

Dissertation title:

Resource Driven Processes: Concept, Use, and Incorporation

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Reaching organizational goals requires executing business processes. Modeling, using, and improving existing knowledge about business processes establishes organizational best practices. A common method for this is accomplished in an activity-oriented way by modeling, using, and improving business processes based on recurring activities and their order. Furthermore, modeled activities and their coordination can be automated with the help of IT infrastructures to increase automation and support for actors. Unfortunately, activities and their order in business processes are not always (i) foreseeable at modeling time or (ii) repeated in different executions. This variation of activities and their order among business processes decreases the usefulness of activity-oriented modeling approaches and raises the need for another approach to (i) support such business processes and (ii) reproduce desired outcomes. In addition, this need is intensified by increasing demands toward individualized products and solutions, as each product and solution can require custom-tailored activities in a different order.

In this work, we introduce a resource-driven approach for modeling and executing business processes. Our approach relies on automatically allocated interrelated resources for supporting actors participating in business processes and reproducing their desired outcomes. To create definitions of business processes in a resource-driven way, we present a formal resource-driven process modeling language capable of specifying business processes in terms of their goals, capabilities, and interrelated resources. To evaluate and validate our approach, we conducted a survey with 416 participants. Results of the survey confirm our claims regarding (i) increased support for actors of business processes and (ii) the reproducibility of their desired outcomes using our resource-driven approach.

For using resource-driven processes in organizations, we present a resource-driven process management life cycle involving four phases. The first phase of the life cycle describes steps needed for preparing an IT infrastructure enabling the steps conducted in other phases of the life cycle. In the second phase, business experts model resource-driven processes by starting with specifying goals and ending with selecting appropriate interrelated resources. The execution of resource-driven processes takes place in the third phase. Upon initializing modeled resource-driven processes, interrelated resources of resource-driven processes are

automatically allocated, if applicable. The allocated resources collaboratively work toward the goals specified in definitions of resource-driven processes resulting in interactions between resources. In the fourth phase, these interactions are analyzed to generate resource-centric recommendations to guide business experts during modeling. We implemented a series of prototypes and conducted an expert survey to validate and evaluate the life cycle.

Finally, we present the means of incorporating resource-driven processes into activity-oriented business process models. Therefore, we present a new type of activity construct called context-sensitive activity, adapting the execution based on the current situation. We validated the concept of context-sensitive activities by extending a tool for activity-oriented business processes to support context-sensitive activities.