Requirements Definition for Domain-Specific Modelling Languages: The ComVantage Case

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Abstract. The goal of this paper is to investigate the challenge of defining and answering modelling language requirements with domain specificity in the instance case of the ComVantage EU research project, which provides a multifaceted domain, with subdomains identified along two dimensions: a) the application dimension, where subdomains are defined by the application areas providing use cases: mobile maintenance, customer-oriented production and production line commissioning; b) the technical dimension, where subdomains are derived from a grouping of the encountered technical problems - supply chain definition in virtual enterprises, business process-driven mobile app and data requirements, business process management considering the execution environment and control of access to its resources/artefacts, design of products and services, or incident escalation management. The paper describes the requirements sources, their definition methodology and an initial derivation of modelling method building blocks from the identified requirements.

Keywords: modelling requirements, metamodelling, business process, knowledge acquisition.

1 Introduction

The paper addresses the challenge of conceptually modelling a multifaceted domain and of identifying requirements for realizing a modelling method that can answer this challenge. The content is mainly targeted to the conceptual modelling community.

From a conceptual modelling perspective, The ComVantage research project [1] tackles a domain encompassing three application areas from which both distinguishing and overlapping concepts emerge. The application areas are symbolically depicted in Fig. 1 (derived from [1], public deliverable D311):

1. For production line commissioning, two key phases can be identified: the pre-deployment phase - from the design of a production line (based on its output specification) to its deployment, and the post-deployment phase - focused on cycle time monitoring and process control;
2. The customer-oriented production refers to the on-demand production of shirts based on customization requests, and the triggering of a production process to fulfill the required customization;
3. The mobile maintenance refers to a requirement for remotely monitoring machine sensors and running test cases in order to diagnose defects and initiate repair requests.

**Fig. 1.** Overview of the ComVantage application areas

The core focus of ComVantage is to propose a run-time information system architecture to cover these application areas, based on mobile app front-end consuming a Linked Data-based back-end. Our main task, reflected in the current paper, is to complement the run-time component with design-time support in the form of a modelling method that can help future businesses adopting the ComVantage technological specificity to structure and analyse their business and map its IT requirements in a process-centric and holistic manner.

A modelling method for ComVantage needs to deal with this domain heterogeneity, thus the result must be a hybrid method covering multiple layers of abstraction, from domain-specificity to concepts that are generic enough to be reusable over the three application areas (to capture their overlapping aspects). Thus, we can state that the paper describes a knowledge acquisition effort, enveloped by the requirements elicitation phase for the run-time information system, and an initial structuring of the resulted knowledge in the form of a modelling stack. An overview