Advanced Task Management – Concepts and Implementation*

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Abstract The demand for business process management and for automation of business processes increases. It turns out that not all tasks of a business process can be automated; especially processes in which a significant number of tasks have to be performed by people. Thus the concept of task management has been developed to incorporate these tasks in automated business processes. In this talk we present our understanding of task management. We focus on concepts helping people organizing their work, for example a task recommendation system, since they have not found their way into state of the art workflow technology.

Keywords: Task Management, Business Process Managemant, BPM

1 Extended Abstract

Service-oriented computing (SOC) increasingly becomes the foundation of large-scale IT infrastructures. In particular, the demand for business process management (BPM) and for automation of business processes increases. It turns out that not all tasks of a business process can be automated and thus be implemented as (Web) services; especially processes, such as engineering processes, in which a significant number of tasks have to be performed by people. The concept of task management has been developed to incorporate these tasks in automated business processes (cf. [1, 3–5]).

The primary objective of task management is the creation and management of tasks carried out by people, where those tasks are part of business processes. Thus, task management can be viewed as a system managing the tasks performed by state-full resources, regardless whether these resources are humans or not. Examples of non-human stateful resources are robots or job management systems of computer clusters. Generally speaking, task management serves as a broker between tasks required by business processes and resources performing these tasks. As a result the actors using a task management system are playing one of the following roles: (i) sources request a service from a performer by creating a task

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within the task management system and (ii) performers undertake these tasks for execution. To support an efficient execution of tasks the task management system has to take into account the needs of sources and performers.

Resources that carry out these tasks have certain execution capabilities and properties. A major objective of our work is to extend current workflow technology to reflect the characteristics of resources in task management. We focus on the following two issues: (i) people carrying out their tasks in such way that is optimal from their perspective and (ii) dividing their tasks in subtasks which are more manageable for them.

It is known from appropriate studies, that people typically have a hard time to carry out several tasks in parallel, so they start linearizing their work (cf. [2]). One of the problems associated with the linear execution of tasks is the considerable cognitive load when switching from one task to another. Our approach extends the prior art by introducing concepts to task management that reduce this cognitive load. We introduce a concept that help people finding an optimal schedule for their tasks by recommending an optimal order. The recommendation system considers the contextual proximity of a performer to a task so that a context switch produces a lower cognitive load that means less setup time is needed. Users obviously can ignore the recommendation to provide them with the flexibility to react to unforeseen situations.

Investigations in the field of human computer interaction (HCI) show that people usually structure the working of a task by splitting it into a set of smaller subtasks, so that the overall task can be managed. Workflow research in the past has not paid much attention to this approach. We developed a concept for supporting this work approach by giving the people the ability to arrange their tasks as a set of subtasks (cf. e.g. [6]). In particular, we have identified two rearrangement patterns, namely split and merge, which helps people to manage their individual work approaches.

Sources also have requirements on the execution of their tasks. For example they define deadlines on tasks or require that a task is performed by a resource providing a defined set of capabilities (e.g. a person which has a certain role). These requirements are well understood and have found its way into appropriate workflow systems (cf. [1]); so we did not find any need for additional research in this area and have based our work on what is already available.

We implemented the concepts as described above as a set of proof of concept implementations. Currently we are working on an integrated task management solution that will serve as a core component in future IT infrastructures. We believe that our task manager can cover a broad spectrum of usage scenarios and reduces the need for isolated task management solutions.

In this talk we present several scenarios in which task management plays an important role. From these scenarios we extract basic requirements on a generic task management system and we provide an enumerative definition of such a system. Selected concepts like a task recommendation system and a task rearrangement system are subsequently presented. An outlook to prototypes that are developed based on the concepts introduced by this work concludes the talk.

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