

Towards Integrating Usability and Software Engineering Using the Mapache Approach

Alexander Behring, Andreas Petter, Max Mühlhäuser

{behring, a.petter, max}@tk.informatik.tu-darmstadt.de

An integration of usability (*UE*) and software engineering (*SE*) must, besides on a process level, be addressed on the technical level of artifacts and tools. Hereby, consistency checks crossing UE and SE become possible, modifications of artifacts can be propagated across the UE and SE border by (semi) automatic tools, changes can be tracked, and the other discipline's resources can be used (e.g., mock-ups in SE artifacts).

Mapache is a model driven UI engineering framework and research platform developed in our group. Four of its concepts are discussed in the light of integrating UE and SE. In *Mapache*, all components are centered around models. Tools operate on them, application logic is bound to UI model elements for capturing events. Renderers present the UI model to the user at runtime and can also be used for editing (at run- and design time).

We argue that using a model driven approach, with all artifacts complying to a common metamodel, integration of SE and UE artifacts on a technical level becomes more feasible. More specific, we emphasized the use of four *Mapache* concepts:

- **Use of models:** artifacts in *Mapache* are models complying to metamodels. Using the metamodel, links between UE and SE artifacts and elements can be established.
- **Execution of models:** instead of transforming models into code or another intermediary artifact to be executed, they are directly interpreted at runtime. This allows the use of design time techniques and tools at runtime.
- **Refinement of UIs:** tracking of interdependencies between different UI versions allows more flexible synchronization. Changes by UE and SE engineers are propagated through linked UI versions using UI refinement. Thus, concurrent work can be synchronized.
- **Integration of automatic and manual processing:** automatic approaches are combined with manual rework, supporting a more efficient synchronization of linked artifacts. Engineers can choose how much effort to put into which artifact, and more effective semi-automatic synchronization is possible.

Nevertheless, such an integration on the technical level alone will, in our eyes, not be the solution. Other issues, like the process level and education, need to be addressed as well. Furthermore, we see the opportunity and need for research regarding to what degree UE artifacts should be formalized.