


Development of a graphical modeling tool for Resource-Driven Process Manipulation (RPDM) with Role-Based Access Models

Bachelor thesis

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1 Motivation

Business processes can be viewed from three perspectives: The control-flow, data, and resource perspectives [RAH16]. Historically, Workflow Management Systems (WMS) have aimed for process automation and only focused on the control-flow perspective.

Some authors make the distinction that Business Process Management Systems (BPMS) have evolved from the classical WMS to support a more holistic view of organizational business processes by incorporating, among other things, the resource perspective (cf. [Kar95]). However, research in the Business Process Management (BPM) research community has strongly emphasized the control-flow perspective. Therefore, future research on the “resource perspective is promising” [RM16].

Recently, a few resource modeling tools such as *Sphinx* [Ihd+19] or *Rembrandt* [Ihd+22] have been developed. While these tools can be used for resource allocation or scheduling, obtaining a graphical overview of resources is hard.

Role-based access control (RBAC) models allow to specify access privileges [RAH16]. They allow, i.e., role hierarchies or constraints (cf. [San+96]).

To connect the resource perspective with the control flow perspective, the idea of Resource-Driven Process Manipulation has been introduced in [SR23]. Here, resources are equipped with change patterns that alter the control-flow once a resource is allocated for a task. Under these conditions, the question of optimal allocation becomes harder, yet the options to fit an allocation into an existing schedule are extended. While approaches to solve the configuration and allocation problem have been provided [SR24], a configurator that allows the design of resources, their connected change patterns, and roles are missing.

Extending a state-of-the-art service-oriented workflow execution engine, such as the CPEE¹, with a graphical resource view could leverage the capabilities of such an engine to a “truly” BPMS. Enabling the interaction of resources and the control-flow creates a more realistic picture of resource allocation

2 Problem statement

Currently, no web-based modeling tool for resource-driven process manipulation exists.

This thesis aims first to develop a modeling tool that enables the design of resources and resource roles and connecting the change patterns (as described in [SR23]) to them. The change patterns should be designed in a BPMN-like manner, and blockstructuredness for change patterns is needed. Further, an approach to store data on previous process performances is desirable for a resource profile. The created modeling tool should be designed in a service-oriented way. The interaction with a service-oriented workflow engine and the connected process configuration tool must be specified.

3 Requirements

- Strong interest in software engineering and the development of web-based tools
- Interest in business process management

4 Contact

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¹<https://cpee.org>

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