SPECIES
Production System Evolution

Tullio TOLIO - Politecnico di Milano
Department of Mechanical Engineering
AGENDA

SPECIES meeting opening - Prof. Tullio Tolio

Formalization of Information of Product, Process and Production Systems, Considering their Co-evolution - Prof. Tullio Tolio

Analysis of an Industrial Case - Joint Evolution of Quality Control System and Production System - Ing. Ghilemi (Marposs S.p.A)

Integration of Different Inspection Devices During the Evolution of Production Systems - Prof. Anath Fischer
AGENDA

ABOUT “SPECIES- Production System Evolution”

ORGANIZED EVENTS

TOOLS

FUTURE MEETINGS

SPECIES

Analysis of an Industrial Case - Dr. Hartmut Freitag (XENON Automatisierungstechnik GmbH)

Co-Evolving systems/products Species: Inspiration from Biology and Application in Controlling Evolving/Reconfigurable robots - Prof. Hoda ElMaraghy

Self-Healing Analysis of Production System in Product Lifecycle Management - Prof. Darek Ceglarek

Concluding remarks - Prof. Tullio Tolio
Meeting Opening

AGENDA

- Opening, welcome, introduction of invited guests
- Approval of the agenda
- Approval of the minutes
- About “SPECIES-Product, on System Evolution”
- Organized activities
- Web-site
- Planning of the future meetings
The **Mission** is to investigate approaches, techniques and methods devoted to determine the most appropriate evolution strategy for a production system, grounding on knowledge about competitive environment changes, with a particular focus on evolving product and process characteristics.
Special Session in 4th International CIRP Conference on Digital Enterprise Technology (Bath, UK, 19-21 September 2007)

Organized by:
Professor Paul G. Maropoulos
Professor Stephen T. Newman
Special Session in the 9th ASME Conference on Engineering Systems Design and Analysis Conference (Haifa, Israel, July 7-9, 2008)

Organized by:
Professor Yoram Halevi
Professor Anath Fischer
Development of a Conceptual Reference Framework to manage manufacturing knowledge related to Products, Processes and Production Systems, considering their Co-evolution

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1.1 Introduction

The Manufacturing sector is nowadays characterized by a continuously increasing level of complexity, basically due to the large number of requirements that must be met at a production level and to the presence of many different sources of information in the market. This high level of complexity affects both the physical and the architectural aspects of the manufacturing companies, together with the management, financial and organisational aspects. The increasing complexity of production requirements and environment complicates the problems of configuration identification, implementation, management, control and continuous improvement of products, processes and production systems.

To manage such a complexity, it is necessary to capture the most important relationships among the different objects composing the overall system, by adopting a holistic and highly integrated view. For this purpose, knowledge-based analysis methodologies and tools have been developed by systems engineers to support the decision making process all over the product/process/system lifecycles. However, depending on the lifecycle phase in which each decision maker operates, different levels of detail of the required and available information are needed. Therefore, due methodologies and tools developed to support such decision making processes must be tailored to these different needs.

In the phase of production system configuration starting from “green field”, for instance, very aggregate information on the production requirements and on the capabilities are available. At this point, exact analytical techniques [1, 2] are very frequently used to support the decision making process; these techniques require very few and aggregate information on products, processes and production systems to provide general configurations that are suitable enough to meet production requirements.

On the other hand, approximate analytical techniques [3, 4] fit better with the problem requirements during the phase of detailed systems configuration, when some knowledge concerning the system dynamics and unexplored areas affecting performance is already available. This kind of techniques need more precise information concerning the dynamic behavior of the system and the new
The document proposes a UML structure for the formalization of data concerning *Product, Process and Production Systems*, which is:

- Dynamic and flexible
- Referred to existing standards
- Easily appliable to different case studies
If you are interested in SPECIES-WG topics and want to learn more information, feel free to contact us:

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http://www.species.polimi.it