

ACTIVE Annual Report 2009



<http://active-project.eu>

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 addresses the need for greater knowledge worker productivity with three integrated research themes: easier sharing of information through a synergy of informal techniques such as collaborative user tagging and wikis, and a formal approach based on ontologies; sharing and reusing informal knowledge processes – by learning those knowledge processes from the user's behaviour; and understanding the user's context – so as to 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.

Summary of Activities

During 2009 the project has delivered an initial set of technical deliverables, building on the architectural and conceptual work done during the previous year. Various extensions have been created for the Semantic Media Wiki, e.g. a lightweight ontology editor. A tool has been built to enable users to create processes in a top-down fashion. Software has been written to support context and process learning, based on the TNT (text, network, time) approach; current algorithmic developments are building on this. Server and client software has been written to implement an ACTIVE Knowledge WorkSpace (AKWS). The server software provides the architectural framework for the project. The client software provides the interface through which the user performs everyday actions such as context switching and tagging. Each of the case studies has created a prototype which will be thoroughly validated during the early months of 2010. This will provide feedback which will influence further technical developments leading to an enhanced prototype which will be extensively validated from September 2010.

Merging formal and informal – the Semantic Media Wiki and user tagging

The Semantic MediaWiki is an extension of MediaWiki, the software used by Wikipedia. In the Semantic MediaWiki the links between pages have associated, informal semantics. The Semantic MediaWiki is already widely used; in ACTIVE its functionality is being extended and it is also being validated in the demanding environments of the three case studies, where it is an important tool for knowledge sharing. The extensions include a lightweight ontology editor, see figure 1, and the

capability to export to RSS, iCalendar and vCard. The project has also created an improved query facility for the Wiki – *Ask The Wiki*.

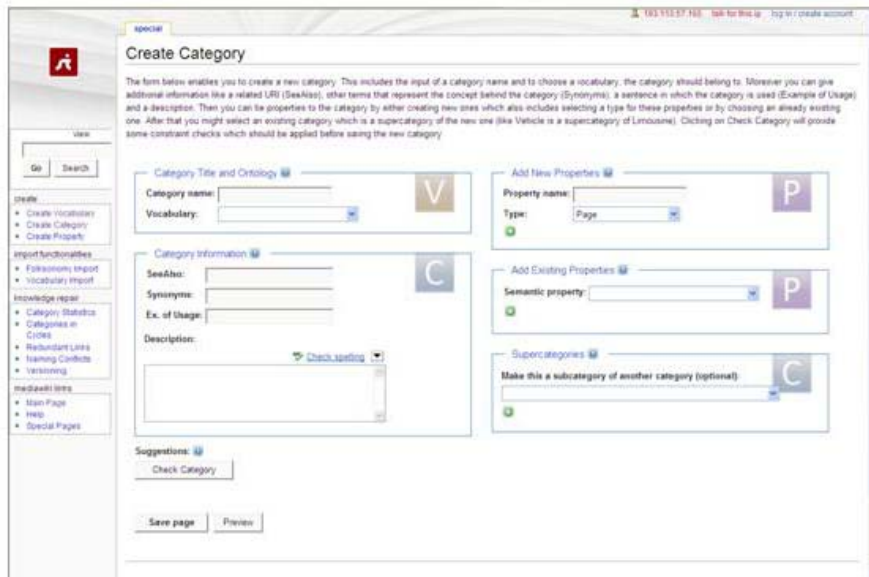


Figure 1 Lightweight ontology editor for the Semantic MediaWiki

ACTIVE also supports informal user tagging. Users are free to create their own tags and the system also makes recommendations, e.g. when closing a Word file. These recommendations can be accepted or ignored. The user can search both on tags and on the content of files, or on both.

Tags can also be used dynamically in a way equivalent to folders. SemFS, developed in part within the project, takes exactly this approach to overcome the limitations of the current folder paradigm.

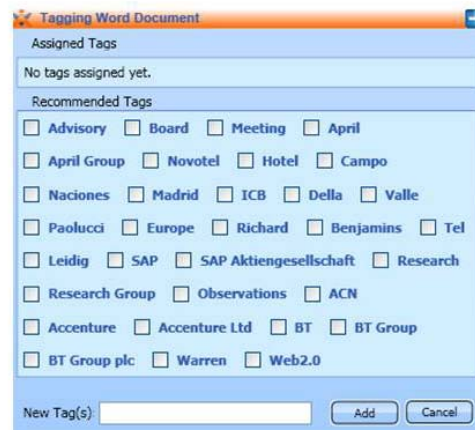


Figure 2 Tag recommendations



Figure 3 Tag and content search

Informal Processes – learning, reusing, sharing

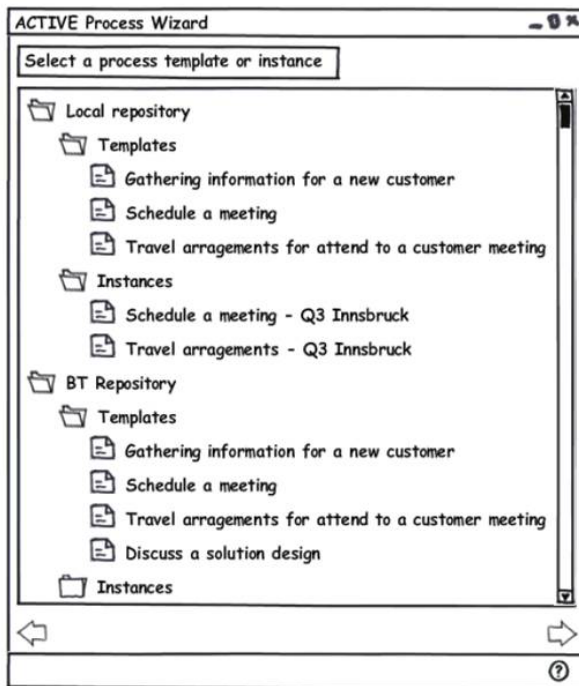


Figure 4 Schematic of process wizard showing templates

Informal processes are created and used by all of us everyday as we do our work. Yet we often do not write these processes down, share or reuse them. Frequently we forget and have to reinvent them. ACTIVE is taking both a top-down and bottom-up approach to processes. A process wizard has been developed to enable the top-down creation of processes by users. At the same time, reusable processes will be learned from repeated patterns of events within the machine. Once learned these process can be visualised, in the same way as top-down created processes. Whether created or learned, these

processes will shared and used to guide people through their everyday tasks. This means not just recommending the next step in a process but also suggesting what the user needs to achieve the next step, e.g. which application files. Once processes are shared they can be improved by the expertise of different users. In addition to this, software is being written which will automatically optimise processes.

Using Context to guide Information Delivery

Knowledge workers frequently switch contexts in their daily work. For example, consultants switch between working on proposals for different customers and lawyers switch between different cases. ACTIVE filters information so that the user can see what is relevant to his or her current context. Figure 5 shows how this works. On the left-hand side we see the user opening a file in Word; he has a choice from all recently opened files. On the right-hand side we see what happens when the user ‘opens from context’. The user sees only those files which are associated with the current context.

As with processes, top-down and bottom-up approaches are used. In the former the user creates contexts, manually switches the system between contexts, and explicitly associates information objects with contexts. Figure 6 shows the ACTIVE taskbar which allows the user to switch between contexts. The current context (‘WP11’ in the figure) is shown highlighted. Clicking on another context (e.g. ‘WP3’) switches context. ‘More’ enables the display of more contexts, whilst the blank box enables the user to type a context name (assisted by predictive typing).

In the bottom-up approach, machine intelligence techniques are being developed to learn context based on user behaviour; to automatically detect when the user has

changed the context of his work and switch the system context accordingly; and to automatically associate information objects with contexts.

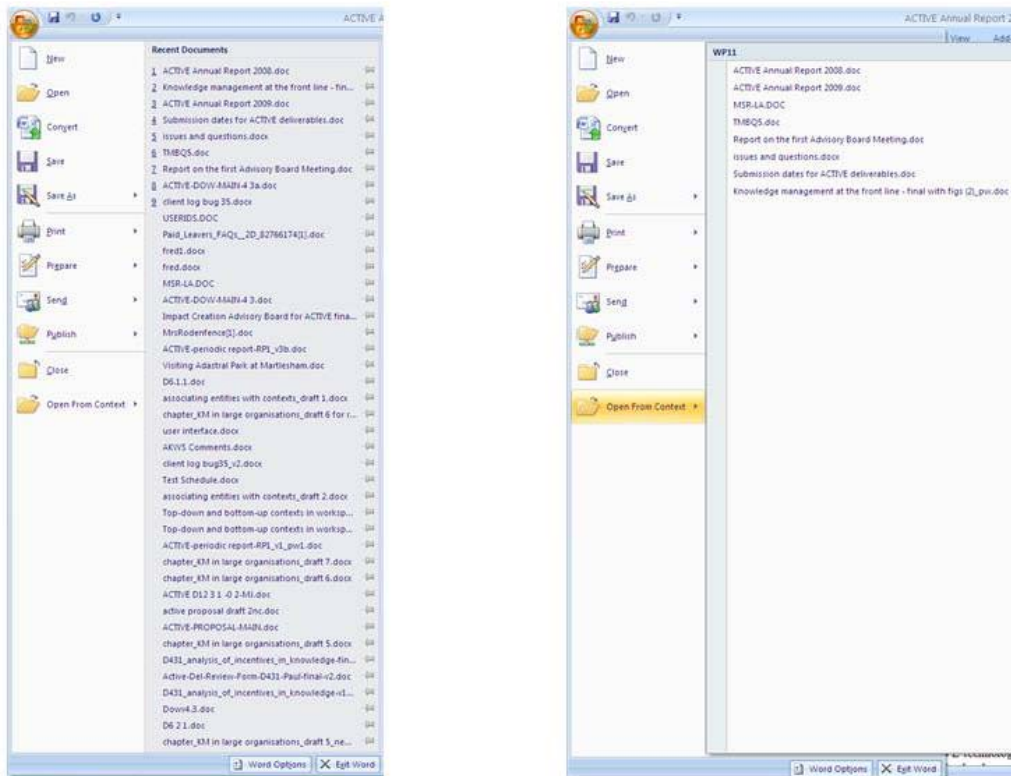


Figure 5 Opening a file without (left) and with (right) filtering by context



Figure 6 ACTIVE taskbar

ACTIVE in the organisation

ACTIVE technology is being thoroughly trialed within three case studies, to ensure it achieves the desired goals. At a very early stage of the project the concepts underlying ACTIVE were evaluated with the members of the user community, and the feedback influenced the initial prototype development. That prototype is now being trialed with users and feedback from these trials will influence the final system. Trials of the final system begin in the Autumn of 2010. The lessons learned from these trials will enable fine-tuning of the system and also help understand how to best introduce the technology into an organisation. All these trials are looking at the value of the technology both from the viewpoint of the user and also of the organisation within which the user works. Amongst the specific organisational issues being investigated are the costs and benefits of using lightweight ontologies for knowledge representation in organisations, and the effect of incentives to create and use such ontologies.

Case studies

The ACTIVE case studies serve to validate and exploit the technology, and also as vehicles to demonstrate its benefits. They are in three distinct sectors:

Telecommunications ACTIVE technology is helping BT's technical and sales specialists to share and reuse their expertise, and to locate the skills they need to respond rapidly to customer needs. A particular emphasis is on the rapid creation of high-quality customer proposals. The case study is also looking at understanding user processes to see how they can be improved.

Consultancy The problems faced by Accenture are in many ways similar to those faced by BT. Accenture consultants need to share knowledge rapidly and effectively, for example in order to create customer proposals. There is the added challenge that Accenture's consultants are distributed across the globe. In addition, ACTIVE technology is being used to make it easier for Accenture people to find information – everything from a corporate policy to an organisational chart.

Engineering ACTIVE technology is being used to guide Cadence electronics designers through the complex process of designing an integrated circuit. The aim is to make knowledge about design processes explicit and shareable. That way the knowledge acquired by experienced designers can be shared with the less experienced.

User Involvement, Promotion and Awareness

ACTIVE has two advisory boards to help guide its work. The Scientific Advisory Board gives general scientific guidance about the direction of the project whilst the Impact Creation Board advises on how best to exploit the technology. Both boards met for the first time in April 2009 and will meet again in April 2010. Membership of these boards is drawn from the leaders in the relevant scientific and venture capitalist communities.

ACTIVE has also been keen to establish relationships with other related projects and organisations. Guest speakers from such projects are often invited to present at ACTIVE meetings. During the year this has included representatives from the APOSDLE (<http://www.aposdle.tugraz.at/>) and MATURE (<http://mature-ip.eu/>) projects, and from Nature's (<http://www.nature.com/>) web publishing group.

During the year, ACTIVE researchers have also organised a number of scientific workshops on topics related to the work of the project, e.g. CIAO2009 (<http://semanticweb.org/wiki/CIAO2009>). ACTIVE has also sponsored a number of related conferences, e.g. this year's European Semantic Technology Conference. Sponsored conferences, and other related events have been videoed and are available at <http://videolectures.net/active/>.

Future Work

The current user trials in each of the cases studies will be completed early in 2010. Feedback from these trials will influence development work leading to the final case study prototypes, the trials of which will start in the autumn of next year.

Amongst the software developed during the final year will be software to:

- learn contexts based on the user's behaviour;
- learn processes, again based on the user's behaviour, optimise those processes, and use this process knowledge to guide users;
- perform data mining whilst, as far as possible, preserving user privacy.

During the 2010 there will also be increased emphasis on exploitation, in particular amongst the commercial partners, as ACTIVE technology becomes mature.

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ACTIVE Partners

BT	http://www.bt.com http://www.btplc.com/Innovation
AIFB at Karlsruhe Institute of Technology	http://aifb.uni-karlsruhe.de
iSOCO	http://www.isoco.com
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Forschungsinstitut für Rationalisierung	http://www.fir.rwth-aachen.de
HERMES SoftLab	http://www.hermes-softlab.com
kea-pro	http://www.keapro.net
Microsoft Innovation Center	http://www.microsoft.com/emic

Facts and Figures

ACTIVE is a three year Integrating Project running from March 2008 until Feb 2011.

The total ACTIVE budget is €1.9 Million, of which the EU contribution is €8.2 Million.

ACTIVE has 12 partners in 7 European countries.