

Master thesis proposal: “Flexible Service Systems”

Background

Process models are usually depicted as directed graphs, with nodes representing activities and directed edges control flow. While structured processes with pre-defined control flow have been studied in detail, flexible processes including ad-hoc activities need further investigation. Flexible process graph is a novel approach to model processes in the context of dynamic environment and adaptive process participants' behavior. The approach allows defining execution constraints, which are more restrictive than traditional ad-hoc processes and less restrictive than traditional control flow, thereby balancing structured control flow with unstructured ad-hoc activities. Flexible process graph focuses on what can be done to perform a process. Process participants' routing decisions are based on the current process state. As a formal grounding, the approach uses hypergraphs, where each edge can associate any number of nodes. Hypergraphs are used to define execution semantics of processes formally.

Task

The thesis will contribute to the evaluation of the flexible process graph applicability for the purpose of defining and executing flexible web service compositions – flexible service systems. In such a system services are not assumed to be always available, service execution order might vary considerably in different execution instances, new requirements might pop-up at runtime. It should be proposed how data flow can be supported in such scenarios. Flexible process graph principles should be implemented and integrated into the ORYX editor (this includes stencil sets for modeling flexible graphs and process execution support).

Contact

Artem Polyvyanyy
Artem.Polyvyanyy@hpi.uni-potsdam.de
+49(0)331-5509-195