ACTIVE – Enabling the Knowledge-Powered Enterprise

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ABSTRACT

Knowledge workers are central to an organisation's success – yet the tools they must use often stand in the way of maximising their productivity. ACTIVE (http://www.active-project.eu), an EU FP7 integrating project, addresses the need for greater knowledge worker productivity with three integrated research themes: easier sharing of information through combining the ease-of-use of folksonomies with the richness of formal ontologies; sharing and reusing informal knowledge processes, by automatically learning those processes from the user's behaviour and describing the processes semantically; and using machine learning techniques to describe the user's context semantically and thereby tailor the information presented to the user to fit the current task. The results of ACTIVE are relevant to all knowledge work; they are being validated in the domains of consultancy, telecommunications and engineering.

Categories and Subject Descriptors

H.4.1 [**Office Automation**]: Groupware, workflow management

General Terms

Algorithms, Human Factors

Keywords

Ontologies, task context, knowledge processes, folksonomies.

1. INTRODUCTION

ACTIVE is a 3 year EU integrating project creating the next generation of semantically-enabled knowledge management technology. The project began on March 2008 and runs to February 2011. The ACTIVE budget is €11.9 Million, of which the EU contribution is €8.2 Million. Table 1 overleaf lists the chief ACTIVE contacts. Table 2 lists the twelve ACTIVE partners.

## 2. KNOWLEDGE SHARING – MERGING THE FORMAL AND THE INFORMAL

ACTIVE is developing conceptual models for enterprise knowledge which integrate lightweight modelling paradigms based on tagging (folksonomies) with expressive knowledge models (ontologies). Such conceptual models will embrace business resources, actors, tasks, work contexts and knowledge processes. These models will enable the sharing of knowledge, processes and contextual information between users in an organisation and across organisations. ACTIVE is using machine learning techniques to learn ontological knowledge structures from the way in which informal tags are created and used. Linked to this work, the project will be investigating the costs and benefits of using lightweight ontologies within enterprises; and also the effect on users of incentives to create and use such ontologies.

3. INFORMAL KNOWLEDGE PROCESSES – LEARNING, REUSING AND SHARING

Figure 1 3-layer process model

ACTIVE is investigating how knowledge workers make use of informal knowledge processes, how such processes can be described semantically and learned. For the user and the organisation, the objective is to guide people through such processes and to enable sharing of process knowledge. ACTIVE has developed a 3-layer process model: the bottom layer describes processes as documented in terms of low-level events, in a form appropriate for machine learning; the middle layer is at
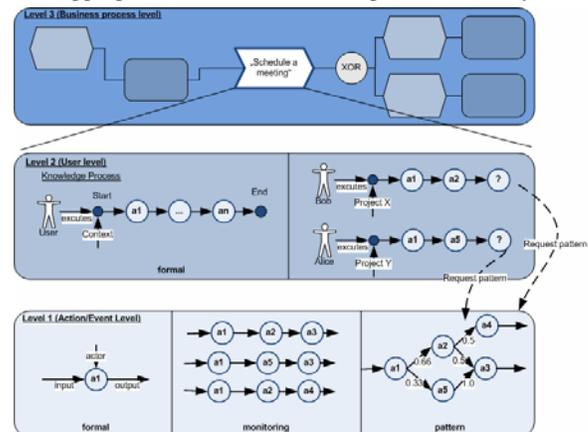

the level of the user's experience; whilst the top layer describes processes at the level of the organisation. Figure 1 illustrates this.

4. USER CONTEXT – TAILORING USER EXPERIENCE TO TASK CONTEXT

Within ACTIVE a user's context is described semantically. The emphasis here is on task context, i.e. understanding on which of several tasks the user is currently working. The user is free to specify his context, but additionally ACTIVE will learn that context automatically, anticipating similar situations in the future.

For the user, the end-result will be to prioritise information according to his or her current tasks and to shield the user from information which is currently irrelevant.

5. THE KNOWLEDGE WORKSPACE – ORCHESTRATING THE USER EXPERIENCE
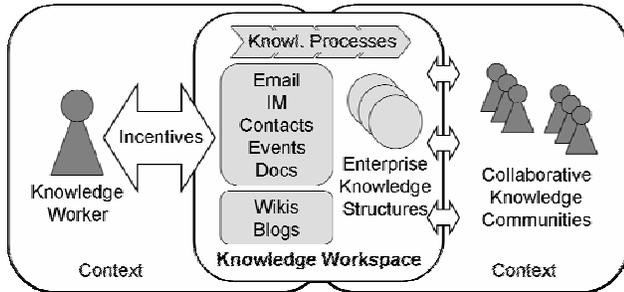
Fig 2 The ACTIVE knowledge workspace

ACTIVE is an Integrating Project. That means there will be cross-fertilisation between the project's research strands; for example, the use of tagging for knowledge sharing will be extended to identifying and sharing knowledge processes. It also means that all the project's innovation will be presented to the user in a unified way, through the ACTIVE Knowledge Workspace.

The Knowledge Workspace does not replace the user's existing applications. On the contrary, it is conceived as an open framework that incorporates 'ACTIVE-ated' user applications, orchestrating how they present information to the user. For example, the prioritisation of emails within the user's email application will take into account the user's current task context. Presentation of information through the Knowledge Workspace is underpinned by a model of enterprise knowledge, developed collaboratively by the knowledge workers. Figure 2 illustrates the relationship between the knowledge worker, knowledge communities, and the components of the ACTIVE knowledge workspace.

6. VALIDATING THE TECHNOLOGY – THROUGH REAL-LIFE CASE STUDIES

ACTIVE is validating the technology, both at the user and organisational level, through three case studies:

Telecommunications – helping BT's technical and sales specialists to share and reuse their expertise, and to locate the skills they need.

Consultancy – enabling Accenture's consultants worldwide to share knowledge, in particular by lowering the barrier's to knowledge sharing.

Engineering – guiding Cadence Design System's electronics design engineers through the complex processing of designing an integrated circuit.

Through an iterative process, validation will take place at the end of each year, allowing regular feedback into development. The project will take particular account of the need to scale to enterprise-wide applications. The consultancy case study in particular will potentially extend to a userbase of over 100,000.

7. ACKNOWLEDGMENTS

Table 1 ACTIVE Contacts

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Table 2 ACTIVE Partners

BT (Project Coordinator)	http://www.bt.com	Cadence Design Systems	http://www.cadence.com
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iSOCO	http://www.isoco.com	FIR	http://www.fir.rwth-aachen.de
Jozef Stefan Institute	http://www.ijs.si	HERMES SoftLab	http://www.hermes-softlab.com
STI Innsbruck	http://www.sti-innsbruck.at	kea-pro	http://www.keapro.net
Accenture	http://www.accenture.com http://www.accenture.com/techlabs	Microsoft Innovation Center	http://www.microsoft.com/emic