The building block method. Component-based architectural design for large software-intensive product families
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11 Organisational and Process Issues

The way in which an architecture is conceived has consequences for the development process and the development organisation. The BBM has so far been described as an architectural design method in the broader scope of architecting. In this chapter we shall take a look at some consequences for process and organisation. We shall not describe a complete development process or development organisation (see [Kru99b] and [JGJ97]). Instead, we shall concentrate on those parts which are specific to the BBM.

11.1 The Process of Architecting

The process of architecting has to be such that a system can be developed which fulfils its purpose. The success or failure of a system will depend on how well it is able to serve its purpose under the constraints of cost and time. It is important that architects are in close contact with business and product managers to be able to use their input early in the development life cycle. Architects have to be involved in customer business modelling, application domain modelling and commercial product design (see section 2.6) even if these design tasks are not their prime responsibility. Architects have to analyse requirements for their technical impact and decide on their feasibility. Architectural design and technology, on the other hand, are design tasks which are driven by the architects themselves.

Internally, the process is driven by risk. The architects identify issues of risk and set priorities for their mitigation. Work proceeds with the issues of the highest risk. Risk is regularly re-evaluated. Instead of working on a general level, architects may sometimes therefore be forced to perform in-depth investigations to secure major design decisions. We shall not attempt to describe such a risk-driven process in detail.
11.2 Development Processes

A business unit needs to execute processes for developing its products, for policy and planning, for managing people and technologies and for production, sales and service [AMO*00]. We will not describe all these processes but only look at the development processes. The processes which are needed for developing a product family depend on the stage of the development. Initial stage development has to be distinguished from steady stage development.

11.2.1 Initial Stage and Steady Stage Development

Initial stage development of a product family is characterised by the absence of a product family architecture and of implemented BBs. In the initial stage a product family architecture and one (or a small set of) product(s) are developed. This development should deliver a basis for the product family.

   Heuristic 101: Develop a first product that can be used as a basis for the product family.

Only meeting both goals together, a commercially and technically viable product and the product can also serve as a stepping stone for a product family, makes the development successful.

Steady stage development of a product family is characterised by refactoring and extension. The product family architecture may need to be changed to address new product features or new technologies. Existing BBs may need to be refactored and new BBs need to be added.

   The product family architecture and the implementation of the products should be kept up-to-date, that is, decay because of environment changes or implementation short-cuts should be fixed through refactoring. BBs are refactored and generics consolidated. The development of new products can take advantage of the fact that a proven base of BBs can be used as starting point. The quality of the product family architecture and its implementation determines how easy the development of similar products is.

11.2.2 Initial Stage and Steady Stage Processes

In the initial stage there are two parallel processes and in the steady stage there will be three processes.