**ARTEMISIA
General Assembly**

De Doelen Congress Center
Rotterdam, the Netherlands
23 October 2008

**European competitiveness
and well-being through
ICT-based innovation**

'European
competitiveness
*and well-being through ICT-based
innovation'*

ARTEMIS

CONTENT

A Busy Period

Drafting MASP and cooking up Proposals

" European

competitiveness and

well-being

through ICT-based

innovation "

Welcome to the second edition of the *ARTEMIS Magazine*.

A lot has happened since the first edition in June 2008, during our spring General Assembly in Athens.

Many companies and institutes have been busy forming consortia to make project proposals for the first call of the ARTEMIS Joint Undertaking (JU). That call closed on 3 September 2008, and we are happy to see that the number of proposals met our expectations. The JU is now in the middle of its selection process, and we hope to see results of that in the coming month.

Meanwhile, in the summer, ARTEMISIA was active in drafting an update to the Multi-Annual Strategic Plan (MASP) 2009, which will form the basis for the second call of the ARTEMIS Joint Undertaking, expected in February 2009. A so-called 'Summer Camp' was organised in July, and many meetings of the various Working Groups and the ARTEMISIA Presidium were held to generate inputs for the new MASP.

The Strategic Research Agenda (SRA) Working Group, co-chaired by Laila Gide of Thales and Eric Schutz of STMicroelectronics, generated the working draft with help of Alun Foster of the ARTEMISIA office. This is now being discussed by the JU Governing Board; it will be finalised and adopted at the Governing Board meeting of 24 November 2008.

The new MASP highlights the intention of ARTEMIS to build self-sustaining innovation ecosystems for European leadership in Embedded Systems, based on Centres of Innovation Excellence. Workshops will be organised in 2009 to develop a working programme for this approach.

We are happy that ARTEMISIA keeps growing. At the beginning of September, we passed the 150-member milestone. We update the information about our membership on our website every time new members are accepted, so check out our website to see the latest status.

Already in Spring 2008, ARTEMISIA decided to organise its Autumn General Assembly back-to-back with the ITEA-2 Symposium, and have a Co-summit with the EUREKA ITEA-2 Cluster on the day in between the two events. This Co-summit will be on 22 October 2008 in Rotterdam, the Netherlands. The title of the Co-summit is 'European competitiveness and well-being through ICT-based innovation' – an area in which both ARTEMIS and ITEA-2 are very active.

There will be various parallel sessions on technical areas during the Co-summit. Next to this there will be Special Focus Sessions during the ARTEMISIA General Assembly on the following day. You will find an introduction to these sessions, written by the respective chairs in this edition of the ARTEMIS Magazine.

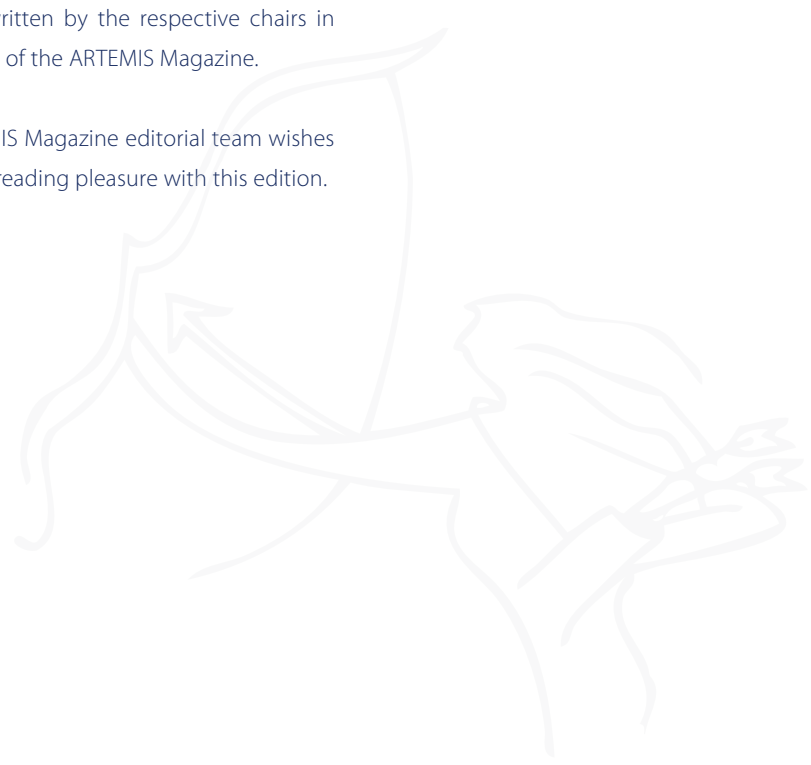The ARTEMIS Magazine editorial team wishes you much reading pleasure with this edition.

FOREWORD:

JAN LOHSTROH
Secretary General
ARTEMISIA Association

Robots face up
to musical challenge

"The Young Person's Guide to" … Embedded Intelligence
and Systems. Prizes for NICTA, HAMK, teamDARE

A TEAM FROM THE AUSTRALIAN INFORMA-
TION AND COMMUNICATIONS TECHNOLOGY
CENTRE OF EXCELLENCE (NICTA) AND THE UNI-
VERSITY OF NEW SOUTH WALES (UNSW) WON
FIRST PRIZE IN THE 2008 ARTEMIS CONTEST OR-
CHESTRA COMPETITION WITH A ROBOTICALLY
OPERATED CLARINET. THE CLARINET PLAYED
RIMSKY-KORSAKOV'S FLIGHT OF THE BUM-
BLEBEE AND RAVEL'S BOLERO. WHILE THE SEC-
OND-PLACED TEAM FROM THE NETHERLANDS
IMPRESSED THE JUDGES WITH AN EXTREMELY
REALISTIC SOUNDING ROBOTICALLY-DRIVEN
GUITAR, THE NICTA/UNSW ENTRY TOOK FIRST
PLACE BECAUSE OF ITS HIGHER TECHNOLOGI-
CAL DIFFICULTY.

Robot playing the clarinet.

The ARTEMIS Contest Orchestra challenges contestants to build devices that play standard unchanged musical instruments to demonstrate the creative potential of embedded systems. The competition is aimed at higher education and universities. The event in 2008 was held in Athens during the General Assembly of the ARTEMISIA Association.

"The general standard of the entries rose significantly from last year and the clarinet player was no exception," said former ARTEMISIA President Dr Yrjö Nuevo. "The jury placed it as the overall winner due to its playing ability and the complexity of its mouthpiece design. This competition is about demonstrating the capabilities of embedded systems by using them to perform the complex task of playing a musical instrument, and the NICTA/UNSW clarinet achieved this."

EIGHT-MONTH PROJECT ~ It took the NIC-TA/UNSW team eight months to develop the clarinet player. According to Dr John Judge of NICTA, his team won due to the high level of technical difficulty in the design of the robot 'mouth', and the device's unique, completely embedded computer system.

The robot's mouth uses two servomotors that apply force to the clarinet reed to make a sound. The smaller servomotor mimics the action of the human tongue, while the second applies a damping force to the reed, copying the action of the human lip. Force is applied to the clarinet keys by brass plungers with rubber or nylon feet depending on the key. The clarinet worked without an attached personal computer, the human interface was through an attached keyboard, liquid crystal display (LCD) screen and LEDs.

NICTA is the Australian Information and Communications Technology Centre of Excellence and a member of ARTEMISIA. 'We saw the Orchestra competition as a nice introduction to NICTA for schools," explains Dr Judge. "We have been taking the clarinet around trade shows and getting a lot of interest from school kids – and particularly girls.

"The task of playing a musical instrument is also nice and complex – and refreshingly different from many other contests, particularly the military ones. Moreover, it gave us the opportunity to raise our profile in the area of embedded software technology."

NICTA worked with the neighbouring University of New South Wales – one of its founding members – because of its specialist music acoustics laboratory. And UNSW not only enjoyed the research but has also gained a valuable research tool as a result of the competition.

"Overall I think our entry was best although the Dutch entry sounded fantastic," says Dr Judge. "On sound alone, the guitar was probably better, but taking technological difficulty into account pulled us over the line.

"I would like to see the Orchestra competition more widely promoted to get more entries," he adds. "It definitely raised our profile in ARTEMIS. One of NICTA's main interests is the field of embedded software and we have technology in this area that we would like to see taken up more widely."

LOTS OF DESIGN FREEDOM ~ Illustrating the concept of embedded systems is not easy. The ARTEMIS Contest Orchestra takes a light-hearted approach to a serious subject and has become a significant international technology award.
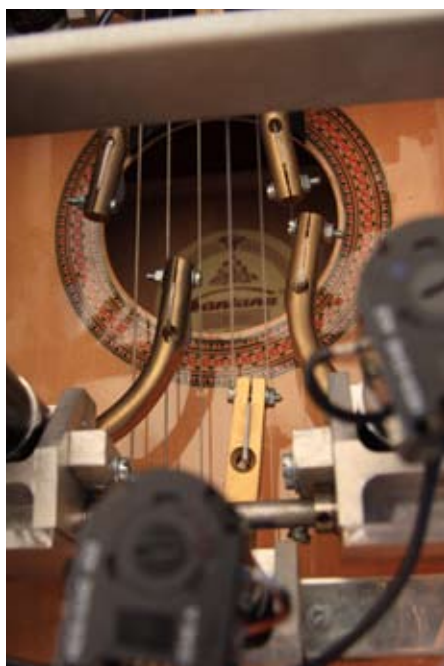
Robot playing guitar.

"It is a great idea," says Frank van Heesch of Dutch runner up teamDARE. "We had already participated in Eurobot and were looking for something else. We are particularly enthusiastic about this competition as it has nice loose rules giving us lots of design freedom. Other competitions involve robots fighting it out on a small table and do not necessarily engender a lot of interest. Playing musical instruments really does make people enthusiastic."

TeamDARE is a group of eight people from around Eindhoven with a good balance of mechanical engineering, electronic engineering and software expertise that builds robots as a hobby. They met up originally in 2001 at university in Eindhoven when they participated in Eurobot. They now have a variety of jobs but continue working on robots in their spare time.

"We have a lot of experience in building autonomous devices and pick our own challenges," adds Van Heesch. "We know how to divide up the electronic and mechanical tasks but here we also had to be particularly silent – something new to us. So we used compressed air."

The team entry consisted of a guitar-playing robot, with actuators plucking the strings. Embedded software running on four microprocessors in the instrument controlled all the actuators as well as the drivers and the vision element to follow the conductor's baton.

"Our instrument was the best sounding – but the first prize went to clarinet," says van Heesch. "I agree with this because it is much more difficult to control the airflow through an instrument than toggling a guitar string!"

"I think ARTEMIS could have made more of the prize event. We have been getting a lot of interest for musical gigs at public events – 15- to 20-minute musical presentations seem to make people very enthusiastic. And we are now scheduled as the 'opening act' at series of public concerts in the next few months – the list is on our website."

More information:
Artemis Contest Orchestra competition:
www.artemisia-association.org/artemis_orchestra
NICTA: www.nicta.com
teamDARE: teamdare.mine.nu/

Contestants were interviewed by Paul McCallum.

Summer Camp 2008

Cross-national innovation ecosystems

THE 2008 ARTEMISIA SUMMER CAMP, HOSTED BY THE ARTEMISIA ASSOCIATION IN BRUSSELS IN EARLY JULY, WAS THE LARGEST SUMMER CAMP YET, WITH APPROACHING 100 REPRESENTATIVES OF THE ARTEMIS COMMUNITY.

The first ARTEMISIA Summer Camp, in 2006, focused on picking out the scientific and technological priorities among the many objectives that had been set in the three technical parts of the Artemis Strategic Research Agenda that had just been published.

The second Summer Camp, held in 2007 in Vienna, established a structure of application sectors and technological domains to focus R&D on the needs of industry and society. This structure became embodied in the 'Sub-programmes' in the 2008 Annual Work Programme of the Joint Undertaking.

AN EVOLVING STRATEGY ~ Our third summer camp this year had several objectives. First and most importantly, it is the main mechanism by which members of the ARTEMISIA Association convey their opinion on the evolution of the ARTEMIS strategy.

It is now two years since the first version of the ARTEMIS Strategic Research Agenda was launched at the ARTEMIS press event that took place at the prestigious Bibliothèque Solvay in Brussels. A true strategy should not need frequent revision. However, in our world of embedded systems, where disruptive technologies and disruptive applications can suddenly appear, where markets can be volatile, and where global economic developments can change the balance of industrial forces in months, we need at least to consider from time to time whether our strategy is still valid and align it as needed.

The Summer Camp confirmed the essential content of the ARTEMIS-JU 2007 Multi Annual Strategic Plan (MASP). In particular, after a lengthy debate it was agreed to keep the 'Sub-programme' structure and approach. However, the attendees suggested, for the

future, to introduce additional application sectors such as sea and space exploration, and systems for the elderly. It was also agreed that other sectors are not excluded, but if they are to be addressed by projects, they should be addressed not in an isolated way but as additional sectors to those of the existing Sub-programmes so as to achieve more generic results. Similarly, projects might span parts of the scope of more than one Sub-programme.

R&D AND INNOVATION ~ The second objective of this year's Summer Camp was to consider how the ambition of the ARTEMIS-JU to enrich the 'Innovation Environment' for embedded systems might be achieved, given that the primary mechanism available to the ARTEMIS-JU is funding of R&D Projects, whereas the Innovation Environment part of the ARTEMIS Strategic Research Agenda envisages an 'innovation ecosystem' in which there are synergistic relationships between producers, suppliers, users, public sector organisations, scientific research, and education.

One outcome of the Summer Camp is, as a consequence, that ARTEMIS-JU Sub-programmes,

and all projects to be supported by the AR-TEMIS-JU, will be expected to contribute to the formulation or enrichment of particular innovation ecosystems. Their main focus will, of course, continue to be scientific and technological R&D: the impact is likely to be on the nature of R&D consortia and on their approach to dissemination and liaison with other projects and organisations.

SUCCESS CRITERIA AND METRICS ~ The ARTEMIS-JU has five-year targets that are derived from the 2016 targets for the ARTEMIS-ETP. These encompass impact on markets; significantly enhanced productivity; increased engagement of SMEs in the supply chain; a strategy to realise the seamless interoperability necessary for the ambient intelligent environment; a strategy for European-sourced tools; cross-sectorial sharing of technology and devices; a number of 'radical innovations'; and a significantly enhanced relationship between the educational system and industry.

An ARTEMISIA Working Group on Success Criteria and Metrics has begun the process of re-formulating the ARTEMIS-JU targets while retaining their spirit and ambition, so that indicators of progress can be established. Summer camp 'syndicates' worked to refine the re-formulation of targets and to suggest potential indicators of progress

After further refinement, the indicators will be used to monitor the contribution of both individual projects and the ARTEMIS-JU overall to achievement of the high-level targets.

A TOOL POLICY ~ There is a long-standing conflict between the desire of users for interoperability and interchangeability of tools and the present situation of mostly

non-interoperable proprietary tools and tool-sets. The Summer Camp agreed to an approach of 'ARTEMIS Tool Platforms' each of which may be specialised for a particular sector or part of the design flow. They are not to be commercial entities, necessarily. Instead they are conceived as sets of commonly agreed interfaces and working methods with a view to supporting interoperability.

NEXT STEPS ~ Volunteers from the Summer Camp attendees agreed to form a short-lived task force to revise the ARTEMIS-JU MASP, taking into account the outputs of the meeting. This has now been done. At the same time the MASP was shortened and simplified to focus on core strategic issues, so not all the detail discussed at the Summer Camp appears explicitly in the revised MASP. Instead, the outputs from the Summer Camp will be worked on further by AR-TEMIS-JU working parties and eventually incorporated into Sub-programme definitions, into the Annual Work Programme - especially objectives for projects and criteria for proposal evaluation, and into both projects and programme monitoring processes.

THANKS ~ The ARTEMISIA Association thanks all those who took part in the Summer Camp, the Working Groups and individuals who prepared material for it, those who could not attend but submitted their views before or after the Summer Camp, and those who helped afterwards in the revision of the MASP, for their constructive co-operation. It is through sharing of visions and opinions like this that we will achieve the original ambitions for the European Technology Platforms, with ARTEMIS among the leaders.

Bob Malcolm,
Input from Laila Gide, Eric Schutz, Alun Foster

European Competitiveness

and well-being through ICT based innovation

ARTEMISIA AND ITEA2 ARE ORGANIZING THEIR RESPECTIVE ANNUAL EVENTS COLLABORATIVELY THIS YEAR. THIS IS NOT ONLY MORE EFFICIENT FOR THE ATTENDEES, WHO ARE OFTEN FROM THE SAME COMMUNITY, ITS ALSO AN OPPORTUNITY FOR BOTH PROGRAMMES TO PRESENT THEIR VISIONS SIDE BY SIDE, SPECIFICALLY ADDRESSING THE INNOVATION NEEDS IN EUROPE FOR THEIR RESPECTIVE DOMAINS.

What is clear is that the Software Intensive Systems and Embedded Systems R&D domains, though distinct in many ways and addressing differing geographic perimeters within the growing Europe, share more than a common community of actors. They also share many common goals that, in addition, address the major concerns of the European

Rudolf Haggenmuller, Chairman of the ITEA2 Board.

citizen. Concerted effort by all those involved, focusing on synergies and complementarities towards these common goals, will yield marvelous opportunities that will benefit businesses and citizens alike.

As a first step, we have put together here the visions as pronounced by the Chairmen of ITEA 2 and both, the former and current and President of ARTEMISIA, in preparation of the discussions and presentations that are planned for this "Co-Summit": one where we anticipate that the vast majority of actors on the embedded and software intensive systems domain will be present.

'European Competitiveness through ICT based innovation' according to Rudolf Haggenmuller:

"Innovations of information and communication technologies (ICT) are vital to Europe's competitiveness and economic welfare." This is the opening statement of the "Aho Report", an independent expert report on EU high-tech research from May 2008.

ITEA and ITEA 2, the EUREKA research programmes on software intensive systems and services have been contributing to European competitiveness and economic well-being since meanwhile more than 10 years, with major achievements and results in aerospace, automotive, consumer electronics, medical systems and telecommunication. Our ambitions to combine research excellence with innovation, to deliver tangible results and to address societal needs are more valid than ever.

In the upcoming version of our Roadmap, we react on the mega-trend towards "societal computing" generated by the grand challenge of sustainability in the societal domain e.g. in energy, health, security and ageing. We structure the application domains into the categories ME, GROUP and SOCIETY, expecting that in future all topics, which we know from enterprise computing like resource management, content management and application integration in future will also be necessary on the societal level.

The grand challenge of sustainability on societal level has a counterpart on enterprise level, namely "service innovation", i.e. the transformation of traditional product companies into service companies. This transformation happens in all industry branches from automotive to telecommunication and creates an enormous need for ICT-based innovation.

To master the needs for ICT-based innovation resulting from these societal and economic grand challenges it is necessary to dramatically broaden the eco system for ICT research in Europe. In this respect, the ARTEMIS & ITEA Co-summit may be regarded as a first step towards better co-ordination of ICT research across boundaries of countries, industries and clusters.

'European Competitiveness through ICT based innovation' according to Yrjö Neuvo:

The ARTEMIS Multi-Annual Strategic Plan describes a way forward for Europe in Embedded Systems, which envisions the focussing of R&D activities on specific technologies and application domains that are key for European industry, opening the way to more innovative products and services that bring added value to Europe's citizens.

In the ICT world, and especially in Embedded Systems, Europe is recognised as having a strong position in research. Converting this excellence into strong, marketable products and services to support economic growth on the world-wide market is the key objective of ARTEMIS .

To make the ARTEMIS vision work, a way is needed to channel the massive energy in European R&D activities into clear, market-driven collaborations. These really are "eco-systems" because, as in nature, the different players interact for mutual benefit, creating a "one plus one is more than two" effect making them effectively self-sustaining. The players need food to grow and need to continuously learn new ways of working if they are not to disappear by natural selection. This is especially true for SMEs, who have the intrinsic agility to react quickly but may not have the "muscle" to survive in an aggressive market. Ecosystems need to be quite large, so that minor setbacks do not make them collapse.

Klaus Grimm: "ARTEMIS foresees a continuing role for European-wide programmes that will stimulate these eco-systems to grow across national boundaries, by judicious application of funding to ensure that innovative R&D ideas make their way into the system, and that they are focused on the 'right' kinds of application to be successful."

With his statement Yrjö Neuvo hands the function as President of ARTEMISIA Association over to his successor Klaus Grimm.

Klaus Grimm,
President ARTEMISIA Association

ARTEMIS & ITEA Co-summit

**De Doelen Congress Center
Rotterdam, the Netherlands
22 October 2008**

European competitiveness and well-being through ICT-based innovation

ARTEMISIA Association and ITEA 2 organise a Co-summit on 'European competitiveness and well-being through ICT-based innovation', October 22, 23. This Co-summit is organised as part of the ARTEMIS Annual Event and the ITEA 2 Symposium and will take place in the congress centre 'de Doelen' in Rotterdam, the Netherlands. The organization expects some 500 participants from industry, universities and research institutes and Public Authorities from all over Europe.

The Co-summit offers an exhibition and parallel sessions during the day programme. Next to this there will be several ARTEMIS Focus Sessions during the ARTEMISIA General Assembly on the following day. ARTEMIS Magazine invited the chairs of the parallel sessions to write a short introduction to their respective areas. Also you will find two focus articles based on the ARTEMIS Focus Sessions.

Web-based communications build 'web of objects'

MORE AND MORE EVERYDAY DEVICES – FROM DOMESTIC APPLIANCES AND MULTIMEDIA EQUIPMENT TO DOMESTIC LIGHTING AND HEATING SYSTEMS – ARE STARTING TO IN-CORPORATE AT LEAST A BASIC INTELLIGENCE. THEREFORE THE CONCEPT OF THE SO-CALLED 'WEB OF OBJECTS' THAT ENABLES SUCH DEVIC-ES TO COMMUNICATE AND INTEROPERATE IS OF GROWING IMPORTANCE. THIS IS NOW BEING ACHIEVED USING 'WEB' TECHNOLOGIES BASED ON OPEN-SOURCE SOFTWARE DEVELOPED IN BOTH EUREKA ITEA CLUSTER AND EU FRAME-WORK PROGRAMME RESEARCH PROJECTS.

The web of objects involves the concept of 'objects' in the physical world – such as devices, sensors and actuators – communicating and interoperating using web-based technologies. This concept is today ready to be implemented using service-oriented architectures and Web-Service technology.

Web Services are a communications technology usable at the device level that comes from the information and communications technology (ICT) world. The challenge was to be able to embed Web-Service technology in very low cost devices to ensure interoperability at that level. This has already been achieved successfully. An example of an industrial application is shown in Figure 1.

PARALLEL SESSION

FRANCOIS JAMMES

François Jammes obtained an engineering degree from "Ecole Supérieure d'Electricité" in Paris in 1976. Currently he is the Web Services collaborative project director at Schneider Electric's corporate Innovation department in Grenoble, France. François Jammes was leading the awarded European ITEA/SIRENA project and is leading the ITEA/SODA project. Beside this project he is also the technical manager of the IST FP6 SOCRADES Integrated Project.

Web Services provide a unifying, interoperable and open architecture solution for any use – such as in home, building, industrial, automotive or telecommunications applications. They offer:

• The means for interoperability between any application domain;
• Interoperability between IT tools and devices;
• Flexibility and auto-discovery of devices – 'plug and play'; and
• Programming efficiency.

A large community of developers is now using Web-Service technology, which is available as

Figure 1: Industrial example of a Web Service application

open source. All this has resulted from a series of successive collaborative projects since 2003 with a variety of partners, led by Schneider Electric. These include:

• The SIRENA project, which won the award for the best ITEA project in 2006;
• The ITEA SODA project, nearly finished;

and

• The EU Sixth Framework Programme IST SOCRADES Integrated project.

Technically speaking, Web Services at the device level rely on the implementation of the Device Profile for Web Services (DPWS) specification. Written by a group of companies around Microsoft, this specification has been implemented as a result of a series of collaborative projects and made available as open source. DPWS is now going through standardisation under the OASIS organisation.

PARALLEL SESSION

JEAN H.A. GELISSEN

Jean Gelissen graduated in electronics, specialising in computer technology, in 1977 from the Poly Technical School in Venlo (Netherlands). He did a postgraduate course in Informatics in Utrecht (Netherlands) in 1986. He joined Philips Research in Eindhoven in 1977, working on digital signal processing. He has been Department Head of the Information Processing Architectures department in the Philips Lifestyle programme and is now Senior Director of Strategic Partnerships for the Lifestyle programme. He has been involved in the MPEG standards body and contributed to MPEG-4 and MPEG-21, before leading and completing the MPEG-E activity. He has now initiated work on MPEG-V.

Creative industries:
Where design meets technology

THE EXTENDED FLEXIBILITY, FUNCTIONALITY AND DIVERSITY OF SOFTWARE-INTENSIVE SYSTEMS HAS NOW BEEN DISCOVERED BY THE DESIGN COMMUNITY. THIS HAS RESULTED IN A NEW WAVE IN THE CREATIVE INDUSTRY THROUGH THE APPLICATION OF SUCH EMBEDDED SYSTEMS IN THE ARTS, MUSIC, ADVERTISING, DESIGN PROCESSES AND THE LIKE.

The application of software-intensive embedded systems, the focus of both the EUREKA ITEA Cluster and ARTEMIS, has traditionally been limited to the professional domain or to black – closed – boxes for the consumer sector. Nowadays such systems are part of all our everyday life. In fact, it would be very hard for most people to function without making use of systems based on extensive software content, such as mobile telephones, navigation devices, personal digital assistants, the bigger part of the functionality of modern cars and the Internet. Now, a new ware of software-intensive systems is being combined with creative play, fashion, art and the like. Typical examples include:

• Fashion explorer (Fraunhofer): future Internet technologies will enable services to adapt ready-to-wear patterns to individually created clothing, combining the advantages of ready-to-wear and tailor-made designs. Consumers in high end shops or boutiques will be able to see real-time animated 3D simulations of the selected designs and fabrics projected on pre-scanned

images of their own bodies and even interactively adjust the design.

- Serious application of virtual worlds (AW-Europe): Web 3D is not a completely new platform making 'the old web' obsolete. On the contrary! Web 3D cannot exist without all the clever solutions developed in the past that find their perfect place in a jigsaw of (3D) possibilities. Several professional and successful virtual worlds have been developed for use in both educational and business settings. Different aspects of Web 1 and 2.0 are vital for the success of such virtual worlds in general and the Metaverse is seen as a next step.

- Do music and performing arts contribute to multimedia research? (InfoMus Lab, DIST, University of Genoa): Sound and music play an important role in our lives. The integration of sound and music in multimodal interfaces can improve the immersion and the enactive, embodied content processing, resulting in more effective multimedia applications. 'Embodied sound media' can contribute to improve both novel audiovisual services such as experience-centred and participative music applications, like active listening to support the emergence of new applications, and to improve cultural and social – health or ageing population – scenarios.

- Innovations in gaming (Games Academy): Computer games are today perceived as a creative industry and by most informed people as cultural. Everybody who has developed a game knows that such development is a highly creative process. But what is the nature of the ideas driving this creative development process. The many different aspects of creating a game make it a challenge to keep coherence across the whole process. Key aspects of game development include games versus storytelling, graphic versus technology, human machine interface and the concept of the game. All these have changed over time and impact the technology and standardisation.

- Intelligent playgrounds (CCF): Children spend too much time watching TV and playing computer games, resulting in a growing number of children lacking social contact with peers and being overweight. Innovative, interactive products can stimulate children to be active, play and have fun.

ED BRINKSMA

Ed Brinksma is the scientific director and general chair of the Embedded Systems Institute. He also holds positions as full professor in computer science at Eindhoven University of Technology and the University of Twente. Ed is an internationally recognised expert in model-based methods and their application to communication and embedded systems, and has been involved in a great number of collaborative research projects with industry.

Applying
industry-as-laboratory to high-tech systems

THE INDUSTRY-AS-LABORATORY CONCEPT PROVIDES A HIGHLY EFFECTIVE METHOD OF CARRYING OUT INDUSTRIALLY RELEVANT RESEARCH IN REAL CONDITIONS – CLOSING THE GAP BETWEEN INDUSTRY AND ACADEMIA WHILE SPEEDING USE OF RESULTS INDUSTRIALLY. THIS RESEARCH FORMAT OFFERS MANY ADVANTAGES FOR EMBEDDED SYSTEMS ENGINEERING IN THE HIGH-TECH SYSTEMS INDUSTRY AND COULD BE EXPLOITED IN THE ARTEMIS PROGRAMME.

Industry-as-laboratory is a form of applied research in which real industrial cases and infrastructure are used as the experimental platform. It fills a gap between industry and academia by providing the means to study concerns related to scalability and applicability effectively and systematically under relevant industrial constraints. By being executed in close interaction with industry it also improves the transfer of results to industry. The Embedded Systems Institute (ESI) in

Eindhoven has extensive experience of applying this concept. Examples include: model-based test methods for semiconductor

lithography equipment, user-centric dependability for digital TV, performance prediction for professional printer-copier design.

ESI is the co-ordinating partner of the Dutch Embedded Systems programme, which is carrying out six large industry-as-laboratory projects on industrial embedded systems design in collaboration with industrial and academic partners. On the industrial side, the 20 partners include ASML, FEI Netherlands, Océ Technologies, NXP, Philips Healthcare, Thales Netherlands, and Vanderlande Industries. Academic partners include 37 research groups at Dutch and Belgian Flemish universities.

ESI was founded in 2002 by the three Dutch technological universities – Delft, Eindhoven and Twente – together with the TNO research institute, ASML, Océ Technologies and Philips.

The research programme is focused on systems-level integration and design issues related to vital cross-cutting concerns such as system performance, dependability and evolvability, with a strong model-based approach to systems design.

Healthcare
poses global challenges in ensuring care for all

STAN SMITS

Stan Smits has been Chief Software Technology Officer of Philips Healthcare since 2005. He obtained an MSc in physics from Leiden University in 1974. He held various R&D and general management positions with Digital Equipment Corporation before joining Royal Philips Electronics in 1994. From 2000 to 2005 he was CEO of the Healthcare Informatics business at Philips Healthcare.

WORLDWIDE SPENDING ON HEALTHCARE TOTALLED €3,000 BILLION ($4,000 BILLION) IN 2006, ABOUT 10% OF THE GLOBAL GROSS DOMESTIC PRODUCT (GDP). THIS MAKES IT THE WORLD'S LARGEST SERVICE SECTOR. IN THE USA, 11% OF THE WORKING POPULATION IS NOW EMPLOYED IN THE HEALTHCARE SECTOR, MORE EVEN THAN INVOLVED IN MANUFACTURING. MOREOVER, GROWTH OF HEALTHCARE WILL CONTINUE TO ACCELERATE BECAUSE TODAY ONLY 20% OF THE WORLD POPULATION ACCOUNTS FOR 90% OF THE TOTAL COST.

Several key challenges must be addressed to build a global sustainable healthcare system. These include improving repayment systems, reducing the prevalence of chronic diseases, coping with a shortage of personnel and reducing variations in healthcare. These challenges can only be resolved by addressing organizational and political issues and by accelerating the adoption of technological advancement.

What is required is a transformation from a cost focus to a focus on value for:

• The patient – such as avoiding medical errors;
• Society – increasing the health of the population overall; and
• The healthcare system itself – increasing effectiveness and improving efficiency.

This can be achieved by addressing the continuum of care from prevention, screening, diagnosis and treatment towards management and surveillance. ICT will play a major role in achieving this transformation towards this care cycle driven healthcare.

ICT in healthcare – also called eHealth – is a broad spectrum of products and services spanning from hospital information systems to home care. It is very encouraging to see that the eHealth has been placed high on the European agenda as demonstrated by the focus on healthcare in the EU research Framework Programmes, the ITEA2 EUREKA Cluster and ARTEMIS.

The parallel session on Healthcare Services will highlight two examples of this care-cycle-driven transformation for home care by Vital-Health Software and Philips Research.

FOCUS SESSION

Embodying ARTEMIS:
the future in open device platforms

COMPLEXITY, PACE OF CHANGE AND MARKET DYNAMICS ARE STARTING TO MAKE THE DESIGN OF EMBEDDED SYSTEMS NOT JUST ART, BUT WIZARDRY. NEW DESIGN PARADIGMS ARE DIRELY NEEDED. BITS AND PIECES OF THE SOLUTION ARE BEING DEVELOPED IN DIFFERENT BUSINESSES AND SCIENTIFIC DISCIPLINES. THE CHALLENGE THAT ARTEMIS IS FACING IS COMBINING THESE INTO A PRAGMATIC ENGINEERING PRACTICE SUCH AS THE NETWORK ON TERMINAL ARCHITECTURE (NOTA). NOW IS THE TIME TO JOIN THIS OPEN-PLATFORM INITIATIVE.

Digital convergence is expanding to the business of combining communications, information technologies, entertainment, consumer electronics and mobile services. Product companies are facing increasing diversity and complexity – requiring them to manage a wider variety of different types of products using ever more complex technologies. Technology components evolve at varying paces, resulting in shorter product and system lifecycles. Economies of scale are continuously being challenged by an increased need for variants and customised solutions.

The two key causes for such developments are:

1. **Digitalisation** that frees the context. Information can be used in other instances and for other purposes than the original. Digital information can be scalably and controllably replicated. Digitalisation is not only about digitising the content, but also the intermingling of physical and digital worlds in all walks of life.

2. **Horizontalisation** that is about competition. Today, everybody is starting to have access to any technology. Horizontalisation has different game rules to the vertical product business, where one manufacturer controls the whole development chain. The new horizontal mode of

TATU KOLJONEN

*Professor Tatu Koljonen is Vice Presi-
dent, Strategic Research of VTT Tech-
nical Research Centre of Finland.
Koljonen is responsible for VTT's
technology strategy, strategic part-
nerships, research, standardization
in ICT field. VTT Technical Research
Centre of Finland plays a pivotal role
in the Finnish innovation system. It
is an impartial expert organisation
and with over 2000 researchers it
is the biggest contract research or-
ganisation in Northern Europe. VTT
has long background in embedded
system design with more than 100
researchers full time working with
the topic and dozens of related
project on-going.*

*" Co-creation
and
collaboration
will redefine
the roles in
the ecosystem "*

operation is leading towards increased specialisation and more differentiated roles and expertise. In addition, the sources of innovation are changing and becoming more decentralised – innovation takes place everywhere, not just within the confines of corporate research and development (R&D). The organisation that divides the work correctly, with proper architectural and interface choices harnessing the creative minds of the global village, captures value.

**ACCESS TO SMALLER PIECES OF INNO-
VATION ~** The ability to use open innovation and collaborative R&D will be the key

to success in the digital convergence business. Convergence is about merging different businesses and scientific disciplines. Best practices in different industries are adopted more widely and inefficiencies reduced. Technologies, business models, and products and services in particular diverge as more customised solutions are in demand. In many disciplines, completely new paradigms and ways of working have to be learnt to use innovation fully from a variety of non-traditional sources.

To survive, companies need to renew their R&D and technology platforms to be able to cope with the required diversity. Modular scalability and flexibility are required for

product diversity, quick market entry and failing fast. Allowing industry and the whole development community to develop their innovation directly in a compatible form will provide fast access to new innovations and new levels of third party use, which minimises innovation-to-product lead times. The same subsystems can be used in all platforms.

Open hardware platforms also give us access to the 'long tail of innovation' taking place in small companies, research institutes and universities. Co-creation and collaboration will redefine the roles in the ecosystem – such as moving responsibility for testing and verification of independent subsystems to the vendors and shifting a significant amount of R&D work to the technology providers. New tools– for example for agile vendor selection – are also needed with an abundance of potential partners.

PLATFORM FOR INNOVATION ~ The primary goal of the open-architecture initiative is to agree on a unified way to integrate, communicate and define module interfaces in embedded devices. This enables different developers to innovate, develop, optimise and verify interoperable modules independently. The model resembles the logic behind Internet protocols. We define a set of common communications protocols and certain rules on how nodes can use these protocols. The result is a platform that fosters new independent innovations and provides a basis where innovations can grow and evolve.

NoTA is a modular, service-based systems architecture for mobile and embedded devices. NoTA device consists of service nodes (SN) and application nodes (AN) that communicate through logical interconnect (IN) – see Figure 1. IN provides two basic means of communication, namely message based and streaming. The former is bi-directional and used for service messages. The latter is

uni-directional and used for large amounts of data such as media content. Service nodes have unique service identifier (SID).

NoTA sub-system provides the physical implementation for a set of nodes – ANs and/ or SNs. Sub-system consists of all the software and hardware resources – including peripherals, memories, controllers and internal buses – needed to implement the defined nodes. The only means for a sub-system to use another sub-system's resources is via service nodes. Every NoTA sub-system consists of the NoTA interconnect stack.

The principles of NoTA are:
• Systems-level loose coupling;
• Service based;
• Interconnect centric;
• Message and data driven; and
• Implementation-wise heterogeneous.

Benefits of NoTA include:
• More fit-to-purpose products and services;
• Managing complexity and scalability;

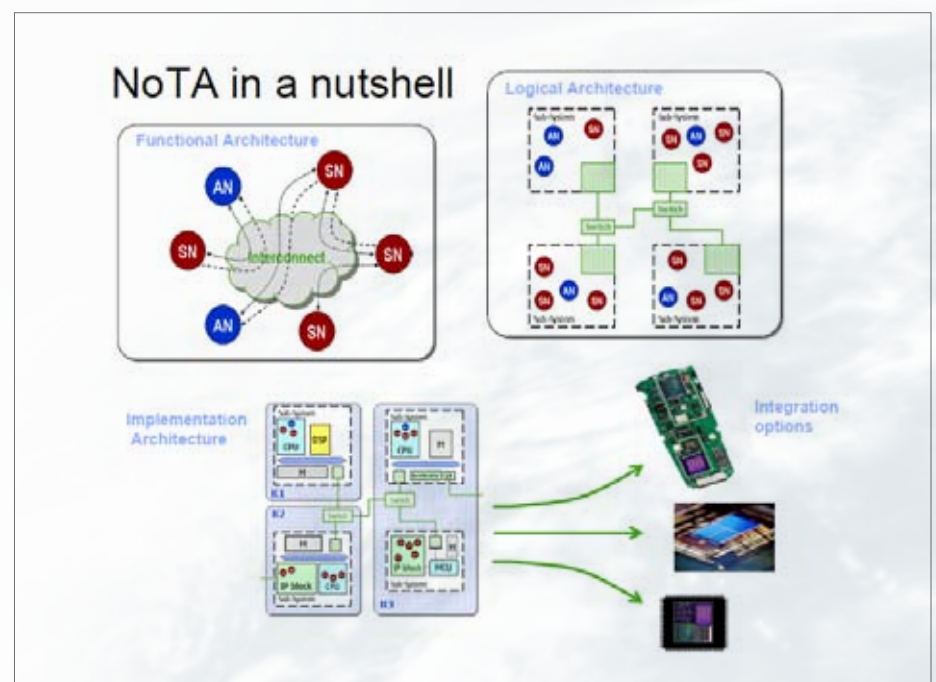*" we now invite the whole developer community to join "*

Figure 1: Business support in NoTA ecosystem

- Reduced time-to-market, shifting the design effort from the end to the beginning;
- Bill-of-materials down with increased competition;
- Simpler specification work;
- The use of common modules across all the platforms increasing economies of scale;
- An opportunity to shift R&D work to technology providers; and
- Increased competitiveness with continuous platform improvements.

BUILDING THE NEW ECOSYSTEM ~ To release the full potential, we need to have a living and innovative ecosystem around NoTA. The more innovative people are attracted to the community, the better the opportunity for the whole community. The community will consist of technology providers, product companies, engineering and R&D service providers, integrators, research entities and all involved developers.

The open-source branch of the community will reach the long tail of innovation, while the other branch will bring in the latest commercial technologies and new innovations. Already 15 leading-edge companies and a number of universities have actively collaborated in NoTA technology development. With this open initiative, we now invite the whole developer community to join.

To gain common acceptance, the set-up of the open-architecture initiative needs to be

beneficial for the majority of players involved. Openness and transparent win-win reasoning will also remove unnecessary doubts around the initiative – minimising the risk of monopolised control points, increasing competition among technology providers, providing efficient means to manage growing complexity and offering opportunities for open innovation and increased agility.

The promise of fair competition together with growing business opportunities in the common horizontal marketplace are the biggest incentives for technology vendors. The larger marketplace will also tempt engineering service companies such as software houses, testing service providers and tool vendors – see Figure 2.

The licensing scheme has to fulfil the needs of different user groups. The legal framework required has to be simple for developers, universities and start-ups, whereas large companies consider proper intellectual property rights (IPR) risk management a top priority. To make the solution easy for all parties to adopt, NoTA is provided using a dual licensing model. The first and lighter available license is the GPLv2 open source license. The second available license is tailored for large companies and is a royalty-free technology license having specific terms on IPR and other related rights.

More information about joining NoTA can be found at www.notaworld.org
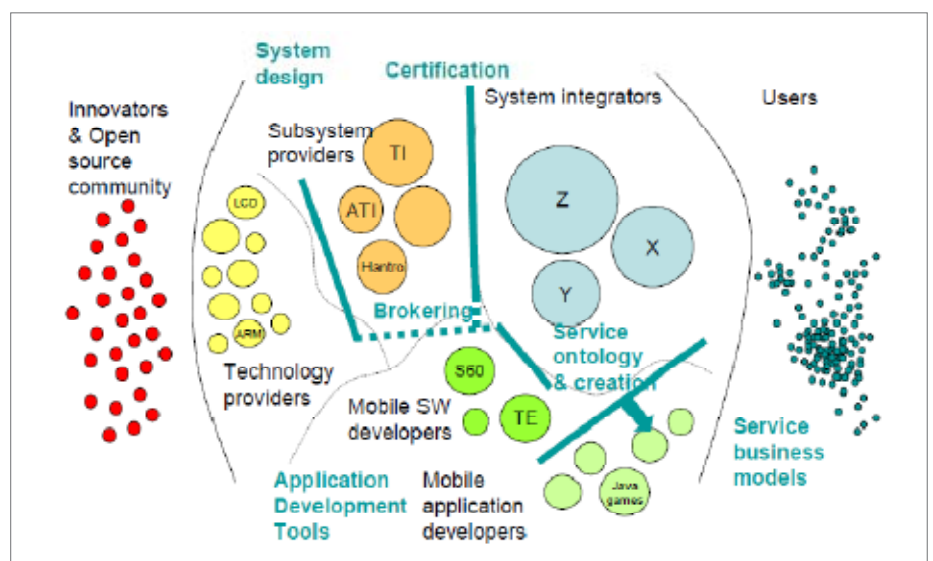

Figure 2: NoTA in a nutshell

FOCUS SESSION

Consortium building
in Europe

Mobilising SME participation

ON SEPTEMBER 4TH, ARTEMISIA INTERVIEWED STEPHEN O'REILLY OF ENTERPRISE IRELAND, WHO IS ALSO THE FP7 ICT NATIONAL CONTACT POINT FOR IRELAND AND AS SUCH IS IN CLOSE CONTACT WITH LOCAL NETWORKS OF SMES, LARGE INDUSTRIES AND ACADEMIC INSTITUTIONS. THE PURPOSE OF THE INTERVIEW IS TO DISCUSS IDEAS AND IDENTIFY POSSIBLE ACTIONS THAT ARTEMIS CAN UNDERTAKE TO STIMULATE INNOVATIVE SMES, UNDERPIN THEIR BUSINESS GOALS AND AUGMENT THEIR PARTICIPATION IN COLLABORATIVE R&D.

What, in your experience, are the main obstacles to innovation confronting high-tech SMEs today? ~ Firstly, let's be clear: most high-tech SMEs are very innovative by nature. No problem there! The issues we see are in directing them to the next level in R&D innovation: in other words, how to get them involved in collaborative R&D projects, and the networks that grow out of these.

The main barrier to this is lack of knowledge or information about the available programmes. If they have never been involved before, they are unlikely to go and look for information themselves – they have other things to do. We need to push the information to the companies instead. Those who have been involved previously in such programmes and who have the contacts are OK: If they have no contacts, they just do not find out about such things. It's also hard for us as NCPs to find out about the companies who really should be involved, too! We use mailing lists to distribute information, but if they are not on them, then they often miss the boat.

On the other hand, there is indeed a lot of information available on the web. Maybe too much, even! It can take a whole day to sort through all the available web-sites to find what you need. What these SMEs really need is someone who they can call, and be able to understand everything from a 20 minute conversation. The FP7 NCPs are already important in doing this.

Another significant barrier is the high cost of actually taking their innovation ideas and IPR gained in such collaborations to market and making business out of it. This goes beyond what can be funded with public money, but they still need advice on how to get appropriate financial support for this.

Once these SMEs do get interested, how do we help get them into programmes? ~ There is a perception issue: Some SMEs are left with the feeling that these programmes are only for large enterprises or big universities. Even when we reassure them that this is not the case, it's still hard to get them connected to

Stephen O'Reilly: "We need to do more than talk about engaging SMEs in consortia. Concrete actions are needed."

> " *We use mailing lists to distribute information, but if they are not on them, then they often miss the boat.* "

a consortium, which are indeed often under the control of larger players. It's a question of profile and trust: How can we help SMEs present themselves well so that consortia will have the confidence to let them join?

Another main concern in the minds of some SMEs is the fear that the "big boys" may run away with their IPR, which they value very highly. We need to reassure SMEs that they are properly protected under the IPR rules.

It's important to stress to SMEs that funding on offer is for innovative R&D, and that it should be seen as an investment for their long term future, say up to 5 years after starting the project. This helps us show that it is interesting for them to be part of a strong network of partners (a kind of "self-sustaining ecosystem"), and also help appease their reti-

cence about making such a long-term commitment (after all, a collaborative project like these can take a year to set up and run over three years or more – SMEs are sometimes worried about such a long-term view).

Once an SME is in the system, though, things usually go well.

What actions do you think could be undertaken at the European level to help address these issues? ~ One way of getting SMEs to collaborate is to encourage Universities to bring them into European projects. The Universities generally have close contacts with the right networks already. This works for FP7, where Universities are often project coordinator, but it may be more difficult in ARTEMIS. Here, a company would probably need to play this role, due to the more downstream nature of the programme. Again, the question of confidence in the SME comes up, and of using existing contacts and networks.

We can also look at the way the programmes are structured. It's OK to have the aspiration of engaging SMEs, but there really needs to be concrete action to make this happen. For example, some thematic areas of the Framework Programme dictate an SME involvement by some kind of quota: percentage of budget, etc… This seems to work well, but it may happen that some SMEs will be engaged only "to make up the numbers". In these cases, it does tend to become obvious if a partner has no real contribution, though. This may need to be emphasized in the project evaluation phase: if there is no impact if a partner were to disappear, then he most likely need not be there in the first place.

Another approach could be to encourage local modification of participation rules. Already in some countries, the national rules

require that, for example, a university can participate only if an SME is participating too. Turning it around like this is a real incentive – the universities are generally well connected, as I said.

Brokerage events tend not to work well for SMEs – why is this? ~ Possibly a lack of knowledge about the events in the first place, but also because of the costs. Coordination and support actions under the various Framework Programmes (for example EPISTEP) can have budgets available to help SMEs attend such events – this can help. There is a strong argument to have special supporting actions to encourage SMEs involvement in JU projects like this, but it only makes sense once the programmes are running – they need to be parallel actions.

We also need to see steps to help SMEs to actually participate within the individual consortium. They often have a lot of legal and financial questions, and they need to get fast answers. The NCPs can fulfil part of this role, and indeed they already do. In Ireland, and I believe in other countries too, we also give a "feasibility grant" to support SMEs once they are involved in a consortium during the proposal writing phase, for if they need to travel etc…. This means that they don't have to invest too much in advance, should the project not actually get started. This won't cover travelling to a brokerage event, though.

Targeting specific companies (and especially SMEs) in each country, and supporting their involvement in the brokerage events, guaranteeing that they can get face-to-face exposure to the main players, and eventually reimbursing some of their travel costs, as for example EPISTEP did, will be a great help. We only need to do this with new participants – the old hands will not need this level of support.

Another idea I have is for a kind of "virtual brokerage event" through a dedicated web site. Project proposers can present their ideas in the very early stages to attract initial interest, but they can hide their project again, say after a fixed time, so that later details can

> *" for a kind of 'virtual brokerage event' through a dedicated web site "*

remain private to the consortium, and that the problems caused by last-minute applicants can be avoided.

You mentioned the "feasibility grant" for writing project proposals. What do you feel about two-step proposals, like those AR- TEMIS will be using? ~ Such a two-stage proposal process can be useful, but it has pros and cons. The level of detail that must be given in the initial proposal is important. How much change is allowed between the outline and the full proposal (in budgets, actual partners, etc…), and how can comments on the outline proposal be taken up in the final one? A clear description of what they can expect from the Evaluation report and what they can do with recommendations it makes is needed. If the outline proposal needs to be too detailed and too fixed, then there's no point in it – consortia will need to compile a full proposal before they can draft an outline proposal. It reflects back on the level of effort needed to make this outline proposal. Let's not forget that the procedures for applying for a project under

existing schemes are already seen by some SMEs to be very complicated.

One suggestion on this would be to maybe describe some maximum deviation limits that can be allowed on budgets, partners etc.

Also, we need to remind possible participants about the feasibility grant and other financing possibilities, to cover the costs of writing the outline proposal. This can certainly help to lower the threshold for SMEs to participate.

Stephen, thank you very much for your time and expertise.

Interview recorded by Alun Foster,
Programme Coordinator Artemisia Association
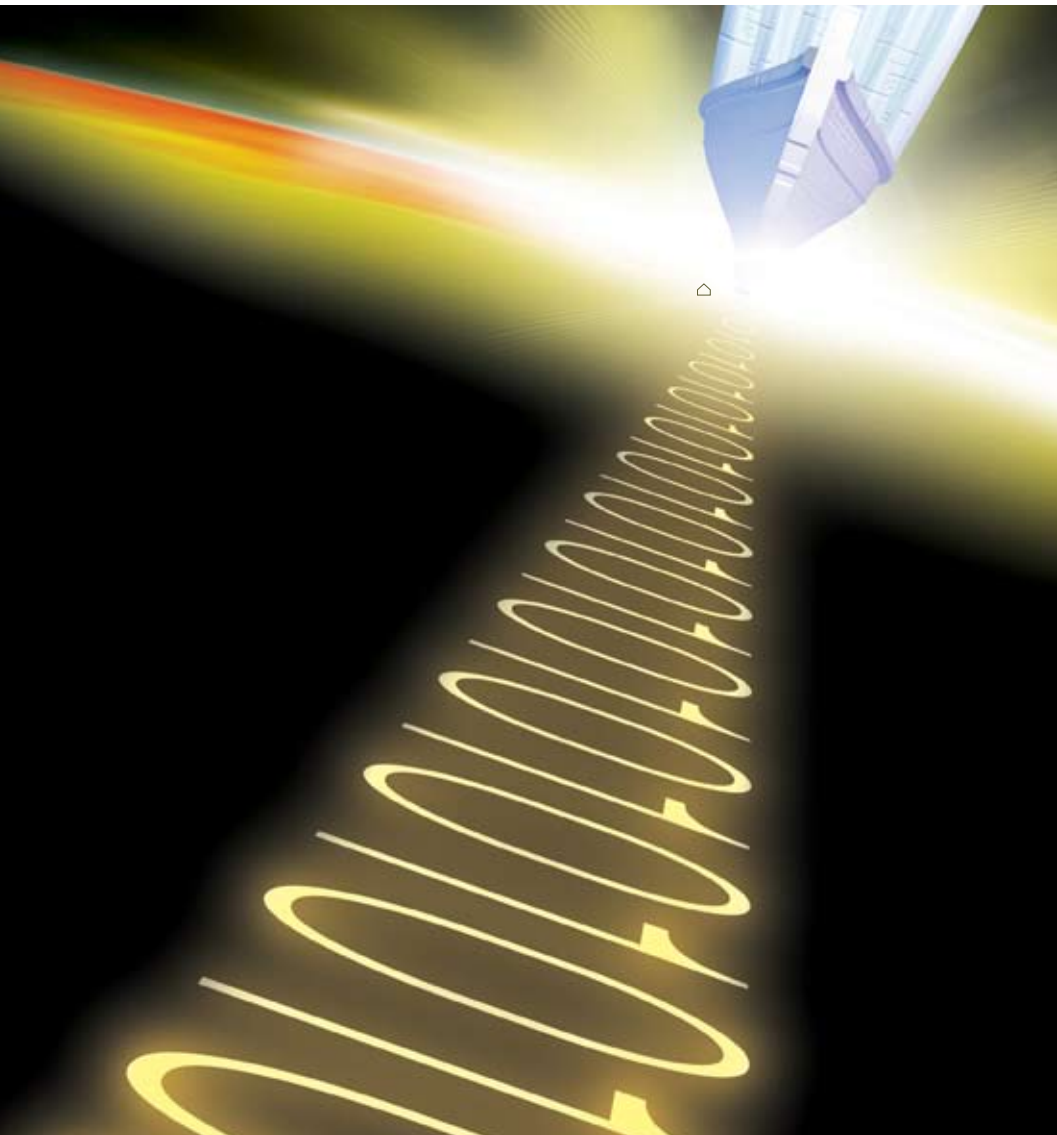
Getting high-tech
SMEs on board

SMALL AND MEDIUM-SIZED ENTERPRISES (SMES) ARE A FUNDAMENTAL INGREDIENT IN ARTEMISIA. THEY ARE A SOURCE OF TECHNOLOGY AND INNOVATION, BRINGING AN AGILE AND CREATIVE APPROACH TO ADDRESS REAL PROBLEMS. THE ULTIMATE GOAL OF ARTEMIS STRATEGY FOR SMES IS THE FULL DEVELOPMENT OF THEIR POTENTIAL IN THE EMBEDDED SYSTEMS AREA. SPAIN IS ALREADY WELL IN ADVANCE IN ITS SUPPORT OF HIGH TECH SMES THROUGH PROMETEO – THE SPANISH TECHNOLOGY PLATFORM FOR EMBEDDED SYSTEMS.

SMEs are taking part in ARTEMIS projects as key players in diverse aspects of the research and development (R&D) process: as research partners of larger companies, and also leading high technology developments of specialised devices, productivity tools, market niche applications, etc. This is complemented by a predominant role in the innovation ecosystem, transforming new ideas into marketable products and services that satisfy the needs of customers and users.

SUCCESSFUL APPROACH IN SPAIN ~ Participation by SMEs is particularly active in Spain. A significant indication is that almost 25% of ARTEMISIA Chamber A members are Spanish – 8 out of 33 SMEs are from Spain, according to the member state in ARTEMISIA web page. Another significant figure is that Spain was the country with the highest representation at the ARTEMIS Brokerage Event that took place in Düsseldorf, Germany in February 2008. With 27 Spanish entities, this number was even higher than that of the hosting country. So, it would now be reasonable to expect a high participation in ARTEMIS projects from Spanish SMEs. Currently, there are three major obstacles to innovation confronting high-tech SMEs

in the area of embedded systems. The strategy in Spain has focused on overcoming these barriers, or at least reducing them:

- Mobilising SMEs and providing means for them to participate actively in R&D initiatives, where some structure and support is required, represents a major barrier. In Spain, this active participation has its roots back in May 2005, with the launch of PROMETEO . This technology platform provides an open framework for stakeholders, led by industry both large and small, to define R&D priorities, timeframes and action plans for a number of strategically important issues in the successful development and deployment of embedded technologies in Spain. The network involves 120 organisations, of which almost 40% are SMEs. A key success factor of the platform is the continuous support from and collaboration of the Spanish Ministry of Industry, Commerce and Tourism (MITyC) as well as the Spanish Centre for the Development of Industrial Technology (CDTI).

- A key concept in innovation is the combination of technical breakthroughs and realistic marketing. New technological ideas can only be regarded as innovative if they can lead to marketable results; high technology markets such as embedded tech-

**SERGIO BANDINELLI AND
JOSEBA LAKA**

*'Getting High Tech SMEs on board'
is written by Sergio Bandinelli and
Joseba Laka. Both authors work at
the European Software Institute in
Spain; respectively R&D Projects
Area Director and manager of the
Embedded Software Systems unit
at the R&D department. Bandinel-
li was part of the team that cre-
ated the Design Methods and Tools
SRA for ARTEMIS. Currently he is
member of the ARTEMISIA Steer-
ing Board and he is Chairman of
Chamber A.
Laka joined ESI, September 2006,
after eleven years in a variety of
roles and positions in the software
industry. Since than he has been
involved in local and European
R&D projects in the area of embed-
ded software systems, while lead-
ing the Spanish Embedded Systems
technology platform PROMETEO.*

nologies represent major challenges for SMEs. PROMETEO fosters effective public-private partnerships and creates a network of agents with different backgrounds and objectives: purely market oriented, R&D actors, embedded technology developers, etc. Dynamic SMEs participating first in PROMETEO and then in ARTEMISIA have seen R&D opportunities with clear marketable goals – applied research and experimental development – as a realistic way to implement innovation in their portfolios.

• The great majority of embedded systems technology providers and integrators are high-tech SMEs acting at national and regional level, linked in many cases with a handful of large companies that act at an international level. Again, creating an open network for industry, academia and research centres, where all members have the same opportunities, has been one of the vehicles for SMEs both to receive innovation inputs and to offer high-tech skills and knowledge in Europe-wide communities such as ARTEMIS as a European Technology Platform (ETP) initially and now ARTEMISIA as an industrial association. Moreover, the extension of the PROMETEO platform to the PROMETEO-UII mirror innovation unit, again with support from the Spanish Public Authorities MITyC and CDTI, has boosted the internationalisation of R&D activities for SMEs. PROMETEO-UII provides services both to Spanish companies looking for EU Seventh Framework Programme (FP7) or ARTEMIS Joint Technology Initiative (JTI) related projects and to European companies looking for Spanish partners that could help form project consortia. The PROMETEO FP7 Office manages a large database of companies of all kinds and size that are interested in embedded systems
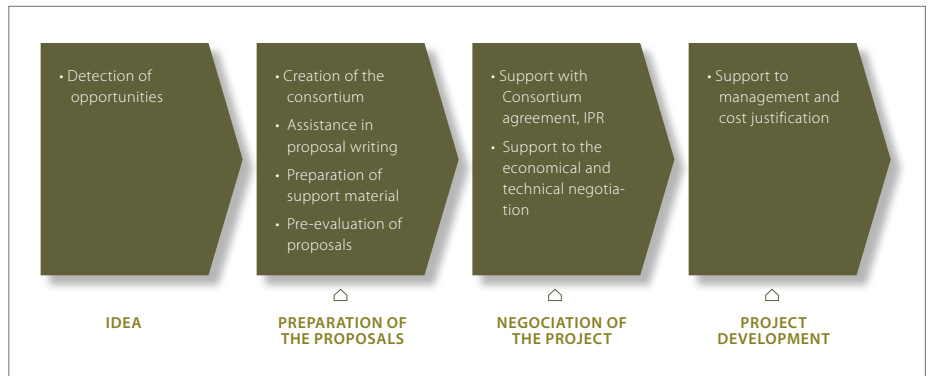
Figure 1: Stages in the life cycle of European projects

IDEA
- Detection of opportunities

PREPARATION OF THE PROPOSALS
- Creation of the consortium
- Assistance in proposal writing
- Preparation of support material
- Pre-evaluation of proposals

NEGOCIATION OF THE PROJECT
- Support with Consortium agreement, IPR
- Support to the economical and technical negotiation

PROJECT DEVELOPMENT
- Support to management and cost justification

and FP7. The office offers a range of free services to organisations to:

– Search for Spanish partners during proposals in preparation; and
– Support all stages of the life cycle of a European project – see Figure 1:
  a. Conception of the ideas,
  b. Creation or integration of consortia,
  c. Assistance in proposal writing,
  d. Negotiation of contracts, and
  e. Support to project management.

Network support is key to tackling obstacles. Open, multidisciplinary and innovation-focused networks are valuable instruments to help high-tech SMEs overcome major obstacles related to the active and productive participation in European initiatives, both market and research oriented. So far, PROMETEO has been a well-founded vehicle to implement such a network at national level and to deliver support services through the mirror PROMETEO-UII.

Although national networks are invaluable to cluster and co-ordinate activities, they are based purely on the willingness of partners to collaborate and contribute. They therefore need support from Public Authorities to operate and provide supporting structures to the high-tech SMEs.

Consequently, national networks need to assume more relevance in future roadmapping activities, and such networks should be co-ordinated in inter-cluster activities to boost further the active contribution of high-tech SMEs. The ARTEMIS Joint Undertaking (JU) presents significant opportunities to create such inter-cluster initiatives in the area of embedded systems.

*" three major obstacles to innovation confronting high-tech SMEs in the area of embedded systems. "*

ARTEMISIA
elects new president

ARTEMISIA Association

ARTEMISIA HAS ELECTED DR KLAUS GRIMM, HEAD OF THE DAIMLER SOFTWARE TECHNOLOGY LABORATORY IN GERMANY, AS ITS NEW PRESIDENT. A MATHEMATICIAN, DR GRIMM HAS BEEN A MAJOR DRIVER FOR THE MORE EFFICIENT DEVELOPMENT OF HIGH QUALITY AND SAFE EMBEDDED SOFTWARE IN A RANGE OF SECTORS – FROM AEROSPACE TO CARS. HE IS FASCINATED BY THE CHALLENGES AHEAD IN EMBEDDED SOFTWARE – AND IN THE INITIAL PHASE OF A KEY EUROPEAN SUPPORT INITIATIVE.

"The European automotive industry is still the global leader in innovation based on embedded systems. But we face challenges from Japan and perhaps other Asian countries. This is one of our motivations for concentrating our efforts in Europe."

Dr. Grimm started his career with electrical/electronic company AEG, working on reliability calculations for technical equipment. "In the mid 1980s, it became clear that systems reliability and safety was increasingly dependent on software rather than hardware," he explains. "So I shifted into software engineering."

In 1989, AEG Research became part of Daimler-Benz. Daimler concentrated the whole of its research into one division, giving Dr. Grimm the opportunity not only to work for AEG but also on defence electronics, space/aerospace and transport. "This was a really fascinating period where I got to know different application areas of embedded systems – not only AEG equipment but also trains, planes, satellites and cars."

GROWING IMPORTANCE FOR VEHICLES ~

"We identified software was of growing importance for vehicles and, in 1998, the Software Technology lab was formed to concentrate all such work – and I became its head. From then on, I have concentrated on developing high quality embedded systems efficiently."

The lab has some 80 people. "We take a cross-sectional approach, investigating techniques that are of interest and use for all business units – cars, trucks, vans and buses. It doesn't make sense to have different approaches to requirements engineering, model-bases development and system testing. We have a lot of potential synergies and we look for standardised approaches."

Daimler involvement in ARTEMIS came about for similar reasons. "Our industry faces a lot of common challenges in the field of embedded systems – particularly in safety-relevant areas. There is no company or research institution that alone can solve these problems. This is why working together with other companies and research institutes in a pre-competitive phase has become more and more a priority.

"In addition, from my own experience I knew that aerospace and other areas have and promising and powerful approaches in terms of modelling, testing and other techniques. We realised that it would be useful for us to co-operate with international companies and research institutes that are focused not only on the automotive sector."

Experts indicate 80% of future innovations in cars will be based on electronics and 90% of these innovations will be based on embedded software. "So we will be facing increasing challenges as more and more software gets into the car and leads to growing complexity," says Dr. Grimm. "We need to manage this complexity to continue to improve car safety comfort, consumption and emissions.

"You can do lot of things with embedded

software rather than hardware as software gives lot of flexibility for innovation. Significant improvements in safety can only be obtained using software. But we need to make it affordable for everybody because we can only increase road safety if most cars have such systems. Key success factors are efficient development and standardisation.

A COMBINED EFFORT ~ The EU has already funded international research programmes in embedded software but Dr. Grimm sees much interest in the ARTEMIS approach, which is a combined effort with companies, research institutes, and small and medium-sized enterprises, together with the EU and national public funding authorities.

"Other programmes do not have this combined effort defined by all the stakeholders," he says. "In ARTEMIS we have a common strategic research agenda, developed in both a top-down and a bottom-up approach, integrating all potential stakeholders in a combined effort. ARTEMIS is also specifically focused on embedded systems – unlike ITEA 2, with whom we work closely.

"ARTEMIS is in an initial phase, where we are running through all the processes for the first time. This is a very interesting phase because it gives us the opportunity to discuss the processes and perhaps improve them. For me, this is a fascinating starting phase."

By Paul McCallum

THANK YOU, Yrjö Neuvo!

Already in June of this year was it known that Yrjö Neuvo would step down from the ARTEMISIA Presidium and by consequence also from the important role of President. With continuity of judicious leadership being guaranteed

through the election of Klaus Grimm as President, we are glad that Yrjö will continue to bring his valued experience and knowledge, as well as his very welcome personality, to the ARTEMISIA Steering Board.

Yrjö has been a part of ARTEMIS literally since the very beginning, being asked by Commissionner Liikanen to take the lead of this new European Techology Platform on Embedded Systems called ARTEMIS from the outset. Those of us who have since worked with him in that role will be quick to agree that it has been both a pleasurable and an educational privilege to have done so, and through his guidance we have successfully brought the industrial vision of ARTEMIS to fruition. For that reason, it was decided to publically express the thanks of the ARTEMIS community to Yrjö at the June General Assembly meeting, which took place in Athens.

Athens … How appropriate could a place be for this event, and what more appropriate a gesture than to hand to Yrjö a statue of the goddess ARTEMIS herself? Such was done as a token of appreciation by Kostas Glinos on behalf of the EC and the ARTEMIS Joint Undertaking and by Jan Lohstroh on behalf of the ARTEMISIA Association. Both thanked

Call 1
27 proposals for
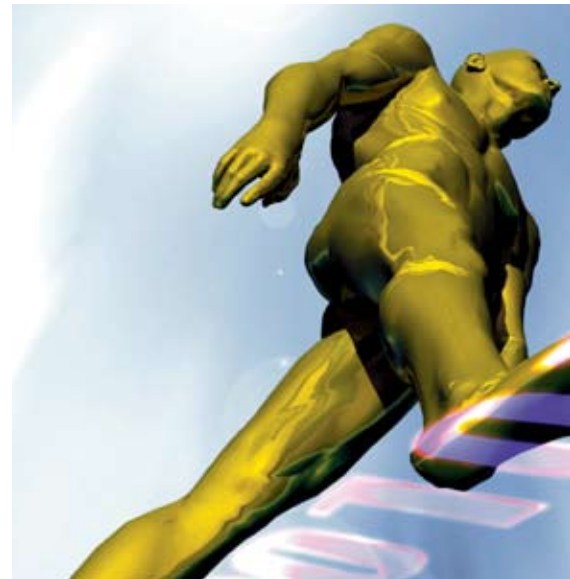
Yrjö for his instrumental contributions to the Embedded Systems ETP, to ARTEMISIA and the ARTEMIS Joint Undertaking.

By Alun Foster, Programme Coordinator ARTEMISIA Association

attracts
€323 mil-

THE FIRST CALL IN THE ARTEMIS PROGRAMME CLOSED ON 3 SEPTEMBER 2008. SOME 27 PROPOSALS WERE RECEIVED, INVOLVING €323 MILLION OF RESEARCH. THE TOTAL OF PUBLIC FUNDING REQUESTED IS AROUND €170 MILLION FROM THE MEMBER STATES INVOLVED AND FROM THE ARTEMIS JOINT UNDERTAKING. AROUND 397 PARTNERS FROM 22 DIFFERENT EUROPEAN COUNTRIES CONTRIBUTED TO THE PROPOSALS. ALL THE MAJOR EUROPEAN PLAYERS IN EMBEDDED-SYSTEMS RESEARCH ARE INVOLVED IN THIS CALL; AND AROUND 28% OF THE PARTICIPANTS ARE SMALL AND MEDIUM-SIZED ENTERPRISES (SMES).

ARTEMIS's first call for proposals was launched on 8 May 2008 with a public budget of almost €100 million. The call has been successful in attracting both large strategic initiatives and smaller, more focused research proposals. This combination was sought in the ARTEMIS 2008 work programme and the embedded-systems community has responded positively. Proposals cover all eight sub-programmes with priority on sub-programmes 1, 3 and 5 as foreseen.

The next step is for the ARTEMIS JU to select proposals for funding. Proposals will be evaluated with the help of independent experts, who will recommend the proposals with the highest potential to generate successful results with major industrial, economic and societal impact. Results of the assessment are expected by the end of October 2008.

By Tom Clausen, European Commission

COLOPHON

ARTEMIS, Advanced Research & Technology for EMbedded Intelligence & Systems, is a Joint Technology Initiative, with a legal structure of a Joint Undertaking, which coordinates the public funding of research and development in Embedded Systems in Europe and brings together the European Commission, Member States and Industry represented by the ARTEMISIA Association; the association of R&D actors in the field of ARTEMIS.

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Telephone +31 88 0036 188
Fax +31 88 0036 180
Email communications@artemisia-association.eu

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Subscription enquiries:
communications@artemisia-association.eu

Submissions:
The ARTEMISIA Office is interested in receiving news or events linked to the ARTEMIS programme, its projects or in general: R&D in the Advanced Research & Technology for Embedded Intelligence & Systems field. Please submit your information to communications@artemisia-association.eu.

Special thanks to all contributors to this issue of the ARTEMIS magazine.

CALENDAR

OCT 21 – 23
2008

ARTEMIS ANNUAL EVENT
ROTTERDAM, THE NETHERLANDS
European competitiveness and
well-being through ICT-based
innovation'

As part of the ARTEMIS Annual Event, a Co-summit Event is organised together with ITEA2. Venue: Concert & Congress Center, De Doelen, in Rotterdam, the Netherlands. The Co-Summit will take place on October 22. ARTEMISIA General Assembly will take place on Thursday 23 October. The General Assembly programme includes Focus Sessions in the morning, which are open for all interested parties. The General Assembly meeting is programmed in the afternoon.
More information:
www.ITEA2-ARTEMISIA.org

NOV 25-27
2008

ICT EVENT 2008
LYON, FRANCE
Europe's leading ICT research event

 "I"s To The Future. Invention – Innovation – Impact. The ICT Event is organised by the European Commission's Directorate General for the Information Society and Media and is usually hosted by the current Presidency of the European Union.

NOV
2008

Expected:
PRE-ANNOUNCEMENT CALL 2,
ARTEMIS PROGRAMME

DEC 2008 /
JAN 2009

Expected:
ARTEMIS BROKERAGE EVENT
& PO INFORMATION EVENT

FEB
2009

Expected:
OFFICIAL PUBLICATION CALL
2 ARTEMIS PROGRAMME

ARTEMISIA Association, or shortly ARTEMISIA, is the association for R&D actors in the field of ARTE MIS: Advanced Research & Technology for EMbedded Intelligence and Systems.
ARTEMISIA is responsible for the ARTEMIS Strategic Research Agenda, and is a founding member of the ARTEMIS Joint Undertaking.
ARTEMIS Magazine is published by the ARTEMISIA Office, which provides information on the developments within the ARTEMIS Technology Platform .

ARTEMISIA Association

High Tech Campus 69
5656 AG Eindhoven
The Netherlands

Tel: +31 88 0036 188
Fax: +31 88 0036 180
communications@artemisia-association.eu.

www.artemisia-association.eu