

ITEA 2

M

Magazine

SEPTEMBER 2010 • NO. 7

ITEA & ARTEMIS Co-summit 2010

A first peek at our major event in Ghent!

Three key views: IWT, Barco and
Triphase reflect

Focus on Belgium

User-created/shaped
mobile services

Project showcases – LOMS & DiYSE



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

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INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

ITEA 2 (Information Technology for European Advancement) is Europe's premier industry-driven co-operative programme for pre-competitive R&D in Software-intensive Systems and Services (SiSS).

As a EUREKA Cluster programme, ITEA 2 stimulates and supports projects that will give European industry a leading edge in the area of SiSS.

M – ITEA 2 Magazine is published three times per year by the ITEA 2 Office. Its aim is to keep the ITEA 2 community around the ITEA 2 projects updated about the ITEA 2 programme status and progress, achievements, projects and events.

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Submissions: The ITEA 2 Office is interested in receiving news or events linked to the ITEA 2 programme, its projects or in general: R&D in the Software-intensive Systems and Services field. Please submit your information to communications@itea2.org.

Opinions expressed in the M – ITEA 2 Magazine do not necessarily reflect those of the organisation.

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Editorial

Quality in a changing environment

In most enterprises, one has to deal with increasing quality requirements while operating in a changing environment: "During refurbishment of the shop, business will continue as usual". In ITEA this is no different.

As this seventh issue of the ITEA Magazine appears, the ITEA Presidium and Office are at the peak of the preparations for our 2010 Co-summit, under the theme: "Mobile and Cloud Power Enabling Massive Scalability and Opportunities for Growth". Elsewhere in this issue we provide you with a peek into the very interesting programme that we have set up around that.

This is the third year that we are organising our event in co-operation with ARTEMIS. And we can be happy with the observation that the quality of the event has continued to improve over the years, while we have grown steadily from about 400 participants in 2006 to around 600 in 2009 with the annual change in locations and with the changeover to a Co-summit with ARTEMIS in 2008. We are working hard to continue these trends in 2010.

Of course the key point is that the quality of the ITEA programme and its results continuously demonstrate further improvements. This should be the clear message at the Co-summit and the exhibition. In this issue, I would like to concentrate also on the operational quality around the ITEA programme.

In order to communicate about our programme and its results, we introduced this ITEA 2 Magazine in 2008 to present the projects, their results and the people behind them to a broader community. So far, we have received very positive feedback. In addition, we are preparing a document focusing on some of ITEA's most prominent success stories, which is to be presented at the upcoming Co-summit in October. Further visible improvements are also becoming real now on our website, e.g. in the registration process for the Co-summit. Also visible is the strong growth in participation to the PO Days from 180 in 2006 to 280 in 2010.

Less visible, but also important in the Office, is the increase in the number of active partners (companies) in our projects – from less than 500 in 2006 to about 800 in 2010. One of the consequences related to this is that the number of processed invoices has quadrupled between 2006 and 2010. Nevertheless, the operational costs have only increased by just a bit more than inflation rates namely about 20 % between 2006 and 2010, and the overhead of the office is still covered by less than 1.1 % of the total programme cost.

Co-operation with others is key, not only in the ITEA programme but also in the ITEA 2 Office. First of all with the ITEA community: basically largely a co-operative, friendly and supportive community which helps us to do our work effectively, efficiently and with pleasure. But also together with ARTEMIS(-IA) within the Offices and towards our third Co-summit. And last but not least with other co-operating partners such as the EUREKA Secretariat for communication, publicity and presence at fairs and events, and with the CATRENE Office in Paris with whom we co-operate on our back-end systems for ICT.

In summary: ITEA is a successful programme and it is a pleasure and a rewarding experience for all in the ITEA 2 Office to contribute to its successful day-to-day operations.

Fopke Klok



Fopke Klok
ITEA 2 Office Director

Mobile and cloud power enabling massive scalability and opportunities for growth

On 26 and 27 October, the ITEA & ARTEMIS Co-summit 2010 will be held in the International Convention Center in Ghent, Belgium. It is the third time that ITEA 2 and ARTEMIS are co-organising this event, with over 600 participants expected from industry, academia, public authorities and press. The Co-summit will give participants a unique view on the combination of research excellence and business-driven innovation in Europe.

The 2-day Co-summit programme is dedicated to this year's theme 'Mobile and cloud power enabling massive scalability and opportunities for growth'.

MESSAGES FROM THE COMMUNITY

On Tuesday 26 October, the programme will focus on messages from both communities. Plenary sessions will present the current status of the programmes and their progress. ITEA 2 Vice-chairman Philippe Letellier will especially touch upon the successes of 12 years of ITEA and beyond.

We are also proud to announce that on this first Co-summit day, the nominees for the 2010 ITEA Achievement Award will present themselves:

- CAM4HOME: Enabling new multimedia deployment in the digital home;
- ESNA: Making wireless sensor networks a business reality; and
- PARMA: Parallel programming for multi-core architectures

The actual Award ceremony will take place on the afternoon of 27 October.

HIGH LEVEL SPEECHES AND INTERACTION OPPORTUNITIES

The second day, Wednesday 27 October, will also have a very attractive programme for participants. The morning will include high level keynote speeches from public authorities and important European industry players. The afternoon will give the participants the opportunity to join the parallel sessions. This year, there will be three such sessions:

- Cloud computing – moderated by Mr Jean-Pierre Laisné of Bull;
- Innovation processes – moderated by Mr José Heredia Alvaro of Jaume University; and
- Multicore systems – moderated by Mr Eric Schutz of ARTEMIS-JU

COMBINING RESEARCH EXCELLENCE AND BUSINESS-DRIVEN INNOVATION

During the full two event days, the Co-summit will be the main stage for the ITEA and ARTEMIS project exhibitions showcasing over 75 projects. Participants will be able to experience at first hand, through project presentations and full demonstrations, the three major focus points of ITEA: innovation, fast exploitation and business impact.

ITEA 2 establishes ties with many competitiveness clusters (PdCs) all over Europe to connect national initiatives at the European level. This is reflected in the presence of several PdCs at the project exhibitions.

IBBT Nocturne

In the evening of 25 October (build-up day of the Co-summit), IBBT will organise a Flemish Nocturne in the ICC Ghent (starting at 17:00). The Nocturne includes a plenary session with speakers from IBBT, IWT, IMEC, Alcatel-Lucent and Spikes. The event will be concluded with a networking reception. The Nocturne is free of charge and open for all Co-summit participants. For more information: <http://events.ibbt.be/en/flemish-nocturne>

CO-SUMMIT 2010

26 & 27 October
ICC Ghent, Belgium



Co-summit *parallel sessions*

A series of parallel sessions will be held in the afternoon of the 2nd day of the Co-summit. The three session moderators have prepared a short summary to give you a first glance at what the sessions will entail.

CLOUD COMPUTING

By Jean-Pierre Laisné, Bull

Nowadays there is no discussion, panel or presentation about any topic related to ICT that can last more than 15 minutes without the terms 'cloud' and 'cloud computing' being evoked and taking over. This is a reality check which relies on the fact that most ICT users are expecting cloud computing to be the next promised land, where they will see most of their problems solved – be they economical, technical or organisational. And while most of these promises are coming from overseas, European ICT players are making significant progress to face up to this new paradigm. The goal of this session is to cover the different aspects the term cloud computing is involving with a panel of European specialists and exchanges with the audience as interactive as possible.

Among the aspects which will be addressed during this session, the challenges posed by cloud computing in defining the future of technologies will be discussed. To do this and explain from what it comes and where it is going, a roadmap will be used to describe the evolution of this major trend, the different offers, architectures and technologies, and to position European initiatives on the map. Questions such as 'How open should cloud computing be?' or 'Is cloud computing an opportunity for Europe and how?' will be asked and answers will try to take into account the different positions of the various players.

Finally, the 'cloudy' side of cloud computing will not be neglected. Issues such as interoperability, privacy and security will be examined. And this should lead the discussions to broader topics such as European sovereignty, economic sustainability and societal impact for the European Community in term of R&D, industry, education, knowledge and digital inclusion.

MULTI-CORE SYSTEMS

By Alun Foster, ARTEMIS-JU

Realising the potential of multi-core embedded systems demands a new approach. Their complexity, stringent constraints on dependability, performance and time to market can only be mastered using highly evolved design techniques. A "one-size fits all" approach is unrealistic, given the diversity of applications, yet the search for solutions that are scalable and that can embrace the design demands across many domains is on. The projects presented here – PARMA, SMECY and ACROSS - give a glimpse of the advances being made in this rapidly evolving field.

The ITEA2 "ParMA" project developed advanced technologies to fully exploit multi-core architectures. While multi-processors are commonplace, the potential of parallelisation cannot be easily exploited. So, ParMA produced a powerful, innovative, and comprehensive set of parallel programming methods and tools to help restructure and optimize compute-intensive applications so they can fully benefit from new multi-core architectures.

ARTEMIS, with "SMECY", looks at multi-core tools for Embedded Systems. Multi-core technologies are strategic in meeting embedded systems' demands and efficient programming of multi-core architectures for resource-constrained and real-time applications (consumer, wireless, transportation ...) is still a grand challenge. SMECY is an ambitious initiative designed to keep Europe at the forefront of Embedded Multi-Core development technology.

With "ACROSS", ARTEMIS builds further on the FP7 project "GENESYS", which defines a virtual platform that can be applied over a wide range of

applications, can be scaled to the requirements of a given implementation and can facilitate re-use of design solutions from different fields. ACROSS will define a real-world hardware and middleware platform that complies with the GENESYS architecture blueprint. The platform will be demonstrated using some demanding applications from the automotive, aeronautics and industrial control sectors.

PRACTICES FOR SUCCESSFUL INNOVATION

By José Antonio Heredia Álvaro, Jaume I University

Most private and public investments in research and development for ICT-based products and services fail to produce valid business results.

The satisfactory selection of practices and their execution during the project life cycle depend upon the specific characteristics of each project. Factors such as people capabilities, degree of project risk in terms of technological and market uncertainties, and type of product are the dimensions considered to have more influence in the kind of management to be executed.

Hence the identification of the project type and the practices to be selected from the rich state of the art could make the difference between having a project with real business impact or just another interesting research experiment.

This session will discuss a new paradigm towards mastering innovation, including forward-looking examples of where a new methodology is used and what impact its application promises.

Topics that will be addressed include:

- Open, focused and user-driven innovation;
- The practice areas for innovation;
- Innovation-culture development; and
- The role of IT support in fostering innovation.

The session will promote discussion on the need for a new collaborative platform providing expert services to support innovation looking for business impact and its potential value for ICT projects.

Join us and register!

Come and join us during this unique European event! For more information and registration, visit the Co-summit website: www.itea2.org/cosummit2010. The registration deadline is 24 September (subject to the limitation on the number of participants)

Focus on Belgium

The Flemish Government strongly supports its dynamic and flourishing information and communications technology (ICT) sector to the benefit of both its large enterprises and its many high tech small and medium-sized enterprises (SMEs). The small size of Flanders makes cross-border co-operation essential and the region fights above its weight in international programmes such as ITEA.

STRONG SUPPORT FOR INTERNATIONAL CO-OPERATION

"Overall, we are strongly in favour of EUREKA and of international co-operation. We strongly believe in such mechanisms despite some problems in agenda setting. We have always been very active in the EUREKA ICT Clusters and will continue our participation very happily."

Leo Van de Loock, IWT

"Flanders funds ICT research in three ways," explains Leo Van de Loock, IWT director industrial projects:

1. Annual strategic funding for IMEC, the largest independent research centre for nanoelectronics in Europe, and the IBBT, which brings together 600 researchers from various Flemish universities and knowledge centres;
2. Project funding through the IWT horizontal schemes, mainly the programme for industrial projects and through the EUREKA Clusters and the EU Joint Technology Initiatives (JTIs) internationally; and
3. Cluster funding, where the IWT funds organisations that promote research collaboration between companies, such as the PICTOR industrial research cluster for ICT innovation which supports the setting up of ITEA and ARTEMIS JTI projects.

International co-operation is important for a small country such as Belgium with its very open economy. "We are the fifth or sixth largest funder of EUREKA projects and a strong believer in Clusters such as ITEA, as ICT is a strongly international sector," says Van de Loock. He sees some overlap between the EUREKA Clusters and the JTIs with the same companies in both. IWT supports the two, appreciating the funding available through the EU programmes but valuing the flexibility of EUREKA and more control possible at local level. However, the multiplicity of systems can be a problem for small countries that have to follow all the different channels and keep its clients informed.

Strong public support for ICT

The ICT sector in Belgium is small but flourishing, and is particularly software intensive. Research and innovation funding is mainly at regional level, with public support for ICT coming through the ministry and the agency for innovation by science and technology (IWT) in Flanders. Wallonia and Brussels also give support, but are less active in the international programmes.

SETTING THE LOCAL AGENDA

The role of large enterprises such as Barco in international co-operative research is important. They act as role models for smaller companies and, as core players, provide a gateway to get other partners involved. They also help set the local agenda, influencing the public authorities.

IWT itself is relatively small – acting as a national contact point for international programmes and as a source of information, thus it is not involved in the direct set-up of projects. IWT represents Flanders and often Belgium on the boards of international programmes such as ITEA.

"We are in favour of cross-border collaboration with the right system of funding," says Van de Loock. "The aim of IWT is getting economic activity in Flanders. However, while the profits are made all over Europe, the costs are here in Flanders in the current system. This is a major problem for capital-intensive research efforts – though perhaps less so for software – that needs to be solved for a real European research area."

Van de Loock believes also that regions need to label research funding for economic benefit rather than pure science. "There is a scale effect through collaboration that is important, but it may be necessary to compromise on direct benefits," he says. "I like EUREKA because the balance is OK. With more centralised operations, the balance could shift."

Survival of manufacturing companies requires a level playing field for the research base and on the production side. And ICT is high on the agenda of the current Belgian EU presidency.

More information: www.iwt.be

Participation helps market transition

Belgian company Barco is a global technology company developing visualisation solutions for professional markets. These include medical imaging, entertainment, infrastructure and utilities, transportation, defence and security, education and training, and audiovisual presentation. An ITEA Founding Company (IFC), Barco has been involved in a series of projects that have helped in the development of new markets and in new methodologies to improve its ways of working.

Software plays a key role in imaging products that optimise productivity and business efficiency. Barco's innovative hard- and software solutions integrate all aspects of the imaging chain, from image acquisition and processing to image display and management. The company is active in more than 90 countries with facilities in Europe, America and Asia. It employs some 3,300 people worldwide and had sales of €638 million in 2009.

The company is a strong believer in publically-funded co-operative research with solid support from IWT. Barco was involved in the establishment of ITEA in 1998. As an IFC, the company participated in all the early workshops and work-group meetings. "It was the right time for Barco as we were planning major changes in our industry and there was a need to develop a common platform for digitisation," explains Luc Desimpelaere, Director Innovation Programmes at Barco.

This co-operation has had a marked effect on the success of the company. For example, the first ITEA project with which it was involved led to the development of digital cinema projection equipment in which Barco is now a world leader. Later projects resulted in new approaches to TV control room management and network control. Moreover, participation in ITEA projects has led to new methodologies for high resilience software and software families to speed up and improve the quality of product development.

ENCOURAGING COMPLEMENTARITIES

Desimpelaere sees a major benefit of ITEA in the complementarities of the companies involved. "We

PUBLIC SUPPORT IMPORTANT

"Publically-funded research projects provide us with the framework for working in a more global context. We work in a small country; publically-funded research makes it possible to co-operate with larger players and it is extremely important that our local public authority is supporting us."

Luc Desimpelaere, Barco

are neither a consumer electronics company such as a Philips, nor are we a service company," he points out. "Rather we are involved in the professional side of television production – the backbone, studios, etc." ITEA also provides a more flexible approach to co-operative research than the EU Framework Programmes, which Desimpelaere finds somewhat artificial. "The Framework Programmes focus on pure technology; ITEA offers a bottom-up approach based on consensus building and market orientation," he adds. However this is still a high risk area and support from the local funding authority is crucial. "The IWT has been very helpful from the beginning," says Desimpelaere.

More information: www.barco.com

Support for continuous improvement

DON'T BE SHY

"As a hint to other SMEs keen to participate in European projects, don't be too shy. The work may be governed by the big players but SMEs have their place inside such projects – which the big players recognise. Don't hesitate to network and make yourself known as that is the best way to get involved in such projects."

Frederik Loeckx, Triphase

"Our technology is intended to speed up the development of power electronics and particularly how they are controlled," explains CEO Frederik Loeckx. "Our platform enables us and our customers to go very fast from simulation to real life."

Applications of the platform include electric and hybrid vehicles. Currently the company is working on converting two 18-tonne delivery vehicles into an electrified version, one into a series hybrid diesel electric truck and the other one into a pure electric vehicle. In both cases, the products are intended for OEMs, with Triphase focusing on the electric power trains.

Triphase uses commercial off-the-shelf (COTS) components wherever possible as hardware design is time consuming. "We focus on the software side, which involves synchronising measurements, controlling electric motors of different types and handling the complete energy management within such a vehicle," says Loeckx.

APPLIED RESEARCH

"We are continuously doing research – applied rather than basic – for which we use public funding from national and European-level programmes." Such funding comes through IWT and the company is currently involved in two national and three European

Belgian SME Triphase specialises in the fast realisation of complex, high-performance, industrial power electronics. This spin-off from Leuven University (KULeuven) focuses on the customisation of electric power conversion systems to specific customer needs in order to help them obtain a competitive advantage in their own markets. Participation in a series of co-operative projects, two in ITEA, has enabled the company to improve its initial technology on a continuous basis.

projects – two in ITEA 2. "Talking to other people in Belgium involved in ENIAC, etc., we are lucky here that all these programmes are handled and funded through a single agency – IWT. This is not always the case in other countries and is major advantage for Belgium." The first involvement in ITEA came about because Triphase was already working on a national project with engineering innovation company LMS – the contact to ITEA 2 for MODELISAR. Involvement with the ITEA EVOLVE project came about through a knowledge centre in Flanders.

Triphase's interest in MODELISAR is the focus on simulation tools and bridging the gap between simulation and real life. "This involved defining standardised application programming interfaces (APIs). Knowing they are available inside the software packages of the different vendors is important as we only need to support one set of functions rather than having to integrate repeatedly in different packages." EVOLVE deals with verification of embedded software – a particular problem in the automotive domain as bugs in vehicle software can be dangerous. "Our development methodology already involves early verification of software and we wanted to be state of the art," he says. "We also have a real-life test bed in the form of zero-emissions racing kart to test the tools we developed."

GAINING ACCESS

MODELISAR is a very large project with 36 partners. "Participation offers not only access to technology but also to networking – providing access to right people at the right place," says Loeckx. "The problem for SMEs is getting the attention of bigger companies;

ITEA helps in streamlining the project and making sure that things get done."

He believes strongly that SMEs have much to offer in co-operative projects: "We are more innovative and flexible, and add different views to the consortium as we are much closer to the market." However it is also a question of balance as SMEs can be frustrated by the bureaucracy and slowness of bigger organisations.

More information:

www.triphase.com

Flexible value chain-oriented approach simplifies mobile Internet service creation

LOMS ITEA 04012



Marc Roelands
Project leader,
Alcatel-Lucent Bell Labs

Partners	University of Rostock Yellowmap
Communology Concentra European Software Institute Devoteam Telecom & Media Fraunhofer IAO Ibermatica Infoman K.U. Leuven ORGA Systems Siemens C-Lab T.U. Berlin University of Paderborn	Countries involved Belgium Germany Spain
	Project start August 2005
	Project end June 2008

The Local Mobile Services (LOMS) project set out to combine Internet service creativity with the rich features of a well-controlled service environment. By hiding complexities from service operators and offering easy template-based service creation and management to service providers, it allows small enterprises and even end-users themselves to offer tailored and geographically-specific services and content without needing technical know-how. The benefits of the approach were clearly demonstrated during the project. Commercial applications are being developed.

Public communications network operators would like to be more than simple bit-pipe providers. They are keen to offer a portfolio of Internet services to address the 'long tail' of smaller service markets among their large customer bases that can be managed directly and charged according to flexible business models, while keeping their operational costs within justifiable limits.

At the same time, more and more businesses want to use the Internet and web technologies to market their products and services, particularly to local mobile users. However such suppliers face many technical hurdles when trying to introduce innovative and widely-available e-services to the general public or to targeted customer segments.

OFFERING A SMART COMBINATION

LOMS realised there was a particular problem for small companies, independent professionals and other individuals that did not have the relevant technical know-how in-house. While various attempts have been made to offer simplified programming environments, technical knowledge is still required. The ITEA project therefore intended to combine service creativity easily with rich, powerful features of a well-controlled service environment.

"We identified a number of barriers to the creation of an ecosystem for Web 2.0 mobile and media applications, particularly for the inclusion of underlying network features such as location and charging," explains LOMS project leader Marc Roelands, now with Alcatel-Lucent Bell Labs in Belgium. "LOMS set out to see how to remove these barriers and create a lot of applications on potentially all existing infrastructures."

It achieved this by the introduction of new intermediaries in the value chain. These consist of enabling services on service platforms and service operators offering layers of service templates for specific application domains that can be easily individualised and used with no technical knowledge.

"Our concept of intermediary actors enabled us to resolve problems by coming up with services in domains such as news gathering or advertising," says Roelands. "The sector knowledge is then expressed

through service templates that can be applied by very local service providers in their country, city or even local neighbourhood instantly without any technical know-how. This was the basis of LOMS and we showed that this worked."

AGILE SERVICE CREATION

LOMS established agile service creation through partnerships and alliances while resolving the complex technical implications of such models as well as the service-creation process itself. This involved both the notion of 'local' services tailored to a specific community or geographical area and the idea of an ecosystem of such services.

The LOMS ecosystem involves a series of new intermediaries in the service-creation process. These include the platform operators which offer the network-related enabling services, services operators providing domain-specific knowledge and service providers driving the market with new services addressing specific new and local niche markets.

Service providers make use of a transparent service template. These enable a service operator to pre-define the performance of the underlying service building blocks using answers from the service providers to a simple questionnaire. Thus service providers can concentrate on the business itself, leaving the service and platform operators to define exactly how the service is operated.

"We could have developed an easier programming environment but this would still have required programming knowledge," says Roelands. "Service templates are the simplest way to provide service operators with a means to encapsulate their domain or technological expertise for easy use directly by service providers, or by higher layer service operators".

A series of methodological guideline documents supports all elements in the LOMS value chain. An open-source service-creation tools suite covers both design and publication of service templates by service operators, and the easy transformation of service templates into specific services. The toolset safeguards the process of producing valid service templates, with related questionnaire models, and the creation of services from them.

BENEFITS TO ALL

LOMS now makes it possible to combine service creativity easily with the rich and powerful features of a well-controlled service environment, thus offering clear value to all roles in the LOMS value chain model. A wide range of large to especially small service providers can benefit from the LOMS framework methodology, ultimately allowing end-users themselves to offer their own services and content. This concept has opened up a broad set of opportunities in concrete solutions for LOMS partners and their customers.

The LOMS approach was demonstrated in two different domains:

- 1. Business-to-consumer**, with a news-publishing application in Germany. This involved a newspaper in Stuttgart providing a map-based local news service in co-operation with an Internet mapping operator. Readers could log on to a map of their area and access news feeds of direct local interest; and
- 2. Business-to-business**, with a machinery field service application that allowed a company to automate its field force network, combining electronic customer relationship management (CRM) with specialised workflow control.

A number of the partners are trying to industrialise the results more widely. For example, in Belgium, the LOMS approach has made it possible to offer niche digital TV services over an IPTV network. And there have been talks with newspaper companies, advertising brokers and also with mobile advertisers about adding other services to geographical mapping systems.

There have also been discussions with service providers to offer a service environment in which their co-workers can easily create applications without having to worry about the complexity of the underlying infrastructure, while the network operator suffers no burden or operating costs for the service providers leveraging their network.

More information: www.loms-itea.org

Ongoing project • DiYSE

Taking a DiY approach to providing Internet-of-things services

Do-it-Yourself Smart Experiences (DiYSE) intends to enable ordinary people to direct their daily 'smart' environment involving interactive objects, devices and media into a personalised communications/interaction experience spanning home and city domains. The objective is to leverage the powerful social phenomenon of do-it-yourself (DiY) to enable non-technical people to participate in an 'Internet-of-things' (IoT) world, creating and sharing their own smart events and systems, and contributing to a new more open IoT ecosystem.

Increased mobility and the drive towards greater efficiency in modern life are creating a platform for the growth of technologies and services that enable intelligent and seamless interaction with the smart environment. DiYSE is conceiving, designing and creating viable technologies, applications and business models based on smart sensor objects, middleware and application-creation tools – promoting growth in an area of significant strategic importance to Europe for an increasingly connected world, whether indoors or on the move.

"We've combined two trends in this project to go much further in making a multisided ecosystem," explains DiYSE project co-ordinator Marc Roelands of Alcatel-Lucent Bell Labs in Belgium:

1. Increasing DiY activity beyond Web 2.0 with people developing their own systems, as well as the availability of new low-cost electronics devices, and web communities supporting people in learning how to build such systems, as DiY magazines did for earlier generations; and
2. The emergence of the Internet of things with the evolution of Internet from not only connecting services to people but also interconnecting all physical objects in homes, cities, etc., using the web.

Ensuring involvement of non-technical users This results in the same problem of barriers as found in the earlier LOMS project, while in addition now working out how people are going to generate or build their own tangible services on top of this Internet of

things, shaping smart spaces with user-imposed applications. This involves much more than pure Web 2.0 software applications.

As with LOMS, DiYSE wants to create and deploy new services easily on top of the newly emerging mobile – and fixed – Internet infrastructures. The complete ecosystem is envisioned to offer benefits to all parties – end user and suppliers as well as network operators and equipment vendors. Effectively, the whole chain benefits. It is also important for governments as DiYSE work is impacting applications for eco awareness or solving the mobility problem in the context of urbanisation, or other societal challenges.

"While DiYSE is a totally new idea, there is a common denominator with LOMS, which is why it makes a lot of sense for me to be the project leader for the two projects despite changing companies," says Roelands. "Both projects are clearly about enabling non-technical users to generate their own applications on top of complex but newly proliferating infrastructure, resulting in new long-tail business opportunities."

However, Roelands sees two main new challenges:

1. Ecosystems have become even more complex with the DiY crowd sourcing effect; the more tangible infrastructure of the Internet of things attracts a lot of potential 'techies' to build individual, fully customised systems – DiYSE is keen to leverage this technical knowledge for non-technical customers, so

involving a larger, more complex variety of ecosystem players; and

2. Feeding smart data into the web from a wide variety of sensors, as implied by the IoT, involves a large number of vendors with slightly different technical conventions and varying application programming interfaces (APIs), according to a wide, un-unified umbrella of standards.

EXPLOITING ABSTRACTION WITH SEMANTIC TECHNOLOGIES

Overcoming this second point has involved the introduction of semantic technologies in the Internet of things, by which users can start talking about meaningful objects at a higher abstraction level than just sensors and actuators with specific technical specifications/formats. Users can simply introduce concepts such as measuring the temperature in the context of their particular application instead of worrying about the low-level specific details of the sensors involved, or the different sensor types needed in different circumstances.

It is also extremely beneficial to make transparent abstractions of contextual situations. For example, multimodal traffic management in a city can involve cars, buses and trains and is influenced by accidents, weather and time of day – resulting in a huge mass of data available for smarter applications. However, if someone wants to build an application, for example

DiYSE ITEA 2 08005



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Project leader,
Alcatel-Lucent Bell Labs

Partners

Alcatel-Lucent Bell, Bell Labs
Alcatel-Lucent Bell Labs France
AnswereTech
Archos
Artı Teknoloji
Atos Origin
Catholic University of Leuven - DISTRINET
Catholic University of Leuven - CUO
ENSIIE-LRSM
FeedHenry
Finwe
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Information & Image Management Systems
Institut TELECOM Sudparis
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Neotiq
Philips Innovative Applications
Pozitim
RinneKoti-Säätiö
Tecnalia-European Software Institute (ESI)
Tecnalia-Robotiker
Thales Communications
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University of Mons
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Vrije Universiteit Brussel - SOFT
Vrije Universiteit Brussel - SMIT
Vrije Universiteit Brussel - Starlab

VTT - Technical Research Centre of Finland
Waterford Institute of Technology
Wiktio

Countries involved

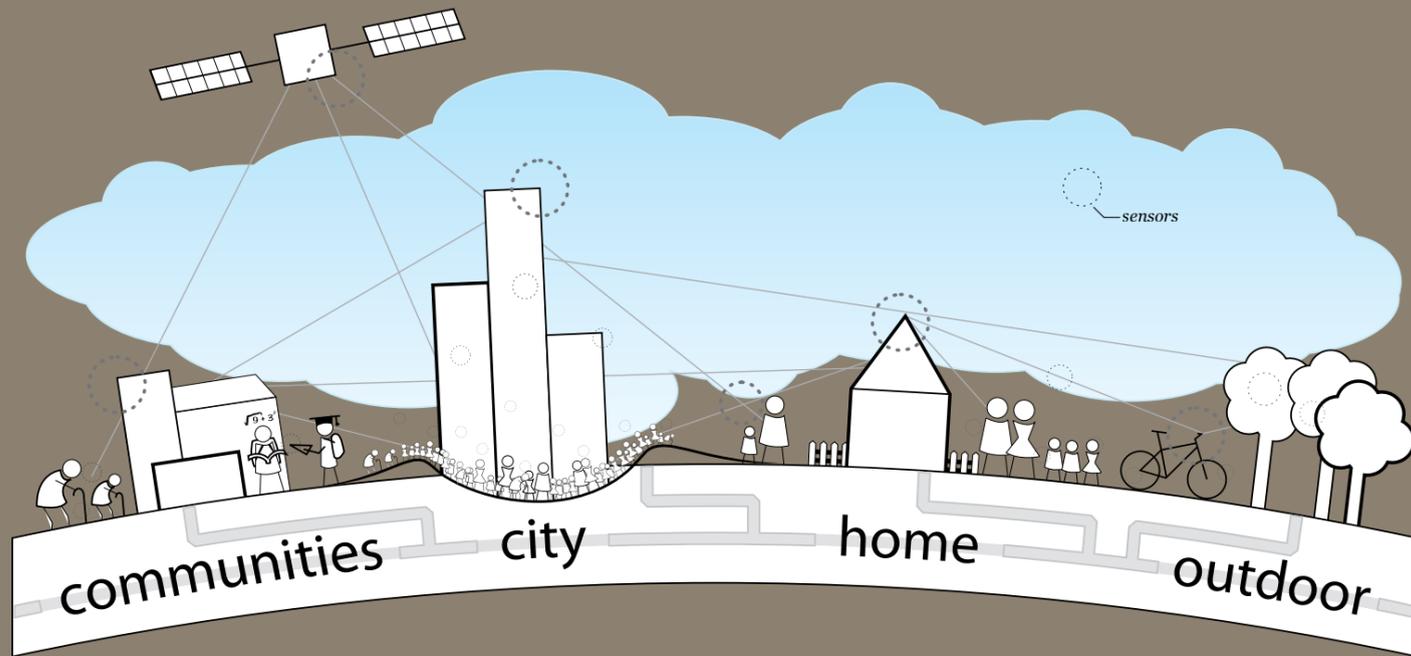
Belgium
Finland
France
Greece
Ireland
Spain
Turkey

Project start

March 2009

Project end

December 2011



for navigation, it would be helpful to abstract patterns from this data specifically relevant to the application.

Thanks to this modelling of the complexity, it is then possible for providers to identify new services that could be offered based on these patterns – for example exploiting the knowledge of which streets are to be avoided at certain times of day.

Other possibilities include augmenting objects in a city with many types of information. This could lead to new ways of communicating between groups of people and interaction with objects in a city that offers a completely different paradigm of communication from the usual mobile (smart) phones.

“The project is about half way through,” says Roelands. “We have carried out lots of studies on DiY social phenomena – involving several non-technical partners looking at how people build things and how they organise themselves in groups. This has enabled us already to draw some conclusions about how we can best leverage how people build things themselves.”

DiYSE is now in a more technical phase, drawing up the necessary architecture. This involves covering the whole ecosystem – from installing and identifying a sensor up to how the user can express certain behaviour or a specific service experience using those sensors in a particular environment.

“We envision covering all aspects of the creation process in the DiYSE architecture,” adds Roelands. “We are now starting on first prototypes and expect by the end of 2010 to have a number of concrete examples.”

A particularly large consortium came together for DiYSE, one of the biggest for an ITEA 2 project. It involves some 40 partners from seven countries: ten in Belgium, six in France, ten in Finland, seven in Spain, four in Turkey, two in Ireland and one in Greece. Partners include large companies keen to provide equipment and network-based functions, through universities and research institutes, to small and medium-sized enterprises (SMEs) working on developing mobile services such as in the domain of elderly care.

GETTING USERS INVOLVED IN THE SMART ENVIRONMENT

This ITEA project supports EU efforts to promote machine-to-machine interactions and the Internet of things. DiYSE is part of the European IoT Research Projects Cluster (IERC, www.rfid-in-action.eu/cerp) which mainly involves EU Seventh Framework Programme (FP7) projects.

Project partners also believe strongly that the landscape is changing dramatically – it is no longer just a question of information or application/service sharing but of a vast engagement of users in the smart,

tangible environment. “While we don’t address privacy directly, by involving the user in shaping the behaviour of the environment and keeping them in control of how the sensitive data they provide is treated, we are keeping citizens in the loop in the long term – avoiding a ‘big brother’ reflex,” adds Roelands.

The outcome of this ITEA 2 project will contribute substantially to the open Internet-of-Things world and the transition to Web 3.0 – the so-called ‘semantic’ intelligent web. Web 3.0 will allow the definition of the meaning of information and services, making it possible for the web to understand and satisfy the requests of people and machines to use web content and, through DiYSE, also connected objects in a meaningful way.

More information: www.dyse.org

Exploitation success – the launch of a new SmartTouch spin-off

The SmartTouch project has been successful in ensuring fast exploitation of its results. As of June 2010 yet another spin-off has been launched in Finland: Bonwal Inc. This company originated from TeliaSonera and offers mobile pocket services and different touch-based services using near-field communication (NFC) tags.

As many of our readers may have experienced at first hand; these electronic voting services have been used during several ITEA 2 Symposia to vote for the ITEA Exhibition awards.

With mobile pocket services, you can manage loyalty and other wallet-related services – such as loyalty cards, coupons and tickets – with a mobile phone and create a new communication channel between service providers and their customers. Furthermore, Bonwal Inc. offers tag management as a solution for handling the functions and content of physical NFC and 2D/barcode tags which can be managed via a web-based interface. The content of the tags can be web links, SMS texts, email or dedicated application processes. Examples of such tag-based services are electronic voting and electronic information requests using mobile phones and NFC tags.

Jukka Suikkanen (CEO Bonwal Inc.) reflects: “We participated in the ITEA SmartTouch project, which was actually the basis for Bonwal Inc. itself. SmartTouch was an excellent experience with having lots of different ideas and pilots from different cultures and companies with strong commitment to co-operation around Europe. The SmartTouch project creates a wonderful perspective for future consumer services and behaviour.”

More information: www.bonwal.com



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A software engineer who likes concrete results

German electrical engineer Karlheinz Topp has been involved in research and development (R&D) in electronics and computer hardware and software, all related to software-intensive systems, for various domains – including military, telecommunications and automotive – for his whole career since joining Bosch 32 years ago. He is also the longest serving member of the ITEA Steering Group, since he took up the position in January 1999.

Karlheinz studied electrical engineering before joining Bosch, where he worked on head-up displays, purely analogue, for the Tornado aircraft. This low-level supersonic ground-attack bomber was a joint development by Germany, Italy and the UK in the 1970s and is still operational.

“We needed equipment to measure the accuracy of the head-up displays,” he explains. “We wanted to produce pixel symbols and decided this could be easily done on a PDP 11 computer using a Fortran program. The youngest employee with some knowledge of programming was me! So I started to work with software.”

It was a very heavy job, working with pure mathematics transferred into the Fortran program and getting the pixels of the picture into the equipment that could then be read out and displayed.

STARTING POINT FOR SOFTWARE ENGINEERING CAREER

“This was my starting point to becoming a software engineer,” says Karlheinz. “Afterwards, we worked on some control units for the Tornado and there I took over not only the hardware development but also the software. I became the department leader for the whole of the software development of this company.”

His department did an excellent job and, right from the beginning, received good assessments. This led the top R&D boss to see a need for the same approach elsewhere. “So, I was transferred to the communications area where I led a centre for software. And, when we sold this telecommunications part of Bosch, I moved to the central advanced R&D

department – moving from subsidiaries of Bosch to the heart of the organisation.”

Karlheinz was involved in several different projects in central research, starting in 1999 with product-line approach, and is now responsible for future development environments in Bosch.

LONG INVOLVEMENT WITH ITEA

“I discovered ITEA when I joined the central R&D department as I was the successor to Mr von Bomhard, who was one of the writers of the original ITEA Rainbow book,” explains Karlheinz. “I joined ITEA as the Bosch steering group member at the beginning of 1999 and was present at the first official steering group meeting – I am now the only member of the steering group who has been there since the beginning.”

Although there have been some ups and downs, Bosch was very happy at the beginning but then reduced its involvement in publically-funded projects. However it is now again very heavily involved in ITEA and the EU ARTEMIS Joint Undertaking. “I much prefer the ITEA/EUREKA style because it is more open and flexible,” he says. “The Framework Programme style is much more regulated right from the beginning.”

Karlheinz also believes strongly in industrial leadership for research. “All publically funded projects should have industrial leadership to ensure that the outcome will be used,” he insists. “Either it is really useful or not. In the Framework Programme you find projects that are there for pure research and you don’t know what the results are good for. It is different in the EUREKA projects as there is a strong emphasis on industry as a leader.”

TAKING A PRACTICAL APPROACH

Karlheinz originally trained as an engineer as, from his early years, he liked work where it is possible to see products or results. “I didn’t want to study something more theoretical, so I looked from some practical parts and electrical engineering was most suitable for me.”

While his move to software was an ‘accident’, he became very excited about the possibilities of doing things with software. He therefore did not try to return to hardware development, although he continued hardware and software development in parallel for some time. “I now focus on software because you are more flexible and have much more possibilities to do something.”

And outside the job? “I ride bicycles, I’m active in carnival and like to travel far away in my holidays – my last holiday was a safari in Botswana, in the middle of the animals.”

Karlheinz Topp

Corporate Sector Research & Advance Engineering Development Environment, Robert Bosch



Innovation Reports

CAM4HOME

(ITEA 2 ~ 06017)

Improving and personalising the home multimedia experience

MoSiS

(ITEA 2 ~ 06035)

Model-driven software engineering improves productivity in the embedded systems industry

ParMA

(ITEA 2 ~ 06015)

Exploiting the power of multicore architectures

CAM4HOME

(ITEA 2 – 06017)

Patrick Schwartz, Grass Valley
France

Improving and personalising the home multimedia experience

The ITEA 2 CAM4HOME project has created a common metadata-enabled content delivery framework to allow end users and commercial contents providers to create and deliver rich multimedia experiences in the home. CAM4HOME simplifies access to and sharing of all contents of specific personal interest with any terminal through any network and through peer-to-peer networks. It exploits a novel concept of collaborative aggregated multimedia to create individualised multimedia contents bundles that can be delivered as semantically coherent sets of content and related services over various communication channels.

Until recently there has been little or no interaction between broadcast TV, broadband Internet TV and mobile TV networks and services. As a result, dedicated content provisioning is required for different networks and user devices, leading to unbalanced services and difficulties of sharing content between TV, personal computers (PCs) and mobile phones.

CAM4HOME set out to develop a 'create-once, deliver-anywhere' approach to enable ubiquitous access to any contents on any device through all networks. The project has simplified access to all content of specific personal interest with any terminal through any network and enabled easy sharing and collaboration

with multimedia contents regardless of the terminal or network in use.

The CAM4HOME approach represents a move from passive consumption to interactive community-based experience and finally the benefit of rich multimedia experiences. Applications considered include:

- Enriching broadcast TV with additional content obtained from the Internet and providing links and interaction with such contents;
- Using metadata to enable personalised coverage of a major multi-sports event with individualised reports of concurrent events combining live and recorded coverage as well as background information; and

- Sharing of computer games with recommendations, analysis and ratings by social groups.

ENABLING INTERACTIVITY BETWEEN NETWORKS

The ITEA 2 project set out to allow interactivity and facilitate multimedia content delivery between heterogeneous networks, user devices and users in social networks while easing user operation for various services. By enabling exchanges between video, HTML web pages and mobile contents, CAM4HOME enables rich media interaction between all devices.

The main benefits offered by rich media services and multimedia deployment in the digital home are the

possibility of developing personalised search and aggregation of contents on an overall range of related media according to the user profile and the user device. It also becomes possible to provide strong links and interaction with social networks – i.e. friend's recommendations.

This personalised search and aggregation of contents is as important as the sustained growth of media contents including rich media contents, emergence of social networks and a trend to non-linear contents speeds up and impacts the partner's business plans which must build new offers to satisfy these requirements.

For partners' from the broadcast industry, CAM4HOME offers an enrichment of broadcast contents thanks to broadband connectivity. By providing true convergence at the metadata level, CAM4HOME allows the seamlessly delivery and sharing of multimedia content to any device.

For users, CAM4HOME enables seamless access and interaction to a wide range of media contents with a possibility to share and collaborate with media content.

ADVANCES TECHNOLOGIES AND METHODOLOGIES

The main technical advance was enabling the concept of collaborative aggregated multimedia (CAM) at the heart of the project, providing a common vision. This involved aggregation of contents and services (CAM Objects) into described collections (CAM Bundles) which can be delivered as a semantically coherent set of contents and related services over various communication channels to a variety of terminals.

Technical challenges lay in describing, processing and exchanging the CAM bundles. In addition, it was necessary to tackle content and metadata interoperability, cross-media and cross-network delivery of CAM content, user experience, context-aware and personalised CAM content provisioning, and the integration and use of peer-to-peer (P2P) community networks.

Advanced and new technologies and methodologies included:

- The metadata framework which acts as the binder between interacting components and allows a semantic description to ease interaction between heterogeneous contents;
- An open service platform supporting interoperable description and processing of digital content and service bundles in multimedia applications and services; and
- Domain-specific devices such as content analysis,

content adaptation and content delivery through heterogeneous networks.

COLLABORATIVE APPROACH FUNCTIONED WELL

ITEA 2 enabled collaboration at the European level with a focus on commercial exploitation. The project was nurtured initially by VTT with the help of several partners and involved 21 partners from 6 countries in all. Grass Valley was proposed and accepted as project coordinator. ITEA 2 offered an ample level of networking between partners thanks to events such as the ITEA Project Outline days, annual symposiums and workshops.

The collaborative approach adopted by all partners to develop and clarify the original concept has influenced the architecture of the system. At the beginning, a lot of face-to-face meetings enabled the partners all to speak the same language, as some came from the fixed or mobile telecommunications industry, others from web and broadcast domains, and others again from research organisations – all with different standards and references. So there was a strong need for a shared common vision and mutual listening.

CAM4HOME marks a step forward in the user-model transformation, with users moving from passive to active as digital multimedia producers and actors. The first trials are already running and the initial applications should be deployed in 2011.

Applications already developing include:

- Personalised casual online gaming with Facebook-like updates, games ratings and new friend notifications for the PELIKONE games portal in Finland, based on the CAM4HOME concept and model;
- Synchronised content aggregation for on-line business services already being exploited to improve VideoNavig management of live webcasts linking speaker video with content such as PowerPoint slides, summaries and list of speakers;
- Live sports events production with automated media asset management being developed for the 2012 London Olympic Games to simplify classification of information and enable synchronisation of different video and data sources in real time;
- Enhanced TV-centred user experience with personalised video-on-demand (VOD) contents, personalised electronic programme guide (EPG) and interacting with social networks and web contents – such as details of films, etc.; and

Easy access and sharing of all content and services that interest you.



...with any terminal through any network!



- Sharing contents between fixed and mobile devices including rich media sharing, IP Multimedia Subsystem (IMS) notification and mobile broadcasting with mediation.

Internal and external standardisation has also been encouraged with the main targets being the Digital Video Broadcasting (DVB) and Open Mobile Alliance (OMA) standards bodies. Several CAM4HOME partners have contributed to DVB CBMS, DVB CM-IPTV, DVB TM-IPI and DVB H, as well as to OMA BCAST.

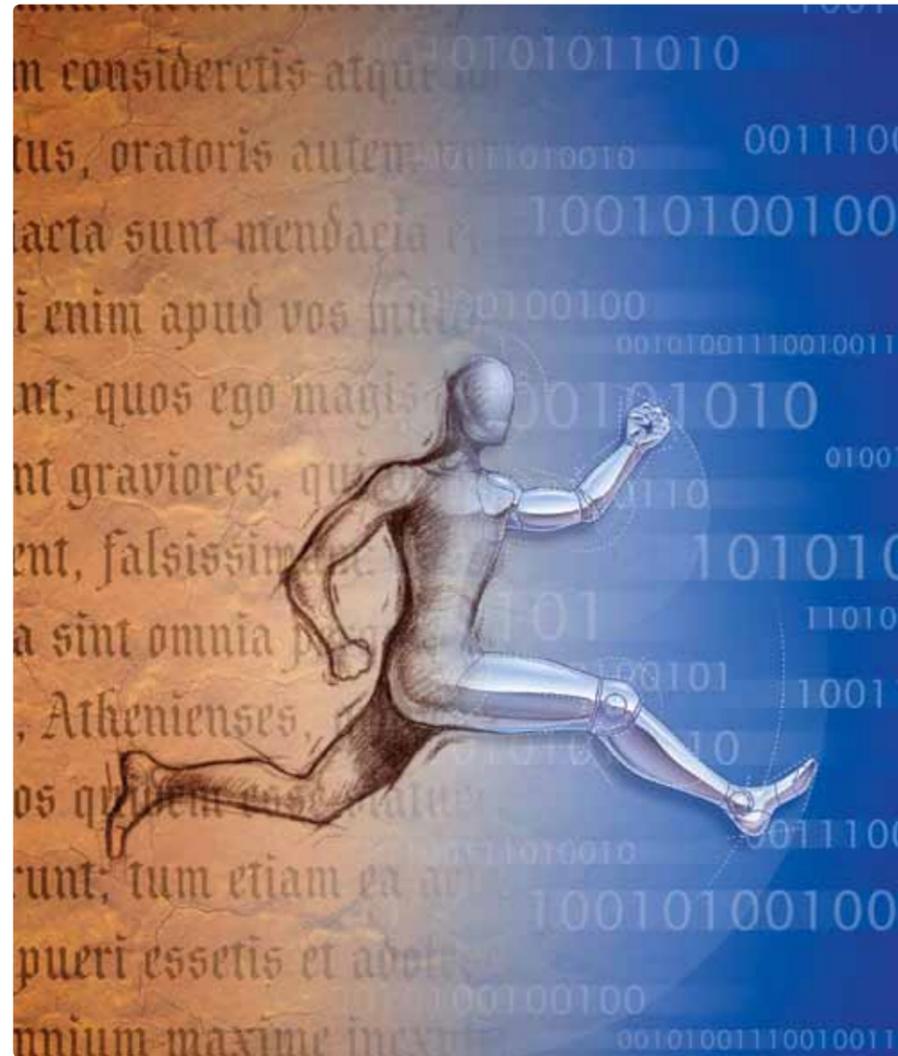
More information: www.cam4home-itea.org

MoSiS

(ITEA 2 06035)

Hans Petter Dahle, ICT-Norway
Norway

Model-driven software engineering improves productivity in the embedded systems industry



The ITEA 2 MoSiS project has developed a common variability language (CVL) for modelling and managing variability and several domain-specific languages (DSLs) for model-driven development of software-intensive systems. The use of DSLs combined with CVL markedly improves productivity in the development of highly configurable embedded software systems. MoSiS has demonstrated best-practice processes in industries such as railway signalling, communications, consumer electronics and manufacturing. A range of open-source tool prototypes and ready to apply commercial tools was also made available supporting the MoSiS languages. The common variability language is now a base for ongoing standardization in Object Management Group (OMG).

Embedded systems software is becoming increasingly critical in the global marketplace in terms of the quality and huge number of systems variants required. MoSiS intended to speed-up engineering work, increase quality, improve cost efficiency and produce more complex products in a reliable manner to ensure the global competitiveness of the European embedded systems sector.

MoSiS realised that embedded systems engineers striving to build highly complex systems needed better tools to increase productivity, particularly important for Europe competitiveness. It saw a major opportunity by working with model-driven engineering (MDE) – not only in modelling single systems but also in modelling variability across product families.

AUTOMATING SOFTWARE PRODUCTION

The key benefit of MDE is the automation of parts of the engineering work. Automatic production of software from high-level models is very valuable as it cuts costs and shortens time to market. It also offers a good way to document and structure the systems involved.

Model-driven engineering as such is not new but this approach has not been widely used for embedded systems. There has been a lack of tools to tackle key problems, in particular handling non-functional requirements such as the availability of only a limited amount of memory, energy or CPU power – constraints not found outside the embedded systems area.

MoSiS involved 12 partners from 5 countries, including two ITEA 2 founding companies: Telefónica and Telvent. The consortium consisted of large industries, small and medium-sized enterprises (SMEs), research institutes and universities. It was co-ordinated by ICT-Norway, the trade association representing the ICT industry in Norway with over 350 members.

It was set up as an ITEA 2 project because of the intention to meet market needs and to exploit the technology commercially as quickly as possible. This benefits both the companies involved in the project and software engineering in general by working with real problems and demonstrating real solutions.

Industrial partners were particularly keen to improve their engineering work. For example, ABB wanted to develop new product lines for railway signalling, while NSN wanted to describe the features of its systems better. And tool vendors such as MetaCase and @-portunity were interested in developing domain-specific modelling languages and saw the value of modelling variability.

All partners were convinced of the opportunities offered by MDE and realised that a joint effort was necessary since no single company was able to create and evolve the MoSiS results on its own. The consortium was also keen to make an impact through standardisation. An approach to the Object Management Group (OMG) for standardisation of modelling variability was a key element of the project from the initial proposal.

The overall goals of the project were to:

- Extend modelling languages, techniques and tools for handling variability of both system functions and non-functional properties;
- Standardise a variability modelling language;
- Extend current approaches for model-driven development to highly configurable embedded systems; and
- Evaluate and demonstrate results through industrial case studies in communications, energy, manufacturing and railway signalling.

MODELLING VARIABILITY

The most important achievement of MoSiS is a language for modelling variability – the Common Variability Language (CVL). When engineering products or systems, a set of products may have the same basic requirements but vary in size or complexity. Modelling variability involves describing such differences at product or complete systems level.

For example, a range of mobile phones can offer the same facilities while having different screen sizes, types of interface – keyboard or touch screen – or user language. In the same way, signalling systems for railways will have to provide the same main functions for any size of station – from simple to very complex; and one station may be very like another, so there would be no need to produce a new model from scratch.

CVL is not totally new. MoSiS built on the work on product lines and variability in earlier ITEA projects such as FAMILIES. However, no-one had really developed a language to model all the aspects of variability, separate from the base model of the system, and with tool support to automate part of the engineering processes.

As a result, MoSiS is expected to have a major impact on both products and product-development processes. In terms of engineering, use of CVL will lead to more cost-efficient production of products. Case studies within the project indicate a ten-times improvement in efficiency. And such automation means that what took weeks or months before can now be achieved in hours.

On the product side, well-defined models allow for more complex systems – and such complexity can be achieved in a more reliable manner. Moreover, this is generic technology, so it can be used in all domains across the whole embedded systems sector with applications already seen in automotive development, communications, defence, energy, health and transportation. It can also be used outside of the embedded systems sector.

EXPLOITATION AND STANDARDISATION UNDERWAY

Several companies have started to use the MoSiS technology, including NSN, engineering consultant Combitech, which has applied the results to the development of a system for a fighter aircraft, and tool vendor MetaCase, which has started to apply it in its tools. These tools make it possible to define the language for a specific domain – for example for NSN in the development of base stations for mobile communications networks.

ABB has used the results to develop the Train Control Language (TCL) which allows modelling of railway stations. This is a graphical language employing industry-standard symbols for railway lines, points, etc. TCL modelling makes it possible to generate automatically a major part of the code required for the railway signalling system. This language has been presented at several conferences in the railway sector.

Good results have also been obtained in the area of MDE for specific domains, particularly modelling non-functional requirements (NFRs), such as performance. MoSiS has provided tool support for the NFR+ Framework developed by VTT. Results of this work show that it is possible to bridge what has been gap between requirements engineering work and implementation in systems. Until now, these have been two separate worlds to a certain extent. Now there is a method for modelling requirements and breaking these requirements into more low-level functions that can be measured and checked that they are met.

CVL tool prototypes are available as open source through SINTEF. The combination of domain-specific languages with CVL will also allow automatic generation of tests for systems variants in the future. Moreover, CVL is now being standardised through OMG with a call for proposals. MoSiS is heading a submission team which includes IBM. Submissions are expected in late 2010 with OMG selecting the best approach.

More information: <http://itea-mosis.org>

ParMA

(ITEA 2 06015)

Jean-Marc Morel, Bull SAS
France

Exploiting the power of multicore architectures

The ITEA 2 ParMA project developed advanced technologies to exploit the power of multicore architectures and so deliver substantial performance improvements in high-performance computing applications. This greatly helps to achieve new goals in modelling and simulation and enables the development of innovative computer-intensive applications to accelerate research in many domains as well as speed the design of better products in industry. The ParMA technology makes it possible, for instance, to explore many more parameter combinations in the form of virtual prototypes, as demonstrated with the automatic 3D-combustion optimisation carried out by ParMA industrial partner RECOM.

Efficient computational power is a key differentiator in both research and industrial applications. It is instrumental for modelling, simulation and engineering design. For over 20 years, device manufacturers regularly increased processor performance by raising clock frequencies. When this was no longer possible because of problems with heat dissipation, power consumption and leakage, they decided to put several cores on the same die.

While such multicore architecture offers many benefits, it has forced software developers to parallelise their code. If this was not done, only one core would be used to run a sequential code and it would run slower since the frequency per core has been reduced. Moreover, simply parallelising the code is not sufficient. It is also necessary to balance the charge on each core and make the coding scalable so that it adapts automatically to the number of cores available.

Parallel programming is the key to taking full advantage of multicore architectures. However, existing parallel programming methods and tools were not able to cope with a high number of tasks or threads. The techniques available were diverse, could not be easily combined and only applied to main parallel programming techniques and on a limited number of platforms.

Moreover, libraries were not optimised for the new multicore-based architectures.

In addition, most high-performance computing (HPC) applications had poor scalability and often existed in several variants – for example:

- One for shared memory systems with Open Multi-Processing (OpenMP);
- One for distributed memory systems with Message Passing Interface (MPI); and
- One for non-uniform memory access (NUMA) clusters with hybrid MPI and OpenMP.

HPC applications developers also had little experience of parallelisation in terms of how to restructure code and organise the data. At the same time, embedded software developers knew very little about multicore architectures – particularly in multiprocessor system-on-chip (MPSoC) devices.

CRUCIAL FOR RESEARCH AND INDUSTRIAL APPLICATIONS

A comprehensive, innovative, integrated and validated set of programming methods and tools was required to harness multicore architectures. Obtaining and maintaining such advanced technology was crucial for European research organisations and industry to improve competitiveness and independence. Indeed, it

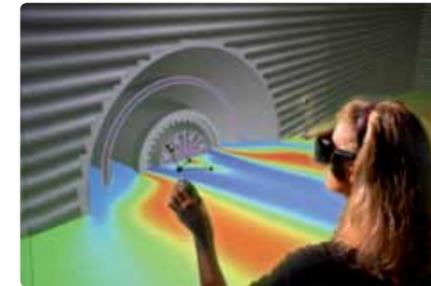
was essential to help the development of computing-intensive applications by providing advanced modelling and simulation capabilities. ParMA set out to meet this challenge.

Consortium members covered three categories:

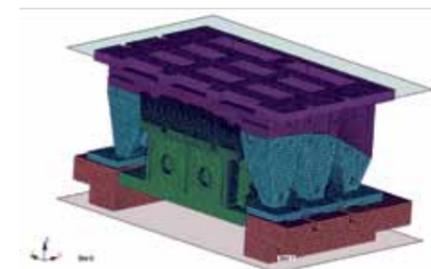
1. *Simulation software* developers asked by customers to handle larger and more accurate models – they needed methods and tools to adapt and optimise their code to exploit fully the power of multicore architectures;
2. *Tools developers* who needed to extend, improve and integrate HPC development tools for debugging, performance analysis and code optimisation to help HPC software developers adapt and optimise their code to multicore architectures; and
3. *HPC platform and MPSoC-based embedded system providers* who needed to design and optimise multicore-based platforms to fit applications needs.

Partners included industrial HPC users, research organisations and supercomputing centres. HPC application developers focused on their own markets which included: 3D-combustion modelling; casting process simulation; metal forming and crashworthiness; avionics; and virtual reality in automotive and x-ray exposure dosimetry. Three partners targeted the MPSoC-based embedded

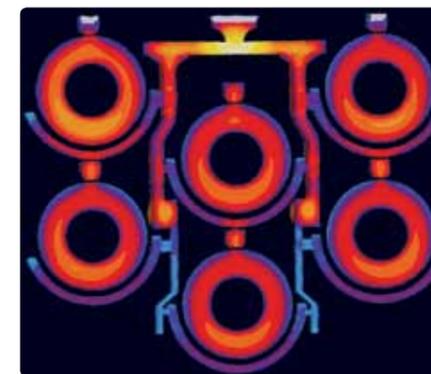
Simulation of a 3D-Boiler with RECOM-AIOLOS
(Visualization of computational results)



3D - Model of entire molding press with several millions elements (GNS-INDEED)



Simulation of the solidification of a break disc pattern (MAGMA)



systems market, including embedded network design and time-constrained applications.

Bull provided the partners with a powerful common HPC platform – a cluster on which all tools were installed and where application developers could experiment with these tools. Thanks to the confidence gained among partners, industrial partners did not hesitate to give the research organisations access to some of their code, enabling them to understand

industrial needs better and so help improve and optimise this code.

DRAMATIC PERFORMANCE IMPROVEMENTS

A series of advanced/new technologies/methodologies were developed. These included mature debugging and performance-analysis tools that have been integrated in a single package that is freely available at <http://apps.fz-juelich.de/unite/>.

At the same time, project partners dramatically improved the performances of more than a dozen industrial HPC applications. In addition, superior platforms emerged – such as bullx, partly optimised by ParMA, which was named as the world best supercomputer by HPCWire in November 2009.

The benefits of ParMA are manifold:

- HPC research organisations worked closely and unified their tools in a single package that has been presented at major HPC conferences. They are continuing to co-operate in new projects so that tools users are guaranteed continued support and evolutions;
- Developers learnt how to restructure and optimise code for multicore applications and obtained new contracts because of superior performance with their applications. Such applications are also much more versatile, able to run efficiently in various environments where before it had been necessary to maintain a variant per type of environment;
- Platform developers are able to stay competitive in their markets; and
- Research laboratories have gained industrial experience which they will put to work in various ways. This includes: creation of a two-year Master's course for simulation sciences and HPC development; and participation in Exascale Labs, recently created by Intel in France with Ex@tec, and in Exascale initiatives, such as the International Exascale Software Programme.

COMMERCIAL EXPLOITATION STARTING

The impact on the business of the partners has already been observed: The main one is customer satisfaction for simulation software tools. An important contract has been signed for instance by RECOM because work with ParMA resulted in a generic algorithm for an automatic 3D-combustion optimisation in a plant that involves several billion possible combinations of parameters. As a result, it is possible for instance to reduce fuel consumption, thus saving around €125,000 a year while reducing CO₂ production by 16,000 tonnes a year.

Other simulation software tool providers are also able to provide their customers with superior capabilities, resulting in better performance, refined simulations and more accurate models, and automatic automation.

A key outcome was the establishment of a closer relationship between the partners. As an example, before the project, the German tool developers operated separately, so their tools – MARMOT, KOJAK and VAMPIR – could not work together. For instance, they were using different trace formats so that the user who faced a difficult problem had to run each tool separately. As a result of ParMA, all these tools use the same trace format and interoperate. In fact, the UNITE package developed in ParMA makes it possible to install and use the tools as a powerful, comprehensive and integrated set of functions.

ParMA also benefited from simultaneous projects or initiatives such as VI-HPS and POPS which were working on some aspects that complemented and thus enriched the ParMA results. Several new projects have been set up subsequently that will continue this work in the framework of ITEA – such as 'hybrid parallel programming for heterogeneous architectures' (H4H), at national level with SILC and eeClust in Germany and at EU level with the Seventh Framework Programme (FP7) TEXT project.

More information: www.parma-itea2.org

CALENDAR

27-29 September
ICT 2010

BRUSSELS EXPO, BELGIUM

ICT 2010 is organised by the European Commission and hosted by the Belgian Presidency of the European Union. ITEA 2 will join EUREKA at the exhibition and the ITEA project CANTATA will present itself.

www.ec.europa.eu/information_society/events/ict/2010

11-14 October
EUROPEAN INNOVATION SUMMIT 2010

EUROPEAN PARLIAMENT, BRUSSELS, BELGIUM

The role of innovation in tackling the grand challenges will be at the centre of discussion with stakeholders and policy makers from all over Europe and beyond. Rudolf Haggenmüller has been invited as a speaker during this event.

www.knowledge4innovation.eu

2-4 November
ECLIPSE SUMMIT 2010

LUDWIGSBURG, GERMANY

www.eclipsecon.org/summiteurope2010

11 November
BITS&CHIPS EMBEDDED SYSTEMS EVENT

EINDHOVEN, THE NETHERLANDS

www.embedded-systemen.nl

16-17 November
EUROPEAN NANOELECTRONICS FORUM 2010

MADRID, SPAIN

The European Nanoelectronics 2010 is organised by CATRENE and ENIAC. Participation is on invitation only.

www.catrene.org

2 December
EMBEDDED SYSTEMS INSTITUTE SYMPOSIUM 2010

EINDHOVEN, THE NETHERLANDS

Organised in cooperation with Point-One.

www.esi.nl/symposium

ITEA & ARTEMIS Co-summit 2010 26-27 October Ghent, Belgium



On 26-27 October, the ITEA & ARTEMIS Co-summit 2010 will be held in the ICC Ghent, Belgium.

This Co-summit is the main stage for the ITEA and ARTEMIS project exhibitions, showcasing over 75 projects that combine research excellence with innovation. The programme includes plenary family sessions of ITEA and ARTEMIS, high-level key note speakers and parallel sessions on different topics linked to the Co-summit theme.

REGISTRATION

Registration for the Co-summit is open to both communities and the public. For more information and registration, please go to our event website: www.itea2.org/cosummit2010

EUREKA News 2010 events

EUREKA at the Hannover Messe



For the first time, the EUREKA Network was represented at this year's Hannover Messe from 19 to 23 April.

Even with the air traffic difficulties at that time, EUREKA's participation at the Messe was a success, raising the visibility of the Network as a whole and welcoming many visitors to the stand. The EUREKA stand showcased prototypes from different EUREKA projects: the Buddy electric car and a self propelled pipeline inspection calliper. A representative of ITEA 2 was present on the EUREKA stand during the first days of the event, joining forces in promoting the Network and its Clusters.



Further highlights during the event were a visit to the EUREKA stand by the German Federal Minister of Education and Research, Professor Annette Schavan, and a well-attended press conference led by MEP Godlieve Quisthoudt-Rowohl, Walter Mönig, who headed Germany's Chairmanship of EUREKA in 2009-2010 and Luuk Borg, Head of the EUREKA Secretariat.



ITEA projects SODA, CANTATA & D-MINT are 2010 EUREKA success stories



This year, the SODA, CANTATA and D-MINT projects have been recognised as EUREKA success stories. Three articles were published about the projects on the EUREKA website. In the past, many other ITEA projects have been featured as EUREKA success stories, such as EAST-EEA, AGILE, SmartTouch and HD4U. Future stories will be announced via the ITEA 2 website as well.

For a complete list of success stories, visit: www.eurekanetwork.org/projects/success-stories

Israel: EUREKA Chairmanship 2010-2011



Israel officially took over the EUREKA Network's rotating Chairmanship for 2010-2011 during the Ministerial Conference in Berlin on 25 June, chaired by the German Federal Minister of Education and Research, Professor Annette Schavan. This Chairmanship coincides with EUREKA's 25th anniversary.

To accept the chair, Israeli Minister for Industry, Trade and Labour, Benjamin Ben-Eliezer addressed the conference about his hopes for the coming year. He highlighted the vital role of innovation and technological development to Israel.

After the Ministerial Conference, the Israeli Chairmanship held its first conference 'EUREKA Israeli Chairmanship: promoting a culture of innovation' on 13 July in Brussels. The conference was organised in association with MEP Bastiaan Belder (EFD), the Office of the Chief Scientist at the Israeli Ministry of Industry, Trade and Labour, and MATIMOP - the Israeli Industry Centre for R&D.

Rudolf Haggenmüller was one of the speakers during the conference session on 'The role of EUREKA in the European Research and Innovation Area'.

EUREKA and ITEA 2 at the European Business Summit 2010



The European Business Summit (EBS) organised by BUSINESSEUROPE and the Federation of Enterprises in Belgium (FEB), was held in Brussels from 30 June to 1 July. The 2010 event concentrated on 'how to put Europe back on track'.

In close co-operation with EUREKA, ITEA 2 was represented by the SmartTouch project on the EUREKA stand and in the plenary programme.

Project leader Tuomo Tuikka (VTT - Technical Research Centre of Finland) was invited to take part in the panel discussion on 'SME's, engine for recovery?'. In this well-attended and lively session, the discussion focused on the question of how we can better enable SMEs to spur economic recovery and long-term growth in Europe including the need for access to finance and the importance of adequate protection for intellectual property. Mr Tuikka added to the discussion by speaking from a research point of view – What role do/



can SMEs play in innovative research projects? – and explaining the business-driven, bottom-up, innovation focus of the EUREKA Network, ITEA as one of its Clusters and the Eurostars programme.

In the evening of 30 June, the EUREKA stand was visited by Belgian Science Policy and SME Minister Sabine Laurelle. Tuomo Tuikka presented the SmartTouch project to the Minister. She was able to experience at first hand several applications that are the result of the SmartTouch project.

