ITEA 2

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Magazine

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EUREKA

Seizing the high ground in
a time of change
Road to ITEA 3

Continuing commitment to
IT innovation in Spain
Focus on Spain

Leading the way to a fuller
multimedia experience
ACDC & JEDI

ITEA 2

INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

European leadership in Software-intensive Systems
and Services – www.itea2.org

ITEA 2 is a EUREKA strategic ICT Cluster programme

Content

Colophon

Editorial

Step by step we are closer and closer to the next phase for our programme. You will find in this edition information on how we intend to enhance ITEA 2 to create ITEA 3. Essentially, the target is to build on the basis of what has made ITEA 2 successful, with some new tools to ensure ITEA 3 will be even more successful, even more flexible and even more open.

We will set up a living organisation to ensure through a quality-management process that our organisation adapts continuously to all the stimuli coming from the outside world. This adaptation is key for the future as nothing is remaining quiet in our environment. We will create a living roadmap to take continuously into account the challenges coming from our projects and especially to create a shared version of the state of the art on the topics of concern to our community about our projects. This roadmap and shared state of the art will be used by project proposers to position their innovation so as not to reinvent the wheel, and will be used by our steering group committee to evaluate the proposals. It will be a way to increase even further the level of innovation in our projects. We also intend to reduce the time between idea and project start. This will be done by a strong involvement of all the parties – public authorities, steering group evaluators and ITEA boards – to reduce the evaluation time and by a new more optimised calendar for our project outlines and full proposals delivery periods. We know how volatile are the ideas. It is important that we can implement them quickly.

Don't be afraid. We will keep the roots of the ITEA success: a bottom-up programme which sticks to the reality of the market; a focus on innovation but one which has the potential to enter the market as quickly as possible; and a flexibility in project monitoring to adapt the project to constraints arising from the market.

The country focus for this edition is Spain, one of our main countries when taking into account manpower involvement in ITEA projects, and you will discover the company INDRA for those who don't yet know it. This is a €2.7 billion company and a global leader in domains such as: transport, energy, public administration, healthcare, financial services, security, telecommunications and media – all ITEA focuses. Note also the entertainment project showcase with JEDI dedicated to 3D TV and ACDC solving adaptive content delivery. Both projects have already provided impressive results on innovation and also on integration of a full value chain, which is a good premise for market exploitation.

I am really pleased to welcome a friend in the Who's Who of this magazine, Klaus Beetz. Klaus is a former member of the ITEA steering group, he has been at the heart of the quality process of ITEA and he is well aware of the strength of our programme. The good news is that Klaus is now the business director of ICT Labs, part of EIT – the new European tool dedicated to innovation. The quality of the relationship will facilitate the co-operation between ITEA and EIT; together we will monitor it on a regular basis and we can say there are already many connections for the benefit of our industry. This collaboration is a good example of how we intend to open our ITEA 3 programme to other clusters.

Sincerely yours,

Philippe Letellier

Philippe Letellier
ITEA 2 Vice-Chairman

Seizing the high ground in a time of change

There is a wide consensus that the next two decades will see continuous change and disruption. By 2030, the world population will have passed 8 billion. The ways of living and doing business will be fundamentally different from today. European industry has to analyse and understand these opportunities – and information and communications technologies (ICT) will be crucial. ITEA is working closely with the ARTEMIS Joint Undertaking to ensure European industry plays its proper role in meeting the challenges and seizing the business opportunities. This is an important part of the preparation for ITEA 3.

There is strong industry backing for ITEA 3 as essential element in public support for software-intensive systems and services in Europe. The competitiveness of jobs and European businesses requires strong support for innovation from both industries and member states.

ITEA and ITEA 2 have demonstrated their efficacy based on a strong, open community, an efficient management process, quality in innovation and time-to-market. ITEA 2 supports the creation of collaborative partnerships across the value chain for successful innovation. Over the last 12 years, it is been able to build a large community across small and large companies, knowledge institutes and geographies.

The EUREKA Network with its ITEA 2 Cluster programme is a unique mechanism supporting innovation partnerships which can develop competitive advantages in international collaboration between large industries, small and medium-sized enterprises (SMEs), universities and research institutes.

Together with more top-down oriented programmes such as ARTEMIS, ITEA 3 will play an important role in strengthening Europe's position in software-intensive systems and services. It is of vital importance for the European Industry to have both bottom-up and top-down programmes. Bottom-up programmes can be more suited to changes in the economy and provide the flexibility to react quickly to new opportunities and developments.

JOINT HIGH-LEVEL VISION

"ITEA and ARTEMIS are currently developing a high level vision for 2030," says ITEA Chairman Rudolf Haggenmüller. "We have identified four areas where we expect major changes globally." The first three are:
1. Management of scarce resources, particularly food, water and energy;
2. Provision of door-to-door mobility, including cars, public transport, electric bikes and aeroplanes, with customers paying for services as an additional option for flexible mobility; and
3. Personalised health and nutrition.

To support these three areas, ICT solutions will involve networked embedded systems at a lower level and global service management platforms on a higher level. A fourth area will be ensuring security of these ICT systems at both the lower and higher levels.

COLLABORATIVE RESEARCH ESSENTIAL

Publically funded research, development and innovation will be required to meet these challenges. "Collaboration is key as no single industry or research institute can develop and provide such ICT platforms alone," insists Haggenmüller. Large industry will have to provide the necessary credibility in view of the scale of the challenges. SMEs will have their part but it is the large enterprises which are able to compete globally and will be responsible for the roll out to the real big markets.

"We have a nice mixture of research and innovation programmes in Europe," he points out. "The EU Framework Programmes are more academic and more oriented to fundamental research. The joint undertakings and EUREKA Clusters provide a balance of top-down and bottom-up approaches with a focus on business."

Klaus Grimm, President of the ARTEMIS Industry Association, concurs. He sees four benefits from public funding of collaborative research:
1. Bundling of forces to overcome fragmentation of effort;

Rudolf Haggenmüller, ITEA 2 chairman (l), Klaus Grimm, president of the ARTEMIS Industry Association (r)

2. Enabling European industry to achieve critical mass;
3. Facilitation of the establishment of centres of innovation excellence and tool platforms ; and
4. Providing a catalyst for risk taking — encouraging companies to look that bit further ahead.

"The role of industry is crucial," points out Grimm. "It is the driver for research and has to be as it sets the targets and priorities." Collaborative research has had an impact on many areas, not least: supporting development of green cars — as ARTEMIS and ITEA demonstrated at the last Co-summit in Helsinki; and driving progress in standardisation.

ONE MISSION, TWO INSTRUMENTS

ITEA and ARTEMIS have much in common. "As we pointed out in a joint high level document in 2010, there is one mission but with two instruments," says Grimm. ARTEMIS starts from a strategic research agenda wich looks 10 years out and which directs research and innovation, and bundles forces to address large common challenges. ITEA is more flexible, bottom-up driven and faster in defining consortia to address specific problems.

While the content is much the same, their approaches are different, according to Haggenmüller. ARTEMIS starts from an agreed pan-European strategy and has annual calls addressing selected topics. It clearly has merits in addressing Europe-wide challenges jointly based on the common strategy and priorities. ITEA is more flexible and can react very quickly to urgent needs.

"Our strategic research agenda is not a limitation," insists Grimm. "It is updated regularly and our annual work programme which is derived from the strategic

research agenda is effectively an annual iteration of it. We have the flexibility to direct calls year by year. And if a project does not seem to be going in the right way, it can be redirected by the Joint Undertaking."

"At operational and practical levels, we have been co-operating for several years," says Haggenmüller. "We are now entering a new period with three actions: development of a joint state-of-the-art database as a baseline for innovation; drawing up a joint high level vision to 2030 on the role of Europe in global ICT; and carrying out research on a global level — world population growth will be outside Europe and the USA and this requires a different approach from past. We need to see innovation in different way with a global web of clusters in co-operation with industrialised nations and emerging countries such as Brazil or India."

"We met again last year to look at our common future," adds Grimm. "This led to the idea of developing an umbrella above both programmes which has come to agreement on a common view that is not an alignment as such but rather avoids contradictions in serving the same mission. This bundles forces and directs projects to one or the other programme."

ITEA 3 is welcomed by ARTEMIS. "The future of ITEA is fairly clear," says Grimm. "Regarding the EU joint undertakings and joint technical initiatives discussions are going on about their future under Horizon 2020 — the EU Framework Programme for research and innovation that will replace FP7." "In any case, it is absolutely essential to have a follow-up programme to ARTEMIS in embedded systems," insists Grimm. "And this will continue to co-operate with ITEA."

Road to ITEA 3

Developing a revolutionary approach

In a time when change will be the norm, ITEA 3 has to be revolutionarily different from earlier ICT research and innovation programmes. It will be a living organisation based on a living roadmap and intends to shorten dramatically the time from idea to project start from 20 to 10 months. It will also take a more global approach to research partnerships and exploit its strong relationships with the other EUREKA Clusters.

The ITEA community decided to reinvent its roadmap for ITEA 3 to be even more flexible and to track the continuous market evolution. Innovation is moving too quickly to predict in advance and so it is valuable to let people in the field decide when and where to put innovation effort. The roadmap for such a target defines a set of agreed challenges which will be covered by ITEA programme and a shared state-of-the-art to ensure the ITEA projects are on track.

The new roadmap will be organised in five sections:
1. Societal and economic challenges – gathering all the challenges targeted by ITEA projects;
2. Projects – describing the projects which produce the state-of-the-art documents;
3. Author database – gathering information on authors of the state-of-the-art documents;
4. Company database – collecting information on the companies involved in the state-of-the-art documents; and
5. State-of-the-art documents from the projects – creating a panorama from the different areas covered by the ITEA projects.

This activity will be the heart of the ITEA 3 innovation steering and evaluation processes. A search engine will enable people preparing new project ideas to see where the state of the art is and from where their innovation will start. During project reviews, reviewers will be able to check presented results against the state of the art. And, the report at the end of the project will provide a clear baseline of the state of the art and a clear indication of where the innovation goes beyond this.

The result will be a continuous updating and not just every four years when a static roadmap would be updated. There will also be a link with ARTEMIS, with its state-of-the-art reports linked to the ITEA database, but the joint undertaking will still need to develop and maintain a strategic research agenda to support its top-down process.

OPTIMISING THE TIMING
An analysis of the timing of the funding decision for recent ITEA calls indicates the delay between the first ideas and actual project start can be 18 months or even longer. One of the goals of ITEA 3 is an optimised calendar which reduces the time between idea and project start, necessary to make ITEA 3 even more attractive to industry.
Such an approach would:
▪ Make a global optimisation of the ITEA calendar, taking into account the funding realities in member countries;
▪ Facilitate local optimisation in the different member countries; and
▪ Explore the space for ad-hoc optimisations allowing a better coordination for phased project starts.

"We trust and believe this is possible," says Haggenmüller. "We have a positive proposal for our Director's Committee that will change our call calendar dramatically. It also needs a change in the way we evaluate the projects and in the way the countries react in their own procedures. We plan to start project outline generation on 15 September and projects will start on 15 July.

MANY ACHIEVEMENTS
ITEA has had many achievements with global impact. Examples include ParMA, which brought together large companies and SMEs to deliver substantial improvements in high-performance computing. It established new goals in modelling and simulation and enabled the development of innovative computer-intensive applications to accelerate research in many domains.

A fresh project is OpenECTS which offers a major step forward in on-board train control systems to overcome existing fragmentation of national systems. There is an urgent need to develop a Europe-wide approach involving both new infrastructure and control systems in the locomotives. Current solutions are proprietary; what is needed is an open system making engines and parts interchangeable. OpenETCS offers this and is good illustration of the strength of ITEA and of EUREKA."

ITEA has also played an important role in healthcare, particularly in advances for medical imaging and automating diagnoses of diseases. Typical is the pulmonary embolism identification system that emerged from the CANTATA project.

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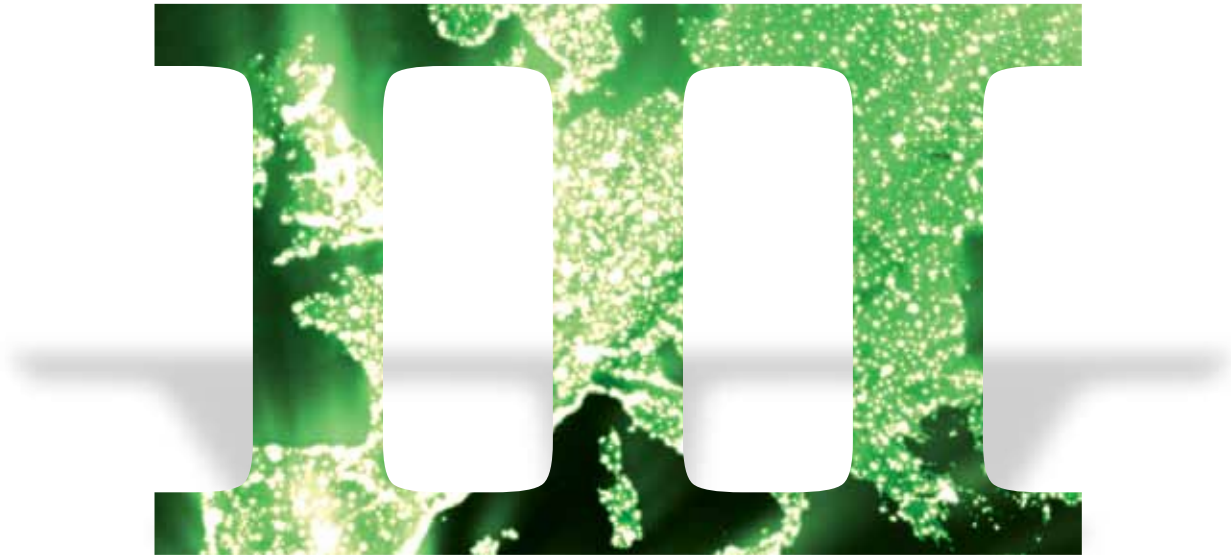
"We are in the concept phase but our core countries — France, Spain, the Netherlands, Germany, Finland, Turkey, Belgium and Austria — are all involved and we are compiling their proposals. However concept is one thing and doing it another, so we need strong and practical support with a willingness to make it happen not only now but also in the reality phase."

IMPORTANCE OF INTERNATIONALISATION
By 2030, the world population is expected to reach 8.3 billion. However 95% of the growth will not be in industrialised nations but in emerging markets which will in less than two decades account for more than half of GDP. The Americas and Europe will account for 22% of this population, 58% will be Asia and 19% in Africa. The industrialised world has no other option than to understand these 8.3 billion people as 8.3 billion opportunities.

EUREKA has a working group on internationalisation. Korea has joined EUREKA and Canada will be an associate member from June this year. Consideration is also being given to involving Brazil, South Africa and Argentina as next candidates.

ITEA has strong, positive relationships with the other EUREKA Clusters such as CATRENE, CELTIC+, EUROGIA+, ACQUEAU and EURIPIDES. ITEA is closely involved in the EUREKA inter-cluster committee and so in the strategic development of EUREKA itself. "We are co-operating closely and I am the current spokesman for the inter-cluster committee," points out Haggenmüller.

COUNT DOWN TO LABELLING
The ITEA Directors' Committee gave the green light for the road to ITEA 3 during the 2011 Co-summit in Helsinki in October 2011, based on an implementation plan developed by the ITEA Board Support Group and the Authorities Committee.

Four documents are being presented to the ITEA Directors' Committee in Istanbul in April 2012. These cover the living roadmap, the living organisation, the shortening of the time and the structural links to other clusters. Based on a positive decision on ITEA 3, ITEA will then make the formal presentation to the EUREKA high level group in Budapest in June to get the EUREKA label for ITEA 3.

The first call for ITEA 3 would be in 2014. "There is still one more ITEA 2 call in 2013 but we expect already gradually to switch to the new speed-up process," says Haggenmüller. "However we want to maintain our traditions such as the Co-summit in 2013 and the labelling decisions in December. The new game will start fully in 2014."

Continuing commitment to IT innovation in Spain

Analysts estimate the ICT sector will become the second largest contributor to GDP in Spain in the next 15 years according to Joaquin Abati Gomez, Manager of National R+D Programmes at the Spanish Ministry of Industry, Energy and Tourism. Within this sector, the digital content subsector will be the fastest growing, particularly the video-game industry, which is considered key due to the enormous creativity showed by local industry and its great economic impact. Spain continues to be committed to ICT research and to growing its SMEs.

The development of new generation networks and increased traffic over mobile broadband networks will be the main factors stimulating future demand. There were more than 24 million Internet users in Spain in April 2010, up from 5 million in 2000. Over 70% of the population is online, and 65% of households have at least one computer of which over 50% have Internet connection. Spain has one of highest number of Internet users in the EU after Germany, France, Italy and the UK.

One of the main axes In the Ministry of Industry, Energy and Tourism action plan for the coming years is dedicated to ICT, with a forecast investment of €2.4 billion, mainly for digital contents. A second axis is the innovation and research sector, with €7.8 billion. "Providing there is a stand still in the economic situation, government cutbacks will not affect excessively the research, development and innovation sectors," says Abati Gomez.

CROSS-BORDER PROGRAMMES CRUCIAL

EUREKA ICT clusters are dealt with by the Secretary of State of Telecommunications and Information Society in Spain. "Our main role, as with all the national public authorities involved in ITEA and other EUREKA ICT Clusters, is to define the national requisites needed to participate, connect the ICT companies with the organisation, evaluate the projects in which these companies participate, certify the adequate use of funding and promote the cross fertilisation of European initiatives and reuse of software and hardware already developed in previous projects under the ITEA umbrella, saving time and money."

Spain sees cross-border public-private R&D programmes as crucial for the national economic evolution of the ICT sector. "Inter-governmental initiatives such as ITEA promote market-oriented collaboration among countries and enable industry and research institutes from more than 40 different countries to co-operate in a bottom-up approach to develop and exploit innovative ideas and technologies."

"It gives our national industrial ICT sector a window to see other countries' possibilities. At the same time, it shows them the new ideas or services in preparation in their backyards, using existing ITEA developments or completely new ones for the planned innovations. It enables sharing of resources, saving money and reducing time-to-market for new products, always following business orientation for the exploitation of the goods and services proposed."

Funding in Spain is through a combination of grants and loans, depending on the type of organisation and the year of the national call. Once labelled, participating projects arrive at the national funding scheme for the R&D sector. This is part of the latest national AVANZA2 plan which has made a real commitment to the development of the Information Society in Spain. AVANZA had a dedicated budget of more than €5 billion between 2005 and 2008 from the Ministry of Industry, Energy and Tourism, through the Secretary of State for Telecommunications and the Information Society.

FOCUS ON GROWING SMES

The role of SMEs in Spain is crucial as the main axis for all industrial sectors and especially for ICT. "It is important to highlight the importance of digital contents in the industrial sector, particularly in the video-game sector, with significant success in recent years," points out Abati Gomez. The market has reached more than €1.6 billion and is still growing.

There is a strong focus on increasing the number of SMEs. Micro enterprises account for 92.2% of companies in Spain, compared with an EU average of 91.8%, while large enterprises account for 0.1% compared with 0.2% on average in the EU. Spain's target for the coming years is to increase the percentage of medium-sized companies from the current 1% to the EU-27 average of 4%.

GETTING INTO BUSINESS

Abati Gomez would like to see greater reuse of applications already developed in one part of Europe but unknown elsewhere. He would like less bureaucracy and greater sharing of research, development and innovation resources throughout Europe with increased industrial co-operation and cross-fertilisation of ideas. He would also like improved exploitation of results with shorter times to market after development programmes. "We should improve commercial strategies and ensure a business orientation is included in all the projects from the beginning," he concludes.

Leading edge IT company focuses on co-operative research

INDRA is the premier information technology (IT) company in Spain and a leading IT multinational in Europe and Latin America. It operates in more than 110 countries with over 35,000 employees worldwide. It is at the cutting edge of high value-added solutions and services for the transport and traffic, energy, industry, public administration, healthcare, financial services, security and defence, and telecommunications and media sectors. Innovation through collaborative research is crucial for the company and it believes strongly in ITEA.

"Innovation is, and always will be, a key strength of our competitiveness and is crucial for our long-term sustainability," says Eloy González Ortega, senior manager and project director at INDRA Systems. "Our commitment is shown by the duration and intensity of our innovation effort, devoting 7% of our annual sales to innovation." INDRA ranks second in Europe in R&D spending for IT companies, investing nearly €500 million during the last three years with over 280 national and international projects in 2010.

Open and networked innovation is a major feature. The company seeks and promotes innovation and talent not only inside the organisation, but also in its clients, partners, suppliers, universities, knowledge institutions and society in general. It follows a decentralised strategy, in which all individuals within the company participate.

INDRA's commitment to innovation translates into alliances with universities and research centres all over the world. The company currently maintains alliances with more than 200 universities and research centres mainly through 14 chairs, 124 bilateral agreements – 24 of them international – and more than 200 research, development and innovation (R&D&I) projects to become an international reference in terms of enterprise-university technology transfer.

ENCOURAGING FAST EXPLOITATION

"ITEA represents the perfect framework for collaborating in R&D&I projects at international level," says González Ortega. "At the same time it allows us to leverage our investment efforts in new technologies with the help of the funds allocated to ITEA projects by the Spanish Ministry of Industry." He sees ITEA as an ideal structure to establish long-lasting relationships with other technology companies, universities and research centres that can complement INDRA's solutions.

"We are fully aligned with ITEA's vision of fast exploitation of project results and these projects act as catalysts for the delivery of these results to the market. We feel very comfortable working in this type of bottom-up project where ideas flow from the participating members to the programme, as opposed to the top-down programmes where you must conform to the specific topics included in a particular call."

González Ortega believes INDRA's contribution to ITEA projects has had a significant impact on their successful development. "Our commitment has been clearly demonstrated by our leadership in several projects, bringing our industry knowledge and expertise to the consortiums to maintain focus on achieving realistic objectives which have a clear usefulness in the marketplace."

"In addition, we have contributed to improve the composition of some consortia by bringing users and industry experts on-board that would otherwise not have participated in these projects. We have also acted as a catalyst for other companies in the industry, especially SMEs."

SHOWING STRONG COMMITMENT

The ITEA 2 project Nemo&Coded deals with network monitoring and control diagnostics for electrical distribution. Labelled in 2008, the Portuguese subconsortium secured funding to start the project in the original time-frame – at the end of 2009. INDRA was convinced of the importance of the project and secured funding to start in 2011. "The results from Nemo&Coded constitute a fundamental element to support and implement the new energy paradigms that European institutions are researching to respond to the energy challenge."

OpenETCS – an archetypal ITEA proposal for quality

By Philippe Letellier, ITEA 2 vice-chairman

The ITEA 2 programme focuses on accelerating the innovation process, pushing innovation on the worldwide market as quickly as possible, with our famous 'fast exploitation' concept. Our target is to select proposals with a great potential for making an important impact on the worldwide market based on innovation.

We receive a set of very good proposals for all of our calls for tender that subsequently deliver innovations which are really deployed on the market. I would like to pick one example of such a proposal in our last call – OpenETCS – to stress some characteristics of the proposal that have convinced the evaluators to push it as one deserving fast funding. We hope it can be useful for future proposers to steer their proposals in the right direction to cope with the main characteristics we are seeking.

OpenETCS is oriented to a key societal challenge: it wants to ensure signalling safety for the rail-transport system. Safety of people is at stake and OpenETCS will enhance the level of safety; it is without any question a societal challenge with great value for society.

OpenETCS is on a key business topic: the European railway industry is still a world leader. Safety is a key demand from customers and the public authorities everywhere in the world. OpenETCS enhancing the safety of the railway system will give our European industry more arguments to sell new products at the global level. When you are a leader, it is always a great advantage to continue to push innovation and be able to put onto the market new products inaccessible, at least for a while, by the competition. It is a way to increase the gap with the competition.

OpenETCS gathers together the main European players: the project involves major European users such as Deutsche Bahn in Germany and SNCF in France, leading industrial enterprises like Alstom and Siemens, and a set of innovative SMEs and academic, which will deliver strong innovations. The consortium is without doubt focused on a unique target, which is safety of train signalling at an affordable cost level.. The quality of the consortium – key customers to ensure the proposed solutions are usable and scalable at actual market level, key enterprises to ensure the ability to access the global market, dedicated innovative SMEs and academics to ensure the level of innovation – and the unique focus of the proposal create the trust in the evaluators' minds.

OpenETCS pushes important innovation: the test phase is always very costly and never reaches an ensured zero-bug implementation. Thus for its safety target, OpenETCS decided to focus on an open-source version of the heart of the signalling software that will allow a lot of developers to monitor the code and check any bad implementation. Furthermore, OpenETCS intends to use formal proof to ensure safety definitively. Due to the complexity and the size of the software, this is an incredible innovation step which OpenETCS intends to take.

OpenETCS will enhance a European standard: OpenETCS is based on the European Train Control System (ETCS) promoted by Europe to enable interoperability through an EU-wide system which equally opens up national markets, closed for more than a century. OpenETCS will enhance ETCS by providing a formalised specification avoiding ambiguities and divergent interpretation of a verbal language specification text and enabling a vendor-neutral reference implementation. By making the core functionality software fully transparent, it will open up the market for software services in equipment lasting usually between 20 and 40 years. To adapt open-source businesses better to the European legal system, this project will be a first application of the EU Public Licence to embedded control software and software tools. Such open-source licensing has been dominated by the USA with versions which do not cover all European needs.

Such strategic vision in the project deserves quick funding by the public authorities. This archetypal example can be used by future proposers to push ITEA proposals based on strong innovation, with important business potential to solve some societal challenges, using standards as a way to disseminate the innovation worldwide.

The strength of our ITEA community is to be able to co-operate all together to generate such innovative projects, with clear targets which make it possible to achieve real impact on the market.

Programme information

New projects in ITEA 2 Call 6

A total of 15 projects were labelled in ITEA 2 Call 6, addressing a wide range of topics.

TRANSPORT

FREIGHT-AAS

Rural freight transport as a service

Small businesses in rural areas often generate too much transport between warehouses and final destinations. FReighT-aaS aims to make such transport more efficient as well as dealing with increasing e-shopping services and their consequences. One main goal is to build a software platform to support development and management of rural planners' decisions and generate further knowledge about the effectiveness of recommendations for rural freight policies.

OPENETCS

Open proofs methodology for the European Train Control System

Europe's railways developed within national boundaries, resulting in different signalling and train control systems, hampering cross-border traffic. The European Train Control System (ETCS) as part of the European Rail Traffic Management System is intended to replace national legacy mainline signalling and train control systems across Europe. OpenETCS is developing an integrated modelling, development, validation and testing framework for leveraging the cost-efficient and reliable implementation of ETCS.

HEALTH

MOSHCA

My mobile and smart healthcare assistant

The number of people with chronic diseases, especially diabetes, is growing worldwide. Self-management of chronic diseases is crucial in the prevention of serious and costly complications. MoSHCA is an e-Health project designed to improve patient-doctor interaction and control of chronic diseases. It provides intelligent, user-friendly medical and well-being decision-making embedded software, using medical sensors for mobile devices and information systems.

MY-SLEEP

Unobtrusive sleep monitoring

Sleep disorders and chronic fatigue syndrome are lifestyle factors which can make it difficult to obtain quality sleep. There is an urgent, identified need to help people get a good night's sleep more often. My-Sleep aims to advance devices and services in the bedroom by improved monitoring, diagnosing and treatment practices to enhance sleep quality. It wants to introduce easy-to-use local and network-supported monitoring service and a sleep coaching service.

MEDIA

ICARE

Innovative cloud architecture for real entertainment

TV services are evolving rapidly. Mid- and long-term convergence of TV will offer new interactive and pleasing capabilities but dematerialised infrastructure and software-intensive systems will offer newcomers affordable solutions to compete efficiently against traditional broadcasters. ICARE intends will demonstrate a way of using the cloud to transport, process, deliver and protect content over a distributed, non-proprietary and adaptive architecture.

INTERNET OF THINGS

SITAC

Social Internet of Things — apps by and for the crowd

The Internet will ultimately interconnect billions of people and trillions of devices. However commercial adoption of Web-of-Objects and Internet-of-Things initiatives is low. SITAC is creating a unifying architecture and ecosystem for seamless connection and co-operation between network-connected entities, whether systems, machines or handheld devices. Innovations include a social networking approach and a distributed framework enabling web-based service representation of smart spaces and the object they include.

ENGINEERING

MERGE

Multi-concerns interactions system engineering

Engineering and architectural solutions are available meeting demanding safety or security requirements in avionics, telecommunications, transport and the energy industry, enforced by domain-specific standards and certification. However, the demand for new capabilities, more integrated devices and more interconnected subsystems are challenging established practices and architectural solutions. Merge will use model-driven engineering to provide tools and solutions combining safety and security in systems development, offering seamless, optimal, cost-effective, safe and secure solutions.

MODRIO

Model-driven physical systems operation

Power plants and transport face stringent safety and environmental regulations in a globally competitive market. Operators must improve systems diagnosis and operation. Modelling and simulation are widely used for system design, but seldom applied to systems operation. MODRIO will extend modelling and simulation tools based on open standards from system design to system operation. The major outcome will be a holistic framework for physical system design, diagnosis and operation assistance.

PROMES

Process models for engineering of embedded systems

Embedded systems consist of mechanical, electronic and software components. Only a smooth integration of these parts can ensure their functionality. To achieve smooth integration, embedded-systems engineering is usually performed in co-development of software, electronics and mechanics – requiring multi-disciplinary, multi-site and multi-organisation development. PROMES will develop new mechanisms for defining and handling process components while integrating mechanical, electronics, and software engineering disciplines.

SERVICES

CARCODE

Platform for smart car-to-car content delivery

Modern vehicles are four-wheel computers, aware of their operational state and their surroundings through sensors, radars and global positioning capabilities, and exchanging information through networking. CarCoDe is developing a software platform for the traffic service domain ecosystem. Tools will be automotive, device and operating system independent software allowing third party developers to generate innovative applications.

DAKSA

Deployable and adaptive knowledge-based service architecture for innovative decision making

Unreliability and fragmentation of services and data sources are making management of knowledge and information very complex. They do not provide coherent aids for good decision making, thus impacting negatively on everyday life and business in many domains, as it is impossible to make good decisions without relevant information. DAKSA aims to mitigate such risks by reducing information errors through a deployable adaptive knowledge-based architecture enhanced by decision-support services.

EMPATHIC

Enabling intention- and emotion-aware products

The success or failure of applications and services is greatly determined by user experience. While careful user-experience design has proven beneficial, surprisingly little effort has been put into measuring and responding to user experience after deploying the application. EMPATHIC aims to achieve better user experience by applying effective computing technologies to understand and respond to user intentions and emotions.

SECURITY

FEDSS

Federated security shield

Societies around the Baltic, North and Mediterranean seas face serious maritime problems from increasing traffic with incidents often affecting multiple countries and societies. International co-operation is essential to resolve these problems. FedSS aims at accessing and incorporating the tremendous amount of data available into security-management systems. The goal is to provide all partners with a new information-handling capability, disclosing data sources on a secure need-to-share basis using semantic information techniques.

PEARL

Pre-manufacturing early evaluation of security for embedded applications

Security contributes to building trust in embedded systems. Cryptography plays a major role in security mechanisms; however security must be incorporated in systems from day one. PEARL will provide a set of tools to help create more secured embedded applications requiring cryptographic services. It proposes an original technical approach in the field of hybrid hardware/software secured systems conception tools and methods for an early security evaluation of security level.

PRI-BIOSEC

Privacy-preserved secure biometric recognition system

Biometrics are employed in various verification systems, with biometric traits compared to reference data in a database server or a smart card. However, this reference data is stored insecurely as plain text. PRI-BIOSEC project will develop uni- and multi-modal biometric crypto systems which can be easily adapted to existing applications including mobile payment, smart card, e-health, access control and public safety applications. The software-intensive system will fully preserve the privacy of the users.

Driving digital TV

Leading the way to a fuller multimedia experience

Digital TVs now offer an ever wider and deeper range of multimedia experiences – from 3D displays on smart phones to the mind-blowing experience of large screen, high definition TVs in the home. Whether it is broadcast TV by terrestrial, satellite or broadband links, high definition Blu-ray disks or fully immersive games terminals, we are a long way from the analogue signals and displays of only a generation ago. Two ITEA 2 projects demonstrate these advances – ACDC showing the power of cloud computing to widen our choice of programming and JEDI the emotion available through the latest generation of three-dimensional TV.

Pulling TV adaptability out of the cloud

ITEA 2 project ACDC is exploiting cloud computing to develop a virtual infrastructure for the adaptation of digital TV signals for more cost-effective distribution of multimedia programming. Broadcasters and network operators will be able to buy services as required rather than having to invest in dedicated equipment, while end users will have access to a wider range of programming on an open platform.

ACDC
ITEA 2 09008

Patrick Schwartz
Project leader,
Thomson Video Networks

Partners
AGMLab Information Technologies
Basari Mobile
Bull
Centre de Recherche Public
  - Henri Tudor
HPC Project
Institut Telecom
KEWEGO
NDS Technologies
Neusoft Mobile Solutions
RESONATE-MP4

RTL BCE
Sanoma News
Sofia Digital
Thomson Video Networks
University of Oulu
VTT Technical Research Center

Countries involved
Finland
France
Luxembourg
Turkey

Project start
June 2010

Project end
November 2012

Website
www.acdc-itea.org

Increasing interchange of digital multimedia means TV broadcasters and operators need to scale their infrastructure to adapt content and distribute programmes. Each broadcaster and operator has to buy its own dedicated infrastructure to encode, process and deliver content for its specific networks and end users. Cloud computing offers an investment alternative, especially for the many feeds that do not need to be encoded in real time. Films, documentaries and even news reports can easily be encoded offline.

"For such contents we can imagine a new business model which will make it possible to mutualise the cost of the infrastructure for the operators by providing pay-per-use encoding, decoding or transcoding services, rather than having their own infrastructures," says Patrick Schwartz, project leader for Thomson Video Networks. "Thanks to cloud-computing infrastructure, broadcasters can ask for transcoding of content and customise delivery to the end user."

NEW BUSINESS MODELS AND VALUE CHAINS
ACDC investigated and experimented with new business models and value chains based on cloud-computing infrastructures combined with contextual semantic information for new services. Use of mutualised infrastructures drastically changes the business model from a capital-cost to an operating-cost basis, reducing the initial capital investment costs, meeting the growing demand for live and file transcoding services, while encouraging the arrival of newcomers to the digital-content delivery business.

The main technological challenges were:
▪ Leveraging cloud computing for multimedia content management;
▪ Enabling automatic metadata generation and collection of multimedia contents; and
▪ Developing a service platform based on a software-as-a-service model, allowing use of hosted contents and semantic information for contextual services.

Major innovations include automatic and scalable content processing for content input, adaptation and storage. The resulting open platform will enable service providers and network operators to aggregate multimedia content, adapt it and deliver it in the correct format for different network topologies and devices.

ACDC involves three layers altogether:
1. The cloud layer for sharing infrastructure;
2. The service platform allowing implementation of software as a service for the different processes, such as transcoding; and.
3. An application layer meeting the different implementation requirements.

The service platform establishes an extension to an existing open platform developed in the ITEA 2 CAM4HOME project with new functionalities. For example, users wanting to receive a specific video or item of music can use a recognition service with personalisation based on semantic technology in a similar way to CAM4HOME but with new semantic functionality. Both Finnish and Turkish partners worked on the semantic requirements for recommendations. In addition VTT, Finland has been particularly in charge of the design and implementation of the service platform and user aware services.

This project also makes it possible to take advantage of a new generation of graphical processing units (GPUs) which prove to be much more efficient for some video-encoding algorithms. Institut Telecom studied two advanced video algorithms, comparing their hybrid and multi-core implementations to know which is better in what circumstance.

MANY TYPES OF APPLICATION ENVISAGED

Applications are legion. A typical use case involved media and communications services specialist Broadcasting Center Europe (BCE) – a subsidiary of RTL – and Thomson Video Networks. The principle was to retrieve programme content in a file-based work flow – for example a film from Hollywood on high speed data links. The content is retrieved by BCE and sent to the cloud where the transcoding process takes place. The broadcaster can then retrieve the file, which has been adapted according to the characteristics of its relevant distribution network.

BCE is installing lots of systems like this for exchanges with FremantleMedia, Hollywood and European broadcasters; it is also used for example in sharing news over the European News Exchange (ENEX). The Movie2Me system – BCE's high-speed content distribution tool – offers a low cost, secure Internet-based global tapeless file distribution system ingesting contents in the Cloud where transcoding services are processed and implemented on Thomson Video Networks VS7000 Unified Platform.

ACDC offers a mix of specially developed software and new infrastructure. For example some of the Thomson Video Networks use cases exploit unified platforms ViBE VS7000, located inside the cloud for process services such as transport and encoding. Other use cases involved software running on existing hardware such as the Bull high performance computer cluster used for many ITEA projects. Several project partners are testing new algorithms using GPUs inside this infrastructure.

"We can already see exploitation starting," says Schwartz. This includes BCE's file-based workflow, a unified platform from Thomson Video Networks which has been installed in several operator locations for web TV applications, and Bull's deployment of cloud solutions to enable on-the-fly adaptation and streaming of IPTV content towards end users.

DEVELOPING A GLOBAL LEAD IN A COMPETITIVE MARKET

Cloud computing is global, so the market is highly competitive with similar solutions emerging in the USA. However Europe still has a lead. "The main difference is that in this project we have semantic services with recommendations on top of the cloud services," points out Schwartz. "We also have some new systems such as the HADOOP system and OpenStack Object Storage used by Bull, HPC project and University of Oulu for these project prototypes."

The ACDC approach involves distributed processing and offers a new way to address IPTV and web TV applications. It also enables distributed solutions based over several nodes. The final demonstrator involves a ViBE VS7000 transcoder in Rennes in France, a link to BCE in Luxemburg with programme contents coming from Hollywood, and all this controlled from Finland.

ACDC worked with earlier ITEA projects such as CAM4HOME, with the Artemis SMECY project on GPU implementation and with the national NextMedia project in Finland. A follow up ITEA project on content protection, bandwidth management and use of cloud computing for distribution management will also start soon.
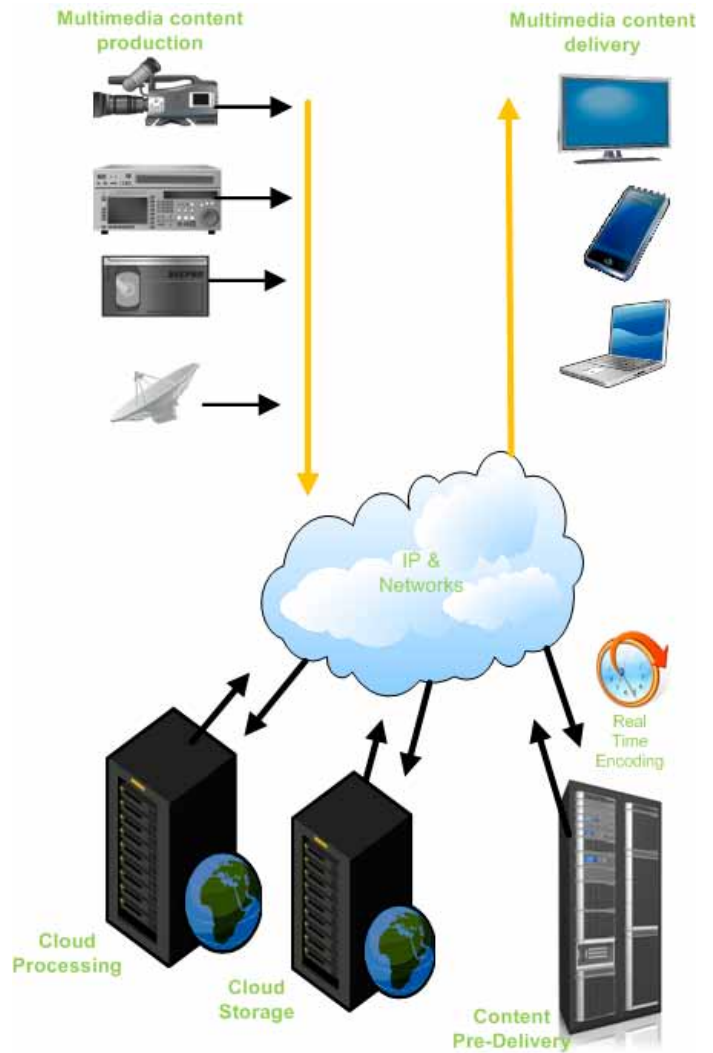
Providing a new dimension for consumer TV

Three-dimensional TV (3DTV) has started to take off with a booming market in TV sets as all new models will be 3D enabled. But while hardware is available, content and distribution are trailing. Although content will undoubtedly develop, especially once the differences between 3D and 2D production are better understood, there has been a need to work on the complete 3DTV delivery chain – and this is where the ITEA 2 JEDI project has a major role.

JEDI
ITEA 2 09009

Issa Rakhodai
Project leader, Pace

Partners
Alcatel-Lucent
Barco
D4D Ingenieria Visual
Hispasat
NDS Technologies
NXP SemiConductors
Pace
Philips Innovative Applications
PLANET MEDIA
SAPEC
Technicolor
Telefónica Servicio Audiovisuales
Telenet

Thomson Video Networks
Trinnov Audio
Universidad Politécnica de Madrid
University of Nantes
University of Zaragoza
Videohouse
VITEC Multimedia
VRT Vlaamse Radio en Televisie
   Omroep

Countries involved
Belgium
France
Spain

Project start
May 2010

Project end
June 2012

Website
www.jedi-itea2.org

According to JEDI project leader Issa Rakhodai of Pace, 3DTV offers many advantages. "It is closer to what we see all day long," he points out. "It can bring out far more emotion in a scene and offers greater immersion and an improved quality of experience. It is a tool for augmented reality and makes games more attractive."

However, the key to user acceptance is quality. In addition, 3DTV faces a series of challenges, not least that 25% of potential users get little or no benefit as in 4 to 5% of cases they cannot see 3D and in another 20% or so, they only see it in a poor quality. Moreover, viewing 3D content can be a problem in terms of having to wear glasses, the need for special user interfaces and disruption when mixing 2D and 3D sequences.

Development of 3DTV does offer benefits to citizens, film and programme makers, and the consumer electronics industry. However, improvements are needed to increase acceptance by users, particularly in terms of viewing comfort.

RIGHT PRODUCTS AT THE RIGHT TIME
JEDI set out to create conditions for European partners over the 3DTV value chain to improve understanding of market evolution and user expectation. The aim was to enable them to prepare the right products in time to meet user demands. Key objectives included:
- Gaining understanding of how 3DTV will evolve and develop for consumers;
- Forecasting a corresponding time scale for consumer acceptance and adoption; and
- Building end-to-end broadcast or broadband communication channels to bring Blu-ray 3D quality – full high definition TV signal per eye – to support these goals.

"There was a lot of discussion in 2009 about the best approach," says Rakhodai. "The first benefit of JEDI has been the development of a common view by all partners on 3DTV and its development." An evaluative end-to-end workflow has been developed for full-S3D video from capture to display via satellite over Europe thanks to co-operation between partners.

Other advances include valuable insights into user experience and preferences – including user interfaces – when watching 3D content on TV. Close relationships and involvement in standardisation groups has also been gained through experimentation and the provision of relevant input and 'live' results.

"We targeted the broadcast and broadband Blu-ray quality end-to-end chain," explains Rakhodai. "This type of workflow did not really exist before apart
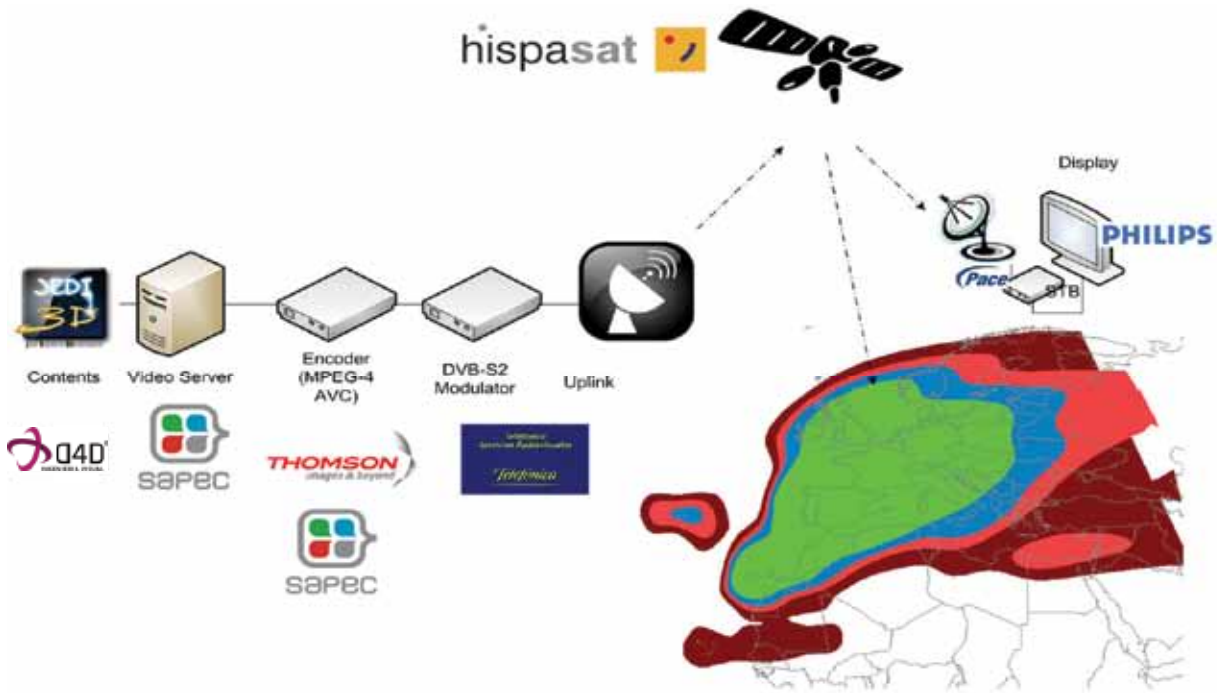
| Capture & Processing | Coding & Compression | Transport & Signaling | Decoding, UI Interface to Display | Viewing & Viewers |

from specific niche use cases evaluated by pay TV operators – and these were proprietary and not full high definition per eye."

The Digital Video Broadcasting Project (DVB) organisation started work on Phase 1 – side by side – frame-compatible 3D signals during the project. DVB has been a success story for Europe as the standard is being accepted worldwide. "Within two months of the Phase 1 specifications being finalised, we were distributing a DVB Phase 1 signal to our partners by satellite over Europe; we are now updating the signal form to meet the proposed Phase 2 specification and are continuing to broadcast this test signal."

GOING FOR A HUGE POTENTIAL MARKET
Involvement in 3DTV is important as this is a huge and highly competitive potential market and it is essential that European partners can maintain and defend their presence. 3DTV broadcasting has started in several countries, including France, Germany, Spain, the UK and the USA.

Standardising on 3D at best quality – that is full HD per eye – and cost effectively requires leveraging

existing technologies and infrastructures. The result is market growth for industry, interoperability and better quality of experience for citizens, and being at the leading edge of the state of the art in Europe.

JEDI is the latest elements in a series of end-to-end chain projects within EUREKA Clusters which have paved way for TV evolution in the past decade. These include the ITEA Magellan project on MPEG4 AVC video compression for standard definition TV, the ITEA HD4U project dealing with HDTV, the ITEA 2 HDTVNEXT project with full HD and full resolution at 1080p50, and the MEDEA+ iGlance and Triton Z 3DTV projects.

At the initiative of JEDI, a common workshop was organised between five co-operative projects in January this year: JEDI, iGlance, French national projects Calder dealing with 3D on mobile and 3DLive dealing with live capture and delivery and the FP7 Skymedia project dealing with HD/3D capture for immersive media experiences.

Exploitation of JEDI results is already beginning with partners over the value chain having already

introduced DVB Phase 1 in their commercial products and experimenting with prototypes for DVB Phase 2. This includes Sapec and Thomson Video Networks with video encoders, Vitec for 2D to 3D converters, NDS for its user interface, Pace for set-top boxes, Philips for TVs and NXP Semiconductors for HDMI and display port chips.

NEXT STEPS
JEDI outcomes will be the basis for further R&D in the domain such as: improving user viewing comfort, assessing usability of 3D over longer periods and 2D-to-3D conversion. Future research will include: tuning 3D rendering in a TV; enabling industrial partners to propose identified and evaluated solution to their consumers; and work by JEDI's academic partners. HEVC and Ultra High Definition (UHD) will undoubtedly be the baseline for the next step in video quality experience both in 2D & 3DTV.

Science or humanities – tough choice for EIT ICT Labs business director

EIT ICT Labs business director Klaus Beetz brings three decades of industry experience in ICT and software in Europe and globally to his new job. He is responsible for coordinating the business activities and supervising the business catalysts of EIT ICT Labs as one of the three directors reporting to the CEO. Experience in the ITEA Steering Group encouraged him to take up this role to help drive innovation in Europe.

A love of both mathematics and literature made choosing between studying the sciences or the humanities difficult. However Klaus plumped for mathematics and philosophy, taught himself computer programming in parallel. "Already as a student, I was fascinated by the plurality of applications and use of software in all the domains of our business and private lives," he explains. "After university, I started my professional career as a software developer and since then software and systems engineering has been my home."

His first job was with Nemetschek in Munich, working on programs for the building industry. "I developed a kernel for finite element calculations for structural engineering of buildings – such as stress analysis of beams and columns," says Klaus. After six years, he became the CEO of the company's technology centres in Slovakia and Bulgaria, where he was responsible for all outsourcing software development as well as the business there.

After five years, he was keen to get back into technology. Siemens offered him responsibility for its department "Software Development Technologies". This job took him back to Germany in 2002, where he was responsible initially for 28 people in Munich. However Siemens was expanding its research and Klaus took charge of ramping up new corporate facilities in China, India and Russia as well as an existing group in the USA.

"In the end, we were some 80 people around the world. Our main task was technology transfer within the Siemens business units and helping them secure their technological future and increase their competitiveness in the software part of their business."

INTEGRATING THE KNOWLEDGE TRIANGLE

Now a decade later Klaus has been seconded to EIT ICT Labs. "The basis here is an integration of the knowledge triangle – education, research and business. We have a CEO and a director for each of these elements: education, research, and business and innovation; each of these elements has a responsible director, all reporting to the CEO."

Klaus was in the ITEA steering group for several years and enjoyed the review role – from initial project outline through full proposal to run time. However, he was keen to see the results of collaborative projects exploited faster and wider.

"Collaborative research is crucial," he points out. "With the so far separate worlds of embedded systems, Internet and traditional Business IT business growing together, our systems become more and more complex. We can only master the challenges coming from this complexity by joint collaboration in terms of open innovation.

"EIT ICT Labs is an excellent instrument on a European level to extend exploitation," he says. "It provides a catalyst to help go from R&D to R&D&I – and not R&D&Die by overcoming the 'valley of death' so the research outcome will result in an innovative commercial product." Collaboration with ITEA is an obvious example, additional funding from EIT ICT Labs will provide a catalyst to speed up exploitation of successful projects.

Now in its second year, the organisation is already in a good position. "We have established an Entrepreneurship Support Systems in each of our countries, with business developers in Berlin, Eindhoven, Helsinki, Paris, Stockholm and Trento. In all of these nodes we help young start-ups and want-to-be entrepreneurs to successfully start and develop their businesses. EIT ICT Labs also helping SMEs or ventures to expand business on a European level – for example with a 'soft landing' in another country – in all our co-location centres we have office spaces and available for a few weeks to enable them to extend their businesses in another country."

In the longer term, EIT ICT Labs is targeting bringing research results faster and better to market. "It is all about job and value creation; our main target groups are start-ups with help for access to finance, business modelling or with our entrepreneurship support facilities. SMEs should not stay as SMEs but grow into big companies. Large enterprises can also benefit through access to a lot of technologies in our networks as well as access to very talented people for instance through our EIT ICT Labs Master's Programme."

Outside business, Klaus has three areas of interest: his family; poems, good literature and good movies; and maintaining his wellbeing – he runs 10 km two or three times a week. He also enjoys the travel around Europe that his EIT ICT Labs job involves.

Guarantee news

Guarantee at Luxinnovation workshop

The rights and obligations for care of the young, elderly and sick are a foundation of society that creates a bond between humans. Our challenge is how to create environments that give care, yet balance the rights and obligations between those roles in society as we age and our society ages. It is also a challenge to use the capital we have invested in homes to avoid taxing the environment too greatly. In giving care, the need to provide immediate aid in case of emergencies is socially as important as care for the chronically sick.

A 'smart homes' workshop was organised by the partners in the ITEA 2 Guarantee project on 18 January at Luxinnovation in Luxembourg. The objective was to demonstrate and discuss innovation in the future smart home to understand 'Alarming at Home'. Alarm systems in and around the home based on the Internet of Things promise to aid people in acute need quickly and help avoid accidents around the home.

The workshop was an excellent chance for healthcare professionals and policy makers in Luxembourg to see how innovation in the Internet can help people vulnerable to incidents around the home. Illustrating how the EUREKA project can link the forces for

innovation in society, such as small and medium-sized enterprises (SMEs), to the common good. Offering the full value of the Internet to society creates better lives for all.

Guarantee and EIT testbed

ITEA Chairman Rudolf Haggenmüller said at the 2011 Co-summit in Helsinki that "EIT ICT Labs can strengthen the business impact of ITEA and speed up the exploitation of research results". The Guarantee ITEA 2 project was the first in line to seek the advantage of the accelerated growth that the EIT will ensure. Both Philips and VTT worked together as part of the EIT ICT centres' activities in Eindhoven and Helsinki to drive forward the EIT testbed to refine those technologies with the greatest appeal for consumer-driven innovations for homecare. "Tremendous impact," says Guarantee project leader Keith Baker of Philips. "Our insights into the market's role of smart lighting and use of robotics in simple and effective concepts to enhance the design of safety for the elderly at home. Multiplying the value of our demonstrators to the project's SMEs many times was a key outcome of the EIT contribution to our project in 2011." Julia Kantorovitch of VTT Finland thought: "EIT health and wellness testbed taught the partners to focus on human-scale issues, the modest, more practical robotic enhancement to everyday devices that will help care for the elderly with a clear value to family." While Jean Gelissen of Philips firmly believes: "The EIT ICT Labs catalysts help transform ITEA 2 project results into meaningful validated business propositions".

MORE INFORMATION:
www.guarantee-itea2.org
www.itea2.org/project/index/view/?project=1140

UsiXML language officially submitted

The new version of the UsiXML language designed during the ITEA 2 UsiXML project has been officially submitted to the W3C Charter Group on Model-based User Interface Design.

For the moment, only the task meta-model, the domain meta-model and the AUI meta-model have been officially submitted, since that was the goal of the first W3C meeting in Kaiserslautern, Germany on 9 and 10 February.

USIXML
USer Interface eXtended Markup Language

The UsiXML submission document is available at: www.w3.org/wiki/images/5/5d/UsiXML_submission_to_W3C.pdf.

The UsiXML consortium is proud to be in charge of putting together a new proposal for the Abstract User Interface, based on all contributions. From the discussion, it is our impression that UsiXML has the most covering, complete, and refined meta-model on which some improvements could be still made to reach a consensus among the group.

MORE INFORMATION:
www.usixml.eu
www.itea2.org/project/index/view/?project=1127

PO Preparation Days 2012

ITEA 2 Call 6 opened with the 2012 Project Outline Preparation Days on 1 and 2 February in Madrid. 255 participants from 18 countries joined the two-day event full of information sharing on ITEA, brainstorming on innovative project ideas and laying the basis for fruitful consortia.

Upfront, around 60 initial project ideas were sent in via the new online project idea tool. During the event, some 45 ideas were presented in the poster session and 40 pitch presentations were held in the parallel sessions. After discussions, ten project ideas decided to present themselves during the concluding plenary session on the second day.

After the event, 40% of the attendees filled in the online evaluation questionnaire. The evaluation results matched the reactions already received in Madrid: an overall score of 4.0 on a 5-point scale. A key element in the evaluation results was the positive comments on the new project idea tool which facilitated networking before the event. The ITEA 2 Office has received constructive feedback on how to improve the tool and will build upon that for future Calls.

The Project Outline deadline was 30 March. 32 Project Outlines were submitted, with a total effort of 3892 person-years. Like last year, the PO Preparation Days were a good starting point for most of the proposals and consortia. Looking back 23 out of the 32 submitted outlines were sent in and/or presented as project idea at the PO Preparation Days 2012.

Calendar

23-27 APRIL
HANNOVER MESSE 2012
HANNOVER, GERMANY

Technology meets progress - HANNOVER MESSE will have eight flagship trade fairs showcasing industrial technology with exhibitors and trade visitors from all over the world

▷ *www.hannovermesse.de*

15-16 MAY
WATER INNOVATION EUROPE
BRUSSELS, BELGIUM

Water Innovation Europe is an event led jointly by WssTP and the EUREKA Cluster ACQUEAU. It aims to push forward the central initiative of the European water sector — innovative collaboration for sustainable & competitive results — through active discussion and debate.

▷ *www.waterinnovationeurope.eu*

5-6 JUNE
ARTEMIS SUMMER CAMP 2012
COPENHAGEN, DENMARK

The ARTEMIS Summer Camp 2012 is a high level strategic meeting of the ARTEMIS Industry Association. Its members give input on the strategy for the ARTEMIS Research Agenda and the compass for the next ARTEMIS call. Participation is on invitation and for members only.

▷ *www.artemis-ia.eu*

13-15 JUNE
EURIPIDES FORUM 2012
GRAZ, AUSTRIA

The event will provide a forum for developers, manufacturers & users of microsystems technology to present their innovation in the fields of Smart Systems, Medical Technology and RFID & NFC applications.

▷ *www.euripides-eureka.eu*

30-31 OCTOBER
ITEA & ARTEMIS CO-SUMMIT 2012
PARIS, FRANCE

More information will follow soon!
▷ *www.itea2.org*

For a frequently updated list of upcoming events: www.itea2.org/upcoming_events

Innovation Reports

EDAFMIS
(ITEA 2 ~ 07011)

Improved imaging, decision making and communications speed minimally invasive surgery

HiPiP
(ITEA 2 ~ 07022)

High performance computing advances cut healthcare costs

EDAFMIS
(ITEA 2 – 07011)

Frank van der Linden, Philips Healthcare
The Netherlands

Improved imaging, decision making and communications speed minimally invasive surgery

The results of the ITEA 2 EDAFMIS project ensure that information technology (IT) solutions can play a major role in the modern operating theatre, especially to meet the growing demand for minimally invasive surgery. Enabling interoperability of equipment, improving real-time imaging technology, simplifying communications with colleagues outside the operating theatre and enabling fast access to expert information allows doctors to work faster, enabling patients to go home earlier and get back to work sooner, as well as helping avoid medical errors.

Modern operating theatres require teams of healthcare professionals to deal with many different instruments during an operation. Equipment includes that for making images, measuring a patient's vital signs such as blood pressure, administering drugs and anaesthetics, and holding and manipulating surgical instruments, as well as providing access to a patient's records.

However, current systems in the operating theatre are stand-alone and not interoperable. Part of the personnel is there just to operate the diverse equipment and provide information exchange. Each has to follow a strict protocol to ensure a correct and flawless process. Moreover, some — such as anaesthetists — are only needed for part of an operation. So they will often work on several operations at the same time — having to enter and leave the operating theatre frequently, involving repeated sterilising. All this is time consuming and leads to errors which can be harmful or even fatal to the patient.

EDAFMIS has therefore developed a new generation of medical operation support systems. This software for a novel generation of systems for imaging and intervention enables easy interoperability and user interaction. It provides a minimal operation cockpit which supports automation and navigation in the operating theatre. A 3D multi-modal user interface supports interaction, both with systems incorporating medical know-how and with the systems acquiring and processing patient data.

REPLACING OPEN SURGERY
The current trend in clinical care is to replace many open surgery procedures by minimal invasive operations which introduce instruments into a patient through a small opening. This improves the success of the procedure, speeds recovery and improves the well-being of the patient.

However, for such operations, the equipment has to work well together — requiring automation support. Equipment is also needed to support navigation of catheters and devices through the patient's body where they cannot be seen directly, acting rather like a GPS navigation system. The use of virtual teams would also optimise the availability for personnel that do not need to be present all of the time.

The problem is that surgical operations have not been well supported by IT. There are too many independent systems trying to communicate with each other. And surgeons have not had access to modern IT solutions such as decision-support systems. EDAFMIS brought together a group of healthcare equipment companies in the Netherlands with a major computer software company in Turkey to change this.

EDAFMIS focused particularly on decision support during planning of the treatment and during the operation itself. The latter involved two different elements:

1. Decision support by measuring all kinds of signals from the patient's body and relating them to already-published knowledge. If there is some reason to warn the surgeon, then some form of alarm can be given; and

2. Support for navigation of all types of instruments within the body with the focus on minimally invasive surgery where the surgeon cannot see the instruments yet needs to ensure they are in the right spot in the body. This requires some form of imaging and navigation, involving real-time image enhancement based on earlier images together with images made during the operation.

IMPROVING COMMUNICATIONS

The ITEA 2 project also worked on improving collaboration during operations — for example, minimising the number of times that people not needed all the time but only for short periods have to enter the operating theatre. The answer is virtual support from outside the operating theatre.

While this was not totally achieved, the first steps were made to obtaining second opinion when not totally sure of an action without the colleague having to come from another part of the hospital and the necessary sterilisation delay. It involves connection via a wireless network to an iPad tablet computer so that the colleague can see images of what is happening in the operating theatre and can exchange annotations and words in real time. The result is faster operations which is good for the patient and for the throughput of the hospital. While the system is not yet totally automated, it much improves planning and working together.

Other innovations included:

- Advanced imaging — mapping 3D images on 2D images, using different colours to aid navigation. The problem is that X-rays do not see enough — mainly showing the bones rather than soft tissue.
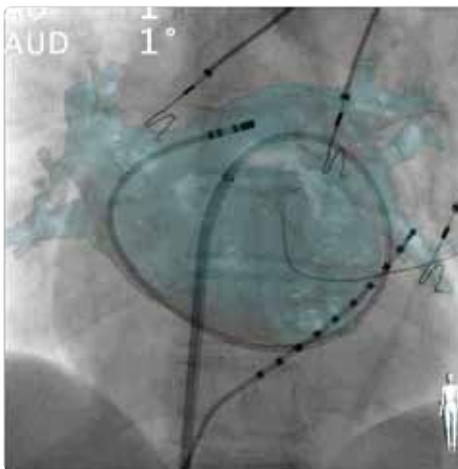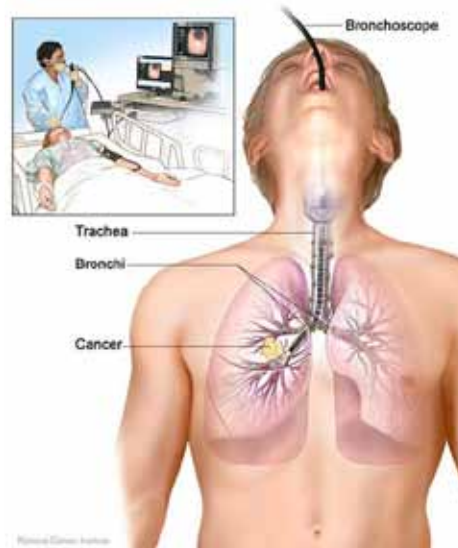
Work focused on improving visualisation of soft tissues based on combining images made before the treatment and during the operation, presenting them in real time to enable the surgeon to work with them;

- Developing decision-support systems for use during the operation that connect to worldwide accessible databases with evidence-based

medicine so that the relevant rules can be applied during treatment. The rules used still need to be selected in the planning stage because there are so many but it can help apply the right ones in practice; and

- Validation of real-time connection and collaboration with personnel outside the operating theatre.

ENSURING FAST EXPLOITATION

A particular benefit has been fast exploitation of results with several products well on the way to commercialisation. Philips will be launching an advanced system for navigation in heart operations in May 2012 with three buyers already lined up — universities in Berlin in Germany and in Boston and Chicago in the USA. This offers electrophysiology procedures for treating electrical problems in the heart — particularly irregular heart beats. And a Philips internal start-up is studying the market and developing its first application for oncology-directed products based of EDAFMIS results.

Product lifecycle management software and systems company Sopheon is keen to use the decision-support tool developed for use during operations to get an enormous amount of information from external sources, showing several ways to get the right information out of it either in the same type of requirement or in other non-healthcare areas.

Mobile services specialist Mobilera has developed an iPad application in collaboration with several hospitals in Turkey which will buy them for internal co-operation later in 2012. And electronic health record company ZorgGemak is now enhancing record handling to deal with real-time data in the operating theatre while offering the connection between the operating theatre and the external world on iPad and other systems.

TAKING A GLOBAL LEAD

The major outcome of this ITEA 2 project is a marked improvement in quality and speed of treatment in operating theatres. First time right avoids medical errors — currently some €80 billion is spent annually on new operations to correct such errors. Moreover, Europe is in the global lead both in navigation for minimally-invasive surgery and in offering a validated iPad application for these types of use.

MORE INFORMATION:
www.edafmis.eu

HiPiP
(ITEA 2 07022)

Frank van der Linden, Philips Healthcare
The Netherlands

High performance computing advances
cut healthcare costs

The ITEA 2 HiPiP project has developed affordable high-tech medical image-processing applications based on high performance computing multicore, multiprocessor technologies. Innovations include improved throughput times with reduced latency and jitter from parallelisation, lower hardware costs and reduced development times from use of standard hardware, and the possibility of 3D template matching. Applications are ready for exploitation in minimally invasive surgery, automated medical screening, radiotherapy scheduling and aging research.

Real-time image processing is of increasing importance in healthcare – particularly for minimally invasive operations, automated screening and medical research. While modern imaging can provide ever more detail, this has resulted in massive amounts of data to be processed. The focus of HiPiP was to apply parallel processing technologies to make faster use of this information – ideally in real time. Similar problems arise in other sectors where vast amounts of heterogeneous data have to be processed quickly.

Key applications of faster 2-, 3- and 4-D – space and time – images were seen as detailed brain imaging, minimal invasive surgery, real-time radiation therapy planning, mass screening for early cancer detection and faster operation of high resolution transmission electron microscopes.

AFFORDABLE MULTICORE PROCESSING
The main problem was to deal with multicore processing in an affordable way with special attention

to medical-image processing. French computer maker Bull and Netherlands-based Philips Healthcare therefore decided to combine forces in a collaborative ITEA 2 project involving two complementary national competitiveness clusters: System@tic in France and Point-One in the Netherlands.

Bull had lot of knowledge about parallelism and was keen to adapt its high performance computing multicore, multiprocessor technologies to time-critical and demanding applications in new areas. Philips wanted to increase the speed of image processing while reducing the cost of its medical-imaging equipment.

Key HiPiP objectives included:
· Reducing complex image-processing latency to enable immediate use of image information – for example in minimally invasive surgery where it allows a surgeon to manipulate complex equipment inside the body while receiving a real-time view;
· Enabling high throughput image processing to handle very large and heterogeneous data sets – such as providing effectively supercomputers on the desktop while increasing the breadth of research studies;
· Predictable short image-processing times for
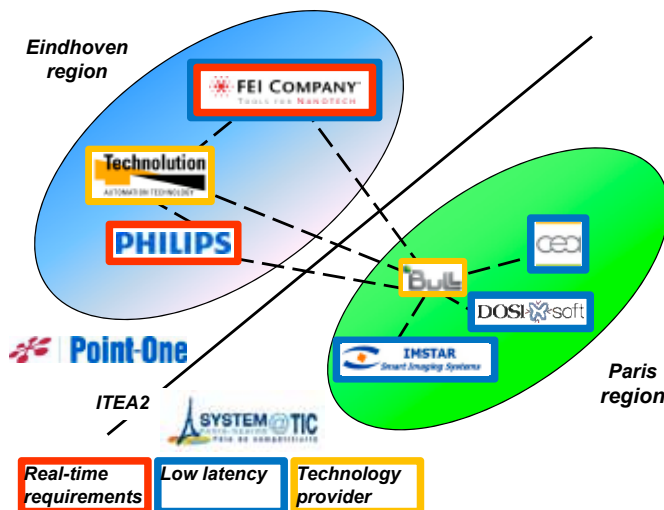
medical operations and diagnosis, and for the use of high resolution instruments; and

• Providing inexpensive solutions for complex tasks – applications, systems and networks as well use of standard hardware solutions.

All this required the development of new algorithms and dealing with process scheduling and memory access not normally carried out in traditional operating systems. Results were well up to expectations with improvements in algorithms offering up to 30% more throughput, 50% lower latency and 20% less jitter. Server-based support was also developed to allow massive image processing, enabling for example project partners FEI and CEA to obtain reductions in processing time of up to 97%.

Introduction of advanced management of computing resources or virtualisation made it possible to carry out background and real-time processing on the same hardware. This enabled Philips, for example, to achieve a more than 50% reduction in process hardware costs in its medical-imaging systems – equivalent to €2,000 per system. Previously, each kind of image needed its own processor, with another processor for all kinds of background tasks. The aim was to combine real-time and non real-time processes on the same hardware to reduce equipment costs. This involved improvements to scheduling and memory access.

MARKETABLE PRODUCTS IN PIPELINE

Significant progress was achieved in the ITEA 2 project, enabling four of the partners to be able already to launch a series of different products on the market in 2012 based on HiPiP results.

For Philips, HiPiP has not only increased speeds but also improved real-time aspects of multicore processing – particularly the predictability of images being be shown in a very short time with little variation in the time taken to process the images. This now enables a doctor to see an image taken a tenth of a second earlier, allowing much improved hand-eye co-ordination when using advanced image processing during surgery.

Such an approach is crucial for minimally invasive surgery where the doctor has to look at the screen to see what he is doing because the equipment is somewhere in the body of the patient. The information needs to be processed quickly while reducing noise in the image and enhancing elements which are important for the doctor to see. Moreover, it is now also possible to make much better images while at the same time reducing patient exposure to X-rays.
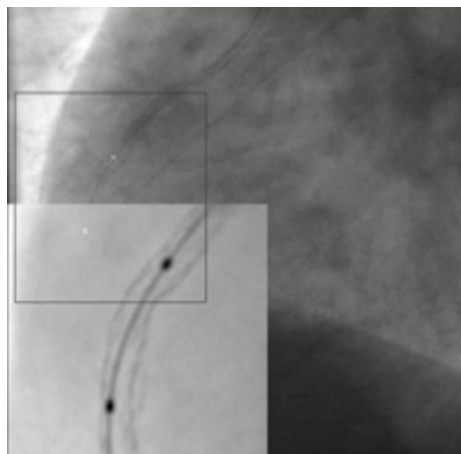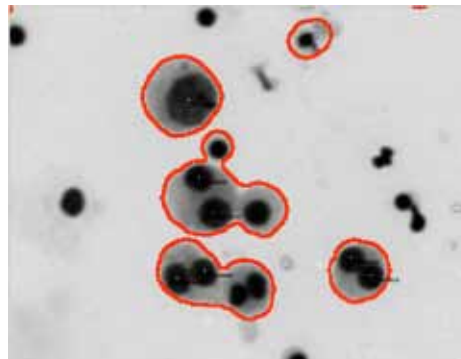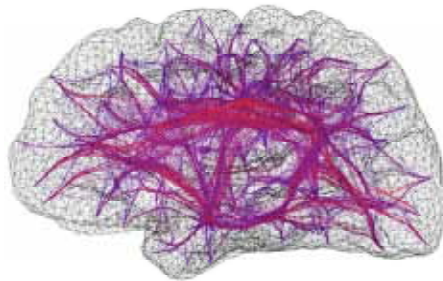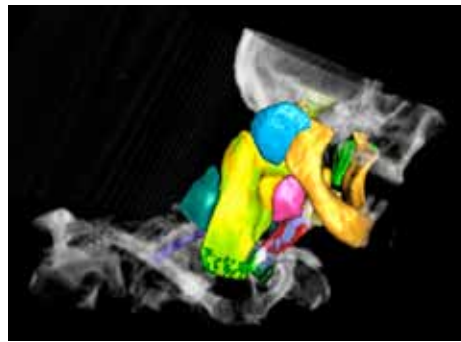
Electron microscopy specialist FEI has increased speeds by a factor of more than 100 using novel algorithms in combination with graphical processing units with hundreds of cores in their post-processing workstations – reducing processing time from hours to minutes.

CEA in France had been carrying massive brain scan studies for Alzheimer's disease research with processing time for one image as long as a week. The results of HiPiP have now reduced this to several hours. This means that much more can be done – for example several images can be taken from one person for comparison. This will play an important role in future medical research. The resulting algorithms will also have clinical applications.

French partner DOSIsoft is involved in planning for oncology radiotherapy which needs to be fast as the body is moving and the cancer growing. Best targeting of treatment requires imaging of the cancer an hour before therapy treatment but this was impossible before. HiPiP has now made it possible, cutting the time for required imaging to only 20 minutes. Skilled manpower resources are also reduced as the process can be partially automated – before a doctor was needed to indicate the organs seen on the screen.

Automated digital imaging specialist IMSTAR has been able to make a step change from manual to automated high-throughput medical screening systems, enabling improved performance at a reasonable price. While an algorithm existed for automation, processing took too much time. Automated tissue and cellular imaging can now be run continuously with only unusual cases having to be referred back to a doctor.

Bull itself has made important advances with new application domains and market targets for high performance computing. It has extended its systems with real-time capabilities for image processing and other time-critical applications. And it now has a scalable real-time high performance computing infrastructure ready for use in other commercial projects.

COMMERCIAL AND MEDICAL BENEFITS

Overall the project was a major success with a limited number of organisations working well together with clear goals and marketable results. HiPiP has boosted Europe's position on the global stage with a greater understanding of real-time parallel processing. And it has brought about important benefits in patient care through faster, more targeted treatment and reduced X-ray exposure.

MORE INFORMATION:

http://hipip.eu

EUREKA News

Korea EUREKA Day a success

Brussels, 21 March

Over 200 participants representing national governments, funding agencies, industry and academia attended the Korea EUREKA Day event, which took place in Brussels this year. The event was organised by the Korean Ministry of Knowledge Economy (MKE) and the EUREKA Hungarian Chairmanship. Under the theme of 'Bringing Korean and European innovation together', the conference held on 21 March aimed to provide a platform where technology and innovation experts from Europe and Korea could share project concepts for the generation of new proposals and establish new connections. Ministerial representatives from Korea and European countries, the European Commission, members of the EUREKA Network and its Clusters discussed on how to further Korean-European co-operation.

In the afternoon, several matchmaking sessions provided the opportunity for companies to identify potential partners. ITEA 2 Office director Fopke Klok presented the ITEA 2 Cluster in the session on IT and electronics technologies. Furthermore, OpenETCS project leader Klaus-Rüdiger Hase of Deutsche Bahn presented the ITEA 2 project to the participants in that same session.

Sources: EUREKA - www.eurekanetwork.org & KIAT - www.kiat.or.kr

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