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Social workflows—Vision and potential study

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ABSTRACT

Social workflows pervade peoples' everyday life. Whenever a group of persons works together on a challenging or multifaceted task, a social workflow begins. Unlike traditional business workflows, such social workflows aim at supporting processes that contain personal tasks and data. In this work, we envision a social workflow service as part of a social network that enables private individuals to construct social workflows according to their specific needs and to keep track of the workflow execution. The proposed features for a social workflow service could help individuals to accomplish their private goals. The presented idea is contrasted with established research areas and applications to show the degree of novelty of this work. It is shown how novel ideas for knowledge management, facilitated by a process-oriented case-based reasoning approach, support private individuals and how they can obtain an appropriate social workflow through sharing and reuse of respective experience. Two empirical studies confirm the potential benefits of a social workflow service in general and the core features of the developed concept.

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1. Introduction

During the past years, social networks have been a subject of increasing interest and have demonstrated significant benefits for their users. They allow users to make new friends and to stay in contact with old ones, but also to make connections with people with similar interests and goals. Today, social networks provide and integrate an increasing number of communication and collaboration services as well as specific apps. For example, the social network Facebook enables to form groups for information sharing about specific topics, it includes mailing and chat services for communication, instruments to enact polls, and apps such as Doodle.com for event scheduling or Spotify for sharing music playlists.

While such online services already support the execution of particular activities of private individuals, they still cannot be integrated to form a more complex flow of activities. However, quite often private individuals have goals that are much more complex to reach and hence require a more detailed planning of several tasks to be done, involving different people such as friends or professionals. Examples include moving to a different city, changing jobs, changing cars, planning group vacations, etc. These more complex goals require the planning and execution of a particular type of workflow. For instance, moving to a new city requires searching available apartments first, then selecting potentially approved ones, making appointments with the landlord, visiting the apartment, and taking a decision. In this process, information about the quality of the city district are collected, appointments must be scheduled, and information about the local infrastructure are regarded.

In this paper, we introduce the term *social workflow* to describe workflows which are of such a personal nature. We show that social workflows differ from traditional business workflows, which leads to different requirements on workflow management systems. Today, there is no support at all for constructing and executing social workflows, although there are many useful services available in social networks or on cloud service platforms. We argue that this lack of support could be filled by a *social workflow*

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service that establishes linkages between these services and supports users to construct and execute social workflows according to their specific needs. In textual form, such social workflows are already described and shared in various Internet communities which provide how-to knowledge for achieving different goals, in areas like home repair or computer troubleshooting. Today, this is an important body of the existing experiential content on the web and a clear indication of private users' needs and willingness for exchanging experiences on workflows to solve complex problems.

The next section introduces social workflows and social workflow services in more detail. Section 3 describes a concrete example scenario of a social workflow and how a social workflow service could facilitate its execution for a group of private individuals. In Section 4, the concept of a social workflow service is described, including the technical components it involves. Section 5 presents an overview of related work, while Section 6 presents a formative evaluation of the overall idea of social workflows and the concept for a social workflow service. Finally, Section 7 draws conclusions, presents the current state of implementation, and outlines our future steps.

2. General approach and research goals

The research topics of this paper have been investigated as part of the WEDA project.[1] WEDA aims at transferring the benefits of traditional workflow management to the everyday 'business' of private individuals. We call such workflows for private individuals social workflows. Of course, the requirements of private individuals differ from the requirements of a company. For this reason, we developed concepts which are expected to close the gap between traditional workflow management and the requirements of private individuals on workflow management.

In contrast to a business workflow, a social workflow will most likely only be created if its automated execution significantly simplifies the life of the users in the coordination of a complex, collaborative activity. While business workflows shall ensure compliance to business processes by a repetitive and standardized execution, this is not an issue for private individuals. However, social workflows will rather be executed repetitively within a larger community of people with common interests or goals. In addition, different people have at least slightly different requirements, contexts, or environments, thus social workflows demand process flexibility [1,2] rather than standardization.

An essential step to enable private individuals to use a workflow management system is to exploit the features of social networks, because they are already used as platform for the organization of private individuals' life. Based on this assumption, we developed a generic concept which integrates a social network with a workflow management environment [3]. Furthermore, this concept puts process-based knowledge management in a private context because it enables private individuals to share and reuse workflows as well as every kind of resource associated with them. The idea is to let private individuals model their knowledge and experience directly in the structured form of a workflow instead of using arbitrary free text and to give private individuals means to share their experience within a community. This approach, of course, relies on the willingness of users to collaboratively create repositories of workflows, which may continuously evolve and expand to new areas. However, similar ideas have already proven successfully for scientific workflows (cf. myExperiment [4], Wings [5]), i.e., addressing a community of professional researchers (see also Section 5), which collaboratively model and share scientific workflows. In summary, the management of social workflows will benefit from a social network by

- using the network of people with similar interest to describe and share experience on social workflows,
- exploiting existing online services for task enactment in a social workflow during its execution by a workflow engine,
- using the network of people (and possibly professionals) during task enactment.

Based on the above considerations, we now concisely define the terms *social workflow* and *social workflow service* as follows:

A *social workflow* is an executable process representation, serving private individuals and groups of people to fulfil their objectives by providing means to describe and link personal activities and data objects according to procedural rules.

A *social workflow* service provides a modelling and flexible execution service for social workflows addressing private individuals as users. This service includes means to organize, share, and reuse social workflows and the related workflow data within a virtual community of private users.

Our research on social workflows is driven by concrete use cases which are subject of several empirical studies. In the next section, a detailed social workflow scenario is presented which shows how people could use a social workflow service to work together to pursue a complex goal. Using this scenario, we illustrate a technical concept of a social workflow service in Section 4. Further, the usefulness of this scenario (and others) is estimated in two empirical studies. These studies serve two purposes: first, as an exploratory investigation in order to identify promising application areas for social workflows and second, to evaluate if the proposed features of the social workflow service are perceived as useful.

3. A social workflow scenario

We now outline a scenario in which private individuals employ a social workflow service. It is designed according to the personal experiences of students from the University of Trier, who recently attended the famous German rock festival "Rock am Ring". The fully elaborated social workflow is illustrated in Figs. 1–3. These graphical representations have

[1] WEDA is an abbreviation for "*W*eb-basierte *E*rstellung, *W*iederverwendung, *D*okumentation und *A*blaufunterstützung für agile Workflows" which means "web-based creation, reuse, documentation, and execution support for agile workflows". For more information refer to http://www.uni-trier.de/index.php?id=40538&L=2.

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