Introduction to Software Product Lines: Engineering, Service, and Management Minitrack

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Software has become the key asset for competitive products and services in all industries. Thus, competitiveness in software development, maintenance, and related services has become a concern for organizations. Competitiveness can be increased through (1) internal strategies such as the strategic creation and reuse of software assets and (2) external strategies such as outsourcing software development, maintenance, and/or services from third party service providers and acquiring off-the-shelf components from providers and open source communities. A viable third strategy is to develop both strategies in parallel. This minitrack focuses on the first and third strategy.

Software product line engineering (SPL) is an industrially-validated methodology for developing software-intensive systems and services faster, at lower costs, and with better quality and higher end-user satisfaction. It differs from single system development, as:

1. It needs two development processes to work optimally: domain engineering and application engineering. Domain engineering defines and realizes the common and variable features of the product line by establishing a common software platform. Application engineering derives applications by exploiting the commonality and binding variability built into the platform.

2. It needs to explicitly define and manage variability. During domain engineering, variability is introduced in all assets such as requirements, architectural models, components, and test cases. It is used during application engineering to mass-customize applications to the needs of customers.

Software product line research has mostly focused on the modeling and management of variability in the context of embedded systems (e.g., cellular phones). Most software product line experiences have been obtained from large government and private organizations. This minitrack welcomes contributions from the mainstream product line research. It also acknowledges that the extant body of knowledge in the field is fragmented. More holistic and integrative research approaches are needed to help practitioners leverage the research results in establishing and improving software product lines. Indeed, experienced practitioners have sometimes established innovative product lines and enabling practices and systems with limited awareness of the software product line body of knowledge.

This minitrack accepted three papers this year. One of them appears in another minitrack for presentation. This minitrack consists of two papers and one additional presentation.

According to Polyviou, Rizou, and Poloudi the extant research does not properly address Software-As-A-Service (SaaS) selection factors, or attempt to understand the vendors’ perception of the customer preferences. Their paper presents a number of SaaS selection factors that take into account both the customers’ and the vendors’ perspectives. The factors differ across customer segments. Furthermore, vendors appreciate the factors that relate closely to the technical and branding aspects and underestimate the importance of usability and support aspects that are highlighted by the customers.

The paper of Yague, Garbajosa, Perez, and Diaz focuses on software product innovation assessment that is vital for firms to know as soon as possible, if their software products are to be aligned with the market and customer demands. It presents the results of a systematic literature review showing that (1) questionnaires are the main artifacts used to perform product innovation assessment at different organizational levels (e.g., project or company) and at different stages of product development; (2) both unweighted and weighted evaluation schemas are used, based on innovation factors that are most commonly grouped into organization, market, environment, and technology factor families.

The ISO/IEC 26550:2013 standard on product line engineering and management specifies the domain and application engineering processes and the organizational and technical management processes involved. It also establishes a baseline for academic research in the field. Timo Käkölä, the main author of the standard, will outline the standard, ways of applying it in practice, and give an agenda for future standardization efforts. For example, the following areas will have a high priority in future ISO/IEC standardization efforts: variability modeling and the organizational introduction and management of product line engineering.