# Task-Oriented Knowledge Management with TaskNavigator

Oleg Rostanin[1] and Harald Holz[1] and Takeshi Suzuki[2] and Kaoru Maeda[2] and Katsumi Kanasaki[2] and Andreas Dengel[1]

[1] German Research Center for Artificial Intelligence (DFKI), Kaiserslautern, Germany firstname.lastname@dfki.de
[2] Ricoh SRDG, Tokyo, Japan dutsuki@src.ricoh.co.jp, maeda@src.ricoh.co.jp, katsumi.kanasaki@nts.ricoh.co.jp

**Abstract.** TaskNavigator is a novel intelligent task management system providing support for knowledge intensive business processes. By combining agile task management and proactive information delivery, TaskNavigator assists knowledge workers in solving tasks within their complex and flexible working environment. The paper presents the main features and principles of TaskNavigator with the help of an example of preparing a visit of a foreign delegation.

## 1 Introduction

Globalisation, ubiquitous computing, and increasingly complex computational environment are creating a situation of the information overload in the enterprise that present a challenge for enterprise employees. In order to achieve and keep the competitive edge, todays enterprises have on one hand to carefully adjust their business processes to the permanently changing enterprise business goals [ARIS05]. On the other hand, enterprises have to care about the effectiveness of each employee that strongly depends on the employees‘ skills, competency level and their ability to effectively learn in the situation of information overload. A survey of the Ridge Group [RidgeSolis03] shows that employees spend a considerable amount of time looking for necessary information in different sources in order to define tasks properly, as well as find and implement solutions. Emerging desktop engines such as Google Desktop Search, x-friend, MSN Desktop Search, etc. are intended to simplify the process of finding necessary information.

While the concept of a desktop-wide search certainly relieves the user from the burden of querying several different information sources (e-mail, local and network drives, etc.), current desktop search engines still follow the standard, passive query/retrieve model: the user has to explicitly pull for information that might be relevant for a task he is currently trying to accomplish. Besides being inefficient, such pull approaches typically lead to suboptimal reuse rates of available documents. In order to address this issue, several business process-oriented knowledge management approaches have been developed for proactively providing process participants with information that is relevant with regard to

their current tasks. However, as most of these approaches rely on static workflow/process specifications, they typically are inadequate for weakly-structured processes such as knowledge-intensive office work processes [Holz et al 2005].

In this paper, we present a novel task management system, called TaskNavigator, jointly developed by Ricoh SRDG and DKFI Knowledge Management Lab within the Competence Center Virtual Office of the Future (VOF). TaskNavigator supports knowledge workers in their daily work by providing functionalities for agile task management, proactive (i.e. push-like) information delivery and task know-how reuse.

## 2 Knowledge-Intensive Tasks, Information Search and Information Overload

According to [Abecker et al 2000], knowledge-intensive tasks and activities are those that deal extensively with acquisition, creation, packaging and application of knowledge in manifold forms. These tasks can not be accomplished automatically by a workflow management system, need human intervention and creativity, communication between people. The result and flow of knowledge-intensive processes is not always predictable and is difficult to model in advance [Gronau et al 2004]. Typical examples of knowledge-intensive processes are scientific research, software development, or consulting activities. The participants of the agile knowledge-intensive processes often need to interrupt their work and to perform information search in order to make the right decision, to find a solution made by others in similar situation or to find documents related to the current task. A special case of information aqcuisition is asking competent colleagues for information directly or via e-mail. This increases activity lag time and slows down the enterprise-wide process enactment. Another issue of manual information search is that necessary information is likely to be overlooked because of the large and insufficiently organized amount of information available in the enterprise and in the web (information overload).

## 3 Advanced Task Management with TaskNavigator

The TaskNavigator system is a web-based working environment that allows users to keep track of their tasks in form of hierarchical break-down structures. Unlike conventional task management systems, TaskNavigator provides means for task-centred document organisation, so that all task-related information can be associated with the task and become directly available when a user chooses to work with the task. In order to overcome issues discovered in the section 2, namely: difficulty to model knowledge-intensive processes, necessity to find right information quickly in the right moment, distracting colleagues from their work for getting information, the system implements the following solutions:

1. In order to automate task-specific information search, TaskNavigator integrates the state-of-the-art document search and categorization system Brain-

Filer (http://www.brainbot.com). BrainFiler indexes various different information sources like corporate wikis and blogs, corporate documents, business-related documents, electronic journals, case bases etc., acting as a central access point to the enterprise information. TaskNavigator automatically creates keyword-based queries from the textual descriptions of the user's currently selected task, sends these queries to BrainFiler and delivers task-related document proactively (push-like).

2. In addition to proactivly suggesting documents, TaskNavigator also searches for similar tasks using BrainFiler's text similarity functions, and presents these similar tasks together with their former decomposition into subtasks to the user. Users can reuse their colleagues' process know-how by requesting TaskNavigator to create corresponding copies of retrieved subtasks as subtasks of their current task.
3. Although complete modelling of agile processes is not possible, TaskNavigator allows users to create process types - lightweight activity models describing general steps for performing typical activities. Each process type can have a textual description on a wiki page, and each task can can be labeled with such process types, indicating that the task can be regarded as a concrete example of this process type. Based on BrainFiler's classification functionalities, TaskNavigator proactively suggests potentially matching process types for a user's current task.

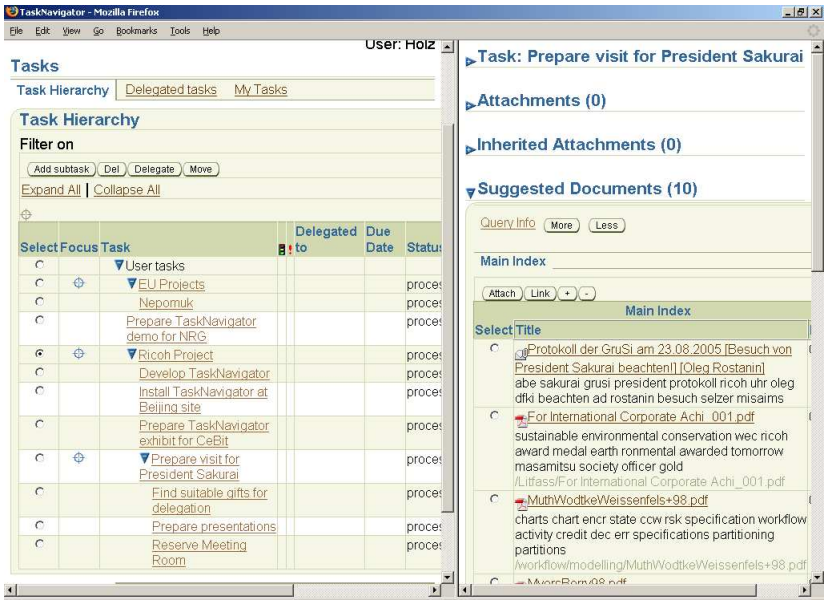


**Fig. 1.** Proactive suggestion of relevant documents for task "Prepare visit for president Sakurai"

Fig. 1 shows an example screenshot from TaskNavigator. In the left-hand frame, the user's tasks are shown as a task/subtask hierarchy. As one of the subtasks of task "Project Ricoh"), the user has created and currently selected the task "Prepare visit of President Sakurai". Using the textual task description, TaskNavigator proactively triggers a search on the user's and company's available documents, and presents the results within the right-hand frame (see Fig. 1, pane "Suggested Documents"). The first two documents are an email containing the minutes of a meeting in which Mr. Sakurai's visit has been announced, and a news magazine article containing an interview with Mr. Sakurai. Following the corresponding hyperlinks, the user can now easily access both task-relevant documents.

## 4 Conclusion

This short paper introduces an advanced task management system TaskNavigator and illustrates its functionalities for knowledge-intensive task support such as proactive information delivery and task-instance know-how reuse by an example of preparing a delegation visit.

## 5 Acknowledgements

Work funded in part by "Stiftung Rheinland-Pfalz für Innovation" (InnoWiss, TEAL).

## References

[ARIS05] IDS Sheer. Aris Platform.http://www.ids-scheer.com/sixcms/media.php/2188/PR0905-E-BR.pdf.

[RidgeSolis03] The Ridge Group in conjunction with Solis Consulting. Information Gathering in the Electronic Age: The Hidden Cost of the Hunt, Safari, January 2003.

[Holz et al 2005] , Holz, H., Maus, H., Bernardi, A., Rostanin, O., From Lightweight, Proactive Information Delivery to Business Process-Oriented Knowledge Management. Journal of Universal Knowledge Management. 2, 2005, Pages 101–127.

[Abecker et al 2000] Andreas Abecker, Ansgar Bernardi, Knut Hinkelmann, Otto Khn und Michael Sintek: "Context-Aware, Proactive Delivery of Task-Specific Information: The KnowMore Project". DFKI GmbH International Journal on Information Systems Frontiers (ISF) 2 (314); Special Issue on Knowledge Management and Organizational Memory. Kluwer 2000. S.139-162.

[Gronau et al 2004] Norbert Gronau, Edzard Weber: Management of Knowledge Intensive Business Processes. Business Process Management 2004: 163-178.