

SO-PC-Pro: Subject Orientation For People Centred Production

Chiara Di Francescomarino¹, Mauro Dragoni¹, Chiara Ghidini¹, and
Matthias Neubauer²

¹ Fondazione Bruno Kessler, Trento, Italy

² Johannes Kepler University Linz, Linz, Austria

dfmchiara|dragoni|ghidini@fbk.eu matthias.neubauer@jku.at

1 The SO-PC-Pro Project

European production companies face a variety of challenges arising from the increasingly complex and dynamic environment in which they operate. These challenges have been understood mostly in economic terms based on the time-cost-quality triangle. The main approach to tackling these challenges has been to rationalize production processes through standardized work procedures and automated systems, aiming to reduce cost and increase productivity. However, the predominant focus on functionality and efficiency neglects a critical factor for sustainable organizational success: the human being. While worker satisfaction, motivation and empowerment have been recognized as critical for healthy production organizations, these human factors are often viewed at odds with the economic goals of a company.

The goal of SO-PC-Pro is to develop methods and tools for holistic design and management of workplaces in production companies, thereby aligning business goals and human needs. It is based on a view of production companies as complex, socio-technical systems of people, processes and machines that flexibly interact. This view is well captured in the “subject-oriented” methodology for BPM. SO-PC-Pro will apply this methodology for the first time to modeling processes and interactions in the production domain, resulting in a new set of ICT-based technologies that will support people-centred workplaces in three ways:

1. through developing new human-machine interactions that allow for higher degrees of autonomy of workers,
2. through empowering workers to re-design their own workplaces using intuitive design methods and collaborative tools, and
3. through seamlessly integrating production and business processes to enable more adaptable workplaces throughout the whole enterprise.

By building on existing models and interface standards, the technologies and case studies developed will demonstrate that people-centred production sites can be created in a not so distant future.

2 Project Objectives

Objective 1: Subject-oriented modeling of production workplaces to increase workers' autonomy Subject-oriented modeling, through its focus on interactions, allows better

adaptation of machines, processes and context to the human worker. This Objective includes augmenting the coverage of subject-oriented modeling to explicitly represent interactions with machines and context, and subsequent implementation and evaluation through a case study. This case study addresses a scenario involving flexible job assignments through communication between workers and machines. This Objective relates to increasing decision autonomy and motivation of workers.

Objective 2: Subject-oriented re-design of production workplaces to empower workers and stimulate teamwork This Objective includes developing subject-oriented methods for workplace re-design according to business and human values, borrowing from and extending methods for value stream design (VSD), contextual design, analysis of change propagation, and wiki-based re-design collaboration. The methods will be usable by those with the deepest insight into human needs at work: the workers themselves. The methods and tools developed are implemented and evaluated through a case study. This Objective relates to the workers' empowerment by involving them in the responsible development of their workplaces, and the stimulation of teamwork.

Objective 3: Seamless integration of production and business processes as enabling technology for holistic workplace designs This Objective targets the development of enabling technologies through seamlessly integrating production and business processes across all levels of control. It is based on the subject-oriented modeling approach establishing a uniform representation for control systems in any area of application. Existing industry standards are used for implementing the interfaces between subject-oriented models and the specific control systems including human and environmental sensor data. In addition, a workflow engine is extended to provide the necessary real-time support for production control. For creating an integration solution ready to be evaluated in a real shopfloor environment, the development effort required would be too large for the scope of this project. Therefore, the technologies developed for this Objective will be preliminary only, and will be developed and tested in a laboratory setting. This also supports Objectives 1 and 2, as the implementation of enhanced workplaces can be directly mapped onto changes in real time production processes.

3 Networking Expectation

We will show how semantic technologies have been integrated in the process management workflow for supporting workers in their working environment, and we will discuss our work-plan concerning future developments and integrations in real-world industries. By attending the networking session, we want to meet and connect with people and other initiatives regarding the use of semantic technologies in industries. However, solutions developed in the context of the SO-PC-Pro project can be extended to the societal domain.

Furthermore, we would like to explore common research regarding semantic and process modeling experiences as a whole.

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