Objective

The aim of this project is to provide a Software Product Line (SPL) development methodology that offers improved modularisation of variations, their holistic treatment across the software lifecycle and maintenance of their (forward and backward) traceability during SPL evolution. Currently, there is a big gap between research in requirements analysis, architectural modelling and implementation technology, and the industrial practice in SPL engineering. Furthermore, the focus tends to be on the design and code level when variations need to be identified, managed and analysed from the very early stage of requirements engineering. Architecture models are related to requirements models in an ad-hoc fashion and implementation tends to rely on pre-processors which are inadequate substitute for proper programming language support for variability. Nor is there any systematic traceability framework for relating variations across a SPL engineering lifecycle.

Aspect-Oriented Software Development (AOSD) can improve the way in which software is modularised. Localising its variability in independent aspects as well as
Software is modularised, localising its variability in independent aspects as well as improving the definition of complex configuration logic to customise SPLs. Model-Driven Development (MDD) can help to express concerns as a set of models without technical details and support traceability of the high-level requirements and variations through model transformations.

AMPLE will combine AOSD and MDD techniques to not only address variability at each stage in the SPL engineering lifecycle but also manage variations in associated artefacts such as requirements documents. Furthermore, it aims to bind the variation points in various development stages and dimensions into a coherent variability framework across the life cycle thus providing effective forward and backward traceability of variations and their impact. This makes it possible to develop resilient yet adaptable SPL architectures for exploitation in industrial SPL engineering processes.

Programme(s)

Topic(s)

Funding Scheme

STREP - Specific Targeted Research Project

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