D1.6.5v2 Report on the Knowledge Web portal

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Abstract.
EU-IST Network of Excellence (NoE) KWEB FP6-507482
Deliverable D1.6.5 (WP1.6)
This deliverable summarizes the updates performed during 2007 in the Knowledge Web portal and provides different statistics such as content and access statistics.

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Work package participants

The following partners have taken an active part in the work leading to the elaboration of this document, even if they might not have directly contributed to the writing of any parts of this document:
UPM

Changes

Version	Date	Author	Changes
0.1	13-11-2007	Ángel López-Cima	First draft
0.2	13-11-2007	Ángel López-Cima	Updates on the statistics
0.3	14-11-2007	Ángel López-Cima	Correction from a review by Oscar Corcho
0.4	19-11-2007	Martin Dzbor	Review, QA, text revision/editing
0.5	21-11-2007	Rosario Plaza	English correction
1.0	26-11-2007	Ángel López-Cima	Final Version

Executive Summary

This deliverable presents the report about the status of the Knowledge Web (KW)[1] Semantic Portal.

The document shows the new functionalities, which were included in the KW Semantic Portal during 2007. It also provides the statistics of the ontologies that the portal manages and we also summarize the evolution of the number of instances within the KW Semantic Portal (in terms of their number, types, etc).

Finally, the document presents the KW Semantic Portal access statistics and draws some conclusions about the issues dealt with outstanding issues and how to improve the portal in the future.

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[1] http://knowledgeweb.semanticweb.org

Contents

1. Introduction

This deliverable presents the report of the Knowledge Web (KW)[2] Semantic Portal.

In this report we present the new functionalities included in the KW Semantic Portal, which include the following:

- The updates of the JPA for the months 36-48 performed in a collaborative way.
- The import of information from a bibliography reference web server, DBLP[3].
- The editing facility of the final report of Knowledge Web.

The backbone of the KW Semantic Portal content is the set of ontologies (*Documentation*, *Person*, *Event*, etc.), which allows managing the KW Network of Excellence (NoE). The portal content changes continuously because the people and organizations involved in the NoE can insert new *articles*, *students*, *meetings*, *exchanges*, etc. at any time. For this reason, the portal content is represented as instances of the concepts in the ontology.

This document also provides the statistics of the ontologies (in terms of number of concepts, attributes, relations, etc) used by the KW Semantic Portal (see Section 5), and summarizes the number of instances of *publication*, *person*, *meeting*, and *exchange* concepts within the KW Semantic Portal in December 2004, December 2005, December 2006, and October 2007.

It also presents the KW Semantic Portal access statistics and draws some conclusions about the issues here presented.

Finally, the document describes how the portal is going to persist after the end of Knowledge Web.

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[2] http://knowledgeweb.semanticweb.org
[3] http://dblp.uni-trier.de/

2. New Internal Knowledge Web Portal functionalities

Two new functionalities have been developed for the KW Semantic Portal that are only accessible by the partners of Knowledge Web:

- The generation of a new Joint Programme of Activities (JPA) for the period that covered the months 37-48 of the NoE Knowledge Web.
- The generation of the final report of the Knowledge Web.

2.1. Generation of a new JPA

According to its contract, every twelve months, the NoE needs to generate a new Joint Programme of Activities (JPA) to plan the next 18 months. In such document, the consortium reviews the last JPA and the technical annex of the NoE, and agrees on new objectives for the next 18 months period.

This task was done in the past for each partner in a local document. Multiple individual documents were then joined into a final document – this process has been controlled by the coordinator of the NoE (IUBK). Then the UPM an IUBK decided to implement a system similar to the Progress Report support to generate the document of the JPA in a dynamic way, with all input from partners being stored in the central (KW portal) server.

According to this need, the UPM developed a system to perform this task by creating a mirror of the Knowledge Web portal accessible only by the partners in the NoE. This mirror portal contained all the information of work packages (WP), partners, and deliverables. The portal also allowed users to complete the required information, such as descriptions and plans of each WP.

2.1.1. Tasks and timeline

The complete process for generating the JPA with all the tasks is described in the workflow shown in Fig. 1. Referring to the figure, the tasks of filling the WP description, the distribution of efforts, the table of activities and milestones, and the Gantt diagram generation are supported directly by JPA system in the Knowledge Web portal.

All the tasks for the generation of the JPA can be given a specific deadline; in the specific case of KW JPA there was the flowing timeline:

- 22-Jan to 28-Jan. Partners fill in efforts for 37-48.
- 22-Jan to 04-Feb. WP leaders fill in WP descriptions for 37-48.
- 05-Feb to 11-Feb. Managing Directors update Activities, Milestones, GANTT.
- 12-Feb to 21-Feb. Area Managers update Plan for Using and Disseminating the Knowledge, Gender Action Plan.
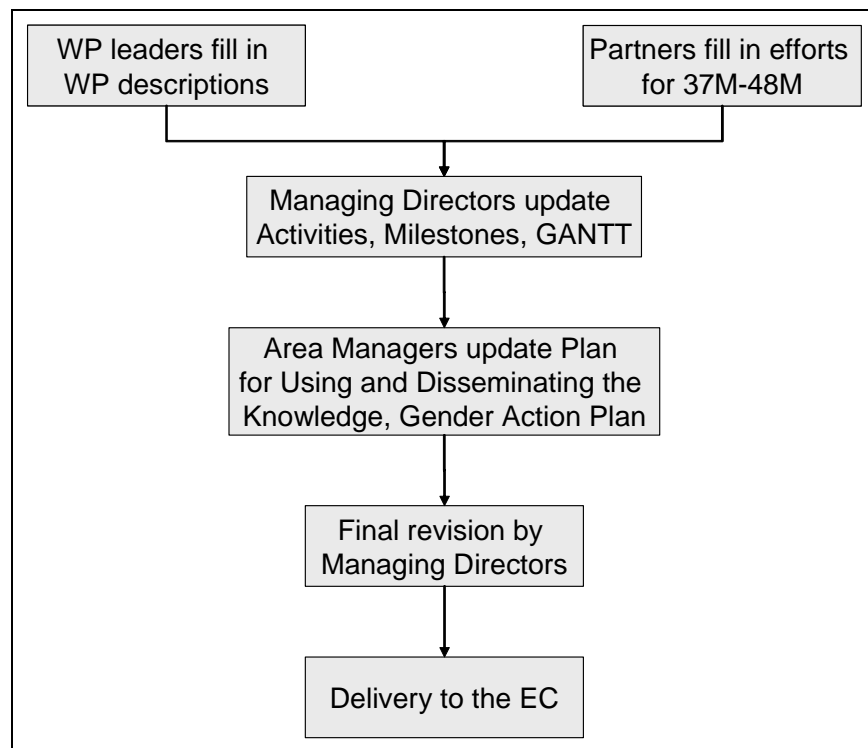- 22-Feb to 04-Mar. Final revision by Managing Directors.

Fig. 1. Workflow of the generation of a new JPA.

2.1.2. JPA system functionalities

The goal of this system was to create collaboratively the JPA 36-48 by allowing the partners to carry out the tasks described in 2.1.1.

The developed JPA system in the portal covers the following functionalities:

- WP descriptions:
    - o Objectives, expecting results, changes and updates, plan of work.
    - o Tasks.
    - o Deliverables.
- Distribution of efforts.
- Generation in HTML and MSWord of:
    - o WP Descriptions.
    - o Table of deliverables.
    - o GANTT diagram.

Additionally, the JPA generation was able to notify to a WP leader when a partner set or modified an effort of their institution in his/her WP, which allows the WP leader to monitor the distributions of effort in the WP.

To achieve the completeness of the JPA documents, the JPA generation system has been designed so that certain activities can be marked as compulsory. Thus, specific partners could be assigned a specific set of responsibilities:

- Each KWeb partner must enter the distribution of efforts.
- Each WP leader must insert the WP descriptions.
- Each WP leader must monitor the distribution of effort in the WP.

- ▪ The managing director must monitor the evolution of the document.
- ▪ The managing director must compile and review the JPA document to be delivered to the European Commission.

2.1.4. Domain ontologies

The domain ontologies used for newly designed JPA generation system included the following: Project, Organization, Documentation, and the Knowledge Web Management ontology. All these are already defined in the Knowledge Web portal.
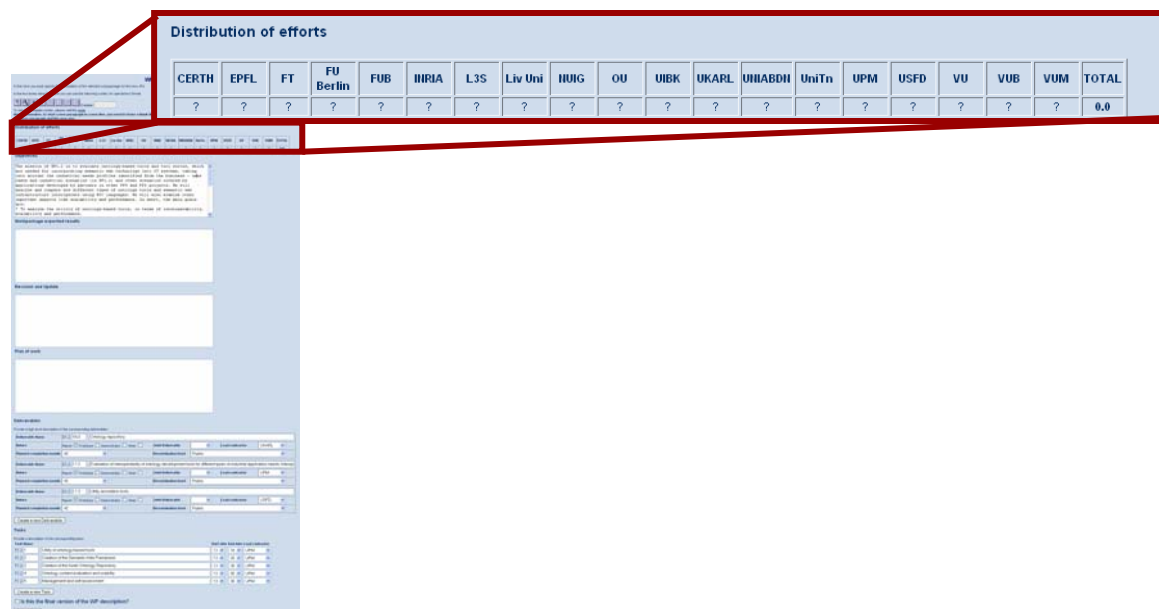
2.1.5. Web based User Interfaces

In order to make the JPA generation system simple to use, a set of forms to harvest the inputs from different partners was designed and implemented, and all these inputs were collated into a set of appropriate documents needed for the final JPA document.

Forms

The forms used in the JPA generation system are the WP description form and the effort distribution form. These forms are shown to the user when he/she logs into the system. Hence, the actual forms depend on the user roles according to who is a partner, a worpackage leader or NoE manager.

The workpackage description form shows the current distribution efforts among all the partners (see Fig. 2) and requests the WP leader the input for the new objectives, the expected results, revision and updates from the original description of the WP, the plan for the next 18 months (see Fig. 3), the list of deliverables to send during the next 18 months (see Fig. 4), and the list of tasks in the WP (see Fig. 5).

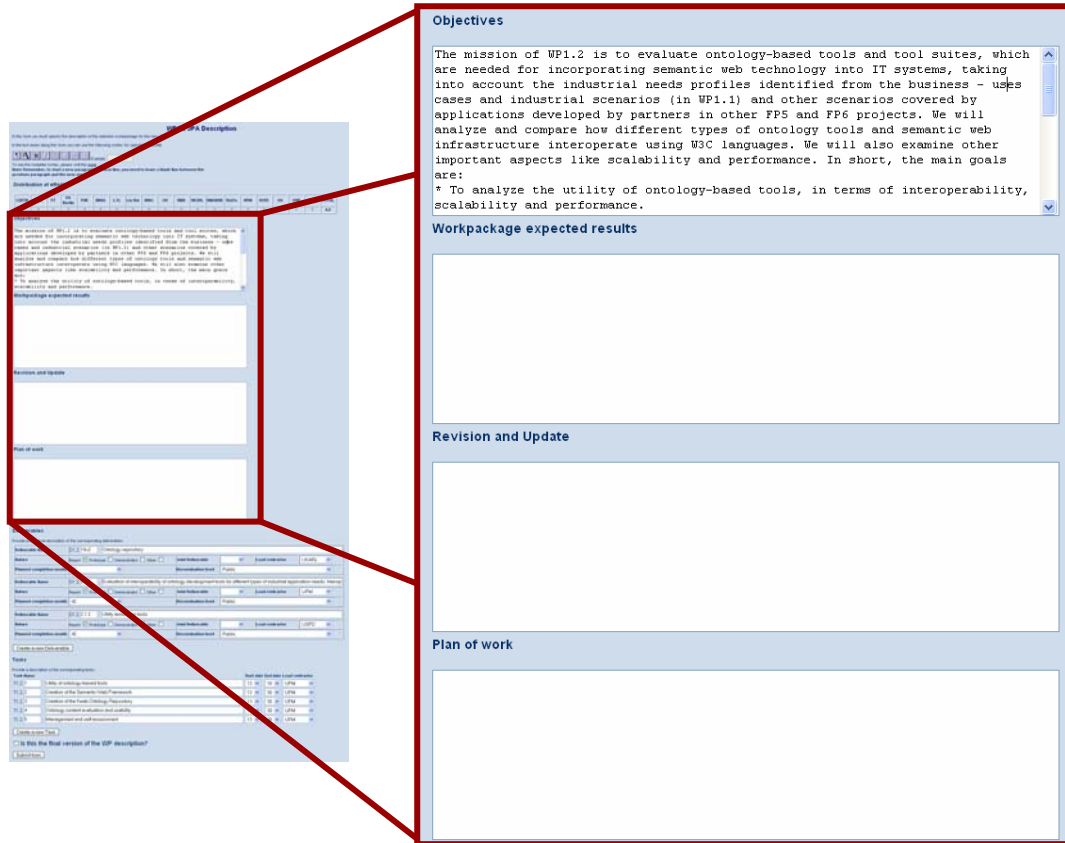Fig. 2. Distribution of efforts in the selected workpackage.

Fig. 3. Description of the workpackage in the JPA.

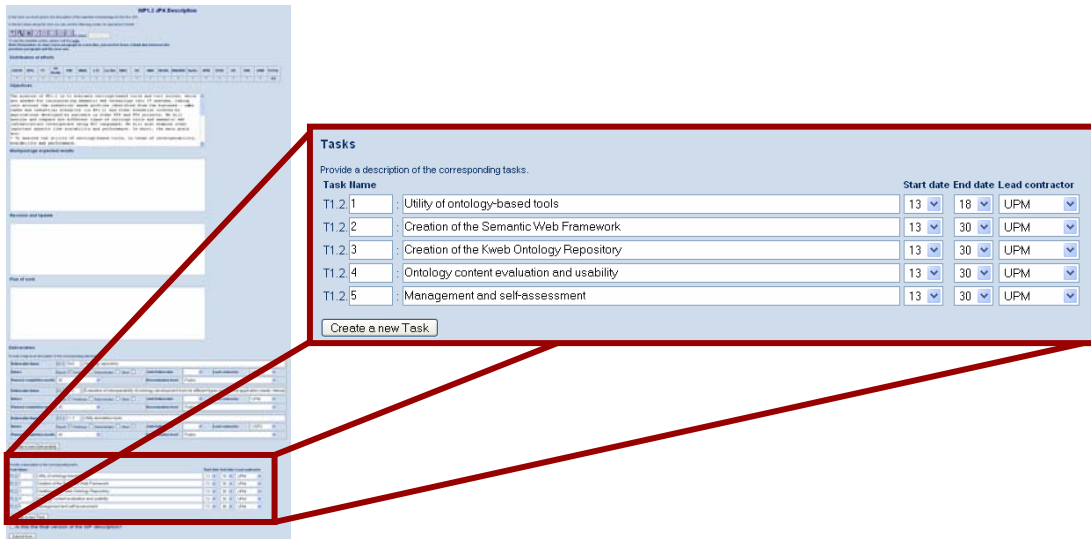Fig. 4. List of deliverables of the workpackage during the JPA.

Fig. 5. List of tasks of the workpackage during the JPA

The form of efforts asks to each partner the plans of distribution of efforts for the next JPA (see Fig. 6). When a partner submit the efforts, the efforts are updated in the form of the WP description (see Fig. 2); in this way, the WP leader knows, at any time, which partner is going to work in the workpackage and how much effort is planned to expend.

Fig. 6. Distribution of efforts of a partner during the JPA.

Generated documents

The final result of the JPA system is the generation of a document in MSWord. With the workpackage description form and the efforts form for each parnter, the system generates an MSWord document with all the information in the required format. This document has different sections:

1. Table of workpackages (see Fig. 7) with a summary of efforts and deliverables planned for each workpackage for the new JPA.
2. Table of deliverables (see Fig. 8).
3. Workpackage description (see Fig. 9). This section contains the full description of each workpackage: efforts of each partner, objectives, plans, expected results, tasks and deliverables of each workpackage.
4. Gantt diagrams of workpackage tasks (see Fig. 10).

Workpackage Nº	Workpackage title	Lead contractor	Nº Person months	Start month	End month	Deliverable Nº
1	INDUSTRY		60.58	37	48	
1.1	Industrial Application Needs	FU Berlin	8.36	37	48	D1.1.4v3 D1.1.5v3 D1.3.7
1.2	Evaluation for technology selection	UPM	15.17	37	48	D1.2.2.1.2 D1.2.2.1.3 D1.2.2.1.4 D1.2.5 D1.2.10v2
1.3	Technology Recommendations	VUB	12.67	37	48	D1.3.6 D1.3.7
1.4	Promotion of Ontology Technology	UniTn	11.67	37	48	D1.4.1v4 D1.4.2v3 D1.4.3v4
1.5	Cross Network cooperations	UIBK	5.83	37	48	D1.5.7
1.6	Semantic Portal Structure	UPM	6.89	37	48	D1.6.5 v2
2	RESERACH		130.58	37	48	
2.1	Scalability	VU	21.53	37	48	D1.2.2.1.2 D1.2.2.1.3 D1.2.2.1.4
2.2	Heterogenity	INRIA	20.52	37	48	D2.2.7 D2.2.9 D2.2.10
2.3	Dynamics	NUIG	17.95	37	48	D2.3.8v2 D2.3.9
2.4	Semantic Web Services	NUIG	38.75	37	48	D2.4.10v2 D2.4.14
2.5	Semantic Web	VUM	23.25	37	48	D1.3.6

Fig. 7. Table of workpackages.

Del. n°	Deliverable name	WP n°	Lead participant	Nature	Dissemination level	Delivery date (proj. month)
1	INDUSTRY					
1.1.2v2	Business Use cases: Collection and Distribution in Economic sectors	1.1	FT	R , O	PU	-
1.1.4v3	Report on results of the Industry-Research co-operations	1.1	FU Berlin	R	PU	42
1.1.5v3	Communication Channel with IB and Industry	1.1	FU Berlin	R	PP	48
1.2.2.1.2	Benchmarking the interoperability of ontology development tools using OWL as interchange language	1.2 2.1	UPM	R	PU	45
1.2.2.1.3	Benchmarking the utility of annotation tools	1.2 2.1	USFD	R	PU	45
1.2.2.1.4	Benchmarking the processing of Inconsistent Ontologies	1.2 2.1	VU	R	PU	48
1.2.5	Architecture of the Semantic Web Framework v2	1.2	UPM	R	PU	48
1.2.10v2	Ontology repository	1.2	UKARL	R	PU	42
1.3.6	Report on OOA activities	1.3 2.5	VUB	R	PU	42
1.3.7	Report on OOA activities	1.1 1.3	VUM	R	PU	48
1.4.1v4	Knowledge Web	1.4	UniTn	R	PU	48

Fig. 8. Table of deliverables.

Workpackage number	1.2	Start date or starting event:						Month 37				
Activity Type		Evaluation for technology selection										
Participant id	USFD	INRIA	FT	VUM	UPM	UIBK	FU Berlin	CERTH	OU	L3S	UKARL	Total
Person-months per participant:	1.33	1	0.67	0.67	4	0.33	0.33	0.33	1	3.5	2	15.17

Objectives

The mission of WP1.2 is to evaluate ontology-based tools and tool suites, which are needed for incorporating semantic web technology into IT systems, taking into account the industrial needs profiles identified from the business - uses cases and industrial scenarios (in WP1.1) and other scenarios covered by applications developed by partners in other FP5 and FP6 projects. We will analyze and compare how different types of ontology tools and semantic web infrastructure interoperate using W3C languages. We will also examine other important aspects like scalability and performance. In short, the main goals are:
- To analyze the utility of ontology-based tools, in terms of interoperability, scalability and performance.
- To define the Semantic Web Framework architecture and to evaluate it in specific scenarios.

From a content perspective, this activity will cover:
- To develop the Knowledge Web ontology metadata repositories: Oyster (decentralized repository) and ONTHOLOGY.org (centralized repository).
- To develop protocols and methods for ontology content evaluation and usability.

Either the repositories or the methods will be inputs for the OOA activity in WP1.3. WP 1.2 will provide support to WP 1.3 for installing and using the ontology metadata repositories in the OOA.

This activity require as inputs results from research activities. Benchmarking methods, benchmark suites, and benchmarking tools produced in WP2.1 and WP 2.2 will be used as inputs for evaluating the technology according to the cases and industrial scenarios produced in WP1.1.

Expected results
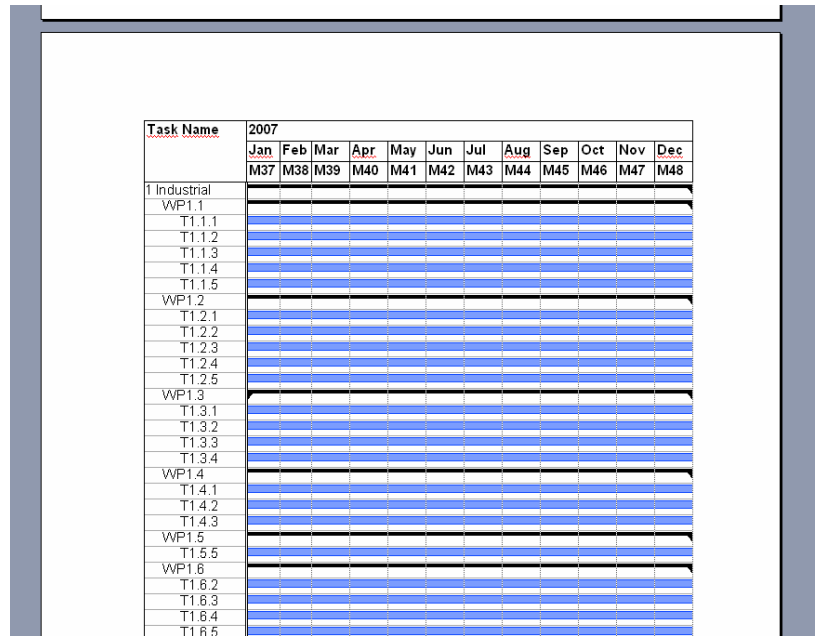
Fig. 9. Workpackage description.

Fig. 10. Gantt diagrams of tasks.

Besides, the portal generates a table with the efforts planned by each partner to expend in the next eighteen month of the project by all partners in Knowledge Web and another table with the same efforts but scaled to twelve months (see Fig. 11). Both tables can be used by all users.

Person*months allocation 18 months

	WP1.1	WP1.2	WP1.3	WP1.4	WP1.5	WP1.6	WP2.1	WP2.2	WP2.3	WP2.4	WP2.5	WP2.6	WP3.1	WP3.2	WP3.3	WP4.1	WP4.2	WP4.3	WP4.4	WP4.5	WP4.6	TOTAL
CERTH	1	0.5	0	0	0	0	0.5	0.5	0	0	1.5	0	0	0	0	0	0	0	0	0	0	4
EPFL	0	0	0	0	0	0	2	5	0	11.56	0	0	0	0	0	0	0	0	0	0	0	18.56
FT	3.29	1	0	2	1	0	0	0	0	2	2	0.5	0	0	0	0	0	0	0	0	0	11.79
FU Berlin	4.25	0.5	0.5	0	0	0	0	0	0	0	0	0.23	1	1	0	0	0	0	0	0	0	7.48
FUB	0	0	0	0	0	0	0	0	0.5	0	2.5	0	0.5	2	0	0	0	0	0	0	0	5.5
INRIA	0	1.5	0	0	0	0	3	11	3	0	3	1	1	0	2.5	1	0	1.5	0	0	0.5	29
L3S	0	5.25	0	0	0.75	0	3.75	0	0	0	0	0	3	0.75	9	0	0	1.66	0	0	0	24.16
Liv Uni	0	0	0	3.5	0	0	0	1.35	1.2	2.7	0	0	0	1.5	0	0	0	0	0	0	0	10.25
NUIG	0	0	0	1	2	0	0	0	15	20	0	0	4	0	0	0	0	0	0	0	0	42
OU	0	1.5	0	0	0	1.5	0	0	0	0	0	0	0.75	3	11.5	0	0	0.75	0	0	0.4	19.4
UIBK	0	0.5	0	1	4	0	0	3	0	17	8	0	0	0.5	0	3	2	1	0.5	0	1	41.5
UKARL	0	3	0	0	0	1.83	2.33	1.83	3.58	0	0	3	2.43	2.43	0	0	0	1.83	0	0	0	22.26
UNIABDN	0	0	0	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.5
UniTn	1	0	0	2	0	0	3.71	4	0	2.42	1.25	1.79	1.21	1.25	0.5	0	0	0	0	0	0	19.13
UPM	0	6	0	2	0	7	5	0	0	0	0	1	2	5	0	1.21	0	1.83	0	1.42	0.63	33.09
USFD	0	2	2	2	1	0	2	0	3.5	0	0	0	1	0	1	0	0	0	0	0	0	14.5
VU	0	0	3	0	0	0	6.6	3.6	0.15	0	2.7	1.35	0.9	1.5	0	0	0	12.5	0	0	0	32.3
VUB	3	0	12	0	0	0	0	0	0	0	6.75	1.5	1.5	0	0	0	0	2.25	0	0	0	27
VUM	0	1	1.5	1.5	0	0	3.4	0.5	0	2.45	7.17	2.5	0	1.83	0	0	0	2.46	0	1.83	0	26.14
TOTAL	12.54	22.75	19	17.5	8.75	10.33	32.29	30.78	26.93	58.13	34.87	12.87	19.29	20.76	24.5	5.21	2	25.78	0.5	3.25	2.53	390.56

Scaled-down person*months allocation 12 months, M37-48

	WP1.1	WP1.2	WP1.3	WP1.4	WP1.5	WP1.6	WP2.1	WP2.2	WP2.3	WP2.4	WP2.5	WP2.6	WP3.1	WP3.2	WP3.3	WP4.1	WP4.2	WP4.3	WP4.4	WP4.5	WP4.6	TOTAL
CERTH	0.67	0.33	0	0	0	0	0.33	0.33	0	0	1	0	0	0	0	0	0	0	0	0	0	2.67
EPFL	0	0	0	0	0	0	1.33	3.33	0	7.71	0	0	0	0	0	0	0	0	0	0	0	12.37
FT	2.19	0.67	0	1.33	0.67	0	0	0	0	1.33	1.33	0.33	0	0	0	0	0	0	0	0	0	7.86
FU Berlin	2.83	0.33	0.33	0	0	0	0	0	0	0	0	0.15	0.67	0.67	0	0	0	0	0	0	0	4.99

Fig. 11. Table of all partners' efforts.

2.4. Final Report

As the bimonthly progress reports proved very useful, the project coordinator requested the same functionality to create a system that allows all partners in the Knowledge Web inputting data and edit the final report collaboratively.

This functionality must include:

- The final publishable activity report.
- The activity report that includes:
    - o   an overview from each area.
    - o   a description of all workpackages during the whole project: overview, meetings, etc.
    - o   a list of deliverables grouped in workpackages.
- Results of the plans for implementing and disseminating.
- And the table of efforts.

For this system, the UPM must carry out the following:

- Modification of the Knowledge Web Management Ontology
- Design and implement of the forms that would request the information required to provide all partners, such as:
    - o   Workpackage description form.
    - o   Effort form.
    - o   Dissemination form.
- A aggregator of all partial pieces information coming from the partners to generate a draft of the final report.

Currently, the UPM is implementing the system that will be released in mid-December 2007, with an aim to receive the information from all partners by the end of December.

3. New External Knowledge Web portal functionalities

We have developed a functionality that integrates the information from DBLP[4] into the Knowledge Web portal using the of the ASPL/FacetedDBLP[5] web service. This information is also visualized when a visitor comes to a page containing information about a specific person in the Knowledge Web.

3.1. DBLP inside Knowledge Web Portal

The university Trier manages the site DBLP[6], a site of Digital Bibliography & Library Project. This site contains a large source of bibliography of computer science literature. L3S and OU have also developed a set of web services to access the information in the DBLP databases, and exposed them via a rich interface called FacetedDBLP.

L3S proposed the UPM to integrate data from DBLP exposed by the FacetedDBLP into the Knowledge Web Portal. This integration intends to make know the publications written by all persons involved in the Knowledge Web directly in the portal.

To carry out this task, we first identified which web services that can be used and the target concepts inside the ontologies used in the Knowledge Web Portal and that are related to the publications. Then, we set a mapping between the output of the web services and the target concepts. Afterwards, we configured the server to execute the mappings and manage the imported information. Finally, we decided/planned how the imported information could be viewed.

FacetedDBLP

These web services of FacetedDBLP are described in the following WSDL files:
1. http://dblp.l3s.de/WS/dblp++.php?wsdl
2. http://dblp.l3s.de/WS/aspl2.php?wsdl

From the available web services, we have identified the following web services that can be used for importing the information:

- *publication_data*: it gets all the information of a publication given the publication identification. The output of the web service is a list of the following records:
    - *dblp_key*: identification of the publication.
    - *title*: Title of the publication.
    - *abstract*: the abstract of the publication.
    - *ee*: a link to the electronic edition of the publication.
    - *year*: year of the publication.
    - *type*: where the publication is published: in proceedings, journals, etc.
    - *source*: the name of the event or journal in which it had been published.

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[4] http://www.informatik.uni-trier.de

[5] http://dblp.l3s.de/dblp++.php

[6] http://dblp.uni-trier.de/

- o *conference*: conference identification in which it was published.
- ▪ *all_publications_author_year*: it gets all the publications of an author in a range of years. The output of the web service is a list of the following records:
    - o *dblp_key*: identification of the publication.
    - o *title*: title of the publication.
    - o *ee*: a link to the electronic edition of the publication.
    - o *year*: year of the publication.
    - o *type*: where the publication is published: in proceedings, journals, etc.
    - o *source*: the name of the event or journal in which it was published.
    - o *conference*: conference or workshop identification in which it was published.
    - o *author:* the same name of the author of the request to this web service.
- ▪ *publication_authors*: gets all the authors of a given publication. The output of the web service is a list of the following records:
    - o *dblp_key*: identification of the publication.
    - o *author*: the name of an author of the publication.

Knowledge Web Documentation Ontology

The documentation ontology in the Knowledge Web is used to represent any type of document generated in a European project. These documents could be management documentation, publications, technical documents, thesis and others.

We have identified a set of target concepts involved in the integration with DBLP: the publication concept and its children concepts (see Fig. 12).
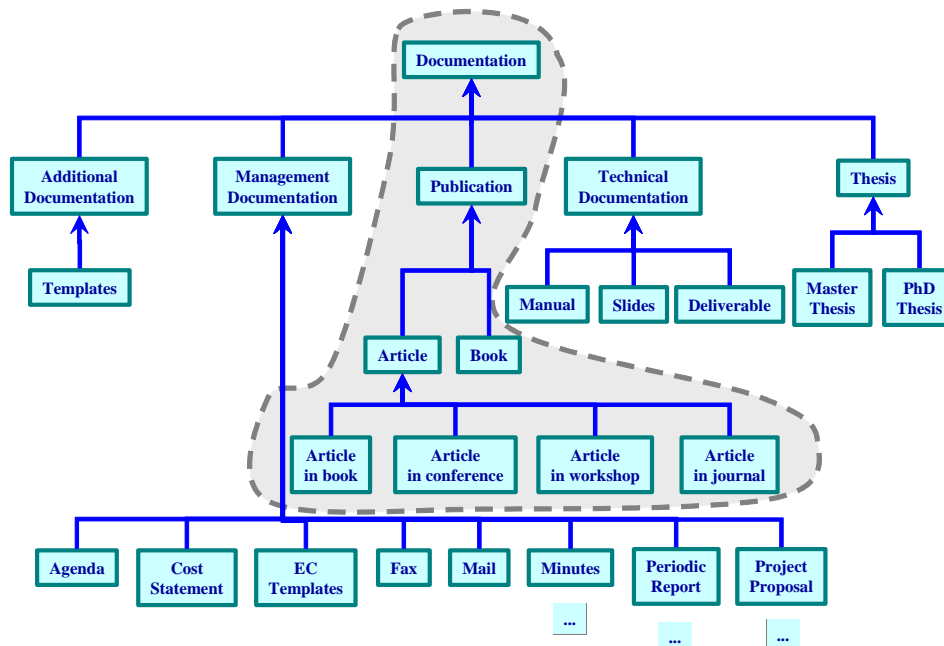
Fig. 12. Documentation Ontology

CONCEPT	ATTRIBUTE (MIN..MAX CARDINALITY)	RANGE	DESCRIPTION
Documentation	Title (1..1)	String	Document's title
	Abstract	URL	Document's abstract
	Version Number (1..1)	String	Document's version number
	On-line PDF Version (0..N)	URL	Document's on-line version in PDF format
	On-line Version (0..N)	URL	Document's on-line version. The format of this on-line version is .doc, .ppt, and so on
	has author (0..N)	Person	
	is associated with (0..N)	Network of Excellence	
	is generated by(0..1)	Organization	
Publication	Date (1..1)		Date of publication
	Keywords (0..N)		This attribute indicates the publication's keywords
Article	Pages (1..1)	Integer	
Article in Book	Book Name	String	The book where the article is published
	Volume (1..1)	Integer	The volume of the book where the article is published
	Edition (1..1)	String	The edition of the book where the article is published
	Chapter (1..1)	String	The chapter where the article is published
Article in Conference	Name of Conference (1..1)	String	The name of the conference where the article was presented
	Conference Place (1..1)	String	The location where the conference took place
Article in Journal	Journal Name (1..1)	String	The journal (magazine) where the article is published
	Volume (1..1)	String	The volume of the journal where the article is published

	Number (1..1)	Integer	The number of the journal where the article is published
Article in Workshop	Name of Workshop (1..1)	String	The name of the workshop where the article was presented
	Workshop URL (1..1)	String	URL of the home page of the workshop where the article was presented
	Editors of Workshop (1..N)	String	List of workshop's editors where the article was presented
Book	ISBN (1..1)	String	The code which identifies a book
	Editorial (1..1)	String	Publishing
	Edition (1..1)	String	
	Edition Place (1..1)	String	The location where a book has been edited
	Number of Pages (1..1)	Integer	Number of pages

Mappings

After having analysed the information that can be requested to the web services in the previous section as well as the information represented in the ontologies that the Knowledge Web portal use, we have identified the followings mappings:

- From *publication_data* web service:
    - *title*→ *Title* attribute of the *Documentation* concept.
    - *abstract*→ *Abstract* attribute of the *Documentation* concept. The *abstract* from the web service is a text, but the *Abstract* in the Documentation concept is an URL. The mapping must convert the abstract into a file and upload it to the portal.
    - *year*→ *Date* attribute of *Publication* concept. The *year* from the web service is the year of publication, but the *Date* in *Documentation* is a date with the format "*dd/MM/yyyy*", where *dd* is the day of the month, *MM* is the number of month, and *yyyy* is the year. The mapping must convert the format date to 01/01/*yyyy* where *yyyy* is the value of the year from the web services.
- From *all_publications_author_year*:
    - *conference*→ *Name of Conference* from *Article in Conference* concept or *Name of Workshop* from *Article in Workshop* concept.
- From *publication_authors*:
    - *author*→ *has author* relation from *Documentation* concept.

Mapping process

To extract the publications written by the people working in Knowledge Web from the FacetedDBLP, a procedure that executes a workflow of tasks has been implemented:

1. Identify all people working in Knowledge Web. This task executes a query in the Knowledge Web portal that retrieves those people who are known to belong to an organization that is involved in the Knowledge Web project.

2. Retrieve a list of publications for each person working in Knowledge Web, using the list acquired in step 1. This task calls the FacetedDBLP web service *all_publications_author_year* given the names of those persons from the task executed in 1 and the year that corresponds to the beginning of the Knowledge Web project and the current year. From these calls, the publication identifications (*dblp_key* field) are obtained.

3. Obtain the detailed publication information. using the acquired publication identifiers (*dblp_key*), this task calls the *publication_data* web service to obtain the fields like *title*, *abstract* and *year*, and also calls the *publication_authors* service to obtain all (additional) authors of the publication.

4. Map the information retrieved from FacetedDBLP to *Documentation Ontology*. With the information extracted in task 3: title, abstract, year and author, this step transforms these data to instances and attributes of the concept *Publication* in the *Documentation Ontology*.

Because the execution of this procedure for a single person is a fairly time-consuming task, this functionality is not provided as a run-time functionality. Instead, this procedure, which includes 4 tasks (as describe aboce), executs every Monday and creates a local mirror of the information from the FacetedDBLP for all publications of Knowledge Web related people. This information is stored locally as instances of the *Documentation Ontology*.

Visualization and data presentation

The visualization of persons in the portal has been extended with the publication of FacetedDBLP as shown in Fig. 13.

Conclusion

We explain in this section how the information from FactedDBLP is imported into the Knowledge Web portal and how it is visualized. From the point of view of designing web pages, the portal manages both the internal and the external information, thus, the information from FacetedDBLP can be shown. Currently, this information is intended to help generate the Dissemination Report of Knowledge Web.

Fig. 13. Visualization of publications from FacetedDBLP.

4. Knowledge Web Portal Ontologies Statistics

As stated in the deliverable *D.1.6.1 "Portal requirements analysis and system design"*, the KW Semantic Portal[7] has been built reusing and improving the technology produced in the Esperonto[8] (IST-2001-37343) project.

This technology is known as ODESeW [2][4], and it is an ontology-based application built within using WebODE ontology engineering workbench[9]. ODESeW allows managing knowledge-intensive ontology-based Intranets and Extranets.

The KW Semantic Portal has been running since March 1st, 2004. This semantic portal can manage multiple interlinked ontologies. So far, six *project description* ontologies (*Documentation*, *Event*, *Organization*, *Person*, *Project*, and *T-REX*), plus one *User* ontology [4], one *Management Report* ontology [4], and one *Risk Management* ontology have been developed to be included in the KW Semantic Portal. These ontologies are intended to support the KW NoE management, the result dissemination, and the different exchanges within the network. These nine ontologies have been developed with METHONTOLOGY [3] and the WebODE ontology engineering workbench, and have been evaluated with ODEval [1]. Such ontologies are available in RDFS and OWL within the portal (a user and a password are required). Five of the nine ontologies used are presented in detail in the deliverable *D.1.6.2 "Portal Ontology"*.

The core of the *project description* ontologies (except the *T-REX* ontology) is being reused in other European, spanish project portals and others portals:

- Esperonto. http://www.esperonto.net
- OntoGrid. http://www.ontogrid.eu
- NeOn. http://droz.dia.fi.upm.es/neon
- X-Media. http://oeg-lia2.dia.fi.upm.es/xmedia
- Servicios Semanticos. http://droz.dia.fi.upm.es/servicios
- Red Web Semántica. http://www.redwebsemantica.es
- OEG portal. http://www.oeg-upm.net.

The statistics of the nine ontologies mentioned above (number of concepts, attributes, and ad-hoc relations) released on 24th November 2007 are shown in Table 1.

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[7] http://knowledgeweb.semanticweb.org
[8] http://www.esperonto.net
[9] http://webode.dia.fi.upm.es

	Number of concepts	Number of attributes	Number of ad-hoc relations	Number of instances
Documentation Ontology	36	36	15	489
Event Ontology	12	10	4	107
Organization Ontology	4	9	9	37
Person Ontology	18	13	11	224
Project Ontology	6	30	22	277
T-REX Ontology	4	6	2	310
User Ontology	10	0	1	53
Management Report Ontology	17	11	15	5518
Risk Management Ontology	6	7	5	222

Table 1. KW Ontology Statistics

5. Knowledge Web Portal Content Evolution

The KW portal content is internally represented as instances of the nine project description ontologies included in the KW Semantic Portal. Content is available in RDF within the portal (a user and a password are required).

To show how the content in the KW Semantic Portal has evolved during its life, we provided the number of instances of the following issues (concepts) in December 2004, 2005, 2006, and October 2007.

❑ Number of publication instances, divided into different categories (in book, in conference, in journal, and in workshop) and books during each year (see Table 2 and Fig. 14).

	Dec 2004	Dec 2005	Dec 2006	Oct 2007	Total
Publication	77	12	51	34	174
Article	67	12	47	28	154
Article in Book	3	1	2	2	8
Article in Conference	33	5	23	16	77
Article in Journal	9	1	3	6	19
Article in Workshop	22	5	19	4	50
Book	10	0	4	6	20

Table 2. History of the Number of Publications inserted in the KW Semantic Portal
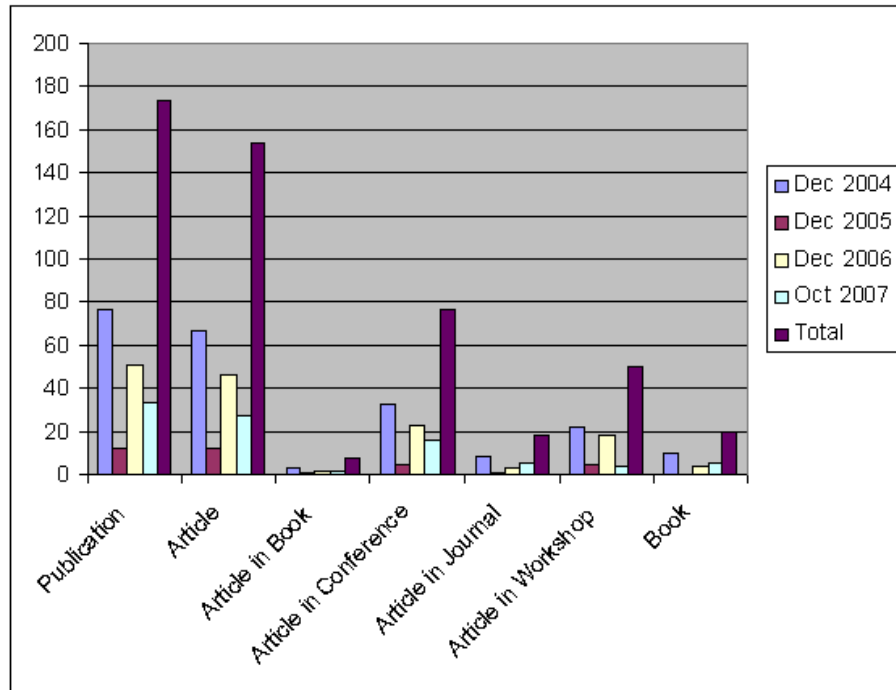
Fig. 14. Graphic of the Evolution of the Number of Publications inserted in the KW Semantic Portal

❑ Number of persons involved in KW, divided into university staff, company staff, and students. The number of instances inserted in the KW Semantic Portal during each year (2004, 2005, 2006, and 2007) and the total number of instances in the KW Semantic Portal are shown in Table 3 and in Fig. 15.

	Dec 2004	Dec 2005	Dec 2006	Oct 2007	Total
University Staff	92	19	13	5	129
Company Staff	9	1	-2	0	8
Student	37	19	2	2	60

Table 3. History of the Number of Persons inserted in the KW Semantic Portal
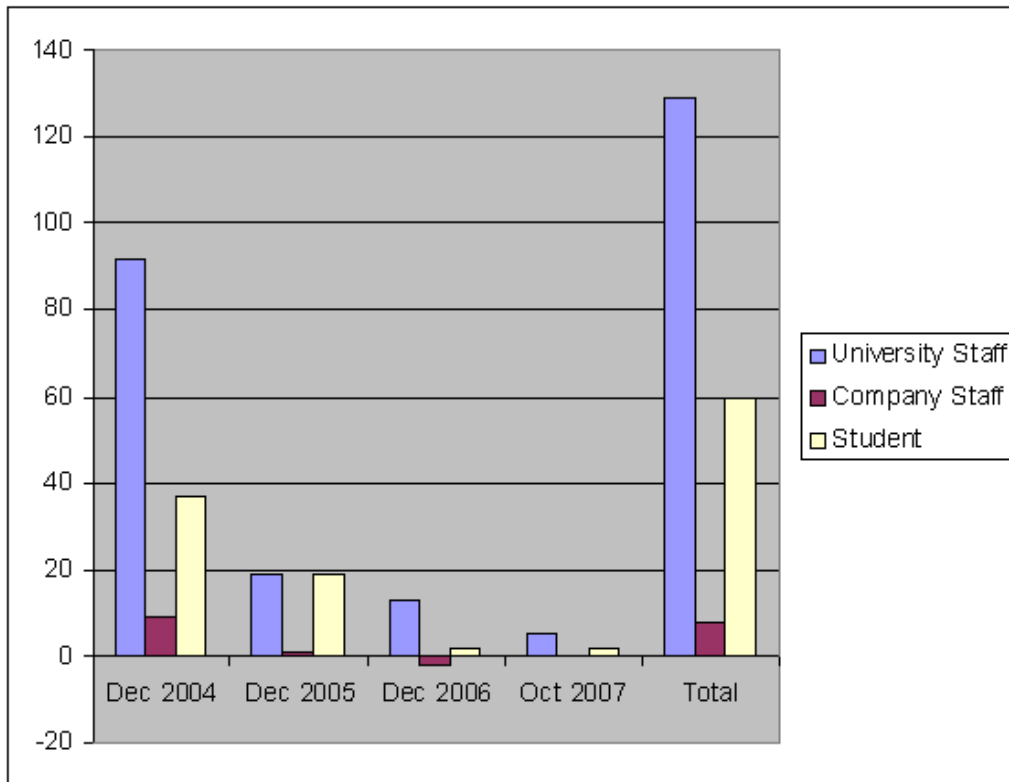
Fig. 15. Graphic of the Evolution of the Number of Persons inserted in the KW Semantic Portal

❑ Number of KW meetings, divided into the three types of area meetings (industry area meeting, research area meeting, and education area meeting) and plenary meetings. The number of instances inserted in the KW Semantic Portal during each year (2004, 2005, 2006, and 2007) and the total number of instances in the KW Semantic Portal are shown in Table 4 and in Fig. 16.

	Dec 2004	Dec 2005	Dec 2006	Oct 2007	Total
Industry Area Meeting	5	2	1	0	8
Research Area Meeting	3	0	0	0	3
Education Area Meeting	5	3	4	3	15
KW Plenary Meeting	3	3	1	1	8

Table 4. History of the Number of Meetings inserted in the KW Semantic Portal
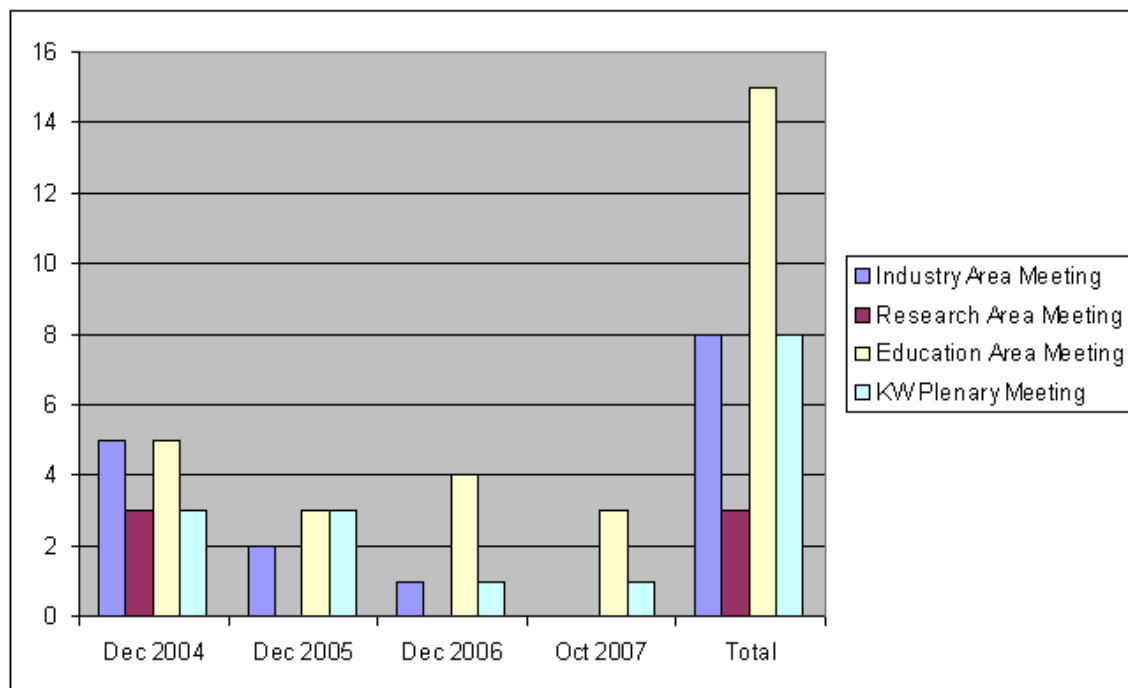
Fig. 16. Graphic of the Evolution of the Number of Meetings inserted in the KW Semantic Portal

❑ Number of exchanges within KW (T-REX ontology). The number of exchanges inserted in the KW Semantic Portal during each year (2004, 2005, and 2006) and the total number of exchanges are shown in Table 5 and Fig. 17.

	Dec 2004	Dec 2005	Dec 2006	Oct 2007	Total
Exchange	14	18	7	10	49

Table 5. History of the Number of Exchanges inserted in the KW Semantic Portal
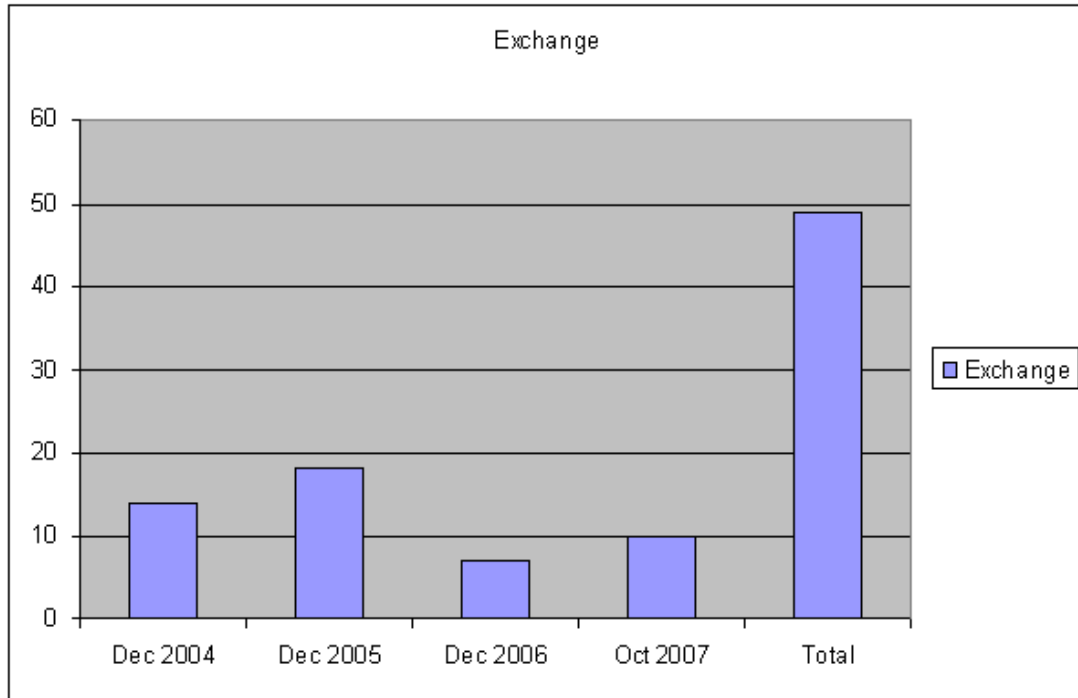
Fig. 17. Graphic of the Evolution of the Number of Exchanges inserted in the KW Semantic Portal

6. Portal Access Statistics

Fig. 18 presents the KW portal hits from March 1st, 2004 to October 31st, 2007. During this period, 941,179 hits were counted. 44% of these hits were made by KW members and 56% by non-KW members.
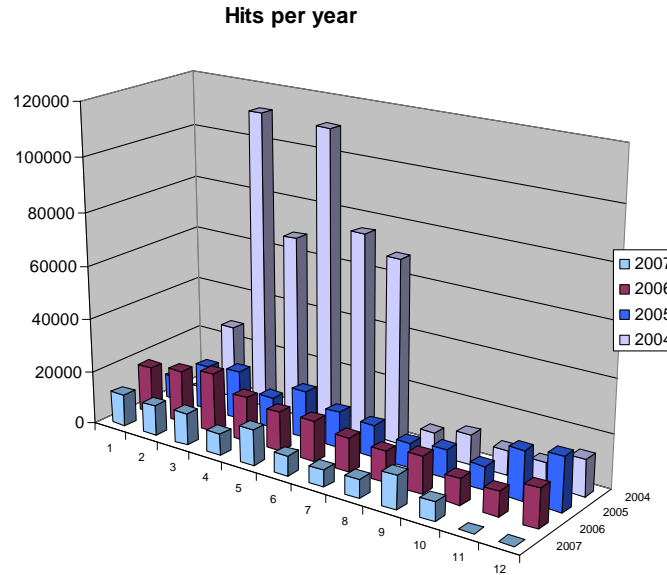
Hits per year

Fig. 18. KW portal visits per year

Fig. 19 shows the access statistics per partner domain from 2004 to 2007; hits from organizations outside Knowledge Web are not included.

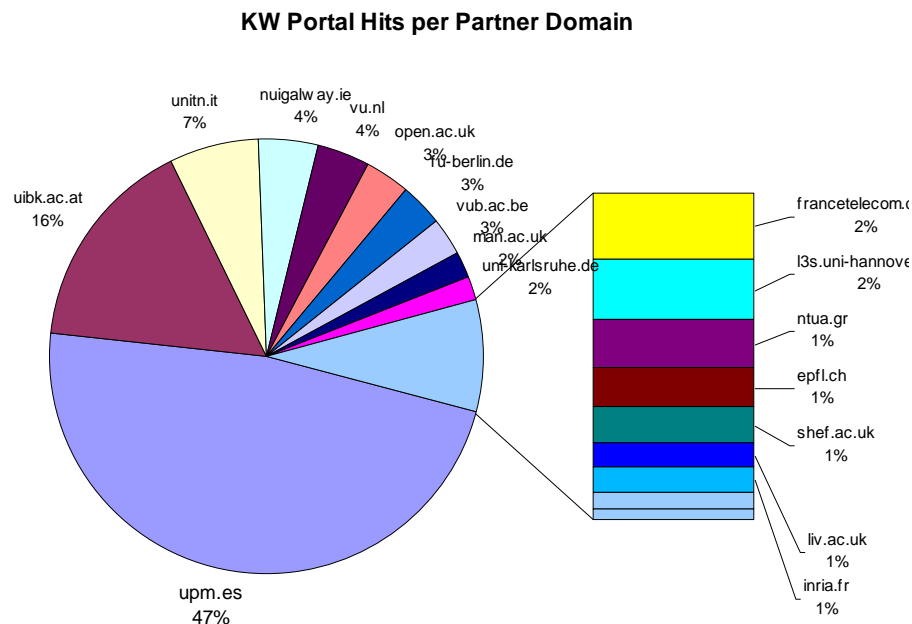**KW Portal Hits per Partner Domain**

Fig. 19. KW portal hits per partner domain from 2004 to 2007

In Fig. 20 we can see that every year the number of visitors from organizations inside and outside Knowledge Web.
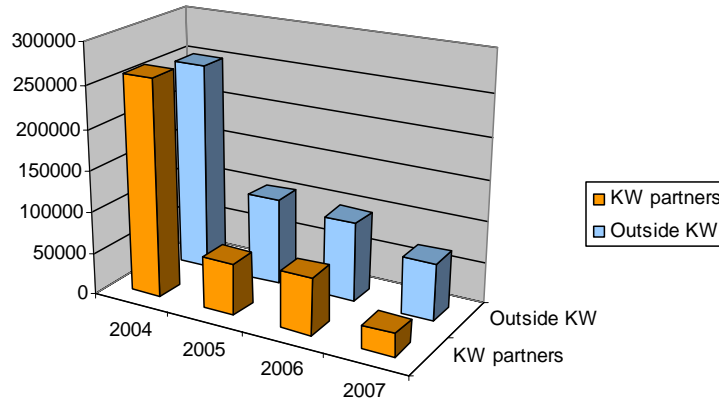

Fig. 20. KW portal visits from non partners per year

After analyzing the access from the top ten countries (see Fig. 21), we can say that from 2004 to 2007 almost all accesses were made from the United States, Spain, and United Kingdom. In the case of Spain, the high number of accesses is due to the management and update of the portal and its content. In Fig. 22 we can see the visits per country per year.
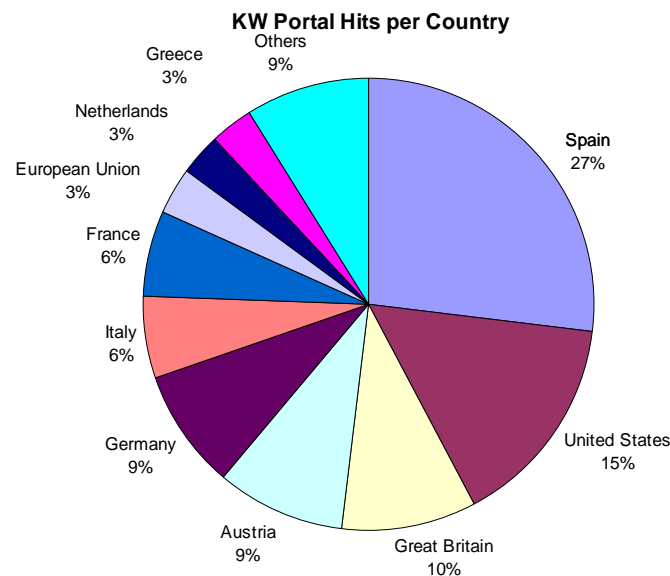

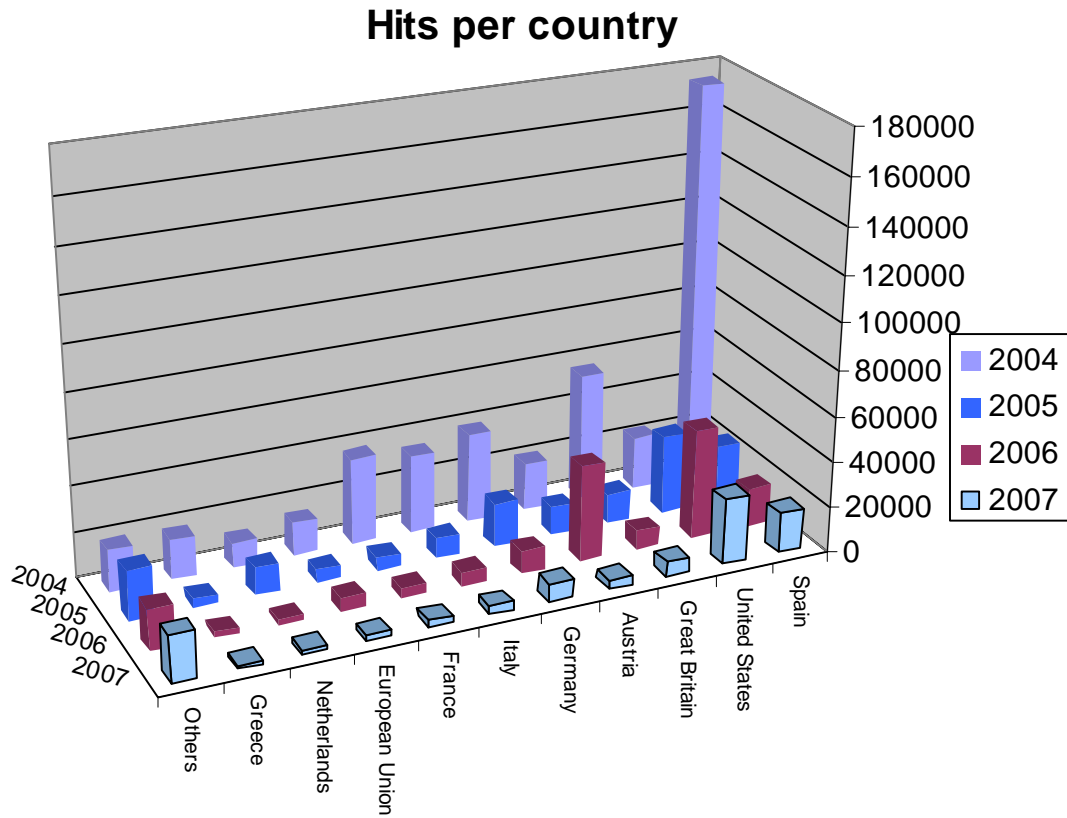Fig. 21. KW portal visits per country from 2004 to 2007.

Hits per country

Fig. 22. Hits per country per year

7. The future of Knowledge Web Portal

Knowledge Web will finish at the end of 2007, but all publishable information, research and documentation will persist after this date.

The portal of Knowledge Web contains public information, and also, internal information. During a meeting between the UPM and IUBK, it was decided how the portal was to be maintained after the project.

The functionalities for knowledge insertion in the Knowledge Web portal do not need to be maintained after the project ends. Consequently, the UPM has decided to create a static version of the content instead of a dynamic one. With this solution, the content will be alive whereas the efforts put in by the UPM to keep the content should be low.

For those documents that are no public but are accessible to the partners of Knowledge Web, there will be a common restricted user portal to allow all partners to download those deliverables.

8. Conclusions

This deliverable presents the new functionalities included in the KW Semantic Portal. The semantic portal hosts the system that allows the edition of the new JPA collaboratively and includes publications taken from the FacetedDBLP web services of the persons involved in Knowledge Web. It serves the system that permits editing the final report of the Network of Excellence.

The KW Semantic Portal is able to manage multiple interlinked ontologies. For the time being, nine project description ontologies, plus one *User* ontology, one *Management Report* ontology, and one *Risk Management* ontology have been developed to be included in the KW Semantic Portal. In this deliverable, the statistics of these nine ontologies (number of concepts, attributes, and ad-hoc relations) released on 31st October 2007 are presented.

We also present the evolution of the number of instances of the issues that we think are the most interesting for the Knowledge Web management. These issues are: publications, people, meetings and exchanges.

This deliverable also shows the visits made to the KW Semantic Portal from March 1st, 2004 to 31st October 2007. 44% of these visits were made by KW members, the remainder 56%, by non-KW members.

Then, this deliverable explains what the future of the Knowledge Web portal will be when the Knowledge Web ends regarding public information, public deliverables, and restricted deliverables to be downloaded by the KW partners.

To conclude, we are currently studying the possibility to reuse the ontologies and the software developed in the Knowledge Web in other project as a tool for helping the management.

9. **References**

1. Corcho, O.; Gómez-Pérez, A.; González-Cabero, R.; Suárez-Figueroa, M.C. 2004. "*ODEval: a Tool for Evaluating RDF(S), DAML+OIL, and OWL Concept Taxonomies*". 1st IFIP Conference on Artificial Intelligence Applications and Innovations (AIAI 2004). Toulouse, France. August 22-27, 2004.
2. Corcho, O.; Gómez-Pérez, A.; López-Cima, A.; López-García, V.; Suárez-Figueroa, M.C. 2003. "*ODESeW. Automatic Generation of Knowledge Portals for Intranets and Extranets*". International Semantic Web Conference 2003 (ISWC03). Lecture Notes in Computer Science (2870). PP: 802-817.
3. Fernández-López, M.; Gómez-Pérez, A.; Pazos-Sierra, A.; Pazos-Sierra, J. 1999. "*Building a Chemical Ontology Using METHONTOLOGY and the Ontology Design Environment*". IEEE Intelligent Systems & their applications. January/February PP: 37-46.
4. Gómez-Pérez, A.; López-Cima, A.; Suárez-Figueroa, M.C.; Corcho, O. 2006. "*The ODESeW platform as a tool for managing EU project: the KnowledgeWeb case study*". 15th International Conference on Knowledge Engineering and Knowledge Management (EKAW 2006). Managing Knowledge in a World of Networks. Springer. LNAI 4248. Steffen Staab, Vojtêch Svátek (Eds). Pages: 389-396. Podebrady, Czech Republic. October 2-6, 2006.