By decentralized we mean that a user can transfer access rights to another subject. In doing so, a user can transfer the ownership of a resource or parts of it, e.g. allowing read access. The integration of apps in Facebook is an example of a decentralized DAC, because the user has to agree that the app accesses some of his/her personal information. The basic idea is that every resource in the system (a workflow, a task, and any further resources) has an owner who is allowed to manage the access rights for the resource. A central issue of this access control – also discussed in public – is that after passing the ownership to another subject it is not possible to trace how the shared resources will be used. For this purpose we will additionally integrate feedback mechanisms [13]. This mechanisms leverage the access control model to a more transparent model in which a private user not only knows to whom resources are passed, but also how they are used. Due to this transparency, misuse of the system could also be prohibited.

3.2 New workflow modeling language

The application of web technologies enables us to pursue the development of modern user interfaces independent of the system platform. It allows the development of adaptive user interfaces following L. Sullivan's "form ever follows function" what could be interpreted in context of UI-development as "form follows data" or "form follows user needs". Here, we propose a workflow modeling language (Fig.1 demonstrated already an example) which is derived from UML activity diagrams.
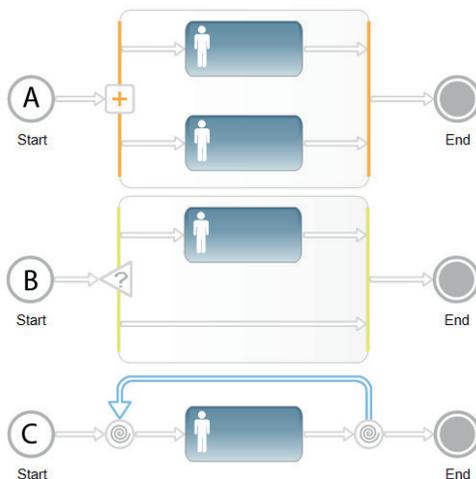

Figure 3 - control flow elements

Figure 3 shows a sketch of the three control-flow structures (parallel execution, conditional execution, loops) we support. Although we only replaced the original UML symbols, we think it will receive more acceptance by business and private users. This assumption is based on current HCI research where "enchantment" is an important aspect and beauty is part of enchantment in using UIs [14]. Furthermore many HCI researchers state that the visual appeal influences factors as (perceived) reliability, usability, information quality, trustworthiness and usefulness [15]. As part of our research, we will investigate what workflow control structures are really necessary for private users and how the control flow of tasks could be visualized even better. In the end we could also imagine a modeling language which does not look like a graph but rather like a game for task delegation.

3.3 Process-oriented case-based reasoning

Workflow modeling usually requires significant skills and experience in the respective domain (e.g. which steps are important when moving to a new city) and in modeling principles in general. Additionally, when performed using some modeling environment, skills in using this environment and knowledge about the available services that can be integrated into a workflow is important. As far as the quality is concerned, a well-designed workflow is hard to produce by a person with no or little experience in workflow modeling. Hence, workflow modeling from scratch is tedious and will probably not be accepted by private users who usually do not benefit from a significant number of repetitive executions of one and the same workflow. To address this problem, we propose a process-oriented case-based reasoning approach sketched below.

To relieve users from the burden to develop workflows from scratch, we aim at supporting a community of users with a similar mindset in collecting their workflows in a repository. This repository is the collective experience in private workflows of this user community and is only maintained by our system. The content of this repository is shared by private users and the access is controlled by the decentralized DAC. Further, every resource (particularly every workflow and every task) controlled by the decentralized DAC can be tagged with annotations, which leads to an enrichment with semantic descriptions. By this social tagging, a private workflow folksonomy [16] for this community will be created. Once the bootstrapping of such a workflow repository (e.g. through content provided by very committed key users; see also section 4) succeeds, less experienced users may obtain their own personal workflows by selecting an appropriate workflow from the repository and modifying it if necessary. For navigating in the workflow repository, we envision two options:

- The users may search for an appropriate workflow by using the tags from the folksonomy. The retrieval engine then proposes workflows with similar tags from the repository for reuse.

- Alternatively, users may start describing their problem by creating a brief sketch of the workflow (e.g. a sequence of 2 or 3 tasks) they are interested in, thereby specifying already some structure of the intended solution. The retrieval component will then propose workflows that contain a sub-workflow similar to what the user has specified. This method is similar to the retrieval via workflow execution traces [17] but our retrieval methods focus on the workflow structure.

If the user is satisfied with the found workflow, s/he can transfer it to the adaptive workflow management system and prepare it for execution. However, if necessary, the user can also manually adapt the current workflow by editing it via the workflow editor. As a step ahead of this manual adaptation, we also envision an automatic adaptation of workflows supported by workflow adaptation cases [11]. Such cases consist of the experience of former adaptations performed by users.

Once the user has transferred a suitable workflow to the adaptive workflow management system, s/he can assign friends or other volunteers for task execution and start the workflow. The workflow management system triggers the task execution in the specified order and monitors their execution status. When it should become necessary in the course of workflow execution, the user can even modify an already running workflow. The agile

CAKE workflow engine therefore provides a breakpoint mechanism [11]. It allows suspending certain areas of a workflow from execution to enable their modification without loss of consistency.

4. GROWING A COMMUNITY

Whether the integration in Facebook will be successful and provide benefits for private users depends on whether a critical mass of users [18] can be attracted. Hence, a core question is how people could be motivated to behave altruistically and share their knowledge in form of workflows. Today, there is no generally accepted solution to this problem, but we think that it is important to gather a couple of active key users to seed the community. Within the WEDA project, we will try find such key users from the students of our lectures on process-oriented information systems. Therefore, exercises in using the personal workflow management service will be included in the lectures. With the community obtained thereby, we also intend to validate the hypotheses we sketched at the end of section 2. For this purpose we will log and evaluate the usage pattern of the platform and conduct surveys via questionnaires.

For the future, an open API for the integration of additional services shall be provided. Thereby developers can create new service tasks and provide them to the community as a shared resource. We assume that the possibility to share every resource (a workflow, a task, and any further resources) and to trace its usage via our decentralized DAC could contribute to the reputation of the person who shared it. In a virtual community it is meaningful to the people to see that their shared resources are useful for others [19]. With a feedback mechanism a user could perceive how her/his workflow model propagates through the network and how it is adapted by others.

The use of a personal workflow management system would not only allow fostering the collaboration between social network friends but also within a broader community. We envision, for example, a "game" for task delegation. A private user could start a public workflow in which some tasks shall be accomplished by volunteers or professional service providers. This is well known as "Humans as a Service" in Cloud-computing [20]. They could be searched by an annotated skill profile or by GPS coordinates if a geographically closeness is important for a task.

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