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# Toward a Real World Workflow Management System

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In the present age of preparing for realization of multimedia network, groupware attracts attention these days as a software tool for finding a solution by group. Generally, groupware is a computer system which supports a certain group whose members have a common goal and work for achieving it, and provides an interface for cooperative environment for these members. Recently, many workflow management systems have been suggested by some corporations, as a part of BPR(Business Process Reengineering), for increasing intellectual productivity and improving quality of work in an office, and they attract a great deal of attention. They function as automatic applications for a fixed workflow in an office.

In general, workflow management system can be defined as “a system that designs the series of work procedure and executes that procedure and manage all works”. To put it concretely, the system has the following functions.

**Design** Describing persons who engaged in the work and the contents of the work and the flow among these person.

**Execute** Delivering e-mail to accelerate work progress as given in the workflow definition.

**Manage** Managing deadline of works and progress status.

If the workflow management system can be realized, there are some advantages as follows:

- The flow of all works is represented clearly.
- The role of each member in the group is represented clearly.

- It is easier to grasp work progress status.
- We will have a trigger to making a database of information related with the work.

In previous workflow management systems, they require works to be represented constructive and clearly, and information to be represented in a computer. However, the real world works contain many exceptional processes that can not be represented constructive and clearly. Furthermore, there are many cases that all information can not represent on a computer. Therefore, it is difficult to apply such previous systems to works including information which can not be represented on a computer.

Moreover, the workflow that has already finished will have a lot of knowledge concerned with works. However, there is no function in previous systems, that can use practically that knowledge.

Based on these problems of previous workflow management systems, we propose a model of real world workflow management. This model have some functions of previous workflow management systems: designing, executing and managing workflow. In addition, they also have the following functions.

- Integrating information flow that can be represented on a computer and works that can not be represented on a computer (ex. documents and works that exist in the real world not in a computer), and managing work progress status robustly.
- Utilizing knowledge of works for next works, practically.

We call it "Real world workflow" which occupies information both on a computer and not on a computer. We distinguish it from a workflow that has been studied and developed.

Designing workflow is one of important functions of workflow management systems. A real world workflow needs explicit representation of the contents of works performed in the real world and information flow in the real world. The design methods proposed previously can represent only information on the computer, such as the person who executes each tasks, the contents of tasks and electronic information flow and so on. However, they can not represent a real world workflow. In this thesis, we formalize them and design a real world workflow by using our formalization.

We selected and implemented a system that is used on trial for controlling and supervising expenses of laboratory budgets in our university as an example for realization of a model of real world workflow management. We realize a function managing work progress status by inputting progress status by workers into the system. These status contain real world work status and electronic information flow. As a result, this system can manage progress status that is well synchronized both of them. Furthermore, we realize a function to storage knowledge and refer it. The knowledge means results and processes of each workflow.

We evaluated the usefulness of our model using this system. To do this experiment, we append our system to the existing system for controlling and supervising expenses of laboratory budgets in our university. In this experiment, there are some time lags between inputted date as progress status and real date, such as a worker forgot to input progress

status. These problems are undesirable from a view point of synchronizing between real world and electric world. However, we should allow a kind of exceptional processing which may happen at a real office work, and manage progress status robustly. Previous workflow management systems can not deal with this sudden exception like this, but our model can do this.

As future works, (1) our model is applied to the other work areas, (2) some improvements are needed and (3) the model is tested on more larger situation.