



CONSULTING/COACHING PRODUCT DEVELOPMENT IN THE USE OF DOMAIN-SPECIFIC MODELLING

Software Product-Line Engineering

- **Domain analysis:** Our software engineering consultants possess many years of experience in the management of large software projects and the design of product lines (e.g. IBM and companies behind high-end enterprise software like Aderant). Beside the functional specifications of the product line our analysis also covers the usability of configuration tools and the user exits of the customization. The domain analysis provides the requirements for the product platform.
- **Design of the product platform:** We coach our customers in the evaluation and selection of potential technology stacks and the identification of design patterns intrinsic to particular technologies. All decisions make use of the possibilities offered by domain-specific modelling.
- **Design of the application development process (artifacts, milestones, roles):** In order for an automated software factory to work properly, the development process must be defined clearly and must be well understood by the whole team. This is typically achieved if the process is adapted to the distribution of deep domain knowledge in the team. Thus, every business unit can contribute its core knowhow to the modeling task.
- **Systematic automation of all pattern-based and repetitive tasks:** Nowadays, there is no reason not to automate repetitive tasks (even in cases of high complexity). We use mature open-source tools based on the ECLIPSE platform and complement them with customer-specific components and commercial off-the-shelf products.

Introduction and Scaling-Up of Domain-Specific Modelling

- **Courses and tutorials:** We possess the necessary materials (tool configurations, model examples and briefing papers) to be able to organise on-site courses and tutorials on domain-specific modelling.
- **Proof of concepts and project pilots:** Starting with the current situation of our customers we coach them on the path to their first practical experiences and project

successes. The cost of the introduction of new methods should be compensated by productivity gains in the first project, already.

- **Definition of graphical model editors:** Nowadays, the development effort for a bespoke graphical editor is of the order of a few months and not years. We use special, model-driven frameworks for their implementation.
- **Definition of an adequate iterative process:** Since domain-specific modelling is based on two parallel workflows, on the one side the definition of applications through model instances and on the other side the implementation and maintenance of the corresponding generation infrastructure, the existing processes usually have to be adapted. The source code as the central deliverable is replaced by model artifacts, transformations and implementation templates. Thanks to the modularization of the modeling task, a direct consequence of the use of domain-specific modelling languages (DSML), the project roles and the communication paths are defined more clearly. This is particularly valuable in distributed development teams.
- **Incremental change:** In large teams and in complex architectural setups new process cannot be introduced at arbitrary speeds. The introduction has to be planned carefully and has to take into account technical as well as cultural aspects.
- **Risk management:** Besides increasing quality and productivity, domain-specific modelling also improves risk management in large projects. Our experience stems mainly from large projects and from the development of systems/products which have thousands of users. Therefore, we are well-qualified to coach our customers in the scaling-up of these methodologies.

Introduction of agile product-management techniques

- **Validation:** Users as well as domain experts have to be included in the software validation process and the definition of priorities. Success rests on the capability to assess market and customer requirements quickly and correctly and to design a practical product roadmap. We can review the product management process in an unbiased manner, identify potentials for improvement and coach the product management team with our methodological know-how.
- **Model-driven product specifications:** Models are centered on abstractions that are also understood by the domain experts.
- **Simulation:** Formal models can be used for the interactive simulation of new features, an innovative and very agile possibility to validate requirements at an early stage.
- **Methodology:** We coach development teams in providing for non-functional aspects like usability, user acceptance testing and the shortening of product release cycles.

Risk management in large, geographically distributed software projects

- **Team coaching:** Organisation and management of high-impact teams for the solution of challenging and risky task.
- **Organisation:** Introduction of practical measures that minimize friction in the communication and exchange of artifacts.