

ACTIVE Annual Report 2008



<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 – the latter to provide improved information retrieval; 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

ACTIVE started in March 2008 and initial work has concentrated on reaching a common understanding of the technical foundations of the project, on developing an architecture, and on understanding in detail how ACTIVE technology can benefit the trialists in its three case studies. In the research domains underpinning the project, progress has been made towards developing a lightweight ontology language; in understanding how to translate between informal knowledge processes as perceived by a user and low level events as recognised by a machine; and in understanding how context can be represented to the user and can guide information delivery. The ACTIVE architecture has been conceived as a set of cooperating software services, the ACTIVE Knowledge Workspace (AKWS). A key feature is that ACTIVE does not replace the user's normal applications, but rather supports them; the end-user can benefit from ACTIVE technology without needing to use any new software tools: the end-user can. Within the three case studies the focus has been on understanding user behaviour and developing use cases whereby ACTIVE technology can offer support to users. In January and February 2009 there will be a validation exercise in each of the case studies. This will feed back into further development during the second year of the project.

Ontologies and Folksonomies- merging formal and informal

Enterprises understand the need for knowledge workers to share knowledge. The problem is that the systems they provide are frequently time-consuming and cumbersome to use, typically employing formal schema. Recently, knowledge

workers have started to use informal techniques such as tagging and wikis to share documents and media objects. The advantage of such informal techniques are that they are easy to use; the disadvantage is that the resultant knowledge representation schemas lack the richness of the formal approach, and do not allow logical reasoning, e.g. to enable semantic search. Work within ACTIVE includes developing and using lightweight ontologies which are computationally tractable, e.g. can be reasoned over in polynomial time, and on learning lightweight ontological structures from folksonomies. The work on lightweight ontologies is currently contributing to the development of OWL2, the forthcoming W3C recommendation for updating OWL. As a prelude to the work on ontology learning, work so far has focussed on ontology evaluation and repair. Informal tags also tend to be personal to the individual user; in ACTIVE we are working on techniques to more effectively share tags.

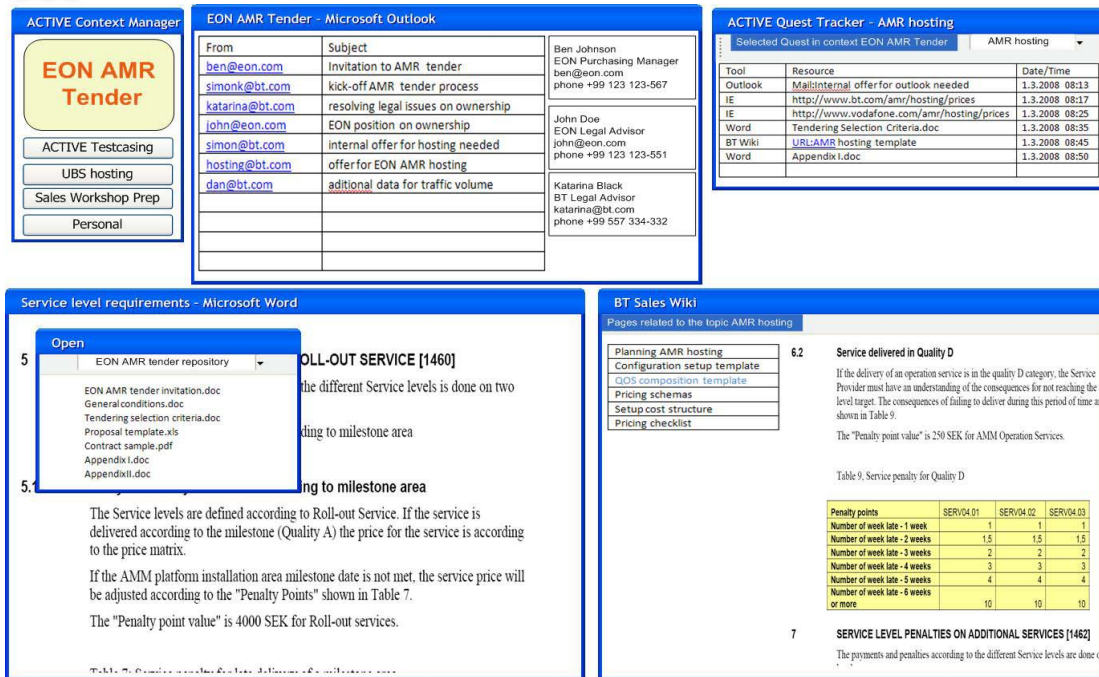
Informal Knowledge Processes – learning, reusing, sharing

All knowledge workers use informal knowledge processes. Unlike formal business processes, which are owned by the organisation, informal knowledge processes are owned by the knowledge workers who create and use them. Examples are: finding information about a customer prior to a customer visit; or writing a project proposal. The drawback is that these knowledge processes are rarely shared and may be soon forgotten, even by their creators. The result is that they are continually being reinvented. The goal of ACTIVE is to use machine intelligence techniques to learn such processes so that they can be reused and shared. Work so far has included developing a model to translate between the knowledge processes as perceived by the user and the underlying events as recognised by the machine.

Using Context to guide Information Delivery

On the one hand, knowledge workers need information prioritised according to their current task. On the other hand, the arrival of new information often stimulates the knowledge worker to switch context; and continually switching context is a major inhibitor to productivity. With ACTIVE technology, the user can set his or her own context; or alternatively machine intelligence will automatically infer the user's context. In any case, knowing the user's context will enable ACTIVE technology to manage and prioritise the flow of information to the user. Through use of context, ACTIVE will help the user find relevant information more quickly and ensure that information presented to the user is right for his or her current needs. When the user does have to switch context, our technology will make that switch easier and swifter, saving the current context to be restored later.

The figure illustrates conceptually how the user can see and manage task context. The context manager (top left) displays the possible contexts, with the current context (EON AMR Tender) highlighted. To change context the user can click on the desired new context. At the top right ACTIVE displays the currently opened files and URLs. The other three windows represent regular user applications: email, word processing and a wiki. For example, in the email application (top centre) the user sees only those emails relevant to the current context; an alternative would be to show all emails with those relevant to the current context prioritised at the top of the list.



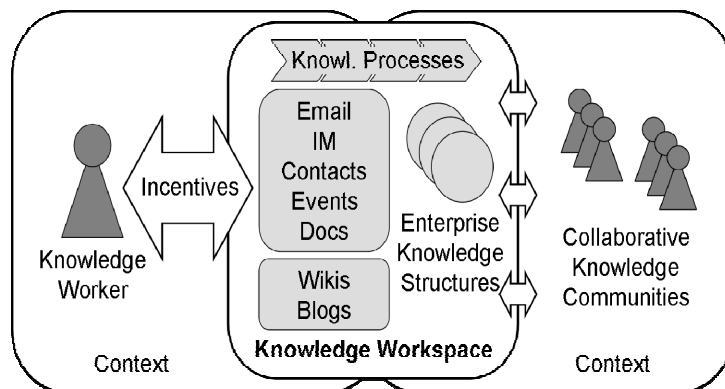
The screenshots illustrate the ACTIVE Knowledge Workspace interface. The 'ACTIVE Context Manager' shows a sidebar with 'EON AMR Tender' selected. The 'EON AMR Tender' window displays an email list with columns for 'From' and 'Subject'. The 'ACTIVE Quest Tracker' shows a table of quest items with columns for 'Tool', 'Resource', and 'Date/Time'. The 'Service level requirements' window shows a document viewer with a table of penalty points. The 'BT Sales Wiki' window shows a list of pages related to 'AMR hosting' and a table of service levels for Quality D.

Illustrating context management and information delivery

The ACTIVE Knowledge Workspace – bringing it all together

ACTIVE is an Integrating Project. That means there is cross-fertilisation between the project’s research strands. It also means that all the project’s innovation will be delivered to the user in an integrated way, through the ACTIVE Knowledge Workspace.

The Knowledge Workspace is the route by which the user will benefit from ACTIVE innovation. It does not replace the user’s existing applications. Instead, it is a way by which the functionality of ACTIVE is brought together and integrated with the user’s everyday knowledge applications.



Case studies

ACTIVE has three case studies which are being used to validate its work. These are in three distinct sectors:

Telecommunications – reusing knowledge and finding skills. ACTIVE technology will help 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.

Consultancy – lowering the barriers to knowledge sharing. ACTIVE technology will enable Accenture’s consultants to become more effective, in particular by lowering the barrier to sharing knowledge worldwide.

Engineering – guiding through the design process. ACTIVE technology will guide Cadence electronics designers through the complex process of designing an integrated circuit.

Each of the case studies has undertaken an information-gathering exercise to understand how the case study trialists work with information and how ACTIVE technology can help them. Use cases have been developed, on the basis of which case study partners are working with the technology partners to develop conceptual designs to be taken to the triallists in early 2009 for feedback.

The User and Business Impact

Validation is not just about making sure the technology works. It is also about making sure the technology is right for the user and right for the organisation. At the end of each project year ACTIVE is undertaking a programme of user validation. Similarly ACTIVE is looking at the business impact of the technology. During the initial months of the project validation methods have been developed, based on methods used in previous projects, and case study partners have received training in these methods. In addition ACTIVE is looking at the costs and benefits of using lightweight ontologies and folksonomies. This in turn builds on previous work on the costs of creating, maintaining and using more heavyweight ontologies.

User Involvement, Promotion and Awareness

In the first three months of the project’s life ACTIVE established its website and created a range of dissemination materials. ACTIVE researchers made an early start to publishing their results - in the first six months of the project ACTIVE researchers had eight papers accepted for publication in international journals or at international conferences. ACTIVE has established two advisory boards. The Scientific Advisory Board will provide technical advice; the Impact Creation Board will provide advice regarding the exploitation of project results. Membership of the advisory boards has been drawn from both the European and the U.S. communities. As already noted, each of the three cases studies has undertaken an initial information gathering exercise amongst the potential triallists; this has helped to create an awareness of ACTIVE within the case study organisations.

Future Work

The next phase in the project, during January and February 2009, will be to obtain feedback from the case study community. At this stage, this will largely take the form of concept demonstrations. This feedback will not only guide the future work of the case studies but will also influence the technical work within the project. Whilst the project is at too early a stage to consider detailed exploitation, each of the commercial partners is already developing its overall exploitation strategy.

ACTIVE Contacts

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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
Jozef Stefan Institute	http://www.ijs.si
STI Innsbruck	http://www.sti-innsbruck.at
Accenture	http://www.accenture.com http://www.accenture.com/techlabs
Cadence Design Systems	http://www.cadence.com
Eurescom	http://www.eurescom.eu
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.