ITEA 2

M Magazine

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ITEA Roadmap 3

An open and structured vision of future uses of ICT & ICT-based services

Agile methodology

AGILE - Achieving a radical improvement in software engineering

FLEXI – Scaling up the agile methodology

Focus on Turkey

PO Days 2009

Interview: O. Kara & Z. Sarilar

ITEA 2

INFORMATION TECHNOLOGY FOR EUROPEAN ADVANCEMENT

European leadership in Software-intensive Systems and Services – the future of embedded and distributed software – www.itea2.org

ITEA 2 is a EUREKA strategic ICT Cluster programme

Content

Colophon

ITEA 2
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.

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

Special thanks to all contributors to this issue of the M – ITEA 2 Magazine.

Editorial

ITEA 2 and Open Innovation

The innovation flow is definitely becoming faster and faster not only for technology but also even more for services and business models. Speed is becoming the key to the market.

Globalisation of the economy is the rule in all the intensive software systems markets.

The complexity of the value chains and deployed systems are such that the actors are no longer able to master themselves all the technologies needed for the deployment of such systems. And no company is able to play the game alone.

We can see a societal trend toward customer involvement. This trend is leading to some form of co-creation, especially for 'digital natives', with user-content-generated and open-source software.

Open source makes it possible to share the development cost between the different actors in an ecosystem. This reduces some infrastructure costs drastically – for example Google, Ebay or Amazon – and thus allows some innovative new business models not economically viable before.

The new challenge is to build winning ecosystems, taking advantage of partnerships with:

- International companies to access the global market;
- SMEs to push innovations on the market; and
- Academics to explore new research domains and fill the innovation stack.

Use of research as a business-development tool is a key point to build confidence between the different players of these ecosystems based on mastering technology.

ITEA 2 appears to be the perfect context to build such partnerships with a bottom-up industrial approach, an industrial strategy focus and an innovation orientation. Take advantage of the new Call 4 to build such ecosystems and deploy them on some successful systems.

I would like to take opportunity of this editorial to thank the roadmap team and its leader Jean Pierre Lacotte for the job they have done with the new ITEA Roadmap 3. This roadmap is a real asset for the ITEA 2 programme and gives us a view of the future of our domain as seen by more than 75 experts from all over Europe, guided by a core team of some 18 people.

ITEA 2 is a cluster of projects. ITEA 2 innovations are coming from these researches. In this issue, we focus on Agile methodology. Our industry is confronted with a need to enhance productivity markedly. The Agile approach gets everyone in an organisation and across whole supply chains to work together in a disciplined way in continuous, short improvement cycles. The result is to cut time to market, increase product quality and improve customer satisfaction while slashing development costs.

The innovation reports gather the treasures of our programme. They are very important for us because they focus our energy on the next step and show how much ITEA 2 is involved in the progress of technology as well as affecting the business of our industrial partners.

My last point is to stress that ITEA 2 success is not possible without people. I am very pleased to invite you to read our profile of Jean Gelissen. He is the kind of project leader we are proud to have in ITEA 2, combining in the same person: competency, energy and the kind of plus which builds conviviality into our projects.

Have a good time pushing new ideas and building new effective ecosystems in the next ITEA 2 Call 4 for the sake of European Industry.

Philippe Letellier

Philippe Letellier
ITEA 2 Vice-Chairman

Have a good time pushing new ideas and building new effective ecosystems in the next ITEA 2 Call 4 for the sake of European Industry.

"An extremely important aspect of this for society as a whole, and public policy in particular, is that it is possible to start from and steer towards societal needs."

ITEA Roadmap, 3rd edition

Much more than just an update

As the key strategy document, the ITEA Roadmap 3 (RM-3) develops the shared vision of the technological direction for the ITEA 2 programme. This roadmap covers the period 2008 to 2014 for software-intensive systems and services. However, it is much more than just an update of Roadmap 2 as it takes a new look at services and needs in a rapidly changing domain.

With the fantastic development of technology – from only few processors overall to several processors per person – in recent years, very few people remain interested in buying or thinking in terms of technologies. Instead of being technology pro-active, looking for services, such as in Roadmap 2, this time, services are looking for humans, agents or machines.

An extremely important aspect of this for society as a whole, and public policy in particular, is that it is possible to start from and steer towards *societal needs*[1]. For these reasons, the roadmap was built in two steps:

1. First of all, it anticipates applications and services corresponding to dreams and scenarios elaborated by industry futurists; and

2. From this, it describes enabling technologies that belong to different groups of 'challenges' and could have various maturity levels. Their success could also depend on external events[2], called in this document 'rendezvous'.

Application and services, as well as technologies, were clustered in five categories each, as shown in Figure 1.

THE APPLICATIONS AND SERVICES DOMAINS

Today and even more tomorrow, the vision of the world maybe very different when services will be looking for us, inducing a new model for application domains.

The world of applications and services (Figure 2) is described as:

a. A cylinder with three segments representing the three application and service providers aiming at users: *Me*, *Group* and *Society*. The three domains have a large zone for contacts and exchange between them:

- **Me:** Individual entity – person, device or machine – achieving and controlling its individual goal and offering/using services to/from others;
- **Group:** Collection of 'me' or 'groups' co-operating towards achieving a common goal, each member contributing to that goal complying with group-controlled rules; and

[1] *Those five applications and services domains are totally immersed in an environment more and more influenced by major societal impact the list of which is not just limited to health, ageing population, urbanisation, environment, knowledge, security & safety, globalisation and 'on the move'.*

[2] *Categories of software technologies as well as the relation to business models, regulation, legislation and acceptance by society and public*

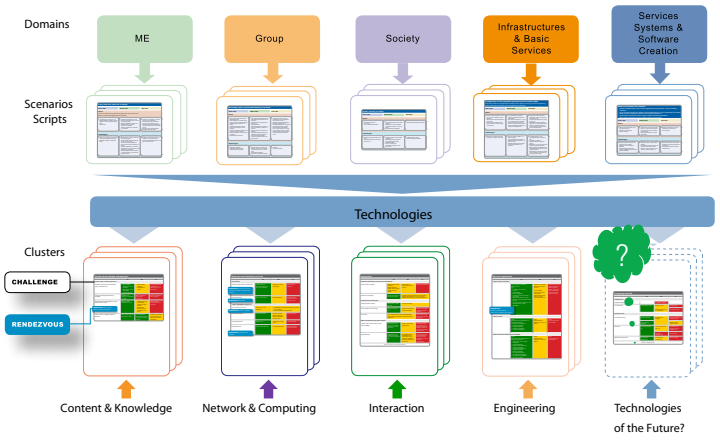


Figure 1 – The Roadmap 3 process

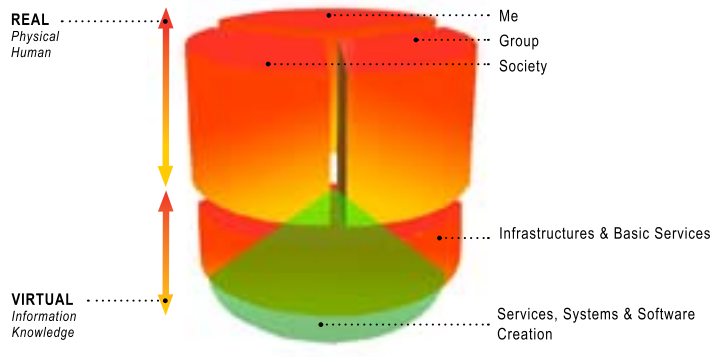


Figure 2 – Modelling the applications and services domains

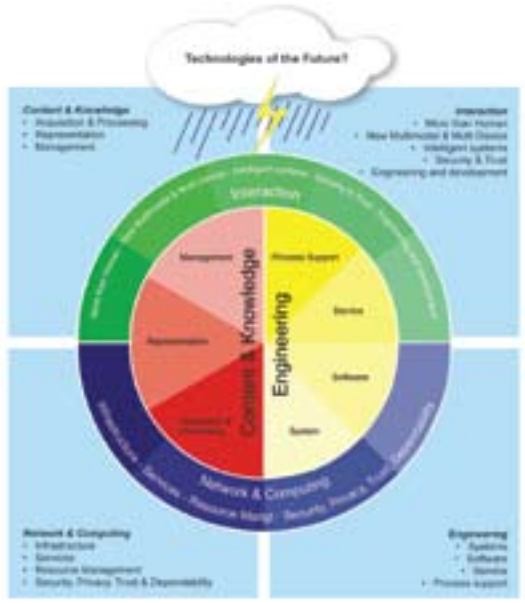


Figure 3 – Enabling technology

- **Society:** Assembly of actors/stakeholders achieving high-level societal or commercial objectives regulated by widely-accepted rules covering all members of an overall community.

  These domains exist of course in the real world but the systems and services are in the virtual – digital – world, shown by the changing colours. However, the border between the real and virtual world is not sharp, so a gradient shows the transition between them.

b. In addition to the three main applicative domains Me, Group and Society, we have the 'pure' software and information technology domains that enable the existence of all these services. These two transversal application domains are:

- **Services, Systems & Software Creation:** A range of activities and software tools required to help actors/persons/agents engaged in designing, implementing, verifying, maintaining and modifying software-intensive products and/or systems and services;

and

- **Infrastructures and Basic Services:** Distributed adaptive services, generic support services and framework services used to compose services, applications and systems dynamically.

These two domains are placed in *Figure 2* as a cylinder below the three applications domains, since it would support all three of them. The *Services, Systems & Software Creation* domain is represented as a cone within all the other four domains, starting at the transition from real to virtual, and going to the bottom of the *Infrastructures and Basic Services* domain to reflect the increase in construction activities.

For each of the domains, actors are identified and their contributions to the domain described in each chapter. By actors, RM-3 means agent, business, customer, machine or product but also services interacting between themselves. The interaction could be person or machine centric – consumer to consumer (C2C) or machine to machine (M2M) – as well as heterocentric, such as business to consumer (B2C) or service to agent (S2A) for agent, business, consumer and machine or service. For each one, the societal issues are developed; the part related to health, shown in a section below, is a good first example. It shows that domains are not independent 'silos'.

CATEGORIES OF SOFTWARE TECHNOLOGIES

In each technology cluster, the main challenges are identified and, for each, a few main generic technologies have been expressed and their development positioned roughly in time – short, mid or long term – within the time frame of RM-3.

But today, the success of a new technology or even a nice combination of technologies – not only based upon software but also hardware often associated and synchronised with external conditions such as the 'Rendezvous' with proposed back-up solutions; *regulation* is a typical one – can no longer be transformed into a business success by themselves.

In a specific chapter entitled *Technologies of the Future?*, the roadmap team proposes a few new directions that could have a major influence on the software industry in the future as well as on software applications and services.

The Roadmap 3 presentation at the 2008 ITEA 2 Symposium in Rotterdam, the Netherlands.

AN EXAMPLE OF THE IMPACT ON SOCIETAL ISSUES: HEALTH

The societal impact 'health' is a generic of a real global and cross-cutting problem that should be handled from all three application domains: *Me, Group* or *Society*. This section describes the topic of health – defined by the World Health Organisation (WHO) as: '"the state of complete physical, mental and social well-being, not merely the absence of disease or infirmity" – for persons over their whole life, from conception to grave in a cross-domain context.

Citizens are supported towards self-management in keeping healthy through prevention and avoiding relapses after a chronic disease has been treated. Healthcare professionals are supported in giving the optimal care in screening, diagnosis, treatment and post-event follow-up.

Healthcare institutes working at the frontline in the health area are starting to adopt an approach called the 'care cycle'. The essence is that the complete care process is focused on the patient and his or her specific disease. To support such a care-cycle approach, technologies are involved inside and outside the hospital to prevent, diagnose, treat and monitor diseases.

In practice, people go through more than one care cycle during their lives and sometimes are in more than one care cycle in parallel, where information from one care cycle, either in the past or parallel in time, might be relevant in another care cycle. Health-management systems should cope with this complexity.

This example demonstrates why borders between domains are blurred and why emerging technologies need to migrate to fulfil domains' request mainly under the pressure of societal requests.

IMPORTANT THOUGHTS ON SOFTWARE-INTENSIVE SYSTEMS AND SERVICES

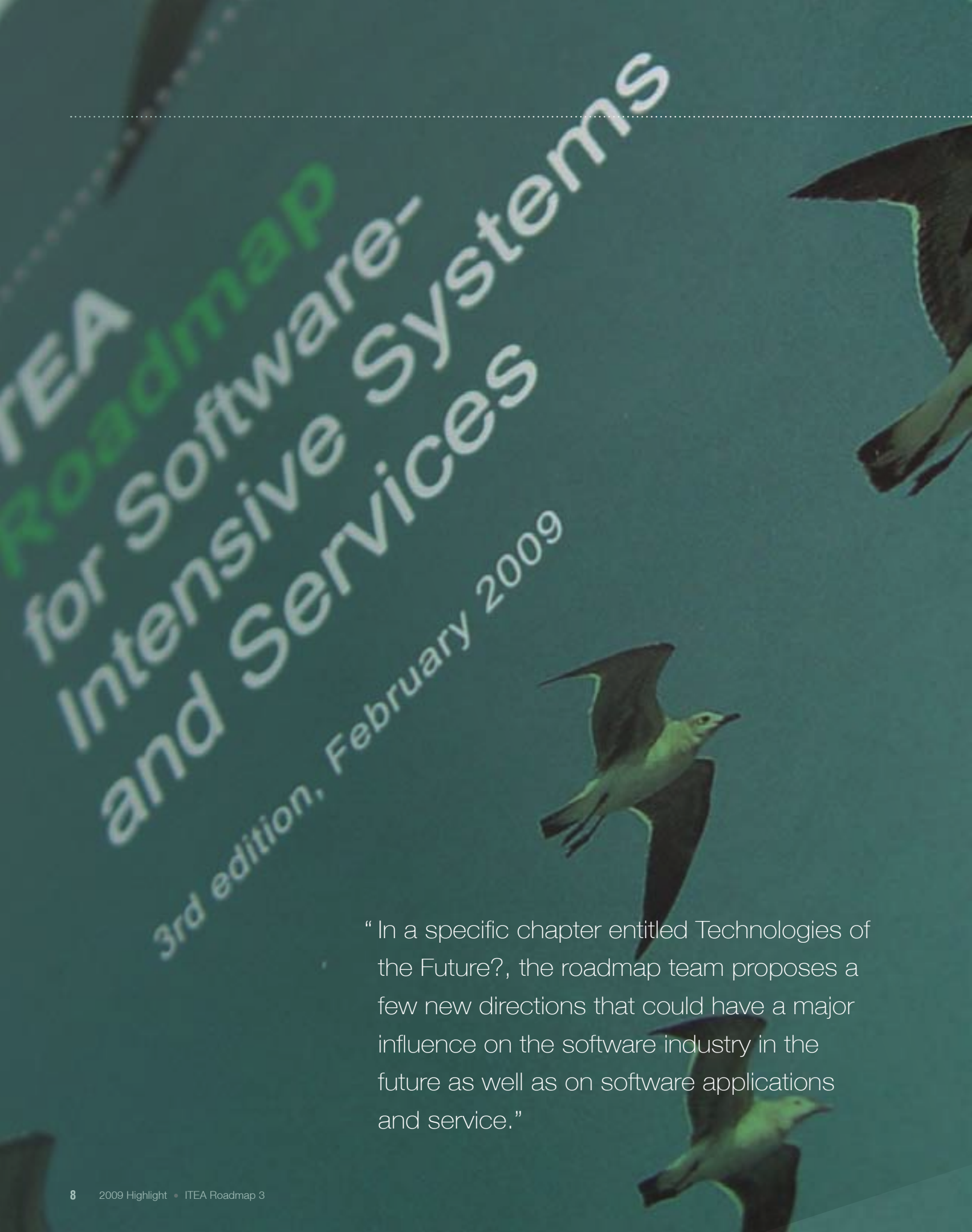
The way the digital world[3] can enhance the real world is a topic that deserves some further exploration. The increasing amount of software together with the presence of the Internet is pushing a global convergence of previously isolated areas. A new scenario is emerging in which the digital component is increasing. This has important implications as the convergence process is creating some sort of a global digital world – without geographical boundaries – in which different innovation rules, not yet fully understood, apply.

In general, a 'world' can be defined in terms of the entities, the rules defining their interactions and environment in which they evolve.

Furthermore, we develop two interrelated directions of thought that are very important to consider when defining a successful business strategy:

1. The economy behind software and software-intensive services and systems; we characterise the various kinds of software and related business models.

[3] *In this paragraph, Virtual is often associated with digital, which is a mathematical representation of the world; Virtual is here either the digital model of the real world or a pure software logic.*



" In a specific chapter entitled Technologies of the Future?, the roadmap team proposes a few new directions that could have a major influence on the software industry in the future as well as on software applications and service."

Jean-Luc Dormoy

THE ROADMAP 3 WORKING GROUP TEAM

The process of creating this Roadmap was based on consensus. The ITEA 2 companies nominated experts to the core team elaborating the document. All in all, more than 75 specialists and young talents in various industries and from major European universities and large research centres contributed to the development and validation of this document.

With my two Co-Chairs, Ger van den Broek & Jean-Luc Dormoy, we would like to give special thanks to the entire roadmap team who, during eighteen months, have with patience elaborated very imaginative contributions and produced additional efforts to make possible such vision in the context of the ITEA 2 objectives as defined by ITEA 2 Board. Also a special thank to the countries which have financially supported this important milestone for the community.

Jean-Pierre Lacotte - RM-3 Coordinator, Thomson

Jean-Pierre Lacotte

	ENTITIES	LIFE AND INTERACTION	ENVIRONMENT	INNOVATION POTENTIAL
Real world	Physical: real life objects	Defined by physical laws (some still unknown)	Physical space	Strongly limited (time, space …)
Digital world	Immaterial needing specific transducer for representation: digital data structures	Definable by software logic	Execution environment	Limits unknown (Constrained by the execution environment and some basic physical laws such as speed of light and size of molecules)

Business models for software, usually for the category 'software as a product', might vary quite a lot.

2. We also show that, while maturing, the economy organises itself around ecosystems, characterised by provider-customer relationships based on more or less generic platforms, which group some infrastructure and basic services with a set of tools, and around which a wide service creation and provision economy can be built.

FOUR MAIN DIRECTIONS

Trying to extract some generic conclusions covering the Roadmap that represents such an important effort will of course be partial but the team proposes four main directions:

1. Even if Moore's law may remain valid for a few more years from the technological point of view, some other factors might limit its applicability. For example, the investment cost to develop and manufacture next-generation technologies could become so high that only very few consortia can afford it and, consequently, the number of available semiconductor production factories will be very limited; the industrial risk will then turn out to be very high and probably unacceptable for high-end products. Are there solutions to bypass or avoid this difficulty?

2. Large systems and systems of dynamically configured systems, aimed at addressing very high complexity and/or accommodating a multitude of various 'users', need specific attention. How do we proceed from experimental set-up to deployment and then full scale that fulfil all possible and necessary 'illities' with a maximum of updated societal constraints? Put in general terms, we have a fundamental system design issue.

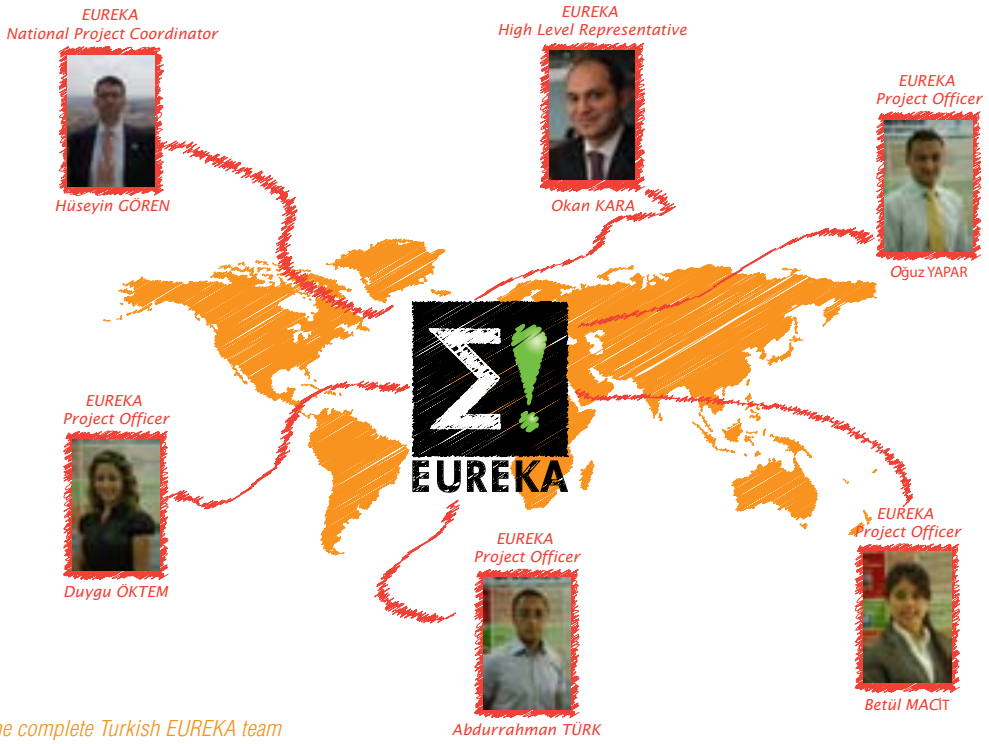
3. The software industry is different from many other industries because the investment cost is mainly based upon up-to-date human competence, and so seems limited – indeed, it is very high. The potential success of a product, system or service relies only on the people who have the capacity to formulate, define, design, develop, update, maintain and support the systems, manage the project and train the users. Do we have today a sufficient number of such specialists in Europe and what about our future needs?

4. The move toward a full information and knowledge society gives the software industry, or industries using software as one of their tools, a very challenging position to contribute largely to understanding the new societal requests and to propose innovative and solvent practical solutions. Will that be the leverage for the future? •

Focus on Turkey

Turkish participation in ITEA 2 snowballing

It was only five years ago that Turkish SMEs took their initial steps in the ITEA programme. Following the success of the first Turkish SME participant – in the AMEC connected home project, which won the ITEA achievement award in 2007, participation has snowballed. There are now 22 Turkish companies involved in ITEA 2 projects and the total Turkish participation in terms of effort already ranks seventh compared with other ITEA countries. ITEA 2 marked this importance by holding its 2009 project outline preparation days in Istanbul on 16 and 17 February – the event also opened the fourth ITEA 2 call for projects.



The complete Turkish EUREKA team

"With the support of the ITEA 2 Office in the Netherlands, the highest participation level of Turkish industry so far among the EUREKA Clusters has been seen in ITEA 2, which is a proof of the great interest of Turkish industry to the Cluster,"

Okan Kara, TÜBİTAK

"Observing industry trends over the past ten years in Turkey, we see that information and communications technologies (ICT) have been developing very fast," says EUREKA High Level Representative (HLG) Okan Kara of funding agency TÜBİTAK – the Scientific and Technological Research Council of Turkey. "Now, in terms of the number of R&D projects funded by TÜBİTAK, ICT has the second largest share and its potential is steadily growing."

However, TÜBİTAK believes accumulation of knowledge within national boundaries is not enough. So, in line with national strategy on internationalisation of R&D, the Council has been encouraging the domestic software industry to take part in research and development (R&D) co-operation with European counterparts to develop value-added services and systems through both EUREKA and the EU Framework Programme.

"With the support of the ITEA 2 Office in the Netherlands, the highest participation level of Turkish industry so far among the EUREKA Clusters has been seen in ITEA 2, which is a proof of the great interest of Turkish industry to the Cluster," adds Kara.

STRONG FUNDING SUPPORT

TÜBİTAK is the leading agency for management, funding and conduct of research in Turkey. It not only supports innovation, academic and industrial R&D and manages research institutes but also establishes scientific and technological policies in line with national priorities. To achieve this, it has developed a concrete framework, the Turkish Research Area, which includes goals, priorities and general mechanisms and funding policies and strategic action plans to realise them.

The Turkish Research Area defines key roles for relevant actors in the national innovation system and sets the major objectives. One is to improve Turkish competitiveness; this has been reflected in the strengthening of national and international R&D funding mechanisms.

The AMEC project team received the gold ITEA Achievement Award at the 2007 ITEA 2 Symposium in Berlin.

"The market orientation is the definite value of EUREKA and ITEA."

Zeynep Sarilar, Mobilera

"We believe strongly in the importance of the internationalisation of R&D," emphasises Kara. TÜBİTAK is highly committed to both EUREKA and the EU Framework Programme. It has supported this commitment by establishing the necessary legal infrastructure to simplify access to funding in case of international co-operation.

"We have a newly developed funding instrument – the Industrial R&D Funding Programme for International Projects – which is specifically designed for EUREKA and Eurostars," he adds. This allows TÜBİTAK to support EUREKA and Eurostars projects with a maximum grant ratio where 60% of all eligible R&D expenses are covered for large companies; this is raised to 75% for small and medium-sized enterprises (SMEs). Moreover, there is no restriction on budget or duration in the programme.

AGGRESSIVE PROMOTION

A dedicated office in TÜBİTAK promotes EUREKA aggressively in Turkey through national and international events, exhibitions and training sessions. A special ITEA 2 information day organised in Istanbul in February 2008 attracted more than 70 companies, representing an important part of the Turkish high tech ICT sector. ITEA 2 Chairman Rudolf Haggenmüller and Programme Co-ordinator Erik Rodenbach gave presentations and helped promote participation in ITEA 2.

In addition, the Turkish EUREKA office looks for R&D co-operation opportunities with other EUREKA member countries and works on innovative bilateral co-operation models. The first such co-operation started with Israel in 2007 with the strong involvement of Ericsson Turkey. This action was directed to mobile technologies in line with Ericsson's technology strategy; a series of EUREKA and Eurostars projects resulted.

STRONG MARKET ORIENTATION APPRECIATED

Mobilera is a leading mobile solution provider in Turkey, offering innovative community management, mobile marketing, and content services. It was the first Turkish company to participate in an ITEA project when it joined the AMEC consortium in 2004. ITEA was responsible for introducing Mobilera and facilitated access to funding through the Turkish EUREKA office.

"We had initially applied for national funding to support our research," says Zeynep Sarilar of Mobilera. "However we were quickly convinced that the EUREKA programme was much better for co-operation. And through ITEA, we had the opportunity as an SME to collaborate with a cross-section of European industry and demonstrate our knowhow."

AMEC set out to develop a software-based framework for the connected home of the future. It explored how an adaptive and intuitive-to-use ambient ecology of products, content, applications and services could support domestic life in future homes. Mobilera was put in touch with Philips Design, the AMEC project leader. "We explained our abilities and were quickly accepted," recalls Sarilar.

"We were in effect the main technology provider as most of the other partners were designers," she continues. "We were responsible for developing the software platform for AMEC. This framework is much easier to integrate and implement than alternatives then available as well as being easier to use."

The resulting framework is already being used by Mobilera itself. The company is also in contact with white goods manufacturers in Turkey to enable them to integrate the framework in their products. "The market orientation is the definite value of EUREKA and ITEA," emphasises Sarilar. "For an SME such as ourselves, research has to be commercial." •

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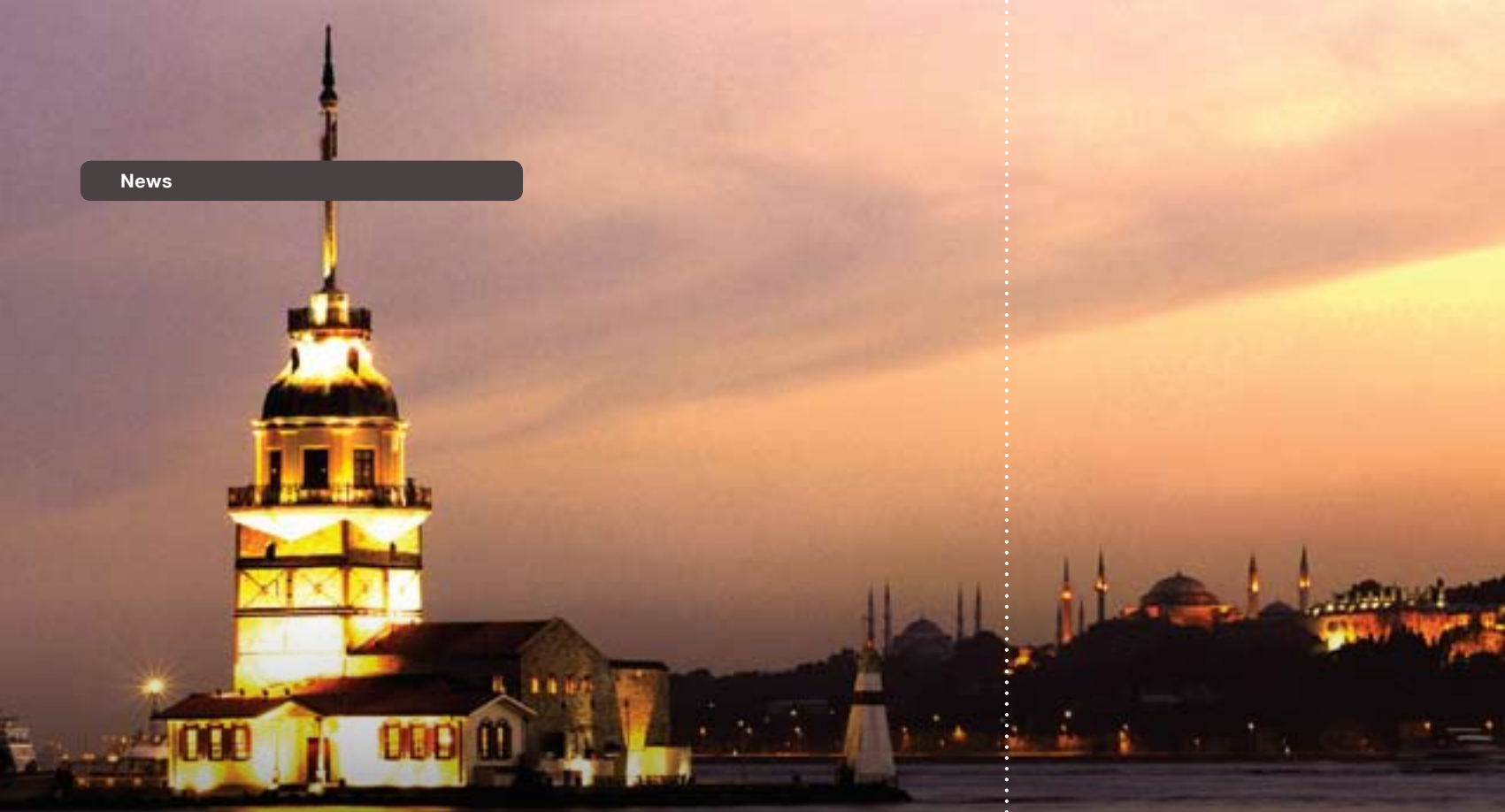


2008 ITEA 2
PO Preparation Days, Istanbul

As traditional, the fourth Call of ITEA 2 opened this year with a two-day Project Outline preparation event. The event took place in the Conrad Hotel in Istanbul, Turkey. The strong growing participation of Turkish companies and the support of the Turkish Public Authorities were the main drivers to have the event in Turkey this year. The event was organised in close co-operation with Hüseyin Gören, member of the ITEA 2 Public Authorities Committee (ITAC), and his team from TÜBİTAK, the Turkish funding agency. Three Turkish companies – Turkcell, Mobilera and Platin – also sponsored the event.

Despite the worldwide financial crisis, the growth in participation at this event continued even this year. For the first time in the course of ITEA 2, the number of participants, consisting of representatives of companies, academics and public authorities from all over Europe, easily passed the 200 mark. Over half of the participants came from industry and SMEs. As expected, there was a strong participation from Turkish organisations, but also from France, Finland, Germany, the Netherlands and Spain. This year representatives of new countries such as Romania and Lithuania were present and even representatives of non-EUREKA countries Egypt and Korea participated actively in the event, showing the expanding visibility of ITEA 2 and the interest from the ICT community.

The event was opened by ITEA 2 Chairman Rudolf Haggenmüller, followed by opening speeches from Okan Kara, EUREKA High Level representative, TÜBİTAK, and Semih Incedayi, General Manager, Turkcell Technology, one of the sponsors of the event.

After the ITEA 2 introduction by the ITEA 2 Chairman and Vice-Chairman, the event followed the proven format to come to initial project proposals. We started with a lively and interactive poster session, presenting between 25 and 30 initial ideas. In this open market, people discussed ideas and exchanged contact details. Following the poster session, participants that already sent in project ideas before the meeting were invited to present their idea as an 'elevator pitch' in one of the two parallel group sessions. This year, the ideas were grouped either in the 'Applications' or the 'Software Engineering' group session.

After the group sessions, participants formed smaller group to discuss common interests with the aim of forming initial project proposals and consortia. The intermediate results of these discussions were presented in a plenary session at the end of the first day. Some 16 topics for project proposals were presented in areas such as healthcare, social networking, energy management and saving, safety, design model checking, sensor networks, open platforms for tools and software as a service, smart systems and products, and web monitoring.

The second day started with a short training session on how to prepare and submit a Project Outline. For the first time, in this Call Project Outlines have to be submitted via a web-based tool called the ITEA 2 Proposal System (IPS). Detailed instructions were given about the use of the tool.

Following the training session, the ideas were further refined and in some cases topics combined. The final results, including plans on how to proceed, were

News

presented at the end of the event and ITEA 2 Vice-Chairman Philippe Letellier closed the event.

The event was appreciated very positively by the participants. There was a lot of interactions and networking, and the organisation received clear and positive feedback from the participants. This was confirmed by the evaluation forms that were filled in by about 25% of participants and which indicated an overall appreciation of 4.16 out of 5 points.

Of course, now it is up to the consortia to develop the project proposals further to a final Project Outline to be delivered before the deadline of 9 April. •

CANTATA deploys content-awareness

Screen shot of the developed CAD application to diagnose pulmonary emboli in the lungs

Deep vein thrombosis and its fatal complication pulmonary embolism (PE) pose a serious health problem. It is estimated that in the EU and US combined 2.5 million people develop pulmonary embolism each year with fatal results in roughly 30% of the cases. Due to its vague and unspecific symptoms, pulmonary embolism is notoriously difficult to diagnose - in two of three of cases the diagnosis is missed. Timely diagnosis and appropriate therapy can reduce the mortality rate to well under 10%.

The advent of multi-detector computed tomography (MDCT) has radically changed the diagnosis of pulmonary embolism in symptomatic patients and has become a routine examination. As the condition is acute and can be lethal within hours, patients are scanned and diagnosed by the radiologist immediately, at any time of the day. As the radiologist needs to read a stack of hundreds of images, good visualization is a necessity for quick and confident diagnosis.

To improve the efficiency of this diagnosis process, Philips Healthcare collaborated with several other large industrial companies, medium-size enterprises, research institutes and universities from Europe in a joined project called CANTATA. This project aims to deploy content-awareness in media systems for a broad range of applications, allowing system intelligence for autonomous operation or assistance.

After three years of research, development and clinical trials, Philips Healthcare is ready to launch a first version of computer assistance in the detection of pulmonary emboli on the market. The system provides assistance to the radiologist by automatically zooming on the left and right lung, and adapting the visualization of the 3D content on the 2D screen aligned with the observed blood vessel. In a later phase the automatic detection of pulmonary emboli in the blood vessels will be added. •

Programme status

What is happening in 2009? The new projects of Call 3

In December last year, the ITEA 2 Board labelled 14 projects of the third Call for a total of 2,970 person-years.

As usual, a number of the new projects address topics that are related to the Software Engineering domain. Five projects could be identified in this domain: i.e. SYLEX, OPENPROD, VERDE, OPEES and USIXML.

The **SYLEX** (System-level exploration and optimisation for deeply embedded, heavily constrained HW/SW systems) project aims to develop a framework that enables optimisation of the design and execution of adaptive real-time embedded systems by integrating modelling, analysis, runtime-adaption and optimisation techniques that cross multiple levels of abstraction and address multiple non-functional system constraints of the different application domains.

The **OPENPROD** (Open model-driven whole-product development and simulation environment) project provides an open whole-product model-driven rapid systems development, modelling and simulation (M&S) environment integrating the leading open industrial software development platform Eclipse with open-source M&S tools such as OpenModelica and industrial M&S tools and applications.

The **VERDE** (VERification-oriented & component-based model Driven Engineering for real-time embedded systems) project aims to develop a solution for an iterative and incremental development and validation of real-time and embedded systems, which integrates testing and analysis. It will foster the industrialisation of this solution through a close collaboration between technology providers and end users from different domains –software radio, space, railway and automotive.

The **OPEES** (Open platform for the engineering of embedded systems) project mission statement is 'to settle a community and build the necessary means and enablers to ensure long-term availability of innovative engineering technologies in the domain of dependable/critical software-intensive embedded systems'. For OPEES partners and supporters, they can achieve this challenge if they succeed in building an ecosystem in the open-source framework, with the relevant business models, to ensure this long-term availability of engineering tools and components.

The **USIXML** (User interface extensible markup language) project proposes to face the challenge of lowering 'total application costs and development time' is to enhance the interface-modelling language UsiXML by adding versatile context-driven capabilities that will take it far beyond the state of the art, up to the achievement of its standardisation.

The ITEA 2 programme addresses software-intensive systems and services. There were three projects in Call 3 that focused on the services aspect. These projects are USERVICE, DIY SMART EXPERIENCES and SUS.

The **USERVICE** (Ubiquitous service infrastructure for the mobile super prosumer) project will investigate how to change mobile users into service super prosumers – that is, producers, providers and consumers of mobile device services –to benefit from the vast number of potential mobile sources of the right, key information and contents. These services can be consumed remotely by other users, in a simple way, with only their mobile devices.

The **DO-IT-YOURSELF SMART EXPPERIENCES** project will enable people to tailor their everyday environment into a highly personalised meaningful communication/interaction experience that can span the home and city domains. The project aims to create a sustainable marketplace for user-generated application (components) for an Internet-of-Things world, in which non-technically-skilled people can participate, (re-)using well-abstracted components, capabilities and devices.

The **SUS** (Smart Urban Spaces) project aims to develop suitable design frameworks and urban standards that will enable European cities to introduce easily and seamlessly the most advanced mobile technologies in new interoperable e-services offered to their citizens. Those services will target improving the daily life of European citizens in their specific contexts, but also improving the productivity and efficiency and local administrations, especially in the management of their relationships with both citizens and urban service providers.

The topics addressed by two projects, ROLE-ID and SEISMIC, are specific for the business environment.

ROLE-ID (Role-centric identity) is developing an organisation-oriented identity extension based on a role-centred vision. It will provide a set of innovative and modular security components and processes that will enhance role management within the infrastructure identity level and provide innovative role functionalities.

The primary goal of **SEISMIC** (Semantically Enhanced Information Systems Management InfrastruCture) is to enhance the safety of distributed, heterogeneous information systems. This includes the enhancement of dependability, resilience and robustness against failures – e.g. through self-organisation mechanisms. The secondary goal is the development of innovative methods and tools for information-systems management, which will allow a tight coupling and inter-working of independent management functions.

The remaining projects focus on ICT, which addresses societal issues, such as healthcare (CARE4ME), energy (NEMO&CODED) and safety (GUARANTEE, VICOMO).

The **CARE4ME** (Co-operative Advanced Research for Medical Efficiency) project aims to increase quality and productivity in the healthcare care cycle by using more advanced medical imaging and decision-support methods, while combining them with different knowledge sources, from early diagnosis to treatment and monitoring.

The **NEMO&CODED** (Networked Monitoring & Control, Diagnostic for Electrical Distribution) project aims to save energy – deploying an energy-efficiency approach – by taking advantage of emerging IT technologies and service-oriented architecture (SOA) concepts and introduce them in the domains of electrical distribution & renewable energy.

The **GUARANTEE** (A guardian angel for the extended home environment) project intends to research software products and services that provide personal safety in the residential environment. These products and services provide direct support and advice to people in unsafe situations, or they connect people and enable the support of others.

The **VICOMO** (Visual context modelling) project will focus on the construction of realistic context models to improve the decision making of complex vision systems and to produce faithful and meaningful behaviour. •

Who is Who

Linked projects enabled software trading - and now for something different

Jean Gelissen has covered a wide range of activities in more than 30 years with Philips Research. Much of this related to multimedia and the necessary software, leading to involvement in ITEA and a series of successful linked projects dealing with software component integration. More recently as Philips has reoriented towards lifestyle products, he has become responsible for open innovation – and his latest ITEA project involves virtual worlds.

Jean Gelissen studied electronics at polytechnic in the Netherlands, specialising in computer technology, mainly hardware. After several years in Philips, he did a two-year postgraduate course on informatics given by the top professors from all the technical universities in the Netherlands.

"I started in Philips supporting measurements and simulations for the digital audio CD being developed at the time," he explains. "I then moved into formal specification methods for product software, mainly for TV." Multimedia was just starting and Philips asked Gelissen to set up a programme in this area. Subsequently, he became head of the department dealing with information processing architecture, mostly embedded software.

For the last two years, Gelissen has been responsible for the open innovation of Philips lifestyle programme – this includes virtual institutes in collaboration with European industry and academia. He also manages co-operation in national and international programmes in the context of open innovation, and deals with standardisation.

INVOLVED FROM THE FIRST CALL

"I have been involved with ITEA since its first call," he says. "I initiated and led four consecutive projects related to embedded software for consumer devices." These projects were EUROPA, Robocop, Space4U and Trust4All. It all started with functional aspects of component-based embedded software but gradually moved into non-functional aspects particularly software life-cycle management and trustworthiness of the installed software base.

One important outcome of this series of linked projects was to open up the ability to trade in software components. The successful conclusion of TRUST4ALL in mid 2007 also resulted in the completion of the international standardisation process on embedded multimedia middleware. The ISO/IEC 23004 MPEG-E (MPEG Multimedia Middleware) standard was published in October 2008, 15 months after the project itself finished.

Much of this work dealt with embedded software for consumer electronics and semiconductors – where Philips is no longer involved following the NXP split off. Philips itself is now a lifestyle-oriented company, reflected in its ITEA participation. It is currently interested in projects on safety in the home, coaching and smart kitchens.

"Our project participation has become more end-user than technology focused – a big change," notes Gelissen. He is currently leading a completely different type of ITEA project – Metaverse1 – that deals with interoperability between virtual worlds and more importantly between virtual worlds and the real world. This is also driving international standardisation in ISO/IEC 23005 MPEG-V (Information exchange with Virtual Worlds).

Gelissen has also been involved in the EU Framework Programmes. "I was in one of the first large projects of the type now known as an integrated project. The Commission was keen to have bigger projects and supported the set up of a counterpart to the MIT Oxygen initiative related to ambient intelligence."

The Ozone project – going one level higher than Oxygen – was on ambient intelligence, mainly in the home domain. The project involved the construction of a kind of virtual laboratory involving Philips, Fraunhofer, Thomson and INRIA – the French national institute for research in computer science and control – that is still going on.

DIFFERENT APPROACHES

Gelissen sees a number of differences between Framework Programme projects and ITEA: "Framework Programme projects are very pre-competitive with a much higher research component, requiring a large number of universities to be involved. ITEA projects are much closer to the market with more industrial involvement but with a significant number of universities when needed."

He sees a big advantage of both in the umbrella provided covering such points as partnership agreements and intellectual properties rights – a real headache otherwise if you had to negotiate an agreement between 10 to 15 companies. Moreover, they enable competitors to work together. "We've had quite intensive relationships with Sony, Nokia and Thomson, which probably not have been possible without this type of construction," he says.

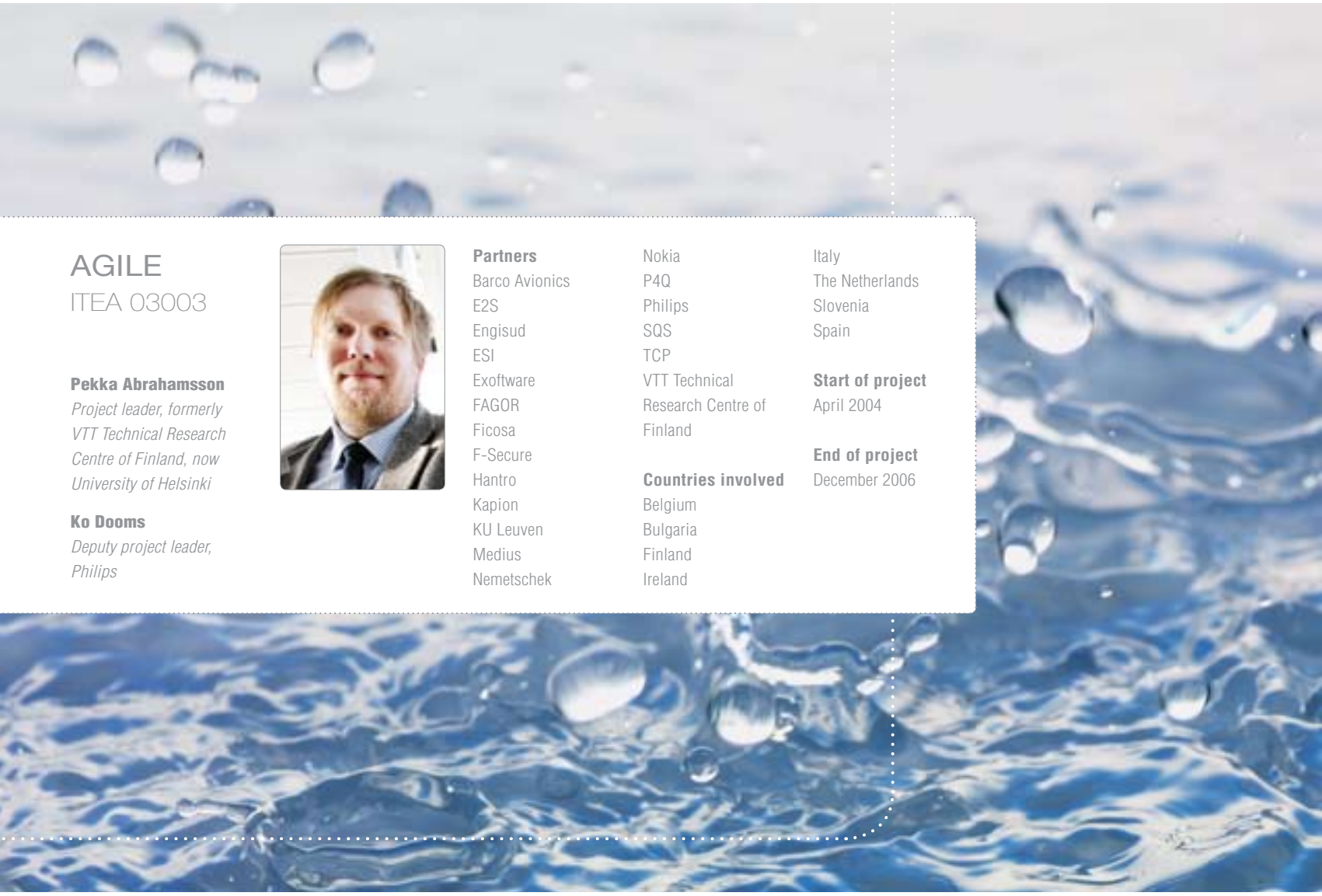
Jean Gelissen
Senior Director Strategic Partnerships
Lifestyle Program - Philips Research

"A major benefit of ITEA is the good and intense collaborations possible not only technically but also organisationally and culturally," he adds. "This results in a very broad contacts and knowledge network where everyone is contributing. And, on a personal level, I gained international recognition with publications, conference presentations, tutorial invitations, requests to participate in reviews and panels, and participation in international standards working groups." •

Agile methodology

Achieving a radical improvement in software engineering

Results of the ITEA AGILE project are leading to a radical change in the way large companies in Europe develop software. A series of pilot case studies clearly demonstrated a massive improvement in efficiency, reducing development costs and increasing flexibility. Use of this methodology can cut lead times, increase quality and improve customer satisfaction for embedded software in a range of industries from aeronautics and mobile communications to consumer electronics. The FLEXI project is now developing and scaling up Agile methodology for much wider use in software development across Europe.



AGILE
ITEA 03003

Pekka Abrahamsson
Project leader, formerly VTT Technical Research Centre of Finland, now University of Helsinki

Ko Dooms
Deputy project leader, Philips

Partners
Barco Avionics
E2S
Engisud
ESI
Exoftware
FAGOR
Ficosa
F-Secure
Hantro
Kapion
KU Leuven
Medius
Nemetschek
Nokia
P4Q
Philips
SQS
TCP
VTT Technical Research Centre of Finland

Countries involved
Belgium
Bulgaria
Finland
Ireland
Italy
The Netherlands
Slovenia
Spain

Start of project
April 2004

End of project
December 2006

Agile is a new paradigm for software development that emerged in the USA at the beginning of the decade. It offers a significantly different approach to software engineering with the added benefit of welcoming changes even late in a project. Change has always been a problem with current approaches but with Agile it is possible to add new features at any time, even up to a few days before product launch.

Moreover, the Agile approach focuses on business-level issues rather than technical ones when developing software. For example, as most consumers use only some 5% of the software-based features offered by a system, the development process focuses on these critical features and puts the effort into getting them to market first. Designing and testing the 95% of features that will not be used is an expensive prospect.

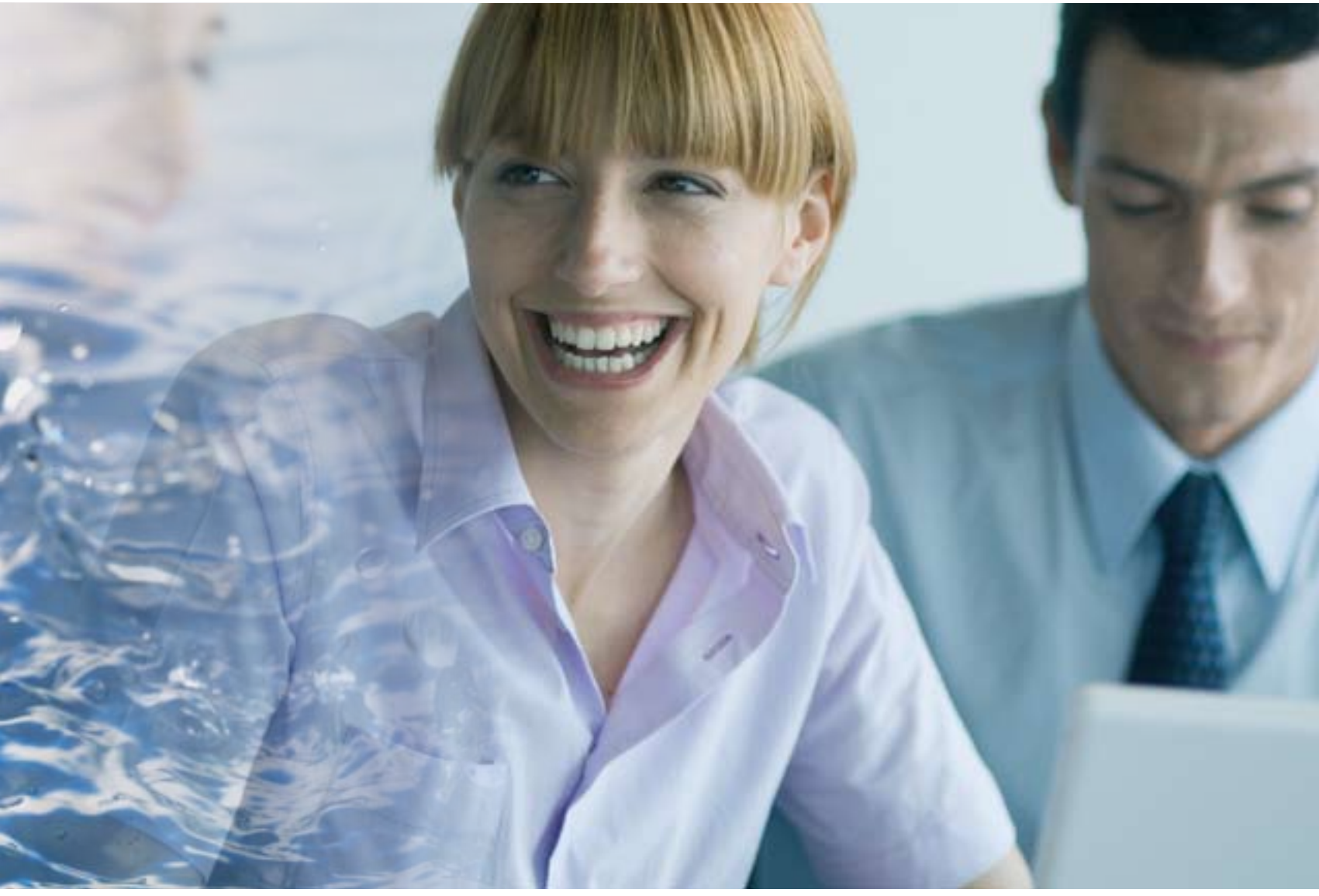
The methodology covers the whole development cycle but focuses on the actual processes, techniques and the tools used to get the systems out. The underlying rationale is based on a multilayer approach with a set of values and a set of 12 principles. Moreover, Agile can adapt to meet the demands of highly regulated industries such as aeronautics systems developments that are subject to a wide range of standards.

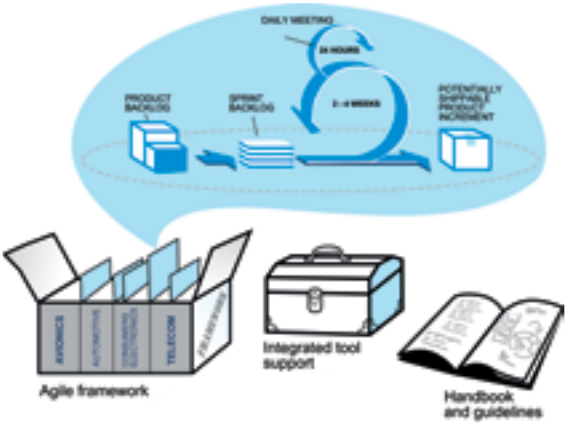
SHORT CYCLES AND FAST FEEDBACK

Unlike current approaches which work on three-, six- or even 12-month cycles, Agile is very tightly constrained with tight delivery in fortnightly or monthly cycles. This requires a radical change in thinking in the way effort is planned and how development costs are estimated. It also requires technological investment and long-term training.

Use of short cycles and clearly defined communications ensure that an organisation can cut feedback time dramatically at all levels – from the technical developer to top management. This reduction in feedback time ensures the developer will get feedback from his work in seconds or minutes. And, at a larger integration level, it is possible to obtain the feedback on whether integration was successful within hours – previously this could have taken weeks. This is a key change.

However, it is necessary to adapt to this fast feedback – it is essential to know what the feedback means and what to do with it. If someone puts forward an idea yet it takes several weeks for the feedback, then a lot of time is lost and, for example, a system could continue to produce more defects or a lot of effort may wasted in a wrong direction.





80 INDUSTRIAL PILOT TRIALS

"It leads not only to significant reductions in lead times but also to an increase in quality and improved customer satisfaction."

Pekka Abrahamsson, University of Helsinki

PROVEN IN PILOTS

The ITEA AGILE project itself involved 19 companies in 8 countries. Nearly 70 pilot developments involving 1800 software engineers in short and long projects in a variety of industries showed the Agile approach could achieve up to 70% reductions in lead times and costs.

"With these pilots, we proved that this significantly different approach worked well in various places around Europe," says project coordinator Pekka Abrahamsson, formerly of VTT Technical Research Centre of Finland and now professor of computer science at the University of Helsinki. "It leads not only to significant reductions in lead times but also to an increase in quality and improved customer satisfaction."

In addition, AGILE succeeded in developing 12 tools that enable the application and use of these ideas. Three of the tools were ready for commercialisation by the end of the project. These include the ATO, developed by E2S in collaboration with KU Leuven and Barco Avionics to support model-driven development in an Agile environment, that is now being marketed, and Softfab, developed by Philips, as a fully automated test-management and build tool that provides a very intuitive and efficient interface for all the test script execution.

Work in large companies such as Nokia Siemens Networks proved particularly successful, despite having to overcome a lot of issues. Moreover, identification and surmounting such obstacles means that it is now possible to help guide other European companies to carry out the same transformation process better and faster.

In addition, the European Agile community is leading the way in global standardisation. "I'm in charge of IEEE 1648, which is the forthcoming standard on Agile methods to be released in mid 2009," says Abrahamsson.

LONG-TERM TRANSFORMATION

Communications are crucial in R&D and application of Agile methodology is relatively simple in a small organisation as communications are easier. But in a large organisation, there might be hundreds or even thousands of developers. So, while the advantages may be obvious, the transformation to a full Agile environment can take a minimum of three to five years. "What we end up with are continuous, very pragmatic improvement cycles," adds Abrahamsson. "And the improvements are down to everybody – there are no separate improvement departments. All are involved – developers and management. That requires a lot of investment. However, in the end it is not about fixing the process; it requires a radical rethink, not just new tools."

Agile methodology is now in the mainstream adoption phase in Europe with many new companies taking it up. And the companies who have been working with this approach from the beginning of the ITEA AGILE project are at the leading edge and have been involved in dissemination.

"Whatever the result in the new globally competitive environment, when feedback time is reduced and we are able to adapt the result, then we are on way to being world-class companies," concludes Abrahamsson. •

Agile methodology

Scaling-up to high-performance businesses

While Agile software development has proven its efficiency in embedded-software development within different organisations, FLEXI set out to scale-up Agile approaches and develop solutions that are applicable directly in industrial use for large and very large software developments involving multicultural, multi-technology and globally distributed partners. Three project partners F-Secure, Nokia and Nokia Siemens Networks give their views.

While the success of ITEA's AGILE project was clear, it left a major question over how to scale-up the process. The challenge is to apply Agile methodology in a global value chain involving multiple technologies and partners who are not all within a single organisation.

The follow-up FLEXI project therefore focused on three components:

1. *Market-shaping innovation:* it is essential to be market leader in a global competitive environment and to be in a position to shape how future markets will behave. FLEXI is specifically addressing issues regarding innovation and how to streamline it. This requires getting everyone in the corporate setting involved and thinking about how new products or services will be better – it is no longer just the job of the marketing department.

A METHODOLOGY THAT DELIVERS

Mobile- and computer-security provider F-Secure – a project partner in both AGILE and FLEXI – started using Agile methodology four years ago. "Most if not all methodologies claim to produce software faster, cheaper and better," says Jari Still of F-Secure. "The difference with Agile is that it delivers value through self-organised teams using the full capacity of the company and true iterativity."

In its previous document-driven projects, e.g. architectural analysis could take three months or even be running three months late as the company tried to figure out every detail in advance. Now the slogan of the FLEXI project is 'From idea to product in 6 months', which F-Secure also had as a company target.

F-Secure pioneered the Agile approach for small and then medium-sized R&D projects, with excellent results. But it also became clear that the whole company needed to support the Agile way of thinking. So F-Secure carried out more pilots in large R&D teams and is now running all its projects whatever their size in this way.

"I can't see us going back," says Still. "For example our human resources department is writing job descriptions based on roles and responsibilities defined in Agile methods. Rewarding systems have also been adapted – with the focus on rewarding teams instead of individuals."

Moreover, Agile is an advantage for the European industry in general. "The aim is to develop a totally new way of working and of conducting software business," he explains. The learning and results from FLEXI will be available by the end of 2009 in the system called the Agile Positioning System (APS). APS will be a web tool that will show an organisation's (or team's) position on an Agile map and will demonstrate possibilities to increase an organisation's Agile capabilities.

SIMPLIFYING WORKING TOGETHER

Another major beneficiary has been project partner Nokia Siemens Networks. "We started in the AGILE project in 2005 as Nokia," explains Kati Vilkki, now responsible for Agile methodology at NSN, the company that came out of the merger of Nokia's and Siemens telecommunications networking businesses.

"The original impression was that Agile was for small teams and not large scale telecommunications projects. In FLEXI, we have enlarged the scope in terms of the number of teams and number of functions involved, resulting in an end-to-end Agile solution. We needed to scale up the methods. This has not been done elsewhere in the world."

Agile offers increased flexibility and the ability to make changes. This is of crucial importance with ever increasing competition. "We need to act much faster," she points out. "And we have to make choices on what brings value to the customer. This all requires much better linkage between product management and development. We are no longer resource driven but value driven."

Other benefits include increased visibility of the actual status of development. Before, everything looked fine when writing specifications or code but integration could take up to 18 months rather than the expected

FLEXI
ITEA 06022

Pekka Abrahamsson
Project leader, formerly VTT Technical Research Centre of Finland, now University of Helsinki

Stig Larsson
Deputy project leader, ABB

Partners
ABB
Answare
Callataÿ & Wouters
Confirmit
DS2
Elektrobit
ESI
Exoftware
Fidelity investments systems company
Freemind
F-Secure Oyj
GEOMATIKK AS
ON2
INDUTRAUX
Innovalia Association
National University of Ireland, Galway
Kongsberg Spacetec
Mälardalen University
Nokia
Nokia Siemens Networks
Objectnet
OPCAT Systems
Philips Applied Technologies
Prosource
Reaktor Innovations
Rovsing Ireland
Scia
SINTEF
Sirris
SQS
Telefónica I+D
University of Oulu
Tampere University of Technology
University of Limerick
Universidad Politécnica de Madrid
VTT Technical Research Centre of Finland

Countries involved
Belgium
Finland
France
Ireland
Israel
The Netherlands
Norway
Spain
Sweden

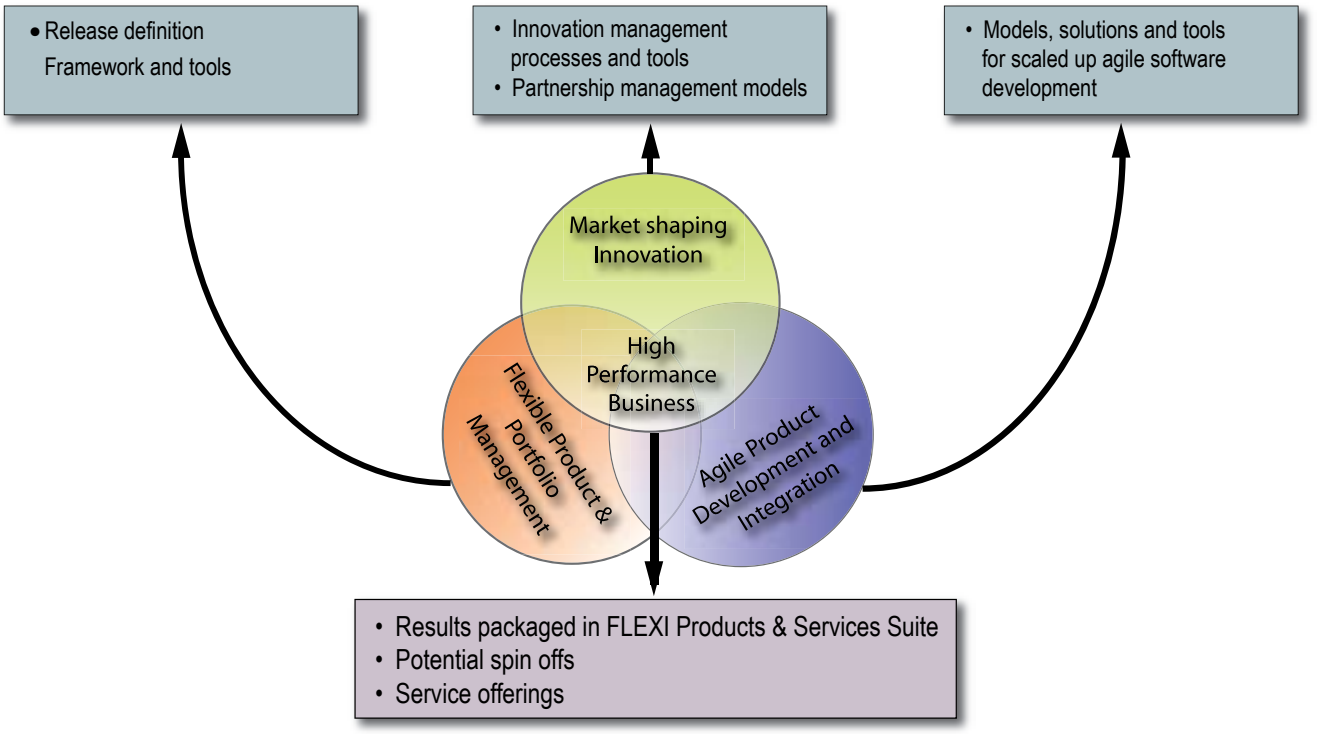
Start of project
April 2007

End of project
December 2009

2. *Flexible global portfolio management:* while it is necessary to be able to plan for years ahead, there is still need to be able to adjust individual deliverables in a road map as new knowledge arrives and to be able to influence forthcoming releases; and

3. *Specific R&D issues:* how to scale-up project management, integration and sharing of information requirements in engineering – all simpler in an Agile environment.

When these three components are put together, the result is a high performance business, explains project coordinator Dr Pekka Abrahamsson. This is why he sees the whole industry gradually changing to an Agile form of working.



"In FLEXI, we have enlarged the scope in terms of the number of teams and number of functions involved, resulting in an end-to-end Agile solution."

Kati Vilkki, Nokia Siemens Networks

two. "Now, by continuous integration and development of small pieces, we know what has been done and what still needs to be done."

INCREASED ENGAGEMENT AND MOTIVATION

Use of Agile was important for NSN with the merger of two companies and restructuring. Agile, self-organised, cross-functional teams increase engagement and motivation. This works in two ways: self-organised teams give team members the power to make decisions about their work themselves, and cross-functional teams provide a tangible result. Quality also improves.

Agile is a big change, affecting all the functions, and it takes time – from two to five years for each organisation. "We can have up to 1,000 people involved in developing a product and all of them have to learn new ways of thinking and working together, which takes time. Moreover, while ex-Nokia staff had a strong background in Agile, Siemens staff had less. So we effectively started again from scratch two years ago in building awareness, running pilots and learning."

There are some difficulties with Agile transformation. These include technical problems is setting up continuous integration, especially with large legacy products, organisational problems in building trust and co-operation between product management and development, and moving to a cross-functional approach that is meaningful from a customer point of view. "However, the approach is particularly valuable and none of our teams have wanted to go back," emphasises Vilkki.

DEVELOPING SOFTWARE ON ITS OWN TERMS

The Nokia devices division has also been involved with both the AGILE and FLEXI projects. Maarit Laanti has been responsible for Agile there since 2007 and is a strong believer in the benefits in terms of time to market, increased quality and better predictability. She thinks such a big change should be encouraged by sharing the necessary information to the people involved and letting them manage the change themselves.

The transformation process involved a large organisation. It started by turning teams into Agile teams, a process that is almost complete. Projects were then changed into Agile projects. Two major change processes are now on-going to convert the whole organisation into an Agile one.

"The great benefit of Agile comes from the fact that it is understanding the software paradigm in its own terms," she says. "Before, we had been transferring development processes as such from other disciplines, such as manufacturing or hardware development, that didn't quite fit. Here we can create processes from a software perspective. Software is abstract, software specifications are subjective and specifications translate to implementation in many ways - unlike hardware that is bound by physical constraints and where the specifications can only be read in one way. The key idea of being agile is to welcome changes and respond to them instead of just simply following the original plan. Fast changes are happening through people, fast feedback and fostered communications." •

Innovation Reports

EPAS
(ITEA ~ 05008)

Ottilia Rouguet, Ingenico, and William Vanobberghen, Groupement des Cartes Bancaires, France

Marking the cards for a Single Euro Payments Area

The EPAS project set out to overcome obstacles to the interoperability of electronic payments schemes in a single European market. EPAS aimed to contribute to the achievement of a Single Euro Payments Area by delivering three major card-based protocols built on open and interoperable standards. An additional objective was to extend this valuable experience to the worldwide sphere of card payments through an ISO 20022 universal standardisation process.

The European banking industry, the European Central Bank (ECB) and the European Commission are working together to ensure the successful creation of the Single Euro Payments Area (SEPA). SEPA will make it possible to make and receive payments in euro between and within countries under the same conditions anywhere in the area. This will ensure that consumers, businesses and public administrations will be able to make cashless payments from their domestic accounts to anywhere within SEPA.

An integrated market for payment services entails the removal of all technical, legal and commercial barriers between current fragmented national payment markets. By developing and using open and common standards, enhancing competition and improving payment services, SEPA will foster an efficient and competitive payments industry in Europe as part of the European Single Market. And a crucial element is the harmonisation of the billions of electronic retail payments made with both debit and credit cards.

Such harmonisation will require issuers, acquirers, card schemes and operators to adapt to new principles know as the SEPA card framework (SCF). Key features are that cardholders can pay with one card all over the euro area, and retailers will be able to accept all SEPA cards in a single terminal. As a result, payment-card processors will be able to compete with each other and to offer their services throughout the euro area. This will make the market for processing card payments more competitive, reliable and cost efficient.

PAYMENT SERVICES DIRECTIVE

The Payment Services Directive (PSD), issued in 2007, provides the legal foundation for the creation of SEPA and aimed at establishing a modern and comprehensive set of rules applicable to all payment services in the EU. Both the European Commission and the ECB believe strongly that SEPA will lead to economies of scale.

The harmonised development of electronic card payments in Europe will offer substantial savings in cash-management operations for retailers – particularly multinational companies that now have to maintain separate card-handling systems per country. The new system will lead to real competition between card handlers as European-wide operations become possible.

Small retailers will benefit as they will only need one type of terminal to handle all types of card operation. And consumers will profit from more efficient card payments at a lower cost – ensuring fast and secure transfers between bank accounts anywhere in the euro

area, and making it possible to use bank debit cards to make payments abroad in euro, just like at home.

To avoid unnecessary legislation, banks, retailers, vendors, services providers, card schemes and users teamed up in the EPAS project to deliver the necessary standards to meet the need for global payment standards by 2010. This will sustain the creation of a single market for card payments in Europe and ensure the emergence of new innovative and competitive payment solutions.

CREATING NECESSARY CONDITIONS

From its inception, EPAS created the necessary conditions to reach SEPA's objectives of achieving the same user experience throughout Europe by:

- Involving the key stakeholders in card-payment, manufacturing and software-development services – including several major multinationals;
- Clearly identifying the business requirements involved; and
- Ensuring a universal solution that could – through ISO standardisation – become the worldwide standard for interoperable payments by cards.

Overall, EPAS has delivered a series of specifications that will enable a smooth migration from today's non-interoperable and proprietary solutions with dedicated interfaces to an open environment based on interoperable hardware and software components from different manufacturers.

The work involved developing three major elements involved in point-of-interaction (POI) transactions:

1. A **terminal management system** (TMS) involving data transfer, including encryption, and maintenance; this ensures easier payment systems administration and suitable security;
2. A **retailer protocol** covering administrative, payment-services and device-services exchanges; it ensures a clear separation between sales and payment functions, removes dependencies between payment services and products, and offers a common protocol for all types of architectures and environments.
3. An **acceptor-acquirer protocol** covering authorisation, completion, rejection, reconciliation, diagnostic and specific service exchanges; this offers a single common solution for multiple acquirers, removes local and regional constraints and embeds security.

A first working demonstration of the EPAS standard took place at the CARTES and IDentification show in Paris in November 2008. Partners Ingenico and Hypercom demonstrated how their payment terminal solutions could be interconnected with acquirer protocol systems supplied by Atos Worldline, an issuer simulator from Experian, a TMS protocol from SRC and retailer protocol systems from Scheidt & Bachmann and Wincor-Nixdorf. GALITT and Integri provided software simulators for this demonstration environment.

PAVING THE WAY AHEAD

EPAS has paved the way to standardised universal specifications free of royalty and/or charges. This initiative, based on the collective work of key stakeholders in the card-payment industry in Europe, will enable them to benefit from a single, common solution available on various platforms provided by global key-terminal manufacturers and solutions providers.

A dedicated legal structure will be set up to ensure the further evolution and maintenance of the specifications and standards. This will ensure the protection of the intellectual property rights (IPRs) gained in the ITEA project and make possible the delivery of references to interested implementers.

The further standardisation process will continue in ISO 20022, where specifications will be delivered and validated during 2009. Availability of an EPAS ISO 200222 standard will enable wider acceptance worldwide and proper convergence with payment standards already developed for credit transfers and direct debits. This will allow banks and users to reduce the gap progressively between card and non-card payment processes.

Wide availability of EPAS specifications will meet industry requirements to base all further developments on a common solution. Consequently, it will reduce the risk of legal action by European regulators to impose an alternative solution in the absence of such an initiative. •

NUADU
(ITEA ~ 05003)

Peter van der Meulen, Philips Applied Technologies, The Netherlands

Tele-healthcare can offer higher quality living

The NUADU project set out to explore the opportunities of using networked services to provide cost-effective and efficient healthcare and wellness services. Such applications could improve the quality of life for an increasingly elderly population and those suffering from major problems such as strokes. Results showed tele-monitoring with feedback provides highly effective support with a lower demand on healthcare personnel. However, questions remain on how to fund such systems.

Overall levels of public and private healthcare expenditure are continuing to rise faster than GDP in the EU. This is not helped by a rapidly aging population requiring costly long-term care and an increasing tendency for young people to be inactive, overweight or obese which, if allowed to continue, is likely to result in higher proportions of disorders later in life.

Chronic diseases such as diabetes, high blood pressure, congestive heart failure and dementia are a major factor, accounting for 75% of all healthcare costs and 85% of all deaths.

Technology can be used to educate and stimulate people to adopt a healthier lifestyle and so prevent such diseases. In addition, people are taking a greater interest in their own health. While traditional health services will have an increasing problem in providing sufficient cover, consumers appear more willing to invest themselves in a long healthy life with a high level of quality.

HEALTH AND WELLBEING

The main objective of NUADU was to see how innovations in electronics and information and communication technology (ICT) could contribute towards improving health and wellbeing. This ranged from those who would like to be more mobile and would like to do exercises supporting that, up to the elderly in care centres who require some kind of help or people who have had a major problem such as a stroke and need managed rehabilitation.

Applications envisaged were those that encouraged people to control successfully their own health and wellbeing. All these required support from three technologies:

1. Sensors – it is necessary to know something about the person being studied, either by using body sensors for heart rate or motion monitoring, or by visual sensors such as cameras;
2. Services – this could be a computer connected to a network which registers all the data that is measured and which can provide feedback to the patient or to a central service; and, in between,
3. Interconnections: hubs, wireless links, ….

The challenge was to bring these technologies together – to see what existed, how they could be combined to provide a solution, and to identify what was missing and then carry out new developments to make things even better overall.

NUADU involved 25 partners, each with its own range of in-house technologies. There had already been a drive for co-operation between these companies based on the need for an end-to-end approach to health problems, the concerns of care providers and the increasing use of sensors and networked services in medical care.

FOCUS ON REAL APPLICATIONS

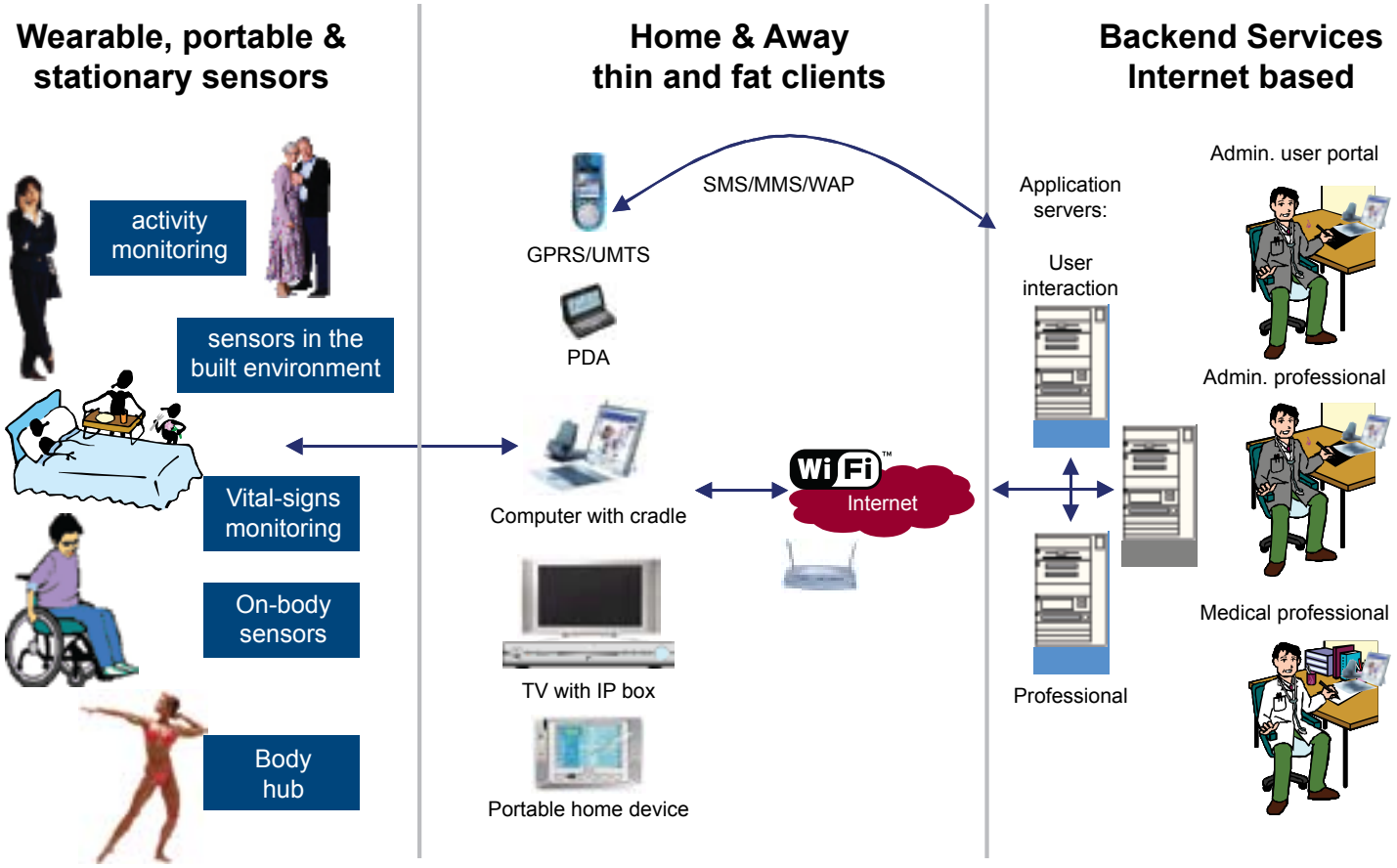
A strong software element meant the project fitted well into ITEA. In addition, NUADU focused on real applications. An important point was the emphasis not just on the technology but also on pilot sites and demonstrations as a key issue was how the technologies were appreciated by users – were they easy to use and user friendly.

Seven pilot sites allowed a direct confrontation between technology and user, and enabled optimisation. These pilots covered:

- Preventative measures encouraging healthcare self-management by municipal workers in Espoo, Finland and self-management of nutrition, activity and weight by consumers in Valencia, Spain;
- Enabling independent living for the handicapped and elderly in Kunheim, France and for stroke victims in Hoensbroek, Netherlands; and
- Effective management of chronic conditions by monitoring of heart patients in Madrid, Spain using mobile terminals as they went about their daily lives.

Key impacts of the NUADU approach include more cost-effective support for health – if you are moving more and get feedback or support, you will make less demands on your doctor of hospital services. In addition, there is a large potential business market as indicated by the number of products already being introduced by Europe's competitors.

A series of new product and service developments emerged, including:



- A tele-medical armchair enabling a series of non-invasive medical tests such as temperature, blood pressure, hearing, breathing performance and memory, suitable for retirement homes and hospitals as well as luxury hotels;
- A small wireless motion-sensor that measures how a person is moving and provides feedback against personal targets such as calorie use;
- Domestic stroke-rehabilitation services, where a stroke victim with a limp for example can have a personalised exercise programme with feedback; and
- A Wellness Diary service on a mobile platform.

INCREASING SUPPORT COST EFFECTIVELY

There is a large demand for NUADU applications in the healthcare sector where people are getting older and care centres are not well staffed. Tele-healthcare allows effective support with much less staff time involved.

Such an approach is particular interesting for healthcare providers and could have a major impact on cost reductions and quality of healthcare. Several studies point in this direction. A recent German hospital study concluded that by using tele-healthcare in a hospital environment, there is a significantly higher survival rate in chronic cases – 35% after 12 months and 20% after 20 months.

The major problem is the economic acceptance of the overall facilities. Healthcare insurance companies are showing interest; if they can really be convinced that it is going to save overall expenditure, they will be keen to invest. Patients themselves or their care providers might also be interested.

This has been one of the most uncertain outcomes of the project – it was possible to develop systems technically but who is going to pay for it (user, physician, insurance, government, …) and who is liable in case of incidents (not clear since rules differ between various countries).

The project is now finished but there is follow up. For example, Philips and VTT have just started the InnoHub open innovation centre in Finland. This will allow them to work together on innovations in the tele-healthcare sector; it also involves a pilot site environment. And also other partners are ready to develop and market more new products based on the knowledge acquired in the project. For example, NUADU led to various promising spin-offs, like a start-up activity in Valencia and new ventures initiated by Philips. •

SMARTTOUCH
(ITEA ~ 05024)

Tuomo Tuikka, VTT Technical Research Centre of Finland

Taking a touching approach to mobile service access

SmartTouch was the biggest project piloting near-field communication (NFC) technology applications in Europe. It involved an extraordinarily wide combination of technology and service producers, researchers and companies in examining the role of NFC technology in city life, the home, wellness and health, technological building blocks, security and privacy, and business building blocks. In addition to developing the basis of NFC-enabled services for payment and ticketing, partners have piloted access control, infotainment and entertainment services.

Near-field communication offers short-range wireless connectivity that enables consumer devices to interact quickly and easily when brought close together or touching. Set up time is much shorter than with Bluetooth for example and such systems are intended to be intuitively easy to use. NFC can enable a wide range of services from using mobile phones to make payments to allowing digital cameras to transfer pictures to a TV set at a touch.

SmartTouch set out to conceive, design, construct and trial a full NFC technology/service platform and develop the main concepts for the corresponding business chains. As a result, project partners have been able to contribute to the development of NFC technology and its standards, and keep up the pace with technological advancement.

Key developments included a complete ticketing system – from the application in a mobile phone, point-of-sales equipment and reader/validator for gates, to back-end system for customer authorisation and remote value reload.

BROAD RANGE OF ACTIVITIES

SmartTouch undertook a broad cycle of activities in an effort to understand and find business areas for such an NFC approach. Technical partners tackled the necessary protocols, enablers, applications, security and privacy through pilot applications in the home, city life and wellness areas. At the same time, other players were seeing what kind of business areas there would be for the future mobile services.

To identify real-life applications of NFC technology and gain a greater understanding of the user experience, SmartTouch carried out 33 pilots and 44 technology demonstrations. Delivering demonstrations for user testing and systems for pilot use was found to be a highly effective way to probe possibilities for successful approaches. Acceptance of NFC in use was considered important for its success.

The different scenarios were developed in isolation, with design and implementation depending on the purpose of the system involved. However, the solutions to implement for example a service enabled by NFC are technologically similar to other services, so there was a certain synergy between the application scenarios. This synergy can be seen as the NFC technical ecosystem.

BASIS FOR SECURE SERVICES

As well as creating new and innovative applications, SmartTouch worked on technology enablers to make application development possible and provide a basis for secure NFC services in the future. Thus, SmartTouch provided the opportunity to create applications for mobile phones, such as working on the basic standard solution for SIM-based payment, and then building service solutions on top of these technologies.

Currently, the whole industry is looking at the development of payment and ticketing applications to open the way for use of NFC technology. SmartTouch piloted vertical applications such as payment in France and ticketing in Frankfurt; smaller tests were carried out in Finland and in Spain. Horizontal industrial sectors tackled included home consumer electronics, business-to-business manufacturing and telecommunications services.

The Frankfurt ticketing pilot involved equipping 750 Rhein-Main-Verkehrsverbund (RMV) public transport network stops with radio tags. NFC-enabled mobile phones are used to make secure ticket purchases simply by touching one of the tags at a stop. The phone user can also receive real-time information on transport schedules. Anyone can use the system to buy single trip and daily passes – the cost is charged to a credit card or as a direct debit to a bank account. And NFC-based mobile tickets are also available for the entire RMV area.

The main breakthroughs in SmartTouch were in the technology to make the NFC possible, providing the mobile handsets with relevant toolsets, protocol-level achievements in standards, making payment possible and methods for security in the production of NFC-enabled subscriber-identity module (SIM) cards. In addition, these elements were used in the creation of vertical applications, ticketing devices, locking devices and domestic electronic devices.

BENEFITTING CONSUMERS AND INDUSTRY

The results of this ITEA project will make two major differences: from a consumer perspective, the idea is to provide a natural and easy user interface for service discovery and use. The pilot projects provided a perspective on value chains where new employment

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and businesses identified include content provider, media and back-end systems.

European citizens will therefore benefit, as the aim is to provide devices that are easier to use. Moreover, at some point in future, many of the things we carry in our wallets today will in future be contained in the mobile device – even our house keys.

Industry in Europe will also benefit:

- Firstly, European players in a range of industries – including communications, banking and local government – have gained knowledge about the technology and have already been able develop new products and services accordingly; and
- Secondly, European industry has improved its competitive position versus Japan and the USA, with project partners actively paving the way for global exploitation of NFC.

KEY ELEMENTS OF EXPLOITATION

NFC technology brings the touch paradigm to mobile services, in addition to other dimensions, thus allowing services such as mobile payment or ticketing by simply touching a reader with a mobile phone. As experienced in SmartTouch, the possibilities are endless, including offering new ways of interacting with home consumer electronics and offering help for people with disabilities and the elderly.

A pilot in the city of Oulu in Finland offered a meal service for elderly people. A touch-based user interface was embedded into a meal menu, which was used by the elderly home-care clients to order their meal for the following day. The application also allows monitoring of the meal-delivery process in real time, increasing traceability and cutting down manual work.

The project is now finished, and in its exploitation phase. More than 22 products have already resulted. These include NFC cards for PCs enabling Internet connections, ticket validators and readers, handset applications and smart-card systems.

A particularly interesting exploitation has been the touchatag spin-off from Alcatel-Lucent. This offers a contactless radio-frequency identification (RFID) tag that automatically launches services. For example, a tag on a painting in a gallery could provide a mobile phone user with information about the painter. Or a cleaning service could register completion of work in a room on a tag in the room.

SmartTouch members have also been active in standardisation work in the NFC Forum and the Mobey Forum, which encourages the use of mobile technology in financial services, as well as in the GSMA mobile communications industry organisation. Examples include the single wire protocol, contributions to security aspects of NFC, and suggestions for work items in context data representation. The NFC Forum has almost finalised its specifications; and NFC standards should be available mid 2009. So, realistically, it will probably be another year before NFC really takes off. •

Upcoming events

12 May 2009
ICT DELTA
UTRECHT, THE NETHERLANDS
A yearly event where science, business and government come together to discuss the future of ICT research in the Netherlands.
www.ict2030.nl

25-29 May, 2009
XP 2009
SARDINIA, ITALY
Tenth International Conference on Agile Processes and eXtreme Programming in Software Engineering - *www.xp2009.org*
Related project: FLEXI - *www.flexi-itea2.org*

3-6 June 2009
OSS 2009
SKÖVDE, SWEDEN
5th International Conference of Open Source Systems- *http://oss2009.his.se*
Related project: OSAMI - *www.osami-commons.org*

18-20 June 2009
EUREKA INNOVATION DAYS
LISBON, PORTUGAL
See special article in this magazine.
www.eureka.be

Expected
October 2009
ITEA 2 SYMPOSIUM 2009
MADRID, SPAIN

EUREKA Innovation Days 2009 approaching!

The EUREKA Portuguese Chair is organising the 2009 Innovation Days in Lisbon from 18 to 20 June. With this three-day event, EUREKA will leverage its visibility to show that it is actively and positively contributing to build the vision of 'Europe Leading Technology and Innovation'. The event is part of the 'European Year for Innovation' and in line with the communication strategy approved at the last EUREKA Ministerial Conference in Ljubljana.

The event will consist of a project results' exhibition, open-air demonstrations of technologies from EUREKA success stories and a parallel programme that will include:

- International conferences;
- Project presentation sessions;
- Presentation of new technology-based companies;
- Venture and seed capital forums; and
- Presentation of R&D funding programmes.

Furthermore, the EUREKA Awards presentation ceremony will be held during the event and it will also be the location of the EUREKA Ministerial Conference on 19 June.

FOCUS ON PROJECT RESULTS

The exhibition will consist of different areas for results of R&D projects, new technology-based companies and R&D results from universities and other science and technology organisations. The exhibition will also be the platform for EUREKA Umbrellas and Clusters to present themselves.

Preparations are well underway and we will publish more information about the event and ITEA 2 participation shortly on our website.

So please keep an eye on www.itea2.org and www.eureka.be!