

IKS Public Report 2010

2009

2010

2011

2012

IKS - Interactive Knowledge Stack is an Integrating RTD Project part-funded by the European Commission to provide an open source technology platform for semantically enhanced content management systems.

*"In only two years, the Interactive Knowledge Stack (IKS) project has released its first working demo of a semantic knowledge engine and is making quite a stir, as early adopters begin integrating it into their content management software. Recent events have also seen part of the results acceptance as an Apache incubator project named Stanbol"
CMSWire Nov 30, 2010*

Summary 2010

From Requirements to Validation

2010 was the second of four years for IKS and saw four important transitions: from requirements to early prototypes; from the prototypes to the design of the Reference Architecture; from the architecture to the first implementation of the interactive knowledge stack, and finally to the early adoption of the IKS software through external CMS companies.

In the first half of 2010, the extensive requirements capture process of the first year came to its close and designs for the IKS Reference Architecture as well as the first prototypes of IKS Components emerged. After a successful project review in April, we increased dissemination activities with an early adopters workshop in Salzburg, demonstrating the first of the IKS components to external CMS companies.

During the summer the first prototype of the IKS, known as the “Alpha Stack” was further developed and soon after that, the first batch of external early adopters began to use the modules and reported their experiences. The development process was kick-started in early 2010 when DAY Software and NUXEO led a workshop in which an initial framework based on OSGi and RESTful services was created. This initial prototype focused on semantic enhancements for non-semantic content and called FISE (the Furtwangen IKS Semantic enhancement Engine). The FISE components of IKS focused on the aspect of semantic lifting which is clearly an important issue for CMS providers at present. It means adding functionality that will enable CMSs to add machine-readable meta-information (aka “knowledge” aka “semantic annotations”) to their primary content. This work was complemented by development work on the knowledge management layer of IKS and, later in the year, work on the user interaction components joined forces with a commercial development for a “semantic editor”.

This is an important aspect of the community-building strength of IKS where we can report three successes in addition to the technical work: successful inclusion of an external development for an RDF-based CMS storage system called “Clerezza” - this group decided to work with IKS and became an Apache Incubator project in early 2010; successful collaboration of IKS with a small company that had started significant work on developing an HTML5 based semantic editor called “Aloha”; and finally, at the end of 2010, the incubation of the IKS Alpha Stack itself, under the code name “Stanbol”. This means that at the halfway stage, IKS has moved from idea to sustainable code base, which was the declared objective in the interest of bringing semantics to CMS technology.

Wernher Behrendt
IKS Principal Investigator/Project Manager



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Important Areas of Work

IKS Community “Hands on Workshops

■ The IKS Community Workshops is an open forum for principal developers from respective communities to join the dialogue and development process in IKS.

In detail, the workshops are held every six months to bring together CMS industry representatives and experts to learn about and test the latest IKS results.

The goals of the workshops are to raise awareness within communities for interoperability of semantic CMS stack, gather requirements, and support existing networks of open source semantic web communities.

There are three major development communities that are addressed:

- The IKS RTD Team including the core industrial partners
- The "early adopter" CMS firms and their developers
- The wider open source communities which will be connected with IKS related developments

3rd IKS Workshop: IKS Early Adopters 22-23 June 2010 Salzburg Austria,

In 2010 the IKS Early Adopters workshop held on 22-23 June 2010 in Salzburg Austria, launched the IKS Early Adopters programme. In attendance were 25

potential early adopters, representing CMS providers, integrators and tool providers, to install and experiment with, the first IKS stack component called the FISE engine, and contribute to the IKS



development roadmap. The result of the workshop was the signup of 9 CMS vendors and integrators as early adopters. They are: QuinScape GmbH,

Important Areas of Work

IKS Community “Hands on Workshops

Gentics, Goss Interactive, Klein & Co, Zaizi Ltd, SourceSense, Punkt.netservices, evo42 communications, and SalsaDev. In the follow-up workshop most of the early adopters were able to demonstrate their validation results.

4th IKS Workshop : "Unleashing the Power of Semantic Data - Today". 9-10 December 2010, Amsterdam, The Netherlands



The 4th IKS Early Adopters Workshop was held in Amsterdam at the Felix Meritis Center (9-10 December, 2010) and was attended by 40 participants from the CMS industry and beyond. In this workshop we demonstrated the value of using IKS semantic enhancement tools in today's Content Management Systems.

The IKS demonstrations were a mix of ready to install IKS software and more experimental advanced semantic applications that show how your system can benefit from more intelligent extraction and linking of content services. The workshop also provided the platform for the demonstration of the experience and results from the first round of early adopter validation of IKS technology, in this case the component FISE.

IKS Components demonstrated:

- Use of FISE semantic enhancement engine by Nuxeo DM within a news domain setting.
- Semantic Interaction Framework - how user interactions and annotations could be supported by semantic technologies with the help of the Aloha HTML5 editor.
- How the component RICK can be applied as an enterprise entity hub for referencing, mapping and local caching of linked data.
- Use of KReS + FISE with Google rich snippets for better findability and search engine optimization of content.

IKS early adopters demonstrated working with the IKS FISE component:

- Tommaso Teofili from Sourcesense presented a plugin in Confluence,

Important Areas of Work

IKS Community “Hands on Workshops



which they will make available as open source.

- Stefane Gamard from Salsadev (a semantic tool provider) showed their automatic categorisation engine via the FISE infrastructure.
- Aingaran Pillai from Zaizi demonstrated FISE integration and future plans for Alfresco ECM.
- Andreas Kuckartz from QuinScape presented the current state of the integration of FISE in the OpenSAGA Wiki extension. It will be made available under an Open Source license.

- Jens Klein from Bluedynamics presented how FISE is integrated into PLONE via a python library.

The second day was dedicated to hands-on integration and planning future development for the upcoming IKS components including enhancement engines as well as the semantic interaction framework.

Important Areas of Work

IKS Early Adopters Coming On-board

« In only two years, the Interactive Knowledge Stack (IKS) project has released its first working demo of a semantic knowledge engine and is making quite a stir, as early adopters begin integrating it into their content management software. Recent events have also seen part of the results acceptance as an Apache incubator projected named Stanbol »
CMSWire Nov 30, 2010

An important metric for the success of IKS is the market validation of IKS technology. This is performed under the auspices of the IKS Early Adopters Programme. But before we put the technology into the hands of our early adopter our industrial partners Nuxeo, Alkacon Software, TXT Polymedia, Pisano, Day Software and Nemein perform the first phase of validation. We then invite CMS providers/suppliers as early adopters to provide the second phase of market validation. The goal is to have 40 external CMS providers/suppliers to validate the IKS Stack by the end of 2012.

The IKS Early Adopters programme was launched in 2010. In the first year 20 CMS providers/suppliers signed up or are in the process of finalising their validation proposal. From this group 5 were invited to present their results at the IKS Amsterdam workshop in December 2010.

First wave of early adotpers

1. QuinScape GmbH
2. GenticS
3. Goss Interactive
4. Klein & Co
5. Zaizi Ltd

6. SourceSense
7. Punkt.netservices
8. evo42 communications
9. SalsaDev
10. Jadu
11. Jahia
12. PAUX Technologies
13. eZ Systems
14. Sitecore
15. OneHippo
16. Ximdex
17. Beorn Technologies
18. Acuity Unlimited
19. Quadra
20. WYMeditor

IKS in the Spotlight

IKS is attracting a lot of attention in the CMS space.

Subscribe to IKS News Feed
www.delicious.com/tag/iks-press-coverage

A conversation about The Interactive Knowledge Stack
20th August 2010, 08:35 min by Richard Walls in: Podcast

My guests on this Talking with Tala podcast are Werner Behrendt and John Pereira of Salzburg Research. They are part of the team behind IKS - The Interactive Knowledge Stack an integrating Project part-funded by the European Commission.

The four year project started in January 2009 to provide an open source technology platform for semantically enhanced content management systems. The concept behind it being, that once developed, the stack can be bolted-on to many different CMS products to add semantic, and semantic web, capabilities. Even though the project is open source, and the obvious use of it is with open source CMS tools, it's use could be of equal value to commercial products.

Their target is engage with 40 small to medium organisations for whom developing such capability would not be possible with their limited resources. They are already well on the way, with many joining in via the project Web site and participating at the first early adopters workshop in Salzburg in June.

Technorati Tags: IKS, Semantic, Web, CMS

Convert SharePoint files to perfect PDFs
Update: IKS Semantic Technology Project Making Solid Progress

In only two years, the Interactive Knowledge Stack (IKS) (code: iks) project has released its first working demo of a semantic knowledge engine and is making quite a stir, as early adopters begin integrating it into their content management software. Recent events have also seen part of the results acceptance as an Apache incubator projected named Stanbol. Here's an update.

Much to the dismay of some, IKS did release an alpha version of their project. OnStive has released the EU-funded effort since the early stages, making leaders to double as early adopters or fit in the semantic business success. The first working demo, IKS: The IKS Semantic Stack v1, was released by Nuxeo (code: iks-1) a few months ago, with new developments to the store already.

Important Areas of Work

Semantic CMS Requirements - and What the User Should Get

« Be a Pal, Help IKS Bring Semantic Technologies to CMS Attention all CMS vendors, IKS (news, site) is inviting you to take part in a survey for evaluating their product's coverage of features, particularly with respect to semantic capabilities »
CMSWire Jul 16, 2010

Gathering requirements is still a difficult exercise, for any software development and the process of gathering requirements for large-scale technical innovations is subject to continuing debate – here is what IKS did: we approached requirements from the perspectives of different stakeholders: the CMS vendors and developers, CMS customers, researchers' beliefs about future needs for “semantic CMS”, and actual use cases ranging from well-understood domains such as travel portals to complex domains such as “Ambient Content in the Home of Tomorrow”. Managing the resulting large set of requirements was difficult, but we were able to firstly, group them from high-level to low-level for each of the layers of the Stack, and then created a mapping between the high-level requirements and the Reference Architecture. In order to communicate the major objectives, we developed the following conceptual framework: We declared the Alpha Version as the “Developer’s IKS” whereas the Beta-Version should become the “User’s IKS”.

In other words, the first prototype of IKS must enable a developer to add new services to the system, and to integrate IKS components into an existing CMS. We achieved this by using so-called “RESTful” services and the OSGi standard for software integration – both methods are well-known and used in commercial software development, but OSGi is rarely used in

academic prototypes, because it requires significant software engineering experience to make good use of it.

The Beta prototype will be more ambitious because it needs to demonstrate how the semantic components actually add value to the end user’s interaction capabilities with the CMS. One of our first applications of Beta-functionality is the project controlling use case where we demonstrate how information from a project management tool gets combined into a web-based, semi-automatic report generator to assist a project manager in producing a project audit report. The idea behind the 4-by-4 grid is that vertically, we map the layers of the simplified Stack and horizontally, we map a content usage chain that represents four distinct types of usage (1) authoring of semantically enriched content; (2) querying of such semantic content; (3) consuming in some way, the results of a query over the semantically enriched content, and; (4) giving the end consumer of the content the ability to further interact with discrete elements of the retrieved, semantic content.

An example of such further interaction would be if we query for concerts of some famous pianist in the coming year, consume as retrieved content the list of concerts and are able to interact with each concert-page or –site by placing orders for tickets, or being able to find information about access

Important Areas of Work

Semantic CMS Requirements - and What the User Should Get

	Functionality "Create" (AUTHOR/USER)	Functionality "Query" (AUTHOR/USER)	Functionality "Consume" (AUTHOR/USER)	Functionality "Interact" (AUTHOR/USER)
Presentation and Interaction	A user of the system can <i>create</i> semantically enhanced content	A user can <i>query</i> for semantically enhanced content	A user can <i>consume</i> semantically enhanced content	A user can <i>interact</i> with the content at the level of his/her domain knowledge
Business logic and Ontologies	A user or customizer can <i>specify</i> who can <i>use</i> your content and how	A user can <i>find</i> content that corresponds to a rich semantic expression which is compliant with the set of activated business rules	A user or customizer can <i>specify</i> how content will be <i>presented</i>	The content items are close to representing real world items and <i>your actions cause behaviour</i> which is close to what the user would expect in the real world
Distribution, Interoperation and semantic lifting	A user or a supporting sub-system can <i>call up additional services</i> to enrich the content you already have	A user or a supporting sub-system can <i>enrich normal content</i> so that the new content supports rich semantic expressions	A supporting sub-system can <i>consume a semantic lifting service and later apply further operations</i> to the consumed content	An external, IKS compliant sub-system can <i>interoperate with the storage sub-system in order to "route" interactions</i> between CMSs
Storage and Retrieval of knowledge-enhanced content	The system can <i>store your semantically enhanced content</i> in a knowledge-preserving manner	The system can <i>retrieve your content and knowledge such that there is a good match</i> between the user's query, the user's expected answer, and the system's results	The system can <i>pre-structure the content and knowledge which it retrieved</i> , in such a way that interoperation, business logic and user expectations for presentation can be satisfied	The system can <i>partition the retrieved knowledge and content into transaction-sized segments which can be retrieved separately</i> for different turns of the interaction

Figure 1: The functionality scope of IKS "Beta" over the simplified Stack

for disabled persons, to the concert venue. By contrast, if the knowledge domain is project controlling then we might want to find all blog entries from staff members who were working in the in work-package "Validation". Being given those entries we may then ask for any Web links that were used by the authors of those blog entries. What this should demonstrate is that semantic technology should enable us to move in a continuum from simple

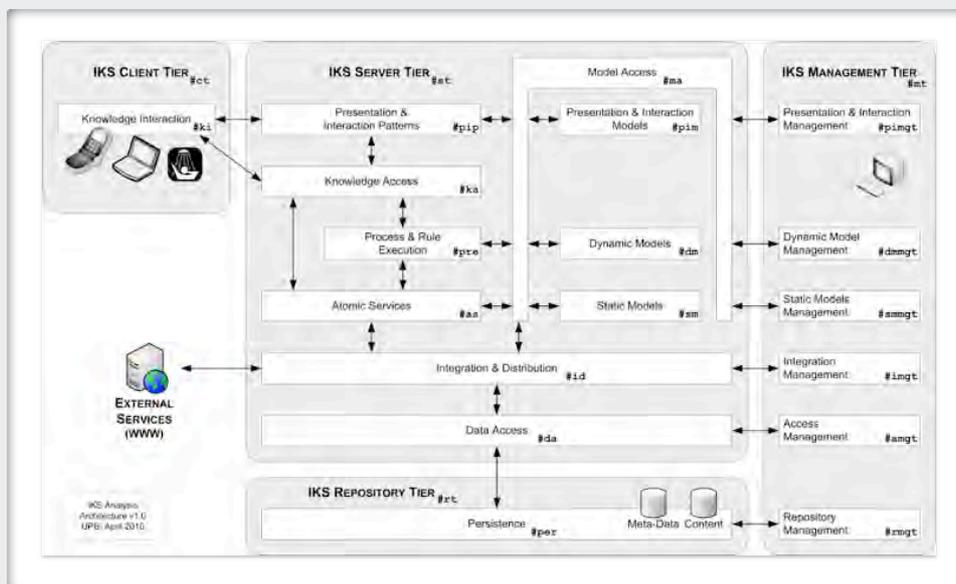
document management to highly structured knowledge domains and we should be able to interact with the information items available in these domains, in a natural, common-sense fashion. Semantic technologies applied to content management are beginning to deliver good results, but the technology still needs to become easier to apply for software developers and this is where IKS is making its contribution.

Important Areas of Work

IKS Semantic Stack Architecture - The Top-down View

IKS needs to resolve a tension that often in research projects, remains unresolved or only partially addressed: there is a high-level conceptual view of what the « Interactive Knowledge Stack » should look

such a situation because it has set out to lower the barriers for adopting semantic technologies. At this halfway stage, we want to show you – the interested reader – how far we are still removed from that target.



The original eight-layer diagram of the Stack in comparison with LAMP and JEE can be found at <http://www.iks-project.eu/iks-story/approach>

The 4-by-4 matrix of the Beta-Version (see figure above) is an attempt to communicate the kind of requirements we need to fulfil. These two top-down views were translated into a

Figure 2: The envisaged Reference Architecture for IKS

like. Then, there is a top-down architectural view which is more accurate than the high-level conceptualisation. Thirdly, there are the existing technology stacks of each CMS that is interested in re-using some of the IKS components. And finally, there are partially overlapping research prototypes for core functionalities of the Stack and since significant portions of these have been developed over years, they do not necessarily fit together as easily as the top-down design would like it. IKS cannot afford

layered software architecture, by University of Paderborn (see below).

This layered architecture identifies a minimal set of software components needed to cover the functionality envisaged by IKS. Actual development of IKS software was partly from scratch, partly ad-hoc and partly using pre-existing components that deviated in part, from the target architecture, as we shall see in the next section.

Important Areas of Work

IKS Alpha Semantic Stack Components - the Bottom-up View

The major conceptual feature of the IKS Stack is its attempt to clearly distinguish between interaction at the user level, its knowledge-based representations in an inferencing layer, the ability to mediate between the knowledge base and external systems, and the ability to make content, knowledge and user interactions persistent. In order to achieve such a large-scale system, research partners were using existing components in their respective areas, as starting points. As can be seen below, the current Alpha Stack reflects therefore, the layering as intended, but its internal structure still needs refactoring to approach the target architecture.

The knowledge interaction component is called "INTERPRET". It is connected via RESTful services, with the knowledge representation and reasoning component "KReS" which deals with ontology and rules management and which is able to connect to different inference engines ("reasoners"). Currently shown at the same level of KReS is the IKS Semantic Enhancements Engine "FISE"

which kick-started development of the Alpha Stack by providing both a framework and a set of relatively easy-to-use components for semantic lifting. Some of the FISE functionality can be seen as implementations of services foreseen in KReS so the challenge here is how to refactor the two in order to end up with a "lean" reference implementation of the architecture. The bottom layer deals with

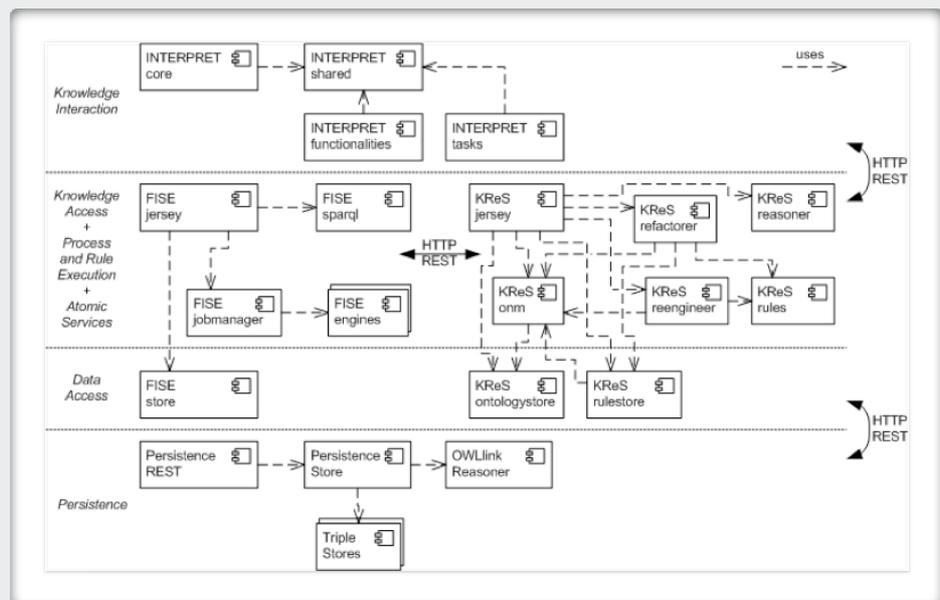


Figure 3: The Architecture of the IKS "Alpha" Stack

persistence for the interactive knowledge stack. One of the concrete developments here is an implementation of the CMIS interoperation standard for IKS, dealing – amongst others – with triple stores as well as relational databases and JCR.

Important Areas of Work

Apache Stanbol

■ IKS has placed much emphasis on developing a good following in relevant communities and one of the partners, DAY Software, has been very active in contributing to several Apache Open Source activities. Having had favourable responses to the early “FISE” semantic lifting modules from the CMS community, with strong encouragement from one of the industrial senior architects and with further encouragement from the EC, we decided to apply for Incubation at Apache in November 2010 and were granted status as incubator project a few weeks later.

component for dealing with local caches of large, external knowledge spaces. With this early move to Apache, we hope to not only, ensure sustainability of the project results, but also to be able to contribute significantly to the building of a code base which embraces as many of the advanced concepts of IKS as possible.

The challenge of “going Apache” is of course, the tension between an eco-system (Apache) that is purely governed by individuals and their willingness to contribute, and another eco-system (the EU-project IKS with EC funding) that is strongly



The code name of the incubation project is “stanbol” (<http://incubator.apache.org/stanbol/>) and it comprises the FISE modules, parts of KReS and a new

governed by work plans and contracts and a description of work!

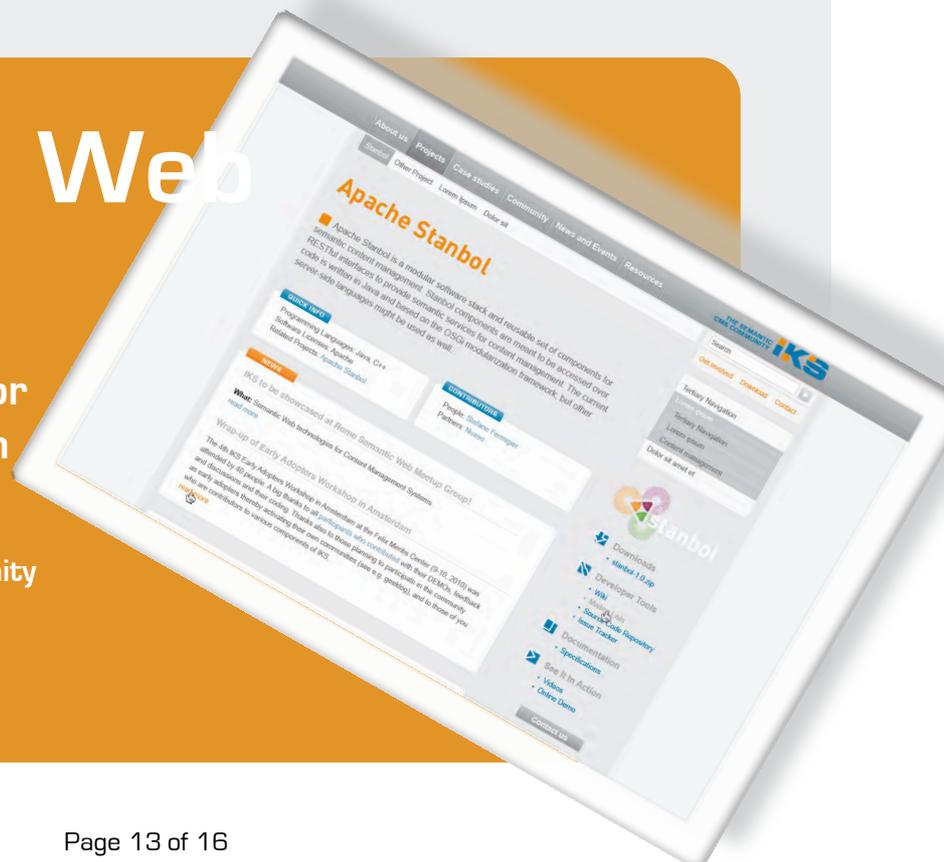
■ The major development work of 2011 is the « Beta » version of IKS with its focus shifting from developer-related to user-oriented functionality. Also, in 2011 all of the IKS-based use cases need to be finished and demonstrate how IKS can be used for the building of semantics-based CMS applications. In the final year (2012) the emphasis will be on demonstrating the benefits of IKS via external show-cases. We can see a number of promising connection points with related developments : several of the open source, natural language processing tools could profit from the simplicity of the FISE-approach thus making several of these tools better used. Another possible development is semantic enhancements to the CMIS standard. Finally, there has been a strong move towards HTML5 as the WWW implementation

language of the future. We are working together with other groups in order to foster governance and convergence in web-based CMS applications. One such example is the « Aloha » Editor to which IKS is contributing. Finally, there are several Apache projects that are complementary to IKS and we are seeking collaboration with those. One early collaboration is with another incubator project called « Clerezza » which is building an access layer to different RDF triple stores. 2010 was a good year for IKS in terms of community building and for getting known as a promising project that is addressing the right questions. 2011 will be a hard year because we will need to show that we also have good answers !

IKS 2011 Web Relaunch

IKS to become a hub for all “things” Semantic in the CMS space

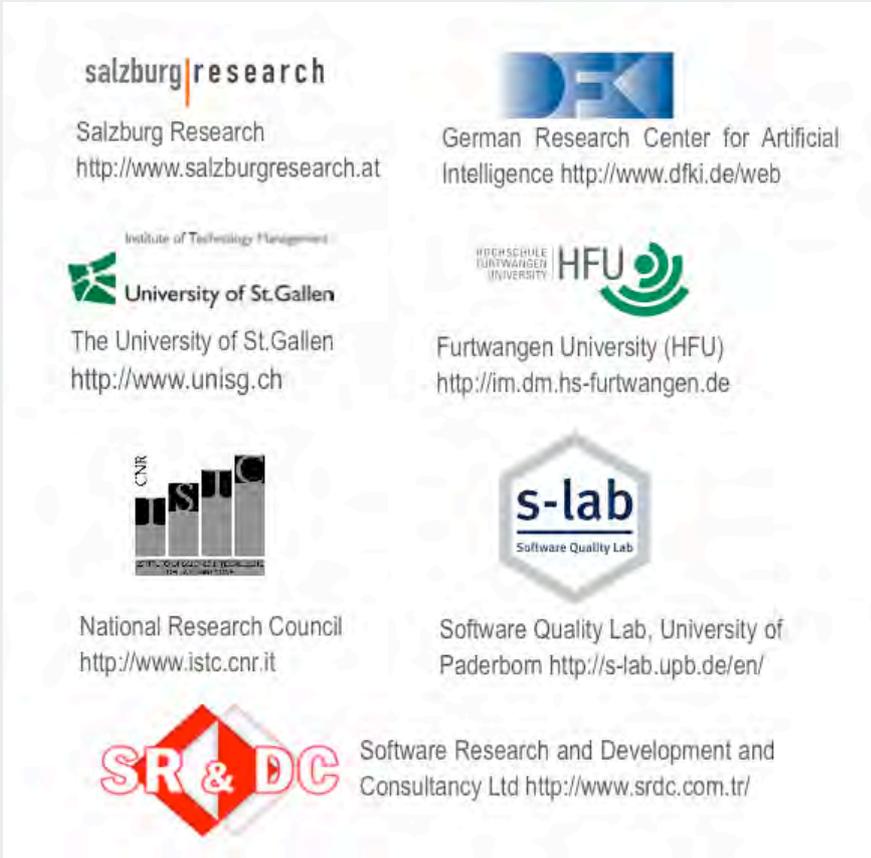
IKS the Semantic CMS Community to be launched mid-March 2011 visit us at www.iks-project.eu



IKS Facts

The EU Project

Research Partners



salzburg|research
Salzburg Research
<http://www.salzburgresearch.at>

DFKI
German Research Center for Artificial Intelligence
<http://www.dfki.de/web>

University of St. Gallen
The University of St. Gallen
<http://www.unisg.ch>

HFU
Furtwangen University (HFU)
<http://im.dm.hs-furtwangen.de>

CNR
National Research Council
<http://www.istc.cnr.it>

s-lab
Software Quality Lab, University of Paderborn
<http://s-lab.upb.de/en/>

SR & DC
Software Research and Development and Consultancy Ltd
<http://www.srdc.com.tr/>

The core consortium consists of seven research partners and six industrial partners. Of the research partners, two are Research SMEs (Salzburg Research and the Software and Development and Consultancy), two are larger non-university research organisations (German Research Center for Artificial Intelligence and the National Research Council), and three are university departments (St. Gallen, Furtwangen University and Software Quality Lab - University of Paderborn).

Industry Partners



Alkacon
Alkacon Software
<http://www.alkacon.com/en/>

TXT Polymedia
TXT Polymedia
<http://www.txtgroup.com/>

PISANO
Better Travel Technology
Pisano Holding GmbH
<http://www.pisano-holding.com/>

NEMEIN
Nemein Oy
<http://nemein.com/>

Day
Day Software
<http://www.day.com>

nuxeo
Nuxeo
<http://www.nuxeo.com>

IKS EU Project

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The six industrial partners are small-to-medium size technology providers and solutions developers for CMS, WCMS, and media management. The industrial partners have a business mindset in common: they acknowledge the need for stronger technological bases for their solutions, they are themselves beneficiaries and contributors to open source software and they see a great promise in semantic web technology.

**join the
IKS Semantic CMS
Community**

www.iks-project.eu