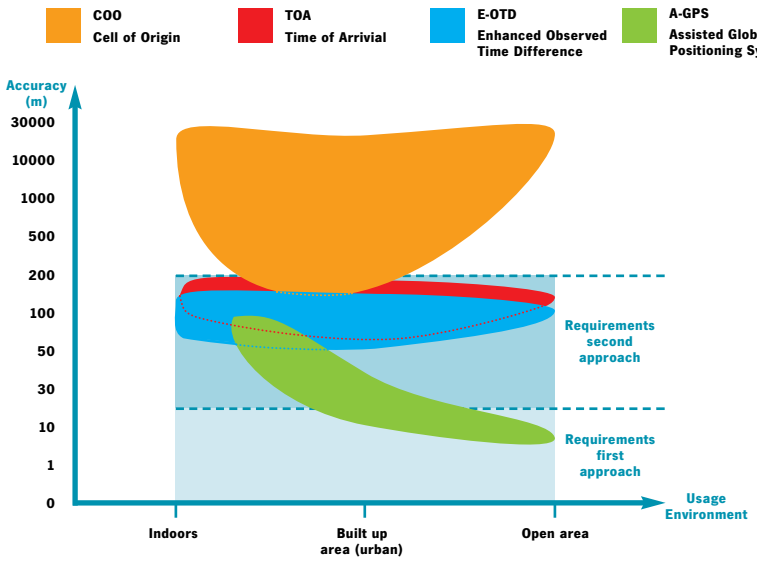
There is a large number of developments related to mobile location services of the future generation. A broadening range of different position determining systems such as Cell-ID show a heterogeneity that makes it difficult to address by operators. An analysis of the GSM standardised solutions such as Cell-ID, TOA, E-OTD and A-GPS (see also the overview of positioning technologies in this issue) was undertaken to reveal key characteristics such as accuracy, usage environment and speed of response in order to provide a well-defined space to match requirements of the services later.

Benchmarking

A number of realistic user scenarios were derived from the understanding of the youth market. These scenarios were then mapped onto the technical capabilities as mentioned before to provide an awareness of the key issues of technology selection to meet user needs requirements. As might be expected, it is not an easy matter to graphically represent these requirements in a feasible and clear way. Consequently, for reasons of simplicity, the technologies' defining parameters were fixed into three measures: obtainable accuracy, usage environment and speed of response. It was easily apparent when examining the scenario in the light of technology capabilities that speed of response is not relevant. Nowadays technologies easily can deliver location information within 10 seconds, so the time aspect would be more than acceptable for the user.

The figure here depicts the accuracy of some selected positioning technologies. The conclusions drawn from the elaborated usage scenarios suggest that accuracy for certain scenarios needs to be 20 m or better. If the accuracy is less than 20 m it might be difficult for the service user e.g. to find a person in crowded areas (such as a concert or busy street). The definition of the usage environment is slightly easier in that it is likely the service would be used by people who are indoors and outdoors, and that users would want to locate friends even if the mobile device was being carried in a bag (in technical terms this is indoors). Therefore it has to work both indoors and in open spaces.

Applying the mapping of the scenario to the technology capabilities, we found that the scenario requirements could not be met by the current capabilities of the positioning technologies. The results from the first approach led into a second iteration of the mapping. The requirements in the scenario were re-addressed and benchmarked once again against the technology capabilities. The second approach revealed that rethinking the acceptable size of the locality to around 200 m would allow the user in the scenario to locate a friend within a space the size of a street block or a larger building. The analysis is then clearly pointing out that two different standardised positioning systems fulfil the relaxed requirements of the second approach. Those technologies are E-OTD and TOA (note that A-GPS does not work properly indoors).



Mapping of micro-co-ordination scenario

Conclusions

This innovative approach led us to conclude that there are indeed some positioning systems providing the appropriate quality of service (in terms of accuracy, usage environment and speed of response) to satisfy user demands, but acceptability highly depends on the actual requirements of the focussed user group. Some services proposed for young people would probably not be acceptable to them if current technologies were deployed, primarily because current technologies cannot offer high enough spatial accuracy in indoor environments. We conclude that in order to gain a wide acceptance, location-based services geared for the youth market need to start with somewhat basic services due to the technological constraints. When the technology is improved in terms of spatial accuracy and the range of usage environments in which it operates, as envisioned in the future of 3G networks, more sophisticated services could be offered.

Further reading

A complete summary of the project results can be found in the deliverable "Location-based services and technologies for the youth market". Two further reports give a more detailed insight into the "Investigation of youth cultures and their mobile service needs" and the "Evaluation of location-based technologies". All reports are available on the P1045 Web page at: http://www.eurescom.de/public/projects/P1000-series/p1045/P1045.htm

POSITIONING TECHNOLOGIES

FOR LOCATION-BASED MOBILE SERVICES

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Location-based services for mobile networks are currently getting increased interest. Location services comprise a broad range of services that incorporate location information in order to provide added value to the user. A key aspect of this type of services is that a user can be provided with information that is relevant in the place where he currently is.

Examples for location-based services are the provision of local information (weather, city information etc.), emergency services, traffic information and m-commerce. To determine the position of a mobile user is a prerequisite for offering location-based services. This tutorial gives you an overview on the principles of gaining positioning information, and describes selected technologies, comparing their advantages and shortcomings.

General principles to determine a position

There are a couple of basic principles and methods that can be used for the determination of the position of a mobile handset:

- Serving Cell: The location of the antenna station of the serving cell is used.
- Signal Level Measurements: The weaker the signal the mobile handset receives, the farther it must be from the antenna station.
- Advanced time: The propagation time of a signal between antenna station and handset can be measured, which allows calculation of the distance.
- Angle of arrived signal: Measuring the angle from which a signal (from a mobile handset) has arrived at an antenna station gives the direction in which the handset is located.

Most of the principles listed above require two or three antenna stations to determine the position, using additional calculation methods such as triangulation techniques.

Regarding the place where the functionality is implemented we can distinguish between pure mobile network-based technologies, mobile device-based technologies and hybrid solutions. Finally, also the satellite-based Global Positioning System (GPS) could be used to determine the position of mobile handsets.

Existing positioning technologies

Below a range of positioning technologies are described. The ones described here are standardised solutions and therefore probably stand the best chances of getting implemented in products.

Cell of Origin (COO)

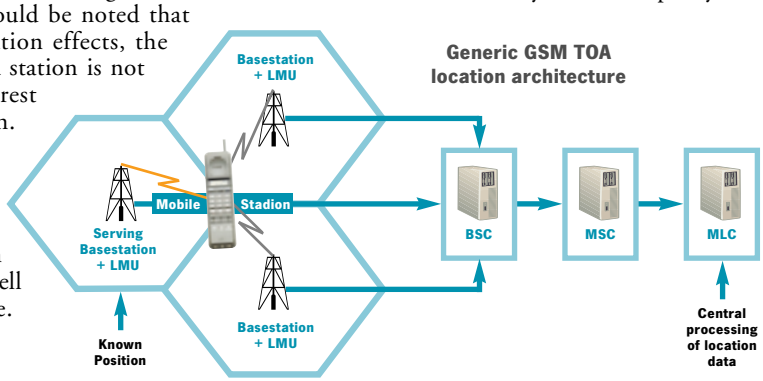
The simplest method for locating a mobile device is based on cell identification. Since this is an inherent feature of all cellular systems, minimal changes to existing systems are needed. The cell ID only has to be associated with location, i.e. the coordinates of the base (antenna) stations must be known. Another advantage of this method is that no calculations are needed to obtain location information. The drawback is that accuracy is directly dependent on cell radius, which can be very large especially in rural areas, even 30 km. In dense urban areas location accuracy is considerably better and it can be as good as 150 m. However, it should be noted that due to propagation effects, the serving antenna station is not always the nearest antenna station. Thus the obtainable accuracy is not as good as could be deduced from BS density and cell geometry alone.

Cell Of Origin (COO) requires no modification to the mobile device or networks and so is able to be used as the LBS for existing subscribers but is less accurate than the other methods employed. In cities, however, the accuracy of COO is probably more than adequate for information services due to the small cell size. The first commercial location services introduced to the market are based on this method.

Time of Arrival (TOA)

Propagation time delay measurements between the mobile handset and several antenna stations can be used for location determination. Assuming two-dimensional geometry and line-of-sight propagation, each time delay measurement defines a circle around an antenna station. Three such circles are needed for unique location determination. A problem of this approach is the accurate time synchronisation that is required between the mobile handset and the antenna station to obtain useful time delay estimates. To achieve this, additional hardware in the network is required. TOA is based on measuring the time of arrival of a known signal sent from the mobile device and received at three or more measurement units. This method will work with existing mobile devices so there is no need for modification to the mobile device.

TOA's accuracy depends on how accurate the timing measurements are. Also the number of used measurement units has great effect, but at least three of them are needed. So the accuracy of TOA is pretty



much dependent on the environment. In metres it can vary between 50 and 200 m.

Enhanced Observed Time Difference (E-OTD)

The method to measure the Observed Time Difference (OTD) on a terminal seems to be a promising candidate for enabling positioning at current and future mobile network systems – in UMTS networks this technology is called OTDOA (Observed Time Difference of Arrival).

If the antenna stations are not synchronised, such a system operates by placing fixed reference measuring points, overlaid on the cellular network and known as Location Measurement Units (LMU) at multiple sites geographically dispersed in a wide area (see figure). Each of these LMUs has an accurate timing source. E-OTD-values are used for determining the mobile device's distance from the base station or LMU. When at least three distances are known, the location can be calculated using triangulation. The distance estimations are not exact. This is caused by different propagation environments, for instance signal reflections, that affect the accuracy of the E-OTD system, which is between 50 and 125 m. Measurements are performed by mobile handsets without any additional hardware, but for handsets available now a firmware (device-specific software) upgrade will be needed.

Assisted Global Positioning System (A-GPS)

This technology relies on the satellite-based Global Positioning System (GPS). The concept considers a GPS reference receiver in the mobile network, gathering navigation messages from all satellites in line of sight. These GPS data are then processed and stored in a Location Server, that provides this information finally to the mobile device. This procedure allows the mobile device a faster location of the satellites currently visible. In this way, the mobile device does not need to wait to perform an acquisition, neither does it need to be permanently linked to the satellites. An A-GPS enabled mobile device is able to track far weaker GPS signals in environments where traditional GPS receivers would fail. The accuracy of A-GPS depends on the environment and it can vary between approximately 5 to 100 m. Generally speaking it is the most accurate technique of those compared here. It works extremely well outdoors but indoors or in dense built-up areas it can be much more inaccurate or not work at all.

Summing up

This analysis makes evident that no single technology has a clear advantage over the others, as they differ in terms of technological, economical and quality aspects. This implies that the final selection of one particular positioning technology may depend heavily on meeting the established requirements, since the final aim is to provide a usable and useful service to the user. This tutorial is based on results from the EURESCOM study P1045 "WOMBAT: Where are the Other Mobile Buddies Around Town?", also introduced in this issue of the mess@ge. Further details and all study reports are available on the EURESCOM Web site at: http://www.eurescom.de/public/projects/P1000-series/p1045/P1045.htm.

NEWLY KICKED OFF PROJECTS AND STUDIES BETWEEN 1 MARCH AND MID-JUNE 2001 WE HAVE STARTED ANOTHER 14 PROJECTS AND STUDIES.

Always On – heterogeneous services (P1101)

The project will design and develop a prototype for a DUS (Device Unifying Service). The DUS will aim to exploit the characteristics of Always On and provide access to online services from multiple devices (e.g. phone, PDA, PC, TV) and from any location. This prototype will then be examined in user trials to understand the commercial and usability implications. The DUS prototype will be implemented as a service on an open platform in an IP environment emulating the concept of the VHE (Virtual Home Environment). DUS is a commercial service of great value for mobile operators or mobile service providers since it provides a more user-friendly interface for their customers. DUS also has considerable value for fixed network operators or service providers since it provides a bridge between fixed and mobile devices. The output will enable the EURESCOM shareholders to boost their future revenues from new broadband services.
Contact: brueggemann@eurescom.de

Mobile electronic commerce (P1102)

The technology which allows electronic commerce on mobile devices is already available, and further developments are happening at a fast pace. However, application fields and business models are still immature. This project will investigate the m-commerce market and produce business models and service scenarios which will help EURESCOM shareholders to gain a lead in this field. The key technologies and methods for m-commerce – cHTML, WML, IP, WAP, MExE and JMDK – will be investigated. Furthermore, a platform concept allowing the creation and deployment of new m-commerce services will be developed.
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Inter-Operator IP QoS Framework – ToIP and UMTS Case Studies (P1103)

Currently, there is a strong technical and market pressure to develop and migrate PSTN, IP and mobile services onto a converged IP network spanning multiple operators' networks. This project will address the challenge of designing a common inter-operator IP QoS provisioning framework capable of delivering differentiated service quality to IP-based services like Telephony over IP (ToIP) or UMTS packet data services. Cost models and business models for Managed QoS services will be analysed. Requirements regarding the main service management processes (SLA negotiation and provisioning, accounting and billing) will also be identified.
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MobilUS: next generation Mobile Information Services on UMTS (P1105)

The upcoming introduction of UMTS will open the way for a whole new generation of multimedia and information intensive mobile services. The project will investigate concepts for the research and development of UMTS-based information intensive services supporting nomadic work and life styles. The project will deliver an overview of UMTS services together with techniques supporting them; an architecture for UMTS service deployment; a prototype implementation of the architecture and an evaluation of UMTS nomadic usage scenarios and applications on such an architecture. EURESCOM shareholders will gain early experience with information intensive mobile services to enable the implementation of these services as soon as UMTS has reached the right penetration level. They will also be able to support the rapidly growing market of nomadic business workers, and thus will strengthen their position in an attractive business market.
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Open Service Architecture: advantages and opportunities in service provisioning on 3G Mobile Networks (P1110)

The success of 3G mobile networks will depend heavily on the ability to provide

added-value services to customers. Standardisation is already defining relevant interfaces between applications and network, based on the Open Service Architecture (OSA) concept. The Parlay Group is one of the main contributors. This project will investigate and enhance OSA specifications to enable innovative services in 3G mobile networks and in a shorter term in GSM/GPRS networks. This will include the evaluation of OSA-based products and demonstration of service development. The business benefits of an open software platform for value-added services for telcos will be assessed.
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Next-Gen Open Service Solutions over IP (N-GOSSIP) (P1111)

SIP is becoming a key technology enabler for Next Generation Services. SIP technology still has to solve a number of issues before it can be widely deployed in European networks. The main goal of the project is to demonstrate the feasibility of constructing and deploying new telecommunications services over IP networks using open SIP solutions. For this, SIP technology will be assessed and SIP-based products will be evaluated. Service development will be demonstrated on an open service platform, which will be accessed by heterogeneous terminals for example multimedia PC, PDA and IP phones. Personal and service mobility, multimedia, any-to-any and multiparty communication is planned.
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Advanced Multi-Provider IPv6 Project (AMPIPv6) (P1113)

Although basic features of IPv6 have been tested and deployed in various experimental/trial networks, there is little experience of some of the newer features of IPv6 – Addressing, DNS, Mobile IP, Network Security etc. This project will practically evaluate these new features in an operational multi-provider environment. The goal is to identify technical issues for the deployment of new IPv6 features and to define strategies towards the provision of new IPv6 specific Internet services for large service providers in a European context. Sample applications for such ISP services will be demonstrated.
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MC-A-RONI – MultiCast Deployment – A pRactical handbOok for Networks and Isps (P1114)

IP-Multicast over MPLS is a hot issue and several vendors have proprietary solutions for it. The main benefit of this project is to come up with a strategy of how IP-Multicast can be integrated into MPLS-based networks and to provide a solution for this process. Additionally high-speed access technologies offering high quality multicast services like ADSL will be looked into. Accounting and billing of those services are required to offer new services and are therefore a main topic of the project. As Reliable Multicast is becoming an important technology to transmit data between Web servers and caches we also need to understand which kind of support is needed from the underlying network and how this can be realised and integrated. The impact of Reliable Multicast on network performance will be studied. The project will use the results from P1010 (RealCast) as input.
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SALTAMONTES – Selected Quality of Services Provision in a Multi Protocol Label Switching/Differentiated Services Internet (P1115)

SALTAMONTES will study and evaluate issues related to Quality of Service (QoS), as implemented by the Differentiated Services approach and Multi Protocol Label Switching (MPLS). The project will focus on the migration concept of IP networks towards the use of MPLS, MPLS-based enhanced IP services, and MPLS interoperability.
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FAN – Future Access Networks (P1117)

The aim of this project is to evaluate the impact of the use of IP over different Layer 1 technologies like ADSL, SDSL, VDSL, PONs, broadband radio etc. In the evaluation process the project will consider aspects such as cost; service requirements; QoS guarantee; operation and maintenance; impact on the network architecture; interworking with the core network; security and network evolution. The project will produce a set of basic guidelines and deployment criteria to support the transition from the present access networks towards the future IP-based broadband access networks. Results will support operators in exploiting emerging access technologies (e.g. Gigabit Ethernet), and will be able to assess the impact of their choice in the future network development. The project will provide an opportunity for operators to share experience and to arrive at a consensus and thus be able to influence equipment suppliers and standardisation by creating conditions that enable high volume production and the corresponding reduction of costs.
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Perspectives for future work on IP QoS issues (P1143)

For harmonised IP-based services, commercial QoS solutions are not available from any operator yet – except to a limited extent within single-operator domains. 'Commercial QoS solutions' are understood as a variety of QoS related activities, functionality from a network and management point of view, applications, etc. The market seems to have arrived at a turning point with different options and directions. The key question for this study is: What QoS and related issues are to be addressed by EURESCOM projects – on a short to medium term (i.e. within the next 1-3 years) – in order to enable the provision of commercial IP-based services with ensured QoS?
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The future CAMERA – Customers and Markets EURESCOM Research Activities (P1144)

A knowledge of customers and markets, in particular their needs, behaviour and value systems, is essential in designing new applications and service portfolios. Despite competition amongst market players EURESCOM projects have demonstrated that economic, user-centredness and cross-cultural issues can be successfully addressed by EURESCOM, provided the scope and orientation is clearly defined. This study proposes to identify collaborative research activities within the field of customers and markets giving shareholders competitive advantages.
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4G – the next frontier (P1145)

Third generation mobile systems have now left the research domain. Whilst according to current plans first 3G networks will be deployed from mid 2001 onwards, the development of business models, applications, services and appropriate terminal equipment is still going on at network operators, service providers and terminal suppliers. In order not to lose momentum system suppliers and vendors are now turning to next generation mobile systems. The network operators and service providers should match these initiatives by outlining their visions for a seamless evolution of mobile systems and identify areas where future research is necessary from their perspective.
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GOLD – Getting Online Learning communities to Develop (P1146)

The growth of online communities has not as yet been predictable, i.e. some communities have failed to attract a sustainable user base, while other communities have flourished. The theory behind this project, developed by the former EURESCOM project P902, stated that people would use different communication tools depending on the types of relationship that they were engaged in and the stage of learning they had reached. This study aims at expanding our knowledge of how communities develop, by examining communication patterns within telcos – using questionnaires to determine relationship types and stages, and using logging software to examine tool use.
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SUMMERTIME IS PROPOSAL TIME – THE PREPARATIONS FOR THE WORK PROGRAMME 2002 HAVE ALREADY STARTED

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Summertime is not only the season for picking strawberries and cherries, it is also the time for preparing the cutting edge projects for next year. That is why EURESCOM is calling for proposals for new projects.

At their June meeting the Board of Governors endorsed the call documents, which were issued to shareholders and members on Friday 15 June 2001. All necessary information to prepare a proposal can be found on the EURESCOM Web site at: http://www.eurescom.de/secure/workprogrammes/WP2002/SummaryEvents.asp

The important dates to remember are the following:

- **Friday 17 August 2001**
  Deadline for submission of preliminary titles and abstract for new proposal for the Work Programme 2002 to PP2002@eurescom.de. A template for this purpose can also be found at the above Web site.
- **Friday 31 August 2001**
  Deadline for nominees for the Groups of Experts. Please note that the planned Group of Experts meeting is scheduled for 25-26 September 2001. Templates for nominations can be found at the above Web site.
- **Friday 7 September 2001**
  Deadline for submission of Project Proposals for the Work Programme 2002. Templates can be found at the above Web site.

On the above Web site you will also find a Stimulus Paper 2002 outlining themes that should be considered to be addressed by projects in the Work Programme 2002. Many of the themes are building on and adding value to achievements obtained through past or current projects and studies. The Stimulus Paper also summarises key factors proposers should consider when preparing project proposals, and contains guidelines from an overall management prospective.

A novelty in this year's Stimulus Paper is the emphasis put on customers and markets issues where we have seen that EURESCOM can successfully carry out large-scale market research and contribute to the pooling of data material as well as carry out complementary analyses with other European bodies.

Further inter-domain themes are dealing with Personal Nets, a 'construct' that is continually present so that domestic and business customers, no matter where they are, can seamlessly integrate all their information, computation and communication requirements and resources within a safe and individually personalised environment, which they control.

Third generation mobile systems have now left the research domain and first 3G networks are now being deployed. This means that the sector players are now turning their research attention to 4G mobiles and beyond. EURESCOM is already working on a roadmap to this evolution and invites shareholders and members to present proposals on what should be researched in 2002 in their opinion.

MIRROR SERVERS

NEWS FROM THE EURESCOM INFORMATION AND COMMUNICATION SERVICES (EICS)

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Currently five shareholders are using a so-called EURESCOM mirror server in their Intranets. See the outline below for a list with URLs.

The EURESCOM mirror server is a server in the shareholder Intranet, which offers the entire EURESCOM Web and FTP site content to Intranet users. The main objective is to support the dissemination of EURESCOM results within the shareholder companies. Users do not have to apply for an EICS password. They have immediate and fast access to all the EURESCOM information and results. The mirror server replicates all the changes in Web and FTP contents on the EURESCOM central servers each night either via ISDN (128 Kbit/s) or via a secure PPTP (Point-to-Point Tunnelling Protocol) connection via Internet. The connection type is determined by the shareholder.

Since the mirror server can only be accessed from the shareholder's Intranet, the EURESCOM security policy is automatically enforced; only shareholder employees may access EURESCOM classified documents.

For more information on setting up and deploying a mirror server please contact Klaas-Pieter Vlieg (vlieg@eurescom.de) or the EURESCOM helpdesk (helpdesk@eurescom.de).

Mirror servers of EURESCOM shareholders	
Deutsche Telekom AG	http://eurescom.telekom.de:3599
France Télécom	http://rd.francetelecom.fr This will change to http://rd.francetelecom.com
MATÁV PKI Telecommunications Institute	http://eurescom.pki.matav.hu
Telenor AS	http://148.121.27.136/default.asp
eircom	http://eurescom.eircom.ie

Please note that these URLs can only be used from within the shareholder's Intranet and are only intended for their employees.

STRENGTHENING THE PAN-EUROPEAN CO-ORDINATION IN TELECOMMUNICATIONS

EU CONFERENCE 'E-MOBILITY 2001' IN GÖTEBORG

Agneta Cassnell, Business Region Göteborg AB

Dr. Claudio Carrelli speaking about the implications of e-mobility.

Organised by the Swedish Presidency of the EU, in particular the regional development bureau of Göteborg, and by the EU Commission, the Conference 'e-mobility 2001' took place in Göteborg on 31 May and 1 June.

EURESCOM was represented by its director, Dr. Claudio Carrelli, who took part in the final plenary session, together with Björn Rosengren, Swedish Minister for Industry, Employment and Communications, and Erkki Liikanen, the Commissioner for Enterprise and the Information Society.

The conference addressed how 'e-mobility' will have impact on European society and its constituents. In particular, it intended to stimulate a wide debate on the future shape of the information society, covering the multiple perspectives on e-mobility and its potential consequences for sustainability in its widest sense – economical, social, cultural and environmental.

The final statement stressed the strategic value of research

The '3G paradox'

The conference seriously debated the so called '3G paradox', which summarises the present 3G situation following the unbalanced UMTS licensing procedures in several European countries, and produced a final statement to be submitted to the forthcoming European Council Summit in June.

The final statement (full text available at http://www.e-mobility2001.org/) stressed the strategic value of research, as well as the importance of co-operation, and made two specific recommendations to the Council:

- To strengthen Pan-European co-ordination for strategic industries such as telecommunications. This issue will appear again for future new wireless standards and licensing schemes.
- To stress the importance of continued strong European research and development in mobile and wireless technologies and applications, in order to strengthen the leading position of Europe in the field.

The relevance of applications

Several speakers repeatedly stressed the relevance of research on applications and not just on technology. The DoCoMo presentation was particularly significant as it not only highlighted the success of the 'i-mode' service, which is mainly due to applications, but also announced the launch of the first, experimental UMTS service which officially started in Tokyo on 30 May. This service named FOMA – freedom of mobile multimedia access – will be offered for four months to 4,000 customers, with free terminals and tariffs lower than the existing i-mode services.

The winning wireless services will be 'G' independent

With reference to future 4G technology or beyond, it was repeatedly stressed that the winning wireless services will be 'G' independent.

The car industry presented several scenarios of the new possibilities offered by the so-called 'car telematics' and put particular emphasis not only on the passenger safety aspects, but also on the relevance of environment sustainability.

EURESCOM's role in the 6th Framework Programme

For EURESCOM the event was a good opportunity to present its deep involvement in e-mobility issues and to advertise its strongest asset: an experienced company with efficient and effective processes for international collaborative research programme management. Such characteristics are valid prerequisites for a future active management involvement in the forthcoming EU Commission 6th R&D Framework Programme. EURESCOM plans to propose to lead one or more Integrated Projects under the 6th Framework Programme of the EU.

Agneta Cassnell, Business Region Göteborg AB

Commissioner Erkki Liikanen gave an outlook on the future of e-mobility in Europe.

new project results

C = EURESCOM confidential
F = for full publication

Studies

P1044 Aspects of Open Source in Telecommunications – Technical Information 1 – Technical Evaluation of Open Source Products (F)
P1044 Aspects of Open Source in Telecommunications – Deliverable 1 –
A strategic study on the use of Open Source in a telecommunications operator's environment (F)
P1045 WOMBAT – Where are the Other Mobile Buddies Around Town? – Technical Information 1 – Location-based services and technologies for the youth market (C)
P1045 WOMBAT – Where are the Other Mobile Buddies Around Town? – Technical Information 2 – Investigation of youth cultures and their mobile services needs (C)
P1045 WOMBAT – Where are the Other Mobile Buddies Around Town? – Deliverable 1 – Location-based services and technologies for the youth market (C)

Applications and Services

P922 VENUS – Virtual collaborative Environment with Next generation mUltimedia Systems – Technical Information 1 – Mock-up Demonstrator (C)
P922 VENUS – Virtual collaborative Environment with Next generation mUltimedia Systems – Technical Information 2
Assessment and forecast on collaborative applications (C)
P922 VENUS – Virtual collaborative Environment with Next generation mUltimedia Systems – Deliverable 5 – Final Results (F)
P1008 Inter-operator interfaces for ensuring end-to-end IP QoS – Deliverable 3 – Specification of Inter-Domain Quality of Service Management Interfaces (F)
P1008 Inter-operator interfaces for ensuring end-to-end IP QoS – Technical Information 1 – Measurement of Performance Metrics and Service Events (F)
P1008 Inter-operator interfaces for ensuring end-to-end IP QoS – Technical Specification 1 – Specification of Inter-Domain Quality of Service Management (F)

Middleware

P815 Communications Management Process Integration Using Software Agents – Deliverable 1 –
A specification of a framework for agent-oriented workflow management systems (F)
P815 Communications Management Process Integration Using Software Agents – Deliverable 2 –
The application of agent technology to workflow management in telecommunication (F)
P815 Communications Management Process Integration Using Software Agents – Software (C)
P905 AQUAVIT – Assessment of Quality for Audio-Visual signals over Internet and UMTS
Technical Information 1 – Relationships between subjective evaluations, objective predictions and system parameter values (F)
P905 AQUAVIT – Assessment of Quality for Audio-Visual signals over Internet and UMTS – Deliverable 4 – Main Findings (F)
P908 OSS Interconnection Gateway System validation (by application to case studies) – Deliverable 3 – OSS Interconnection Evolution (F)
P910 Technology Assessment of Middleware for Telecommunications – Deliverable 1 – Issue 2 – Technology and Product Life Cycle Ratings (F)
P910 Technology Assessment of Middleware for Telecommunications – Deliverable 4&5 – Middleware Platforms Scalability and Dependability (F)
P910 Technology Assessment of Middleware for Telecommunications – Deliverable 7 – Telecommunication Application Domains (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 1 –
Investigation of requirements for an extensible CORBA-based multicast demonstrator (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 2 – Feasibility Study: Application of ADSL as Transport Network (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 3 – Market scan of CORBA-COM bridge products (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 4 – State-of-the-art of QoS Frameworks and Architectures for P910 (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 5 –
Selection, design and requirements capture of an e-commerce application (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 6 – Comparison of relevant Service Architectures (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 7 – Top Level Design of the final project demonstrator (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 8 –
Design and specification of servers to be used in the P910 final demonstrator (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 9 – Study on mobile phone integration for P910 (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 10 – Technological assessment of SOAP (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 11 – White paper on Middleware Platforms Scalability and Dependability (F)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 12 – Identification of Security Criteria (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 13 –
State-of-the-art overview of security methods, mechanisms and products used in Middleware Platforms (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 14 –
Investigation of the Influence of Delegation on the Access Control Model (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 15 – Identification of Actions for Security Logging (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 16 – CORBA Firewalls (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 17 – Security of EJB Analysis and Testing (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 18 – Investigation and Design of an Authentication Server (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 19 –
Investigation of Digital signatures and Public Key Infrastructures for the final demonstrator (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 20 –
Assessment of Personal Security Environment (PSE) Technologies and Products (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 21 –
Design and Implementation of a transparent Interceptor-based Delegation Mechanism (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 22 –
Implementation of a transparent Interceptor-based Delegation Mechanism (C)
P910 Technology Assessment of Middleware for Telecommunications – Technical Information 23 – Joint security and Management Demonstrator Specification (C)

Multi-Service Networks

P1009 Armstrong Ipv6 deployment – "A small step for IP but a giant leap for mankind" – Technical Specification 1 – Transition strategies Ipv4 to Ipv6 (F)
P1009 Armstrong Ipv6 deployment – "A small step for IP but a giant leap for mankind" – Web deliverable – Transition Mechanisms Overview – (F)
P1010 Real-Time Services with IP Multicast (RealCast) – Deliverable 2 – Routing and Reliability in an IP Multicast Network – (F)
P1013 First steps towards UMTS: Mobile IP services. A European Testbed – Deliverable 2 –
Reference architecture and test specifications for a Mobile IP-based core network (C)
P1013 First steps towards UMTS: Mobile IP services. A European Testbed – Deliverable 2 –
Reference architecture and test specifications for a Mobile IP-based core network (C)
P1013 First steps towards UMTS: Mobile IP services. A European Testbed – Technical Specification 1 – Specification of tests (C)
P1014 TWIN - Testing WDM IP Networks – Deliverable 1 – Testbed description and test suites for IP/WDM experiments – (C)

Security and Support

P1007 Application of Intelligent Techniques to Telecommunications Fraud Detection – Deliverable 1 – State-of-the-art in detecting telecommunications fraud – (C)
P1007 Application of Intelligent Techniques to Telecommunications Fraud Detection – Technical Information 1 – Annex A to D1: The Problem – (C)
P1007 Application of Intelligent Techniques to Telecommunications Fraud Detection – Technical Information 2 – Annex B to D1: State-of-the-art – (C)
P1007 Application of Intelligent Techniques to Telecommunications Fraud Detection – Technical Information 3 – Annex C to D1: New Techniques – (C)
P1007 Application of Intelligent Techniques to Telecommunications Fraud Detection – Technical Information 4 –
Annex D to D1: Survey and analysis of existing products – (C)
P1007 Application of Intelligent Techniques to Telecommunications Fraud Detection – Technical Information 5 –
Specification of Intelligent Techniques for Detecting Telecommunications Fraud – (C)

Customers and Markets

P901 Extended investment analysis of telecommunication operator strategies – Technical Information 1 –
Application guidelines for using the investment analysis methodologies and models – (C)
P904 Telework and quality of life – Deliverable 1 – Basic concepts and main results – (F)
P904 Telework and quality of life – Deliverable 2 – Recommendations to shareholders – (C)
P904 Telework and quality of life – Technical Information 1 – Theoretical framework and results (detailed documents) and Annex – (C)
P904 Telework and quality of life – Technical Information 2 – TelCos marketing telework solutions (detailed documents) and Annex – (C)
P904 Telework and quality of life – Brochure – The impacts of telework on a sustainable social development and quality of life – (F)

You can download the documents from our Web site: http://www.eurescom.de/public/projectresults/results.asp

RING-TONES FROM THE TREES

SOME THOUGHTS ABOUT ADAPTATION AND INNOVATION IN NATURE AND HUMAN SOCIETY

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Summertime – singing birds are giving their concerts in every forest and every street. Only the electronic sounds of mobile phones are disturbing this harmony.

Again this unpleasant synthesizer sound – why couldn't this guy choose a less annoying ring-tone for his mobile phone? You look into the direction of the ring-tone to spot the culprit. But what do you see and hear: A starling making sounds like a futuristic mobile phone. If you now think that the sun has grilled the author's brain, I can assure you that the 'ring-tone bird' is reality, at least serious media reported about it in May.

A bird named Nokia

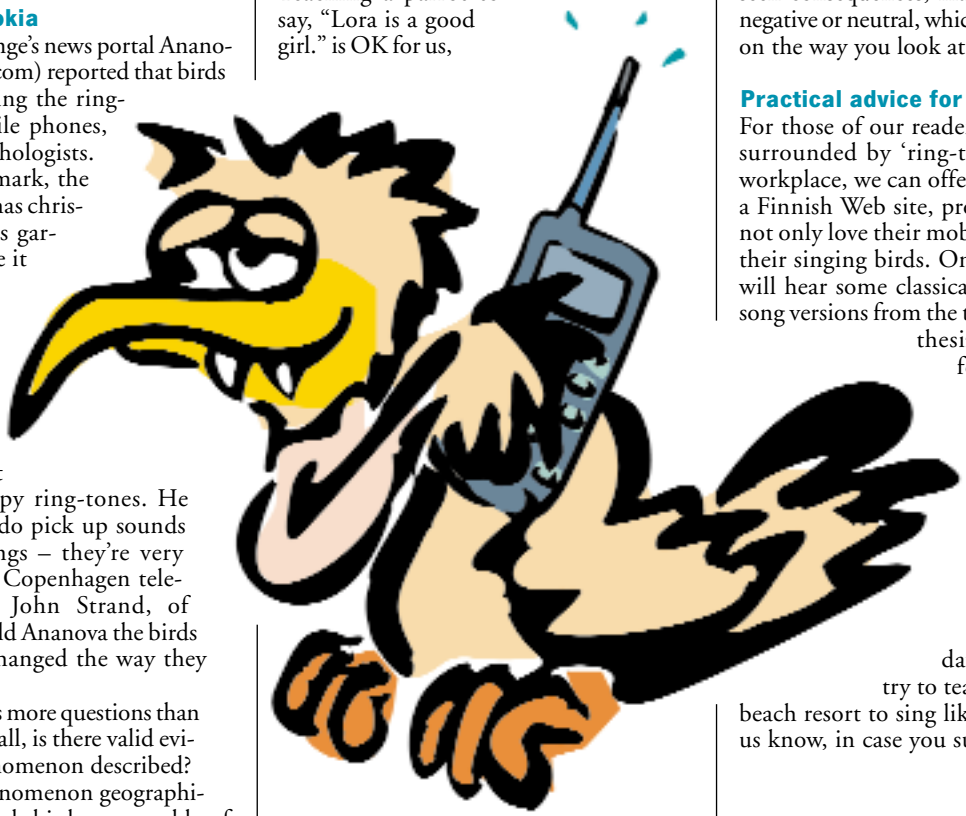
On 10th May Orange's news portal Ananova (www.ananova.com) reported that birds have started copying the ringing tones of mobile phones, according to ornithologists. One man in Denmark, the report continues, has christened a bird in his garden Nokia because it copies his phone. According to a spokesman of the Royal Society for the Protection of Birds (RSPB) starlings are the most likely birds to copy ring-tones. He added: "Starlings do pick up sounds like telephone rings – they're very intelligent birds." Copenhagen telecoms consultant John Strand, of Strand Consult, told Ananova the birds in the city have changed the way they sing.

This report poses more questions than it answers. First of all, is there valid evidence for the phenomenon described? Then, is this a phenomenon geographically limited? Which birds are capable of imitating ring-tones and which tunes do they prefer? Why do they do it – to improve prospects in the mating season? Are 'ringing birds' conquering the urban sound space, causing unforeseeable consequences for the public?

mess@ge asked a renowned German ornithologist for his opinion on this phenomenon. Professor Peter H. Becker from the 'Institut für Vogelforschung' (institute for ornithology) did not know of specific scientific proof for it, but confirmed that there is ample evidence for singing birds imitating voices of other organisms and sounds. He added: "This only happens, if the singing role model of their own species is missing. Moreover, they have to be confronted with the artificial tunes often in order to learn."

'Ringing birds' irritate us

True or not, the 'ringing birds' of Copenhagen irritate us. Usually it is we humans, who imitate nature, for example copying bird songs for ring-tones. Nature, in this case birds, imitating humans are something we are reluctant to accept. Teaching a parrot to say, "Lora is a good girl." is OK for us,



because we are in control of the process. Danish starlings copying our artificial ring-tones without our consent (maybe an IPR case for the WTO?) annoy us because we are not in control of the process and feel a bit ridiculed by some 'lower' creatures which can't even send an SMS.

At least the 'ringing birds' make us conscious of the fact that everything we humans do has an effect on the other creatures populating this planet. 'Ringing birds' are certainly not worrying enough to have bird protection organisations take action. Professor Becker gave the assurance that this phenomenon is probably no problem for the species of birds.

Insights gained from the phenomenon

We may derive two messages from the 'feathered mobile' experience. Number one: Animals and nature in general have a very high capacity to adapt to the changes of the environment caused by human innovations like mobile phones. How nature adapts and if we will always like the consequences is another question. Number two: Whatever innovation we introduce, it will have unforeseen consequences, may they be positive, negative or neutral, which of course depends on the way you look at it.

Practical advice for bird lovers

For those of our readers, who are already surrounded by 'ring-tone birds' at their workplace, we can offer instant help from a Finnish Web site, proving that the Fins not only love their mobile phones but also their singing birds. On this Web site you will hear some classical, unplugged birdsong versions from the time before the synthesizer conquered the feathered world: http://www.kyyro.com/bird-sounds.htm.

Maybe you could use some of the songs as ring-tones for your mobile phones. During the summer holiday you might then try to teach seagulls at your beach resort to sing like nightingales. Let us know, in case you succeed.

WORKSHOP

Lower layers – higher importance
Hot issues in networking

EURESCOM workshop,
25-26 October 2001
Venue: Heidelberg, Germany

Cutting-edge results of EURESCOM projects addressing issues in the lower OSI layers will be presented alongside with selected IST project results and new vendor solutions.

Both access and transport network issues will be covered.

Topical highlights include:
- The impact of IP on the lower OSI layers and the convergence of IP and optics.
- Gigabit Ethernet and 10 Gigabit Ethernet.
- Dynamic provisioning, softswitched optical channels.
- Competing technologies in the metro.
- ITU-T G.ASON and G.ASTN.
- Multi-Protocol Label Switching (MPLS), Multi-Protocol lambda Switching and Generalised MPLS.
- Future role of ATM in the access.
- IP friendly and IP only access solutions.
- Measuring advanced networking solutions.
- Extending and integrating optical access solutions with wireless drops.

Who will be there?
- Networking experts from EURESCOM shareholders.
- Experts from vendors.
- Experts from Europe participating in networking IST projects.

Who should attend?
- Network planners and designers.
- Network architects and strategists.
- People responsible for network deployment.
- IP network engineers.

Demos and exhibitions
Demos and exhibitions will accompany the workshop.

Further information and registration:
http://www.eurescom.de/public/events/events.asp

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