September 2005
Issue nº 1

KoBaS newsletter

IN THIS ISSUE…

EVENTS

04.-07.10.2005
CAT.Pro 2005

21st International Trade Fair for Innovative Product Development, Data and Process Management

http://www.messe-stuttgart.de/CAT

30.11. – 03.12.2005
EuroMold

World Fair for Moldmaking and Tooling, Design and Application Development

http://www.euromold.com

Editorial

Paolo Pedrazzoli TTS

Welcome to the first KoBaS newsletter.

The EU funded project KoBaS (Knowledge Based Customized Services for Traditional Manufacturing Sectors Provided by a Network of High Tech SME) started in June 2004. You are holding the first newsletter, future releases will be published every 3 months. The Integrated Project KoBaS (IP for SMEs) is worth approximately 8.3 M€ and is funded with 4.8 M€ under the European Commission Sixth Framework Programme. The project, led by TTS, involves 21 partners in 10 countries.

Background. Manufacturing enterprises must quickly evolve to face global market challenges and products fast changes. Increased competitiveness, reduced time-to-market, outermost customization will draw out of the market those company who will not quickly adapt to the changing background. Flexibility is a key factor and in order to pursue this need, manufacturing machines grow complex as well as the tasks performed. The greater integration between the machine performances and the related process parameters is a crucial requirement that the user of the machine has difficulties to grasp and control. As a result, task planning, maintenance, machine configuration, training grow complex and new competencies and larger knowledge of the process parameters, machine performances and their interaction are needed

What's KoBaS. The project aims to provide a breakthrough in the current practices in the use of manufacturing machines, creating a NETWORK OF HIGH TECH SMEs that, thanks to a NEW BRAND OF INTRUMENTS developed within the project, will equip those machines with innovative knowledge based customized software solutions for task and process planning, maintenance, training and management support.

Who's in KoBaS. The research work needs to touch the heart of many different disciplines, putting into practice a transversal integration between new technologies and methodologies again to be developed. The KoBaS project addresses these issues by bringing together a consortium, led by High Tech SMEs, of foremost manufacturers and users of Manufacturing Machines, supported by the expertise of several academic and research institutions whose competencies are multidisciplinary and complementary. Check kobas.ttsnetwork.com for partners detail.

KoBaS impact. Knowledge-based services and technology are revolutionizing the economy. Successful companies, whether in manufacturing or services, will derive their competitive edge not from transitorily superior products but from a deep understanding of a highly developed knowledge core competencies. Thanks to KoBaS, less RTD intensive traditional manufacturing SMEs will became RTD capable and aware SMEs. Often, SMEs do not have a formal section for R&D: with KoBaS, these companies will

CONFERENCES

22.-23.9.2005
CARV 2005

1st International Conference on Changeable, Agile, Reconfigurable and Virtual Production

http://www.carv-production.com

3.-14.7.2006
I*PROMS

Virtual International Conference on Intelligent Production Machines and Systems

http://www.iproms.org

have the chance to perceive research activities as a competitive leverage to be exploited in order to compete.They will greatly benefit, gaining the possibility, on one hand, to use intelligent manufacturing machines and, on the other hand, to sell them. This will result in improved customer relations, increased market share, increase of productivity and optimization. Single IT SMEs will evolve towards a network of high-tech Knowledge Intensive SMEs.

The project supports the growth in terms of competencies and resources and therefore creates critical mass. IT SMEs gain a considerable increased know how and experience and benefit from the knowledge sharing and development synergy promoted by the establishment of the Network of High Tech SMEs

I hope you enjoy the reading of this first issue and you will follow next publications of KoBaS Newsletter.

What KoBaS is:objectives and results

Dimitris Kiritsis EPFL

Knowledge Based Customized Services for Traditional Manufacturing Sectors Provided by a Network of High Tech SMEs

High-tech technology for a true innovative jump in the use and exploitation of the production machines.

The idea of KoBaS is to develop flexible and customizable software components allowing the configuration of personalized interfaces that offer a quick and simple access to specific applications, from production planning, to maintenance, training, the management of technical information, …etc…

All these solutions will be based on proven technologies such as Virtual Reality, 3D Simulation, Knowledge Representation, Finite Element Method Analysis etc., which will then be integrated and

The EU funded project KoBaS optimizes in an interactive application able to provide the specialized innovative KoBaS services in one comprehensive environment.

The KoBaS approach is flexible, adaptable and extensible and replies to the needs of a vast panoply of manufacturing processes coming from traditional sectors, though strategic for Europe.

These new services will be offered to traditional SMEs, disposing only little or no resources for Research and Development, by a network of High-Tech SMES.

Thanks to this common platform for industrial innovation, it will be possible for machine-tools and other production equipment to become intelligent, capable to communicate their environment and characteristics, to understand and work with digital models of the parts to produce and to enable an efficient dialog with their users.

KoBaS contributes in favor of a "clean and intelligent production, based on knowledge", which will allow initiating a radical transformation of the design and manufacture of products.

The KoBaS ultimate ambition is to drive to the renaissance of the traditional SME manufacturing industry in Europe.

For further information,
please visit KoBaS web site

http://kobas.ttsnetwork.com

Activities development

For further information on the C2I 2005, Romania:

http://www.eng.utt.ro/ccii/c2i2005/index_ro.html

For further information on the Technopolis Event:

http://www.technopolis.ch/technopolis2005.htm

Friday 16th of September 2005, Spain

has finished the **CEDI 2005** I Congreso Español de Informática (I Spanish Congress of Informatic)
celebrated at Granada from 13th to 16th of September.
Organized by the W3C (World Wide Web) Consortium and the Junta of Andalucía (Consejería de Innovación, Ciencia y Empresa).
Tekniker presented a paper named *"KOBAS: SOA at machines"* by Francisco Javier Díez and Ramón Arana.
On its first half the KoBas project and the proposed solution for SMEs was presented to the audience.
In the second half of it, it was explained the way the integration of the solution will be technically faced by the Integration Component.
(Ramòn Arana, TEKNIKER)

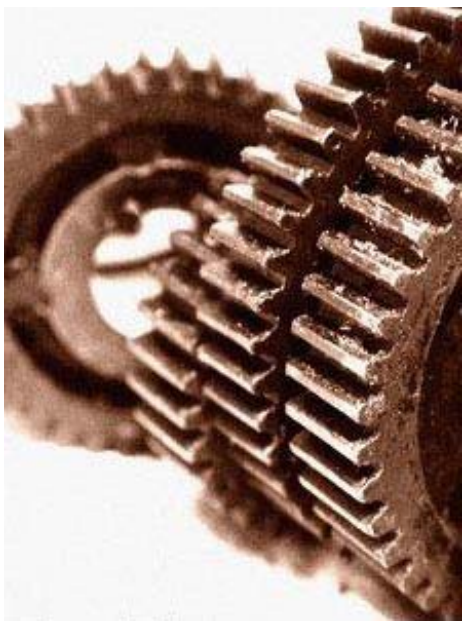
EPFL is prepared a paper titled: *"MACHINED PART QUALITY EVALUATION USING FINITE ELEMENT ANALYSIS"* by Paul Xirouchakis and Alexey Sokolov that was accepted to the **International Conference on ntegrated Engeneering C2I 2005** Timisoara – Romania

Here the abstract

ABSTRACT: The structure is presented of a new simulation software aiming at determining the part distortions caused by milling-induced residual stresses. The planned finite element computations will be implemented on the ANSYS system. The Multiphysics ANSYS module allows to combine the effects of different physical processes and to model mechanical loads, the thermal effect imposed by the cutting processes and the fixturing of the part. The initial residual stresses in the raw workpiece can be also introduced into the computations. The client/server architecture will be used in the software that allows to organize the remote computations on the server so that remote end users can be supported. The paper discusses the theoretical and technical aspects of the software development.
KEY WORDS: residual stresses, FEM-analysis, milling.
(Dimitris Kiritsis EPFL)

We have presented KOBAS at EPFL during the **Technopolis event** on the 13rd of September.

On 27th September I will participate to a round-table and will speak on the theme *"SMEs, how to survive in a knowledge based society and a global world"*.Of course KOBAS will be the conclusion of my presentation stressing out the two main objectives of our project that are : Services oriented software architecture and network of hi-tech SMEs.
(Van Khai Nguyen CADCAMATION)



For further information on the project X-CHANGE:

http://www.x-change-project.net/

Next steps

Anders Jonsson ETHZ

During the autumn, the work done for the definition of the models and the needed functionalities for KoBaS, will be finalized. This includes the definition of the strategy and architecture needed in order to realize the project components. At the end of September there will be a project meeting in Porto in order to discuss the results from this work and to plan the finalization: it will be finished within the 18th months of the project, thus providing a detailed overview of the modeling and specification work done and presenting a clear path for the coming development phase.)

Before that the implementation phase starts with the realization of the components, there will be an important milestone meeting that will be contemporaneous with the European Commission mid-term Revision. The meeting is mainly intended to present and evaluate the results achieved so far in the project and especially the definition and functionality of the components. Moreover, the task related with the setup and management of the developed network of high tech SMEs, will be half way done by month 18; thus the milestone will also evaluate the intermediate achieving of this fundamental activity.

After the milestone meeting, the work with the realization of the components starts. This work deals with the realization of the provided KoBaS services studied and defined before in the project. The implementation work will mainly deal with the development of the software tools and methodologies which together with the network of high tech SMEs will be the base of the project outcome. The result will be a new brand of innovative technologies supporting the manufacturing enterprises.

New projects:

New EU-project to support change management for manufacturing companies

The EU-project **X-CHANGE** (Flexible Change Management for the Factory of the Future) has started on the first of September. The main objectives of the project are to develop an innovative, 'live' flexibility modelling and analysis methodology with wide applicability range and to materialize this methodology into an open software framework able to facilitate lifecycle and change management in production systems and extended enterprises that operate in dynamically changing environments. X−CHANGE aspires to cover the entire lifespan of production systems while adopting a holistic approach by addressing production and business processes in a multilevel structure: the manufacturing facilities level, the logistics level, and the extended enterprise level.

Special dossier: KoBaS R&D Partners

RPK		 Institute for Applied Computer Science in Mech. Eng. (Universitat Karlsruhe (TH))
INESC Porto		 Institute for Systems and Computer Engineering of Porto (UESP operational unit)
ITIA		 Institute of Technologies and Automation
EPFL		 Ecole Polytechnique Federale de Lausanne - LABORATORY FOR COMPUTER-AIDED DESIGN AND PRODUCTION (LICP)
ETH Zurich		 Swiss Federal Institute of Technology Zurich - Center of Product Design (ZPE)
Tekniker		 Research center in applied technology (Foundation)

www.rpk.uni-karlsruhe.de

RPK - Institute for Applied Computer Science in Mechanical Engineering

The RPK Institute acts as a broker between computer science, on the one hand, and mechanical engineering, on the other. As a member of the faculty of mechanical engineering at the University of Karlsruhe, Germany, the RPK is responsible for the education of master degree students in applied computer sciences, virtual product development, product life cycle management, knowledge management based on advanced information and communication technologies, etc.
History of RPK:
1975 Foundation of the Chair for Applied Computer Science at the University of Karlsruhe, Mechanical Engineering Faculty. Dr.-Ing. H. Grabowski is appointed to the position of titular professor.
1977 Foundation of the Institute for Applied Computer Science at the University of Karlsruhe (RPK), lead by Prof. Grabowsk
1979 The institute's first postgraduate student attains his doctorate degree.
1984 The RPK participates in the foundation of the Computer Science Research Center (FZI) with its CAD/CAM technology group (now Process- and Datamanagement). It thereby supports the transfer of research results to the industry.
1988 The institute is awarded the mechanical engineering prize of the German Machine and Plant Construction Society (VDMA), Frankfurt.
1990 The Special Research Field "Computer Aided Design and Manufacturing of Components" (SFB 346) is created.
2000 The RPK start it's research activities concerning Virtual Reality. Installation of a powerwall with projectors.
2002 The RPK celebrates its 25th anniversary with a staff of 86 (among them 28 doctorate students).
2003 Prof. Dr. Dr.-Ing. Jivka Ovtcharova is a full professor and head of the Institute.
2004 Main research areas of the Institute: Life Cycle Engineering, Collaborative Engineering, and Virtual Engineering.

www.inescporto.pt

Role in the project:
RPK is responsible for the development of the Rule-Based Knowledge Core Component. This component is meant to provide the KoBaS network with the possibility to customize, for every manufacturing sector/machine confronted, a Rulebased Knowledge Base (process and geometry related), in order to support the machine task programming, configuration, maintenance and training through a knowledge based system.

INESC Porto

INESC Porto is a research institution working in the interface between the academic world and the industrial and service companies as well as the public administration. Main activities are scientific research and technological development, technology transfer, consulting and advanced training programmes in Information Technologies, Telecommunications and Electronics.

INESC Porto was created in December 1998, having as founding associates INESC, University of Porto and Faculty of Engineering of University of Porto.
Having originated in the Porto branch of INESC, started in May 1985, INESC Porto is the result of a process of deep restructuring of INESC leading to an increase in specialisation and autonomy of the various branches and culminating in the creation of a number of new institutions. INESC will, in the future, take the role of a central strategic and co-ordinating body at national level.
In Kobas project, the Inesc Porto participation will be carried out by the Manufacturing Systems Engineering Unit, whose main goal is to promote the improvement of performance of industrial companies through R&D projects, consulting services, technology transfer and training services.
Internal competencies are related to information technology, systems and methodologies to support enterprise management and organisation.

The main research areas are: advanced information systems for industrial management, Enterprise Cooperation Networks, decision support systems, rationalisation and optimisation of manufacturing processes, technical and organisational requirements analysis, Internal Logistics and Enterprise Integration.
The Unit supplies consulting services to industrial companies, including the analysis and optimisation of business processes, requirements analysis of IT systems, selection of IT systems (ERP and others), change management and support in the implementation phase. These services follow a proprietary methodology, developed over many years of field experience.
The Unit plays also a role in the promotion of the utilisation of advanced technologies by industrial enterprises through dissemination, training and consulting actions, aiming at creating awareness of the advantages and limitations of new technological solutions, identifying new requirements, and supporting its implementation.
To technology suppliers, software houses, systems integrators and producers of manufacturing equipment, the Unit supplies R&D services to develop innovative products in partnership.
Role in the Project:

- RTD Activity Supervisor
- Responsible for the one of Kobas core component: Maintenance Component
- Promotion and dissemination of Kobas results

www.itia.cnr.it

www.epfl.ch

ITIA-CNR Institute of Industrial Technologies and Automation, National Research Council, Italy

ITIA-CNR, as a promoter of industrial innovation, performs strategic activities of Scientific Research and Technological Development for the Competitiveness and Sustainability of Italian and European Manufacturing Industries.
ITIA-CNR acts in tight collaboration with Enterprises, Universities, Research Centres and Institutions within National, European and International Programmes, Projects and Industrial Contracts.
ITIA-CNR activities:

- RTD Activities for the Innovation of Products, Processes, Organisations
- Management of International Programmes and Projects
- Services to Enterprises and Innovation
- Observatory for Technologies
- Education and Training

ITIA-CNR is a Network Institute composed of several nodes, distributed on the national area: sections, laboratories, consortia, each characterized by complementary roles, tasks and aims.
In a sound management logic, the various network subjects contribute to the scientific and technological efficiency as well as effectiveness.
ITIA-CNR activities are mainly addressed to the following industrial sectors: Mechanical, Footwear, Wood and Furniture, Plastics, Biomedical.
These activities are developed in collaboration with enterprises, universities and research institutes, both at national and supranational level, and integrate within the value chain that starts from the scientific and technological research, leads to the industrial innovation and, finally, to the market.

Role in the Project:

- Definition of the Models and needed Functionalities for KoBaS
- Realization of KoBaS Components
- Promotion and dissemination of Kobas results

EPFL Ecole Politecnique Federale de Lausanne

The EPFL has various courses:
ENAC: Architecture, Civil and Environmental Engineering
I&C: Computer and Communication
Sciences
SB: Basic Sciences
STI: Engineering Sciences and Techniques
SV: Life Sciences
CdH : College of Humanities
CDM: College of Management of Technology

The EPFL R&D goals is the development of new computer-aided methodologies and tools to support product design and manufacturing processes and operations in order to increase product adaptability to changing customer requirements, to decrease of time to market of new product deployment, to optimise the product life cycle and the manufacturing process.
The research centre works collaborating with the industrial, economic and scientific environments is a long-standing tradition at the EPFL. From the first computer mouse to methods for decoding DNA a thousand times faster, the EPFL is a unique place of innovation and competence.
Development strategy
• To contribute to economic and social development
• To support campus creativity
Search for competences and partners
• EPFL industrial liason programs
• Partner search
• Participation in European programs (in French and German only)

www.ethz.ch

• Offer of /search for innovations in Europe (in French and Italian only)

Technology Transfer

• Technology opportunities
• Research agreements
• Patents and licences

Role in the project:

- responsible for the "Analysis Services Component"
- Definition, development and implementation of the analysis services (FEM)

ETH Swiss federal Institute for Technology of Zurich

ZPE (Zentrum für Produkt Entwicklung) at ETH Zurich

The main focus of the teachings, research and cooperation with the industry is on product innovation process an product design.
The teachings focus on the education of engineers with competences in innovation and product design
through the medium of current and relevant knowledge, most advanced tools and novel learning methods.
The research's focus is on the development of processes, methods and tools for the successful innovation process, product design and enhancement of efficiency. This goal is achieved through information-, communication- and visualization-technologies in the concept of the digital product.
The industry is supported by cooperation of research and development, direct consulting, offers of advanced vocational training and collaboration of students in all activities to profit of the potential of the digital product and to generate successful innovations and product designs.

We move knowledge – knowledge moves us.

We develop processes, methods and tools for an effective and efficient product innovation and for the support of related operation processes.
The CPD currently emphasizes two main areas of research: Product Innovation and Digital Product.
Within both areas of research, the Center for Product Design concentrates on the point of intersection and the transfer between research and the industry.

Group Product Innovation

The research group product innovation dedicates itself to the innovation process and its methods, to the innovation assessment as well as the transfer of technology.

Group Digital Product

The group digital product focuses on the virtual representation of the real product that accompanies the product development process. In regard to the digital product, an emphasis is put on the structuring of products to platforms, on the management and documentation of knowledge (product data and product information) along the product life cycle. The researches in the area of virtual reality serve as tools for visualisation, simulation and interaction with the digital product.

Role in the project:

- responsible for the "Mechatronics Component"
- Definition of the Models and needed Functionalities for KoBaS

---

www.tekniker.es

TEKNIKER

Centre: The TEKNIKER technology centre is based in Eibar, Gipuzkoa, which has been a predominantly industrial town since the mid 19th century. TEKNIKER's premises are on Calle Otaola, the main road into town. This site of almost 9,000 m2 is home to all the centre's work-force and a great deal of equipment, some of which can be found nowhere else in Spain and ranks with the best in Europe.

Mission: TEKNIKER it is a Research Center in applied technology and legally constituted as a private non profit making foundation, whose mission is to contribute to increase the innovation capability of the industrial sector to improve its competitiveness through the generation and application of technology and knowledge.

Specialist fields: TEKNIKER specialises in manufacturing technologies, i.e. all areas concerned with products, processes, production machinery, handling (capital goods) and all-round management of product life-cycles.

A recent strategic decision has led TEKNIKER to move also towards being a centre for micro-manufacturing and precision engineering.

Areas of industry: The areas of industry with which TEKNIKER works most closely are those involved with manufacturing production and certain emerging areas which are growing up around revolutionary new technologies.

- Auxiliary automotive industry.
- Machine-tools.
- Mechanical capital goods.
- Aerospace.
- Large scale scientific equipment and instruments.
- Metal processing.
- Professional electronics.
- Petroleum and its derivatives.
- Advances, minimally invasive medical equipment.
- Biotechnology equipment and devices.

Role in the project:

- responsible for the "Services Integration Component"
- Definition of the Models and needed Functionalities for KoBaS