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KoBaS newsletter

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EVENTS

Kobas Project will be present at following international conferences:

ICE – 12th International Conference on Concurrent Enterprising [Italy, 26-28 June]

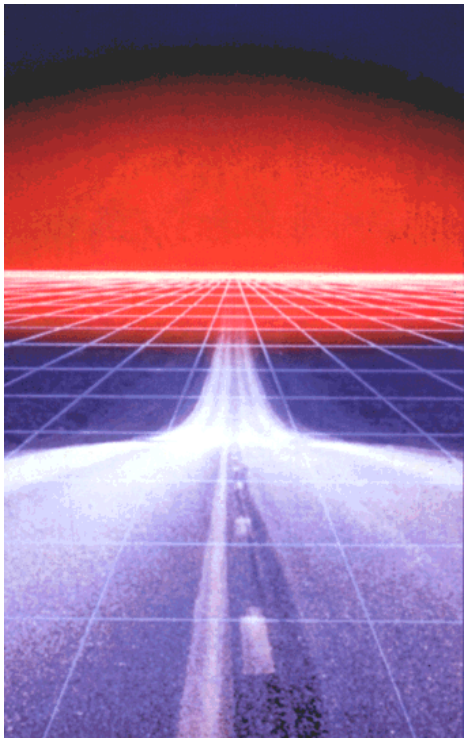
CISTI - 1ª Conferência Ibérica de Sistemas e Tecnologias de Informação [Portugal, 21-23 June]

BASYS - 7th International Conference on Information Technology for Balanced Automation SYSTEMS in Manufacturing and Services [Canada, 5-6 Sept.]

Editorial

Paolo Pedrazzoli TTS

KOBAS from the last review toward the future development



The project objective is to promote a Network of SMEs capable of providing "KoBaS services", and, after 24 months from the project start-date, our research efforts have clearly uncovered where the promises of the original innovative vision are driving us.
During the first year of the project, the Consortium analyzed the state of the art, in terms of existing technologies and related academic work, with regard to the KoBaS approach. Four distinct manufacturing sectors were approached and studied, as case studies to demonstrate the KoBaS solution: metal cutting for aerospace parts, wood-work, cork testing and die-cast. The EC expert reviewed the KoBaS results, after the first year of work. He strengthened the confidence of the Partners into the proposed solution: *"The integrated KoBaS system goes significantly beyond what is currently available in any one system, and should have significant potential in the machine building and user industries"*
significant achievements

Throughout the second year of the project, the consortium has drafted, analyzed and finalized the overall Components architecture. From month 18 on, the actual development of the Tools started and several component, already in beta-release, have been successfully tested and presented in several contexts.

The first prototypes gave to the Consortium the basic tools to carry on some tests to gather industrial response on the task and process planning, machine configuration, maintenance and training tools proposed.
The response to those prototype, even if with limited functionality, was enthusiastic and led the consortium to anticipate a major economic impact for the KoBaS solutions where the knowledge-based services and technology will revolutionize manufacturing. Also the companies met during this early demonstrations, show they understand that successful companies will derive their competitive edge not from transitorily superior products but from a deep understanding of a highly developed knowledge core competencies.

It is foreseen to present the project at the biannual world exhibition Xylexpo, the wood-industry fair. Feedbacks will contribute to focus the last year of KoBaS project on actual demonstration activities with a prompt eye for exploitation. Indeed the last year of the project will mainly focus on the Component fine tuning based on demonstration activities.

Significant breakthrough have been already achieved and the project Core Partners are already looking forward both to a fruitful exploitation and to further research collaboration.

PAPERS DISSEMINATED IN THE LAST PERIOD

Here there's a list and abstracts of the papers produced by the partners in the last months.

Thanks to everybody who collaborate to disseminate the project, its objective and aims waiting for presenting the results.

MACHINED PART QUALITY EVALUATION USING FINITE ELEMENT ANALYSIS

Paul Xirouchakis
Swiss Federal Institute of Technology in Lausanne (EPFL)
Alexei Sokolov
Institute of Production and Robotics (STIIPR-LICP)

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.

KNOWLEDGE BASED SERVICES FOR TRADITIONAL MANUFACTURING SECTORS PROVIDED BY A NETWORK OF HIGH TECH SMES

Paolo Pedrazzoli,
TTS -Technology Transfer System s.r.l
Claudio R. Boër
ITIA-CNR Institute of Industrial Technologies and Automation

ABSTRACT:
Manufacturing enterprises, particularly SMEs (Small/Medium Enterprises), are quickly evolving according to market and products fast changes. Manufacturing machines, as a matter of fact, are a core enabling technology in a number of key industrial sectors (metal, wood, leather, stone, plastic, …), which have common requirements for increased product customization and improved competitiveness in terms of reduced cost, shorter delivery times and improved quality.
In order to pursue these increasing needs of flexibility, manufacturing machines grow more and more complex and the tasks performed by these machines become complex too. The greater integration between the machine performances and the related process parameters becomes also a crucial requirement that the user of the machine has difficulties to grasp and control. Task planning and all the other operations related to the manufacturing machine (such as maintenance, configuration, training and so on), as a result, grow complex too and new competencies and larger knowledge of the process parameters, machine performances and their interaction are needed.
KoBaS approach, its relevance and its foreseen economic impact for the manufacturing sector.

KEYWORDS:
Manufacturing Systems, Knowledge Engineering, Simulation

AN INNOVATIVE APPROACH IN SUPPORTING THE OPERATION OF COMPLEX EQUIPMENT MACHINERY: THE KOBAS PROJECT CASE

Paula Silva , Américo Azevedo, César Toscano, João Cardoso
INESC Porto, Faculdade de Engenharia da Universidade do Porto

ABSTRACT:
This paper presents an innovative approach in supporting the operation of complex equipment. The concept was developed in the context of the KoBaS project (Knowledge Based Customized Services for Traditional Manufacturing Sectors Provided by a Network of High Tech SMEs) whose main objectives are the development of new knowledge based tools for an intelligent use and management of more sophisticated manufacturing machines; and the creation of an innovative extended network of high-tech SMEs for use, customize, support and make business out of the new development tools.

As a concrete example the paper presents a KoBaS solution based on the machine maintenance. This solution allows one to know the machine condition, to detect and diagnose machine failures, to manage ordinary and extraordinary maintenance plans and maintenance work orders and to provide training support for maintenance interventions.

KEY WORDS:
manufacturing machines, manufacturing knowledge, maintenance, predictive maintenance.

A STRUCTURED METHODOLOGY FOR BUSINESS NETWORK DESIGN

Giacomo Copani, Roberto Bosani
IICS Srl – Industrial Innovation Consulting Services
Lorenzo Molinari Tosatti
ITIA-CNR–Istituto di Tecnologie Industriali e Automazione
Américo Azevedo
Inesc Porto - Institute for Systems and Computer Engineering of Porto and Faculty of Engineering of University of Porto

ABSTRACT:

In the new manufacturing environment, a single enterprise does not often own all resources and skills to offer competitive solutions. Therefore, such enterprises become part of enterprise networks of independent core competencies in order to produce marketable products. Thus, Business Networking is an innovative business paradigm that can help companies to remain competitive in the market. Nevertheless, its practical implementation is very complicated because of the several dimensions that it involves, and, especially in network start up phase, because it is often left to the case and not managed with adequate methodologies and tools. The present paper proposes a structured methodology for long term business network design that is based on a network descriptive model and that should be applied by a "network architect". The proposed methodology has been developed and applied in the frame of KoBaS project funded through European Commission Program.

KEY WORDS:
Business Networking, Network design, Network set-up, Enterprise Networking, Network management.

RULE BASED APPROACH FOR CAPTURING AND REAPPLICATION OF MANUFACTURING KNOWLEDGE IN PRODUCT DEVELOPMENT

R. Krikler, B. Culha
Institute of Applied Computer Science in Mechanical Engineering (RPK),

ABSTRACT:
This paper presents an approach for intelligent use of manufacturing systems. The concepts and software architecture presented in this paper will develop in the context of the project KoBaS (Knowledge Based Customized Services for Traditional Manufacturing Sectors Provided by a Network of High Tech SMEs). The project aims to create customized services for manufacturing machines providing a set of tools including advanced task and process planning machine configuration, maintenance, training and management support. The application areas of this approach can be broadened in order to capture knowledge from manufacturing machines and to use it in requirements modeling and embodiment design during product development. The represented idea aims to support an effective and economical product development by frontloading manufacturing process know-how. The results will be help to transfer manufacturing machine based knowledge into the earlier product life phases.

KEY WORDS:
Knowledge Based Systems, Rule Based Systems, Knowledge Management, Manufacturing knowledge, Product development, Requirement modeling

SPECIAL DOSSIER: INDUSTRIAL PARTNERS 2

SCM GROUP

Over fifty years' experience, two million machines in operation in 120 countries, 3.000 employees, 500 million Euros turnover, 20 factories, 25 foreign subsidiaries and an export rate which accounts for 70% of production.

SCM GROUP operates through a number of highly prestigious and renowned brands: SCM, solid wood and panel processing machinery for small, medium and large companies: MINIMAX, ROUTECH, MORBIDELLI, GABBIANI, DMC, STEFANI and IDM, MAHROS, SCM GROUP ENGINEERING.

The production process is completely integrated upstream and downstream in order to offer the market a guarantee of total quality: 2 foundries for cast iron, a metalwork processing division, a dedicated and highly automated factory for the production of electric and electronic components and a study & research division. For over 20 years, SCM Group has been active in professional training and successful cooperation agreements have been established with Faculties and Institutes.

http://www.scmgroup.com

Role within the project: Provider for machining sector case study. Responsible for the case study

SCM Group products are distributed worldwide through subsidiaries operating in Germany, France, Spain, Great Britain, Netherlands, Belgium, Romania, Poland, Russia, Canada, United States, Mexico, Brazil, Singapore, China and through a qualified network of 350 agents and distributors. Its global presence guarantees an efficient and widespread service to all customers.

MCM

http://www.mcmspa.it

Role within the project: Provider for machining sector case study. Responsible for the case study

MCM designs, manufactures and installs machining cells and flexible production systems that have speed and precision available in the industry.

Founded in 1978, MCM has been a pioneer in the development of the automated plants: Horizontal machining centres such as ACTION, CLOCK, FORERUNNER, and the most recent ICARO "ROBOCELL", TANK and JET FIVE provide very high performances when it comes to speed, precision, flexibility and reduction of time and cost.

MCM's production covers a complete range of high quality horizontal machining centres, Flexible Manufacturing Cells and Flexible Manufacturing Systems. A series of automated standard modules gives customers the potential to build a system corresponding exactly to their production needs. Furthermore, MCM designs and produces its own electrospindles, tool changers and rotating tables.

MCM's specific **"mission"** is to support the customer finding a **"global"** solution where MCM supplies not only the machines and the automation modules but also the work fixtures, the tooling, the part-programs and the software to control the entire production cycle for the parts to be machined.

For the above reasons major automotive and aerospace companies as well as small and medium mechanical companies all over Europe and USA have chosen MCM

KMS

Role within the project: Validation of the die-casting demonstration case of KoBaS

KMS is a small business company located at Warsaw in Poland, composed of a fixed staff of around ten persons and a variable amount of subcontracted staff depending on running projects.

KMS activity is focused in the sales of capital goods, technical consultancy and services for the melting industry.

Due to its daily contact, KMS perfectly knows the Polish and the surrounding Eastern countries market.

KMS also covers the formation and qualification of the melting industry of this market.

This is a key question when adapting to new equipments and technologies.

QUINSON

http://www.quinson.com

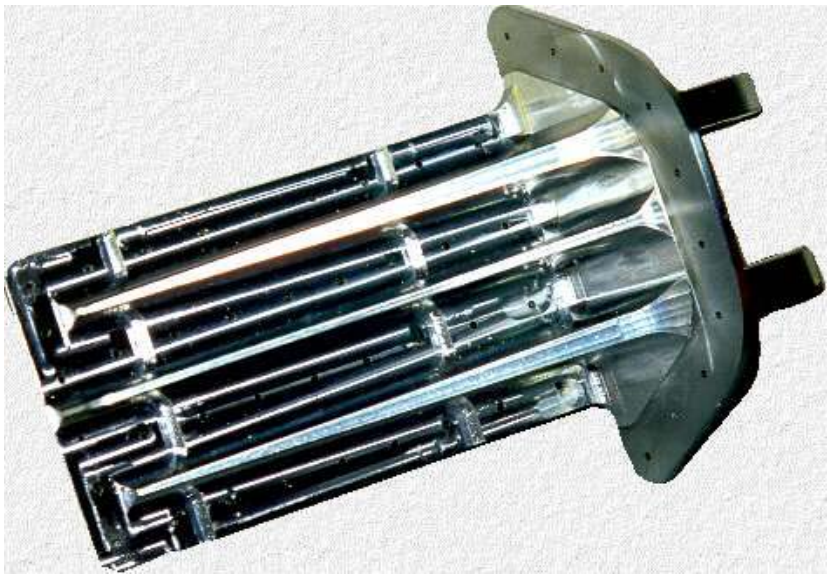
Role within the project: validation for the metal cutting demonstration case of KoBaS

The company produces equipments like couplings, filters, valves, JET seals but also in flight and ground re-fuelling connectors.

In 1906 Mr Quinson founds the society with a 5 people staff. The first important stage is reached in 1950 with the creation of a design office for Quinson that makes equipments.

In 1998 the company affords the installation of tests laboratory (pressure, flow, pressure drop, temperature), In year 2000 Quinson obtains ISO 9002 Agreemen

After having the Patent for "JET" seals, in 1968 Quinson purchases of the society LE ROBY STOP; at that stage the staff was 50 people and after becoming a public company In 1981 it purchases the CATIA cosoles and following the flexible unit 5 axes.



http://www.suberus.com/

Role within the project: validation for the cork demonstration case of KoBaS

SUBCENTRO

This industrial company was created in July 1990, and its mission is the manufacture of high quality cork products obtained from the bark of the cork tree.

Subercentro holds facilities in the south of Portugal (the most world-wide advanced industrial plant in cork industry).

The company puts special emphasis on applied research and technological development through cooperation with companies and research centres both in National/European and International projects.

www.kobasproject.com

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

Project Information:
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