



LarKC

The Large Knowledge Collider

a platform for large scale integrated reasoning and Web-search

FP7 – 215535

D8.1 Training Activities in LarKC

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EXECUTIVE SUMMARY

This document reports the training activities undertaken in LarKC from M7 until M18 (September 2009) of the project. It includes an overview of the internal and external training, educational activities and documentation, as well as training material generation and maintenance. In particular, the deliverable presents the LarKC exchange program. The initial aim of the program is to establish better communication and encourage knowledge transfer within the consortium by facilitating an exchange of PhD students and researchers, between all LarKC partners. Following this the mid- to long-term aim of the program is to enable PhD exchange to organizations outside the LarKC consortium in order to disseminate the LarKC results to other organizations and provide training in the process of using the LarKC platform for research.



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Abstract (for dissemination)	This document reports the training activities undertaken in LarKC from from M7 until M18 (September 2009) of the project. It includes an overview of the internal and external training, educational activities and documentation, as well as training material generation and maintenance. In particular, the deliverable presents the LarKC exchange program.
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LIST OF ACRONYMS

Acronym	Description
DL	Description Logics
MORE	Multi-version Ontology Reasoner
OWL	Web Ontology Language
PION	The System of Processing Inconsistent Ontologies
RDF	Resource Description Framework
RDFS	Resource Description Framework Schema
SPARQL	SPARQL Protocol And RDF Query Language



1. Introduction

The main goal of the Task T8.1 in LarKC is the implementation of a training program for internal and external purposes. This program provides interested audiences within and beyond the boundaries of the LarKC project a series of training activities ranging from general training (e.g., introduction to project-related areas, for the usage of the LarKC platform or for the development of plug-ins) to specific training in the techniques and tools developed in the project. Internal training targets primarily the case study partners. They require additional expertise on particular topics in order to ensure an effective and efficient operation of the respective empirical studies. In contrast, external training targets parties which are not members of the consortium, but are interested in the topics related to the project setting. External training includes educational activities (e.g., co-organization of summer schools and establishment of the LarKC PhD exchange program), but also the user and developer documentation of the LarKC platform and associated plug-ins.

This document is an accumulated report of the LarKC training activities. The corresponding materials will be regularly updated based on the user feedback received. The results of this interaction are summarized in the versions of D8.1 due to M6, M18, M33, and M42.

The current version of the document reports the training activities in LarKC from M7 till M18 (September 2009), including an overview of the internal and external training, educational activities and documentation, as well as training material generation and maintenance. In particular, the deliverable presents the LarKC PhD exchange program prospected to be implemented in this reporting period.



2. Internal Training

The LarKC internal training is designed to deliver the background materials on topics such as reasoning, knowledge representation languages, semantic search, information retrieval and programming models for distributed systems to the LarKC members, so that the trainees can gain some necessary knowledge for the researches of the LarKC project.

Internal face-to-face trainings of case study partners on topics are relevant for the successful operation of the case studies. This includes the delivery of background material on topics such as reasoning and knowledge representation languages, focused training based on hands-on sessions and practical exercises to facilitate the usage of semantic technologies and tools (reasoning platforms, language-specific editors, validators, parsers etc.), and structured delivery of the case study process descriptions (in terms of main phases, phase transitions, data to be collected and measured in each phase, measurements and measurement tools and suites etc). The latter is aimed at ensuring a sound operation of the case studies and at easing the task of result collection.

From M7 until M18 we have organized the following main events of internal training:

- Internal Training Activities at LarKC General Assembly, Stuttgart, 13-15 October 2008
- 'Quality of Service' constraints and 'Anytime' behaviour Workshop, Innsbruck, 29-30 September 2008
- Internal Training Activities at LarKC General Assembly, Bled, 12-14 January 2009
- Architecture Workshop, Stuttgart, 19-20 March 2009
- WP2 Plugin Workshop Sheffield, 23 March-2009
- Internal Training activities at LarKC General Assembly, Milan, 2009

Those will be reported with details in the following.

2.1 Internal Training Activities at LarKC General Assembly, Stuttgart, 13-15 October 2008

The agenda of WP4 research meeting is:

- Distributed ontology reasoning based on resolution (Heiner Stuckenschmidt, University of Mannheim)
- Towards Scalable Ontology Reasoning (Pascal Hitzler, Karlsruhe University)
<http://svn.larkc.eu/wp4/wiki-resource/presentations/2008-10-Hitzler.ppt>
- MaRVIN: inference over billions of triples (Eyal Oren, VUA)
<http://svn.larkc.eu/wp4/wiki-resource/presentations/MaRVIN.pdf>



- Giving Up Tasks How Do Humans Stop Search and Switch Between Tasks? (Hansjoerg Neth, MPG)
http://svn.larkc.eu/wp4/wiki-resource/presentations/StoppingMemorySearch.MPG_081014.pdf
- Comparing semantic models (Jose Quesada, MPG)
<http://svn.larkc.eu/wp4/wiki-resource/presentations/Stuttgart-WP4.ppt>
- Towards Granular Computing on the Web (Ning Zhong, WICI)
<http://svn.larkc.eu/wp4/wiki-resource/presentations/larkc-stuttgart-oct08-zhong.ppt>
- Stream Reasoning and C-SPARQL (Emanuele Della Valle, CEFRIEL)
http://svn.larkc.eu/wp4/wiki-resource/presentations/RDFstreams_and_C-SPARQLpdf.pdf

2.2 'Quality of Service' constraints and 'Anytime' behaviour Workshop, Innsbruck, 29-30 September 2008

The purpose of this workshop is to flush out the various aspects of 'Quality of Service' (QoS). This will include how LarKC users specify the behaviour they require from the platform, how the platform will use this information and ultimately how this will affect the output from LarKC. Secondly, there will be a discussion regarding programming models for achieving incremental and 'anytime' behaviour.

The attendees are:

- Cycorp Europe (Luka Bradesko)
- HLRS (Georgina Gallizo, Axel Tenschert)
- VUA (Gaston Tagni, Frank van Harmelen, Annette ten Teije, Eyal Oren)
- STI (Barry Bishop, Mick Kerrigan)

The agenda of the workshop is:

- Terminology issues
- QoS issues (Axel Tenschert, Luka Bradesko)
- Anytime Algorithms(VUA, Barry Bishop, Mick Kerrigan)
- Stuttgart meeting (how to present the status of WP5, request feedback,...)
- Demo server
- Remote issues (Georgina Gallizo)



2.3 Internal Training Activities at LarKC General Assembly Bled 2009, 12-14 January 2009

The agenda of WP4 research meeting is:

- Plan of Stream Reasoner (Daniele Braga, CEFRIEL)
- Experimental design for mapping human search strategies (Hansjoerg Neth, MPG)
- Human Heuristic Search in Problem Solving (Yulin Qin, WICI)
<http://wiki.larkc.eu/LarkcProject/WP4?action=AttachFile&do=get&target=09-01-20-wici-wp4-report.ppt>
- Data Scheduling for Scalability (VUA and HLRS)
<http://svn.larkc.eu/wp4/wiki-resource/presentations/DataScheduling.ppt>
- Accelerating LarKC by Spatial Reasoning through Granular Knowledge Structures (Yi Zeng, WICI)
<http://wiki.larkc.eu/LarkcProject/WP4?action=AttachFile&do=get&target=LarKC-GKS-Jan-13-WP4.pdf>

2.4 Architecture Workshop, Stuttgart, 19-20 March 2009

The aim of the workshop was to continue WP5 work on the LarKC Architecture Definition. The main goal was to agree on architectural decisions towards distribution and scalability, identifying required features and main building blocks.

Attendees:

- CycEur (Luka Bradesko)
- VUA (Annette ten Teije, Eyal Oren, Frank van Harmelen)
- UIBK (Barry Bishop, Mick Kerrigan)
- Ontotext (Vassil Momtchev)
- HLRS (Axel Tenschert, Alexey Cheptsov, Sabine Roller, Bastian Koller, Stefan Wesner, Georgina Gallizo)

Agenda:

- Thursday 19.03.2009
 - 9:00-11:00 - Required Features and split between plug-ins / platform (Incl. Parallellization and Distribution discussion)
 Identified desirable features: see Support Features (Pre-meeting input document)
 Some open points on how to split features between plug-ins / platform: see Architecture_story_HLRS (Pre-meeting input document)
 Some pictures illustrating the Architecture story (see Architecture story pictures (Pre-meeting input document))



Use cases: to be analysed in order to find out more possible open points (see Usage Scenarios (Pre-meeting input document))

- 11:00-11:15 - Coffee Break
 - 11:15-12:30 - Required Features and split between plug-ins / platform (Cont.)
 - 12:30-13:30 - Lunch Break
 - 13:30-15:30 - Marvin/IBIS: lessons learned applicable to the LarKC Architecture (in order to solve some of the previous actions points) (see Marvin Architecture, IBIS overview slides (Pre-meeting input documents))
 - 15:30-15:45 - Coffee Break
 - 15:45-17:15 - Role of the Data Layer API in the LarKC Architecture. Which components must deal with it? How to integrate it in the global picture?
 - 17:15-18:00 - Urban Baby LarKC: current status and next steps planned (short review), lessons learned applicable to the LarKC Architecture
- Friday 20.03.2009
 - 9:00-11:00 - Next prototype implementation steps (see Building LarKC in Steps (Pre-meeting input document))
 - 11:00-11:15 - Coffee Break
 - 11:15-13:00 - Finalize open discussions from Thursday, definition of next action points, distribution of responsibilities, conclusions
 - 13:00-14:00 - Lunch

Expected Output:

- Draft of overall architecture with main building blocks
- Answer to Open Points identified before the meeting (or strategy on how to solve them)
- Stable list of requirements (required Features) to include in D5.3.1.
- Required modifications (if any) to current Plug-in API and Data Layer API
- List of technologies (specifications, standards,...) to be used in the next LarKC prototype
- Next implementation steps towards a distributed LarKC prototype

Results: The expectations of the meeting were fulfilled, having the following outputs as main results:

- consolidated architecture picture
- consolidation of a global architectural layers picture integrating all components from plug-ins down to physical resources



2.5 WP2 Plugin Workshop, Sheffield, 23 March 2009

2.5.1 Agenda

- 9:30 start, Introduction
- 9:45 coffee

- Short technical presentations with code examples, approx 20 minutes each:
 - Coding to the LarKC plugin API (Mark Greenwood)
 - Using the LarKC data layer (Damyan Ognianoff)
 - Running plugins on the LarKC platform (Blaz Fortuna)

- Break out into pairs and groups along the lines of the M12 deliverables, for pair and team programming
 - 13:00 working lunch
 - Continue breakouts, rearranging as necessary
 - 15:15 coffee
 - Continue breakouts, rearranging as necessary

- 17:00 Report back

- 17:30 end

2.5.2 Report of the workshop

It was generally agreed that the workshop had been a useful opportunity to get plugin developers and platform developers together. Most participants had useful face-to-face communications with others. In the late morning and throughout the afternoon, we split the workshop into four informal groups, working on separate plugin-related topics. These are reported on below.

USFD: Running WP7b use case plugins on the platform

We had already written plugins for the WP7b cancer research use case, but had never run these in the platform. The brief for this subgroup was to implement a platform demonstrator, along the lines of the BabyLarKC or the Urban City demonstrator. This was successfully done, with a very simple single plugin instantiation of the platform.

Issue - the current plugin could most usefully split into 3. The level of plugin granularity expected by the platform is smaller than that provided in this plugin. This will be done in the next phase.

USFD: Wrapping Semantic Annotation as a LarKC plugin

The intention was to wrap USFD's GATE toolkit, enabling an arbitrary GATE application to be run over documents, transforming them into semantic annotations encoded as triples. A plugin was completed, and a very basic single plugin platform written to test it. Several issues were encountered:



- Some details of the plugin are currently hard coded (e.g. the GATE application path). These will be passed as part of a Context object, to be provided in the next release of the API
- The document to be analysed is hard coded. This will be passed as a NaturalLanguageDocument, to be provided in the next release of the API
- There were some difficulties with library conflicts between GATE and LarKC. These were overcome by loading all libraries via the start up shell script, LarKC first and then GATE, so that LarKC versions get priority in the classloader.
- We were unable to print Statements for debugging, the print giving a NullPointerException in either OpenRDF code or ORDI code.

WICI: Receiving suggestions on granular selection application and a use case

WICI has developed one application as a use case of granular selection: user centered computer science literature search system. During the workshop, Zhisheng, Luka, Jose, Blaz have provided many valuable suggestions for us.

- Zhisheng mentioned that WICI hasn't consider the semantic distance of keywords which are used for queries, for example, "reasoning" and "logic" are treated as two isolated keywords in user interests and queries, and WICI will work on that in the near future.
- Luka suggested that user interest centered semantic query refinement can be a good example that related to Quality of Service(QoS) in WP5, hence, WICI is going to have a discussion with WP5 later about this and seek for possible cooperation.
- Luka and Blaz suggested that query refinement based on user interest can be passed to reasoner plug-in to handle, or many other approaches can be tried if possible.
- Jose suggested a comparison of WICI's work on the RDF file for user interest with Application Profile Markup Language(APML) and WICI may have future cooperation consider triple set sub-setting in RDF graph, since MPG and WICI are all working on network statistics for selection from different perspectives.

WICI also gets many new information concerning the change of current API from Damyan and Luka, and WICI would like to thank Mark and Angus for two valuable plug-in examples worked out from this workshop.

VUA: Reasoner plugin

With the helps of Damyan (OntoText) and Luka (CycEuro), Zhisheng (VUA) fixed some problems of the Pellet SPARQLDL reasoner plug-in with the LarKC platform v0.4. After the workshop, the Pellet SPARQLDL Reasoner has been released on the LarKC platform v0.4.



2.6 Internal Training activities at LarKC General Assembly, Milan, 2009

The agenda of the training activities is:

- Framework of Evaluation and Benchmarking of Ontology Reasoners. In this talk, Zhisheng Huang (VUA) presented a talk on the initial framework of evaluation and benchmarking of ontology reasoners and proposed a gold standard specification language.
- Rule-based Reasoners and their evaluation (Barry Bishop). In this talk, Barry Bishop (STI Innsbruck) presented a talk on the framework of rule-based reasoning and the initial ideas about the evaluation of rule-based reasoning.
- Granular Reasoners and their evaluation. In this talk, Yi Zeng (WICI) presented a talk on the framework of unifying search and reasoning from the perspective of granularity.



3. External Training

External training is designed for interested parties regarding the technologies employed or developed throughout the project.

3.1 Plan of External Training Activities

- **Academic seminars / courses.** Academic partners in the LarKC consortium will include training activities on the project key features within their own institution programmes. They will be of different nature, depending on the type of audience that is intended to reach:

- Regular Undergraduate Lectures
- PhD Lectures and Activities
- Postgraduate courses, in the scope of Masters and Specialities

In these areas, the academic groups working in LarKC are responsible for lecturing several subjects, where LarKC-related concepts are being introduced in a gradual way.

- **LarKC public workshops.** It is expected to organize dedicated LarKC public workshops along the project lifecycle. The workshops will mainly consist on topical presentations focused on the most relevant key features and innovations worked out at the moment to be held. Expected attendees to these workshops are:

- Students from the hosting organization or from universities/centres external to the LarKC consortium.
- Research audience: researchers from the LarKC partners and from organizations external to the LarKC consortium
- Business audience: audience from the business units of the LarKC partners or external industry organizations interested on the exploitation of the LarKC results.
- Early Access group: As this is a special target group for the LarKC results, a single section is dedicated for the detailed description of the training plan for this group (see section 3.4).

- **Cooperation with the EastWeb project.** The goal of the EastWeb project¹ is to build an integrated leading Euro-Asian high education and research community in the field of the Semantic Web, the next generation of the Web. LarKC has a plan to cooperate with the EastWeb project. Particular attention will be paid to training events in Asian countries, realized with the help of our Chinese and Korean partners. Their participation in the project opens new opportunities for the European reasoning and search community to outreach their technology towards two of the most rapidly evolving IT sectors worldwide. Elena Simperl (STI Innsbruck) is one of the organizers of the Asian Semantic Web School ASWS,

¹<http://www.eastweb.eu/>



which is organized together with EastWeb for the second time in December, 2008 in Thailand.

- **European summer Schools in the Semantic Web.** Further external training will be provided in the context of existing European summer schools such as the Semantic Web Summer School (SSSW) and the Reasoning Web Summer School. We will contribute to the organization of at least one summer school during the project runtime - in terms of tutors and teaching materials - in order to educate the young research community on the novel ideas and technologies emerging in LarKC project; and to establish the continuity of the research initiated in the project beyond its boundaries. An important part of the external training will also be to train potential beneficiaries of the LarKC platform on how to use it and to register and plug-in additional custom modules. In order to improve the quality of the materials documenting the usage and the further development of the platform the project Web site will contain a dedicated discussion forum for users to provide feedback on the quality of the documents delivered².
- **Participation of LarKC in external workshops.** LarKC will offer training activities (such as topical presentations on certain results of the project) in workshops organized by other projects/organizations.
- **Exchange program.** That is reported in the next section.

3.2 Exchange Program

This section introduces the LarKC exchange program was setup within the first 12 months of the LarKC project. The major aims of the program are:

- The initial aim of the program is to establish better communication between the partners of the LarKC project by facilitating an exchange of PhD students and young researchers, between all partners in the LarKC consortium, to encourage a transfer of knowledge within the consortium. By establishing better communication within the consortium a better shared understanding of the research problems faced within the LarKC project will be reached and ultimately a better quality of research can be conducted resulting in better results from the LarKC project;
- Following this the aim of the program is to enable PhD exchange to organizations outside the LarKC consortium in order to disseminate the LarKC results to other organizations and provide training in the process of using the LarKC platform for research. Exchanging PhD students outside the consortium is crucial to ensure the acceptance of the LarKC platform as a platform for large scale reasoning research and will ensure the endurance of the LarKC platform as an infrastructure beyond the duration of the LarKC project. STI International will play a major role in this endeavor by establishing connections with organizations outside the LarKC consortium that are relevant for the topics of LarKC;

²https://gforge.hlr.de/forum/forum.php?forum_id=522



- Finally the longer term aim of the program is to establish lasting communication channels between the different organization, both within the LarKC consortium and external organizations, beyond the length and scope of the LarKC project. These lasting communication channels will enable better collaboration within the community and will be evident from the number of publications that will be created from cross organization authors. The exchange program will also support the Early Access Group, described in more detail in section 3.4, by raising awareness of the LarKC platform and disseminating results in a timely fashion to early adopters.

For the purposes of describing the exchange program we identify a terminology, which is described in the appendix of this document.

The guidelines are put in place for the purpose of establishing an exchange for a given **Student** with a given **Host Organization**, and ensuring its successful execution and completion. Deviation from these guidelines is possible only with agreement from the work package 8 leader and the LarKC Technical Project Management Board. See the appendix for the detail of the guidelines.

The following table provides an overview of the current academic partners that will participate in the LarKC exchange program. In each case the estimated number of exchanges to be made during the LarKC project is provided:

- **STI Innsbruck**

- Gulay Unel, Cefriel/Politecnico di Milano, June/September 2009 (delayed)
- Florian Fisher, VUA, October/November 2009

- **VUA**

- Martijn Brakenhoff, MPG, April to September 2009
- Gaston Tagni, MPG, 2009
- Zhisheng Huang, WICI, October to November 2010

- **USFD**

- Hamish Cunningham, IARC, 2009
- Kalina Bontcheva, IARC, 2009
- Angus Roberts, Ontotext, Summer 2009
- Valentin Tablan, Ontotext, Summer 2009

- **WICI**

- Yi Zeng, VUA, May 23rd to June 30th 2009. His exchange plan report can be found from the following web link:
<http://wiki.larkc.eu/LarkeProject/WP8/ExchangePlan?action=AttachFile&do=view&target=Exchange+Plan+Report>

- **MPG**

- Lael Schooler, VUA, Spring 2010



- Jose Quesada, CycEur, 2010
- Hansjoerg Neth, VUA, 2010

- **HLRS**

- Axel Tenschert, VUA, 4th to 15th of May 2009. His exchange plan report can be found from the following web link:
<http://wiki.larkc.eu/LarkcProject/WP8/ExchangePlan?action=AttachFile&do=view&target=ExchangeReportAxelTenschert>
- Alexey Cheptsov, Sheffield university, 20th to 30th of July 2009 (in the frame of the GATE Summer School)³

The LarKC PhD exchange program will also run an annual PhD Symposium, where PhD students can present their current research on their PhD topic and receive feedback from the foremost experts in the field. Prior to the symposium, students will submit a report outlining the current state of their research and their future plans. These PhD reports will be reviewed by chosen experts from within the LarKC consortium or externally. A number of PhD students will be chosen to present their work at the symposium, those who are not chosen will receive written feedback in terms of the reviews to their PhD report. The PhD symposium will run and each PhD student will present his or her current work in the form of a short presentation. The experts who performed the reviews will be present to give further feedback on the PhD Students current directions towards their PhD. The PhD symposium offers a great opportunity to students to get feedback on their thesis and to see the research of other students in order to get a clear understanding of the obstacles that they face and potential solutions to these obstacles.

One of the intended side effects of the exchange program and PhD symposium is to establish joint PhD supervision in a cross organizational manner. When a given **Student** is exchanged from the **Student Organization** to the **Hosting Organization** a research topic may be established that has parts to both organizations. In such a case the given **Students** PhD thesis may become supervised by representatives of both organizations. In this way the PhD student will benefit from the knowledge of the representatives of both organizations and will result in a PhD of a higher quality. Also via the PhD student the level of cooperation and communication between the two organizations jointly supervising the PhD will also be improved.

3.2.1 LarKC PhD Symposium

The LarKC Phd Symposium is planned to be a yearly event where researchers conducting their PhD's can gain feedback from more experienced researchers within the community. It also gives PhD students in less advanced stages, an opportunity to see the state of other PhD students who are more advanced, thus enabling them to avoid common pitfalls and mistakes when writing a PhD.

The 1st LarKC PhD symposium has been organized in conjunction with STI Innsbruck and STI Berlin and was held on the 22nd and 23rd of September 2009 in Berlin, Germany. The symposium has deliberately been colocated with the LarKC plenary meeting to make it easy for leading researchers in the LarKC consortium to be present

³This exchange was finally postponed, due to unforeseen issues. New date is still not decided.



and give their invaluable feedback to the PhD students. 18 PhD students have been accepted and will present across the two days of the symposium. Students in early phases of the PhD are given a twenty minute slot to present the outline of the work they will conduct in their thesis, while more advanced students are given thirty minutes to present their current status and remaining plans. The full schedule of the event is listed below.

Day 1 - 22/09/2009

Time	Title	Presenter
9:30	Welcome	Elena Simperl
9:45	Ontology Merging by Matching a Selection of Ontologies in a Cluster Environment	Axel Tenchert
10:15	Towards Agile Ontology Maintenance	Markus Luczak-Rsch
10:45	A Parametric Design Approach to Scalability Management of Semantic Middleware	Reto Krummenacher
11:15	Coffee break	
11:30	Query Optimization in Semantic-Web-Databases	Ralf Heese
12:00	Feedback-driven Ontology Reorganisation	Elmar Wach
12:30	Lunch	
13:30	Evaluating WSMO-Lite	Jacek Kopecky
14:00	Search Refinement through User Interests: A Case Study in Medical Research	Yan Wang
14:30	Semantic Learning for Trend Recognition in Text Collections	Olga Streibel
15:00	Knowledge-based Complex Event Processing	Kia Teymourian
15:20	Structure-based Analysis and Modularization of Ontologies	Goekhan Coskun
15:40	Coffee break	
16:00	Explorative analysis of realworld dynamic networks	Benedikt Meuthrath
16:20	Closing - Day 1	

Day 2 - 23/09/2009

Time	Title	Presenter
9:30	Unifying Search and Reasoning: From the Viewpoint of Granularity	Yi Zeng
10:00	MEMOS: A Methodology for Modeling Services	Mick Kerrigan
10:30	Automatic plugin workflow construction	Luka Bradesko
11:00	Latent-Class Statistical Relational Learning from Formal Knowledge	Achim Rettinger
11:30	Coffee break	
11:45	Information Extraction and Integration from Heterogeneous Semi-structured Web Sources in the Domain of Used Cars	Radoslaw Oldakowski
12:05	Cognitively-inspired Heuristic Reasoning for Scalable Semantic Web Reasoning	Gaston Tagni



12:35	Monitoring and Adaption of Semantic Execution Environments	Srdjan Komazec
13:05	Closing - Day 2	

3.3 Training via the LarKC Wiki and Blog

The training activities in the LarKC Wiki and Blog can be considered as ones for both internal training and external training, because the information appear in the public pages of the LarKC Wiki and the LarKC blog are accessible for both internal members and researchers from the outside of the community. The LarKC Wiki⁴ and the LarKC Blog⁵ have served as one of main channels for the communications between the researchers inside the LarKC project and the researchers from the outside of LarKC. The research resources which are collected in the LarKC Wiki and the discussions in the LarKC blog provide rich repositories of relevant research information. That is achieved mainly via the following approaches: Semantic Web Technology Hierarchy at the LarKC Wiki, Training material in the LarKC Wiki, LarKC Blog for Training, and the online video training.

- Semantic Web Technology Topics at the LarKC Wiki: The pages of the Semantic Web Technology Topics⁶ at the LarKC Wiki are designed to be a place for the LarKC community to collect different technologies and topics that are relevant to LarKC. So far the following topics have been created.
 - Adaptive Memory
 - Approximate Reasoning
 - Distribution and Parallelisation
 - Information Extraction
 - Thinking At Home
 - Triple Stores
 - Why We Need LarKC
 - Closed World Assumption and Negation as Failure
 - Librarianship: the Forgotten Silver Bullet
 - Granular Computing and Variable Precision Logic
 - Meta Reasoning
 - Contextual Reasoning
 - Module Reasoning
 - Rule-Based Reasoning
 - Resource-Bounded Reasoning

⁴<http://wiki.larkc.eu>

⁵<http://blog.larkc.eu>

⁶<http://wiki.larkc.eu/TechnologyTopics>



More relevant topics are expected to be added. Moreover, part of the content in the LarKC Survey deliverables such as D1.1.1 (Overview of relevant work in other areas) and D4.1 (A Survey of Web Scale Reasoning) will be converted and added into the corresponding Wiki pages after those deliverables are finished.

- Training material in the LarKC Wiki. The LarKC Internal Training Wiki page ⁷ collects resources for mutual education of the LarKC partners. The External Training wiki page ⁸ will eventually contain material for educating external parties on how to use the LarKC platform.
- LarKC Blog for Training. The LarKC Blog serves as a forum for the LarKC researchers.
- Online video training. The training page provides some links to the external online videos, which include Video Lectures on the Semantic Web⁹ and Video Lectures on Search Engines¹⁰.

3.4 Training for Early Access Group

LarKC has created a **Researcher Early Access Group** that is open to participation to scientists working in related fields. Members of this group will get early access to project infrastructure and will be invited to experiment with plug-ins on the collider. Plans for training the members of the Early Access Group have not yet been finalised, but the following options are considered:

- programming by example: providing a set of pre-programmed open-source plugins that the Group members can adapt
- an instruction video explaining the overall LarKC plugin architecture, and the general design motivations behind it. This is easier to get across in a spoken than in a written medium
- joint programming sessions: these are 1-2 day events where LarKC designers can instruct the members of the Group and do "physical handholding". Because of the high overhead of these events (time, travelcosts), we expect to do at most 1 or 2 of these
- home-visits: in order to get more people involved at each of the organisations participating in the Early Access Group, LarKC designers might visit those organisations on-site. This is more cost- and time-efficient for the Group members than the joint programming sessions.
- textual material: we will make extensive use of the LarKC wiki for publishing online documentation, both on the plugin interfaces and on example plugins already written. We will use the wiki facilities for collecting feedback and improvements

⁷<http://wiki.larkc.eu/InternalTraining>. The pages under the folder 'InternalTraining' are designed to be internal ones which are accessible by internal members only.

⁸<http://wiki.larkc.eu/ExternalTraining>

⁹http://videlectures.net/Top/Computer_Science/Semantic-Web/

¹⁰http://videlectures.net/Top/Computer_Science/Search_Engines/



on this documentation from the Group members. (This should prepare the documentation for wider exposure at a later stage).

3.5 Early Adopters

3.5.1 1st Early Adopters Tutorial

The 1st Early Adopters Tutorial took place on the 1st June 2009 at the ESWC 2009¹¹ in Crete. There were 22 registered attendees for the workshop, with with more than 30 people eventually in attendance. Participants to the tutorial had the opportunity to work directly with the LarKC Platform and used a number of LarKC workflows including: Urban City, GATE Transformer with CyC reasoning, Using a rule-based reasoner plug-in with RDF(S) entailment regimes, and Using a DIG interface plug-in to reason with ontologies with an external DIG reasoner. The agenda of the tutorial was:

09:30 - 10:00	Introduction to LarKC
10:00 - 10:30	LarKC architecture
10:30 - 11:00	Coffee break
11:00 - 11:15	Hands-on: WebSPARQL pipeline
11:15 - 12:00	Hands-on: IRIS: rule-based reasoning
12:00 - 12:30	LarKC data model
12:30 - 13:00	Distributed processing in LarKC
13:00 - 14:30	Lunch
14:30 - 15:15	Hands-on: GATE and Cyc: Reasoning with Company Data from News Articles
15:15 - 16:00	Hands-on: Urban Computing
16:00 - 16:30	Coffee break
16:30 - 17:15	Hands-on: DIG - Wrapping DL reasoners
17:15 - 17:30	Wrap up session. Presentation of the LarKC collaborative software development environment

Within the 1st Early Adopters Tutorial questionnaires were given to the participants. Through this, feedback regarding the tutorial was analysed in order to improve the the next Early Adopters Tutorial and to learn from the comments and suggestions from scientist outside the LarKC project.

The most early adopters rated the organization, the program and their individual impression of the tutorial as positive and they are interested in another tutorial. Further, all participants suggested their preferred development environment and version control system. This suggestions were considered for LarKC internal discussions about usage of development environments and version control systems.

¹¹<http://www.eswc2009.org>



3.5.2 2nd Early Adopters Tutorial

The second Early Adopters Tutorial will be held in conjunction with ISWC 2009¹² in Washington DC on the 25th of October 2009. The aim of this tutorial is to enable participants to get access to early research results and technologies from the LarKC project. Having completed this tutorial participants will have the basic skills required to develop their own plug-ins for the LarKC platform and run their own experiments on the LarKC platform. The tutorial will run as a full day event, with presentations from experts on the LarKC platform and a series of hands-on exercises designed to introduce the participants to the different aspects of the LarKC platform. The structure of the tutorial has been improved based on the feedback from the successful tutorial at the 6th European Semantic Web Conference (ESWC09), and will ensure that also the US-based community has access to the research results from the LarKC project. The planned agenda for the second tutorial is as follows:

9:00 - 09:30	Overview and Goals of LarKC
9:30 - 10:30	Introduction to the LarKC Architecture
10:30 - 11:00	Coffee Break
11:00 - 11:30	Hands-on 1: Working with an existing LarKC pipeline
11:30 - 12:00	Introduction to the LarKC Data Layer
12:00 - 13:00	Hands-on 2: Building a LarKC decider plug-in to create a pipeline from existing plug-ins
13:00 - 14:00	Lunch
14:00 - 14:30	Introduction to Distributed Processing in LarKC
14:30 - 15:30	Hands-on 3: Building a LarKC plug-in and integrating it into an existing pipeline
15:30 - 16:00	Coffee Break
16:00 - 17:00	Hands-on 4: Understanding and Manipulating the Urban Computing pipeline
17:00 - 17:30	Closing and Wrap-up

3.5.3 Plan for Early Adopters Tutorials and Workshops

Chinese LarKC Developer Workshop

The 1st Chinese LarKC Workshop will be held at the 2010 Chinese Web Intelligence Conference, October 2010 in Chongqing, China. Its aim is to disseminate the vision, scientific approaches, current versions of LarKC and invite more developers and researchers to participate in the development of LarKC plugins.

There will be a keynote talk about LarKC, several tutorials introducing LarKC APIs and hands on sessions, a demo session including (DBLP search support, Medline search refinement, Using a DIG interface plug-in to reason with ontologies with an external DIG reasoner, GATE Transformer with CyC reasoning, Using a rule-based reasoner plug-in with RDF(S) entailment regimes, etc.). Meanwhile, some major introductory Chinese document of the LarKC project will be provided. More detailed information can be found at: <http://wiki.larkc.eu/CDW2010>.

¹²<http://iswc2009.semanticweb.org/>



3.5.4 LarKC Developer Forum

The LarKC developer forum provides a location to early adopters and developers for the discussion of issues related to the LarKC platform. The developed forum is currently hosted in the GForge system at <https://gforge.hlr.de/projects/larkc/>. It provides a number of different ways that developers can discuss issues and raise problems to the LarKC platform development team:

- **Forums:** Two different forums are provided where open discussions regarding the larkc platform can occur. The **LarKC-developers forum** is used primarily by internal and external developers to discuss issues related to the development of the LarKC platform. The **LarKC-users forum** is used by those developing plug-ins or those building new LarKC workflows from existing plug-ins to discuss issues related to their development efforts.
- **Trackers:** The trackers at the LarKC developer forum provide a structured way for developers and users to raise issues against different parts of the platform, and particular plug-ins or workflows. The **bug tracker** is used to raise issues in the case of finding errors in the way in which these components operate. The **feature request tracker** is used to request new features in the platform, a particular plugin, or a certain workflow. The **patches tracker** is used to provide information, either from developers to users or from users to developers on patches that work around certain existing issues in the larkc platform. Finally the **support tracker** is used for raising technical support tickets so that users can request help in identifying if a particular issue is a bug, a missing feature, or just an error in using the platform.
- **Mailing Lists:** Three mailing lists are provided that provide a means of communication between developers and users, without having to go through the web portal. The **larkc-commits** mailing list is populated by automatic messages whenever new the larkc source code is updated. This provides a means for developers and users to track when changes of the codebase occur and by whom. The **larkc-dev-support** and **larkc-user support** provide mailing list for communication between platform developers and plugin and workflow writers respectively. Each of these mailing lists is regularly checked by members of the LarKC development team in order to quickly give feedback to early adopters. Each of the mailing lists also have an archive such that developers and users can check out older messages for solutions to current problems.
- **Releases:** This are of the developer forum provides a download area from which the latest versions of the LarKC platform can be retrieved. Developers and users can register for notifications of when new files are added to this download area, such that they can stay up to date with the latest version of the platform.

GForge is currently based on the same software as the popular open source development web site sourceforge.net. To improve the visibility of the larkc development effort the LarKC project is currently in the process of migrating to the sourceforge website. This will also mean that the developer forum will also migrate to this new location; however as both systems are based on the same underlying technology no change will occur to the functionality available to developers.



A screenshot of the current LarKC developer forum in the GForge system can be seen in figure 3.1.

Software development is an important aspect of the LarKC project. LarKC has always striven to achieve the highest standards of the open source software development process, offering the developers, adopters and end-users a reliable environment for the development and maintenance of the software solutions. Guided by the user feedback and considering the growing number of both external and internal contributors to the LarKC developments, a Forge-based collaborative development environment was set up and hosted by the SourceForge.net service. The new LarKC@SourceForge.net development environment is not limited on the number of external users, as before, and allows sharing the LarKC innovative technologies with the global audience. To the main LarKC@SourceForge.net's features can be referred the following:

- subversion-based version control system for accessing and management of the source code (available at <https://larkc.svn.sourceforge.net/svnroot/larkc>)
- file release system for easy downloading the released software (<https://larkc.svn.sourceforge.net/svnroot/larkc>)
- powerful user and developer support system, including the user support forum and mailing list (a more detail description is provided at <http://wiki.larkc.eu/LarkcProject/WP5/LarKC-SourceForge>).

The only requirement for getting started with the LarKC@SourceForge.net is to have a valid account at the SourceForge.net. A new account can be purchased at <http://sourceforge.net/account/registration/>. For accessing the new software repository, the account should be approved by the project administrator. The new repository contains the revision 759 of the old repository. The users who have any updates to this revision, should commit them directly to the new repository, following the same procedure as for the previous repository.

3.5.5 Chinese LarKC Developer Forum

The Chinese LarKC developer forum is aimed at providing Chinese developers an online discussion board to communicate with each other on LarKC related development issues in Chinese. Currently, the forum is hosted together with the Chinese LarKC user Forum (<http://groups.google.com/group/larkc-chinese-forum>). A screenshot of the LarKC Chinese Forum is shown in Figure 3.2.

Chinese LarKC developer forum sends news update related to LarKC monthly. And is responsible for providing releases related information to the Chinese community. Based on the Google groups translation functionality, the forum is also responsible for translating development issues which are written in Chinese to the LarKC Developer Forum which supports English inquiry. Major issues proposed by LarKC Chinese developers will be collected and sent to LarKC consortium or discussed on LarKC Chinese Developer Workshop.



The screenshot shows the GForge project page for LarkC. The header includes the GForge logo, a search bar, and navigation links like 'Log In' and 'New Account'. Below the header is a series of tabs for navigation: Home, My Page, Project Tree, Code Snippets, Project Openings, and LarKC. Under the LarKC tab, there are sub-tabs for Summary, Forums, Tracker, Lists, Tasks, Docs, Surveys, News, SCM, Files, and Wiki. The main content area is divided into two columns. The left column contains a project description: 'The aim of the EU FP7 Large-Scale Integrating Project LarkC is to develop the Large Knowledge Collider, a platform for masive distributed incomplete reasoning that will remove the scalability barriers of existing reasoning systems for the Semantic Web.' Below this is a list of project details: Development Status: 3 - Alpha; Intended Audience: Developers; License: Apache Software License; Natural Language: English; Programming Language: Java; Topic: Scientific/Engineering. Further down, it shows registration information: Registered: 2008-06-04 11:49; Activity Percentile: 42.85%; View project activity statistics; View list of RSS feeds available for this project. The right column is titled 'Developer Info' and lists project administrators and developers. Project Admins include Axel Tenschert, Bastian Koller, Georgina Gallizo, Matthias Assel, and Sabine Roller. Developers listed include Alexey Cheptsov, Angus Roberts, Barry Bishop, Blaz Fortuna, Christoph Fuchs, Damyan Ognyanov, Danica Damljanovic, Daniele Dell'Aglio, Dan Richner, Davide Barbieri, Delia Rusu, Emanuele Della Valle, Eyal Oren, Florian Fischer, Frank van Harmelen, Gaston Tagni, hamish cunningham, Irene Celino, Ivan Peikov, Jaroslaw Bak, Jia Hu, Jose Quesada, and Kono Kim.

Figure 3.1: The LarkC Developer Forum at GForge



Figure 3.2: LarKC Chinese Forum



4. Concluding Remarks

In this document, we have reported various activities of the internal training and external training activities in LarKC. The internal training includes nine internal meetings on various training issues which range from plug-in development to the architecture design. The external training includes two early adapter workshops. In this document, we have also reported the PhD/researcher exchange activities in LarKC. More activities of external training and internal training will be regularly reported in the sequent versions of this document.



A. The Terminology and the Guidelines of Exchange Program

A.1 Terminology

For the purposes of describing the PhD program we identify the following terminology:

- **Student:** The PhD student or young researcher who is taking part in the exchange program and is actually exchanged from one organization to another;
- **Students Organization:** The organization that the **Student** is affiliated with, both before and after the exchange;
- **Host Representative:** A person or persons who are affiliated with the **Host Organization** that will be the main point of contact for the **Student** during the **Hosting Period**;
- **Host Organization:** The organization that will host the **Student** during the **Hosting Period** of the exchange;
- **Hosting Period:** The period of time that the **Student** will be hosted by the **Host Organization**;
- **Research Topic:** The topic of the research, relevant to the LarKC work plan, that the **Student** will conduct in conjunction within the **Host Organization** during the **Hosting Period**;
- **Research Project:** An optional project in the scope of the **Research Topic** that the **Student** will conduct in conjunction with the **Host Representative** during, and potentially after, the **Hosting Period**;
- **Student Report:** The report that will be created by the **Student** and the **Host Representative** following the completion of the **Hosting Period** to report on the research conducted on the **Research Topic**, and potentially the **Research Project**, during this period.

A.2 guidelines

The following guidelines are put in place for the purpose of establishing a PhD Exchange for a given **Student** with a given **Host Organization**, and ensuring its successful execution and completion. Deviation from these guidelines is possible only with agreement from the work package 8 leader and the LarKC Technical Project Management Board.

- An exchange must be defined a minimum of 15 days prior to its start and communicated to the LarKC work package 8 leader;
- The minimum **Host Duration** for a given exchange is 2 weeks, the recommended period is 1 month, while the maximum is 2 months;



- At this time the **Host Organization** and **Students Organization** are limited to academic partners within or outside the LarKC consortium. The program may be extended to non-academic organizations as the LarKC project proceeds. This extension would result in relevant personnel from both academic and non-academic organizations being exchanged for internships of a similar duration to the PhD exchange. It is envisioned that such internships will follow similar guidelines to those described in this section; however the guidelines will be evaluated when the program is extended to non-academic organizations.
- The **Host Representative** and **Research Topic** must be defined in advance of the exchange and the **Host Representative** should be a relevant person for the particular **Research Topic**;
- The **Research Topic** must be aligned with and relevant to the work plan of the LarKC Project;
- The **Host Organization** should provide the relevant working conditions for the **Student** during the **Hosting Period**. This covers but is not limited to a desk at wish to work and an adequate internet connection;
- The **Host Organization** should provide all the information needed by the **Student** in order to organize the exchange. For example the **Host Organization** should provide information on how to get to the organizations offices and information on accommodation during the **Hosting Duration**;
- The **Hosting Organization** should make all efforts to integrate the **Student** into their organization during the **Hosting Period**. While the **Host Representative** is the main point of contact for the **Student** it is intended that the **Student** should come in contact with as many persons from the **Host Organization** as possible in order to establish new collaborations and improve communication between the **Host Organization** and the **Students Organization**;
- The **Students Organization** is responsible for paying the costs relevant to the **Students** accommodation and travel during the **Hosting Duration**. These costs are then reimbursable against the LarKC project;
- An exchange may be defined in a bidirectional manner, where the **Host Representative** from the first exchange acts as the **Student** in the second exchange and vice versa;
- In the case of bidirectional exchanges it is recommended that a **Research Project** within the scope of the **Research Topic** is defined prior to the exchange starting, that spans the two **Hosting Periods**. Thus the first **Hosting Period** can act as a project kick-off and the second as a project wrap up with communication between the two **Students** occurring between the two exchanges;
- There is no limit to the time frame between the two **Hosting Periods** in the case of bidirectional exchanges, however it is recommended that the period between the two exchanges is not longer than 3 months;



- The **Student Report** should be made available to the LarKC work package 8 leader no later than 1 month after the completion of a given exchange by a given Student. The report should be created jointly by the **Student** and the **Host Representative** and should cover the research conducted during the **Host Duration** and any relevant research results, publications etc;
- In the case of a bidirectional exchange two **Student Reports** should be created, one for each of the exchanges.



B. Reports of Exchange Program

B.1 LarKC Exchange Program Report 2009 by Axel Tenschert

The full version of the exchange program report by Axel Tenschert consists of 13 pages. It is available at the following website: <http://wiki.larkc.eu/LarkcProject/WP8/ExchangePlan>
Here is a brief description of the report.

Name: Axel Tenschert, M. A.
Email: tenschert@hls.de
Institute: High Performance Computing Center Stuttgart (HLRS)
University of Stuttgart
<http://www.hls.de/organization/people/tenschert/>
Duration: 2 weeks (4th – 15th of May 2009)

Visit Institute: Vrije Universiteit Amsterdam (VUA)
Local contact person: Zhisheng Huang, Dr.

The topics have been covered during the visit are as follows:

- Investigation of MaRVIN
- Research Results of Investigation of MaRVIN
- Scalability Issues
- Installation
- Investigation of WP4 Reasoners
- Research results of Investigation of WP4 Reasoners
- The WP4 Reasoner
- DIG Reasoner
- Distribution / Parallelization
- Discussions and Investigation of possibilities for Ontology Matching

B.2 LarKC Exchange Program Report 2009 by Yi Zeng

The full version of the exchange program report by Yi Zeng consists of 30 pages. It is available at the following website: <http://wiki.larkc.eu/LarkcProject/WP8/ExchangePlan>



B.2.1 The Spirit of Scientific Research and Scientific Researchers - A Note on My Visit to Vrije University Amsterdam

Here are some issues which are discussed in the note of Yi Zeng's exchange program report.

- The Pragmatic Aspect of Scientific Research
- Eliminating the False and Retaining the True
- Focusing on Problem Solving and Problem Sustainability
- Challenging Your Life
- Pursuing a Degree for Science, not for the Degree Itself
- The Sanctity of Scientific Research
- The Spirit of Sharing
- The End of the Journey and the Starting of Another

B.2.2 Publications based on the Exchange Plan

- Yi Zeng, Yan Wang, Zhisheng Huang, Ning Zhong. Unifying Web-scale Search and Reasoning from the Viewpoint of Granularity. In: Proceedings of the 2009 International Conference on Active Media Technology, Lecture Notes in Computer Science 5820, 430- 441, Springer, Beijing, China, October 22-24, 2009. (Yi Zeng, Yan Wang, Ning Zhong are affiliated with the International WIC Institute, Zhisheng Huang is affiliated with Vrije University Amsterdam)
- Peiqiang Li, Yi Zeng, Spyros Kotoulas, Jacopo Urbani, Ning Zhong. The Quest for Parallel Semantic Web Reasoning. In: Proceedings of the 2009 International Conference on Active Media Technology, Lecture Notes in Computer Science 5820, 418-429, Springer, Beijing, China, October 22-24, 2009. (Peiqiang Li, Yi Zeng, and Ning Zhong are affiliated with the International WIC Institute, Spyros Kotoulas and Jacopo Urbani are affiliated with Vrije University Amsterdam)

B.2.3 Project Deliverables based on the Exchange Plan

- D4.3.1: Strategies and Design for Interleaving Reasoning and Selection of Axioms (Contributed by: Zhisheng Huang (VUA), Yi Zeng (WICI), Stefan Schlobach (VUA), Annette den Teije (VUA), Frank van Harmelen (VUA), Yang Wang (WICI), Ning Zhong (WICI)).
- D4.7.1: Initial Evaluation and Revision of Plug-ins Deployed in Use-cases (Zhisheng Huang (VUA), Barry Bishop(STI Innsbruck), Florian Fischer (STI Innsbruck), Frank van Harmelen (VUA), Hansjoerg Neth (MPG), Lael Schooler (MPG), Gaston Tagni (VUA), Annette ten Teije (VUA), Axel Tenschert (HLRS), Alexey Cheptsov (HLRS), Emanuele Della Valle (CEFRIEL), Vassil (OntoText), Yi Zeng (WICI), Yan Wang (WICI), Ning Zhong (WICI)).