

# A Shared-Context Information Workspace to Support Knowledge Processes

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**Abstract.** Knowledge workers typically collaborate in knowledge processes and have to be supported with adequate information and communication infrastructures. We propose a shared-context information workspace that organizes knowledge resources within several dimensions. We show how this workspace can be used to support typical knowledge processes.

## 1 Introduction

Knowledge workers collaborate in teams, networks and communities in order to accomplish knowledge processes. They have to be supported with adequate organizational as well as information and communication technologies (ICT) infrastructures. Knowledge management systems (KMS) provide technocratic and document-focused basic support for organization-wide information sharing rather than the management of knowledge workers' personal workspaces and their relations to the workspaces of both organization-internal and inter-organizational co-workers. The need for ICT support of well-educated knowledge workers is rarely considered when corporate KMS solutions are developed. Consequently, actual KMSs often fail to convince users of their advantages [6].

In this paper we describe typical knowledge work processes as well as a personal workspace designed to help knowledge workers organize their personal information and knowledge resources and collaborate on the basis of context shared between their workspaces.

## 2 Infrastructure

There are many tools and applications that support knowledge workers. Categories of representative approaches include personal information management, e.g., [4, 10], personal web management e.g., [2, 12], personal collaboration management, e.g., [3, 11], and personal knowledge management, e.g., [5, 9]. KMS have been proposed as an ICT platform that combines and integrates a number of functions for the contextualized handling of knowledge in organizations [6].

Infotop is a proposal for an ICT infrastructure [7], with time as one of the most crucial attributes of documents. Typically, only appointments are displayed in calendars, rather than e-mail messages, text documents and other forms of documents. It is useful to display a selection of documents, e.g., we may want to see all documents of a project displayed in the calendar, or all documents of a person, i.e., all e-mail messages from and to that person, all files exchanged with that person, etc.

Users have information on their private computers and can also access public resources, typically on the Internet. Additionally, servers on local networks provide extra information that is not accessible to the public, but to a restricted number of users only. We imagine a private, a protected and a public workspace for users. The shared, i.e., protected and public, workspace and the private workspace of an individual can be placed on her computer. It is important to note that a user's protected workspace is not open to the public, but rather allows restricted access only to those individuals that she wishes. Thus, access privileges of the protected workspace have to be configurable in a flexible manner. Typically, public workspaces grant permission to read only, whereas protected workspaces may be open to write.

For a shared-context information workspace, we imagine to have private, protected and public workspaces institutionalized on all workplaces. Additionally, any information in these workspaces has to have meta-information attached, according to the dimensions time (when?), topic (what?), location (where?), person (who?), process (why?) and type (how?), such that powerful query mechanisms can be supported. These dimensions have been identified as being essential for effective categorization, visualization and navigation of collections of contents [7].

### 3 Knowledge work processes

Knowledge workers work together in knowledge-intensive business processes and in especially designed service processes, also called knowledge processes. The latter represent a (portion of a) knowledge life cycle consisting of the activities create (or externalize), value, organize and refine, store, distribute, search, apply as well as feedback/improve knowledge [1, 8, 13]. The life cycle steps can be combined to patterns of typical knowledge processes that are initiated and handled ad-hoc by knowledge workers, such as handling of documented knowledge, acquisition of external knowledge or community/network management. Due to the importance of the typical knowledge process handling documented knowledge, this process is considered in detail with the help of the sub-processes externalization, submission, distribution and search. Additional sub-processes not considered here include application, feedback and improvement. The following also discusses how the processes can be supported by a shared-context information workspace.

– *Externalization process*

is used e.g., to create and prepare a paper or a presentation for a conference co-authored by geographically dispersed knowledge workers who share a portion of their knowledge context, i.e., electronic knowledge sources. Examples of such knowledge sources are links, documents, web sites, data bases, expert contacts. The externalization of information is done with regular applications, e.g., word-

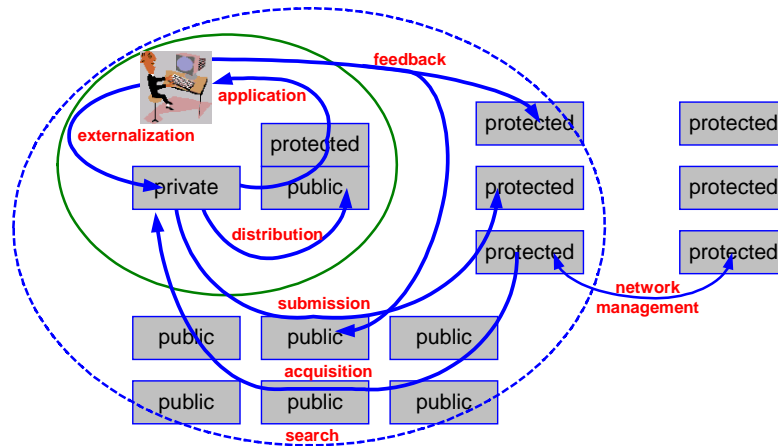
processing software, or specifically designed authoring tools. This process results in documents that typically are at first stored in the private workspace. It is important to have meta-information attached to these documents. This is not sufficiently supported by today's applications.

- *Submission process*  
comprises the sub-processes submit, value, organize & refine as well as store knowledge. The process is triggered by an individual knowledge worker or a group of knowledge workers, evaluated by (members of) a community, e.g., a program committee, reviewed, refined and linked to other knowledge elements by a subject matter specialist, e.g., a person operating a web site on a certain subject. These value-added knowledge elements are occasionally repackaged for specific target groups. Finally, the target audience is granted physical and intellectual access to the submitted knowledge elements. In the simplest case, submission means publication of a new knowledge element and its distribution towards a topic-oriented network, i.e., in a protected or public workspace. Versioning of information and the support of workflows are required for the submission process.
- *Distribution process*  
handles the creation of interest profiles specific to individual knowledge workers. Subsequently, new knowledge elements as well as links to events, learning offerings, meetings or expert advice are distributed according to these profiles. In a more general sense this process handles all distribution of knowledge to knowledge workers in geographically dispersed locations. The distribution process involves moving or copying information from one's private to one's protected or public workspace. It is useful to have this process combined with some sort of notification, especially in the protected workspace.
- *Search process*  
identifies and connects several steps of an individual or joint search for knowledge elements and/or expert advice by a group of connected knowledge workers. Crucial steps in a joint search process include the definition of search locations, the combination and weighing of personal preferences, and the amalgamation of individual search results. Searching is done primarily based on meta-information in one's workspace consisting of one's private, protected and public workspaces. Protected and public workspaces have to be prioritized according to topics, e.g., workspaces of research groups have to be considered only when the search process is aimed towards the research topics of these groups. Findings in protected workspaces are typically more relevant than findings in public workspaces.

Figure 1 depicts all the knowledge processes mentioned above that involve the entire shared-context information workspace of a user.

## 4 Conclusion

We have introduced ICT infrastructures and outlined typical knowledge work processes. KMS are typically restricted to one organization's boundaries. A significant portion of knowledge processes crosses these boundaries and thus can only be sup-



**Fig. 1.** Knowledge work processes. A user is externalizing, distributing, submitting, acquiring, searching, and applying information in her shared-context information workspace. The solid ellipse depicts the user's individual workspace, while the dotted ellipse depicts the user's shared-context information workspace.

ported on the level of a personal knowledge workspace. We have suggested a shared-context information workspace for both personal knowledge management and ad-hoc collaboration that overcomes the shortcomings of existing KMS implementations.

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