HARMOSEARCH
the future of information services

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FP7-SME-1
Project no. 262289

HARMOSEARCH

Harmonised Semantic Meta-Search in
Distributed Heterogeneous Databases

SEVENTH FRAMEWORK PROGRAMME

D9.3 V1.0

Collection of Dissemination Material

Due date of deliverable: 2013-02-28
Actual submission date: 2013-02-28

Start date of project: 2010-12-01 Duration: 27 month

Project funded by the European Commission within the Seventh Framework Programme		
Dissemination Level		
PU	Public	**X**
PP	Restricted to other participants (including the Commission Services)	
RE	Restricted to a group specified by the Consortium (including the Commission Services)	
CO	Confidential, only for members of the Consortium (including the Commission Services)	

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PROJECT ACRONYM: **HARMOSEARCH**

Project Title: Harmonised Semantic Meta-Search in Distributed Heterogeneous Databases

Grant Agreement: 262289

Starting date: December 2010 **Ending date: February 2013**

Deliverable Number: D9.3, Version 1.0

Title of the Deliverable: Collection of dissemination material

Lead Beneficiary: Museumsmedien

Task / WP related to the Deliverable: WP 9, Task 9.3

Type (Internal or Restricted or Public): Public

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Contractual Date of Delivery to the CEC: February 28th 2013

Actual Date of Delivery to the CEC: February 28th 2013

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1 INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

This document describes the dissemination activities carried out by the HarmoSearch consortium members during the project period and provides a summary overview of the dissemination material.

1.2 REALTIONSHIP WITH OTHER DOCUMENTS

The deliverable D9.1 *Dissemination Plan* was the basic for the framework of dissemination activities and sustainability considerations defined by the consortium members. The planned actions as described in D9.1 *Dissemination Plan*, were realized and new actions were performed.

Deliverable D9.2 *Website Launching* provides detailed information about the HarmoSearch website

Deliverable D7.2 *Running Prototype* provides all information concerning the HarmoSearch platform itself.

1.3 DEFINITION OF TERMS AND ABBREVIATIONS

The following terms and definitions are used throughout this document:

Potential partners

Those are mainly boards, associations or institutions from the fields of culture and tourism, with whom the consortium members were in contact. The cooperation was usually with responsible individuals or teams. The aim was to introduce HarmoSearch and to win them for participation in the development phase and for future business relationship.

Letters of intent (LOI)

Those letters are documents outlining an agreement between potential partners to continue an exchange of information, developments, use and advice towards HarmoSearch.

1.4 STRUCTURE OF THE DOCUMENT

This document is structured as follows

- Section 2: Materials to support dissemination activities

The produced and used dissemination materials will be mentioned in general. The Handouts and video tutorials which were produced after the review in November 2011 will be introduced more in detail.

- Section 3: The phases of the dissemination activities

Introducing the project to potential partners, Involving of external partners to take part and *Supporting interested partners* describes the procedure as HarmoSearch were introduced and explained in different areas and to different target groups. Furthermore at this point the letters of intent are presented.

- Section 4: Listing of activities by each member of the consortium

The dissemination activities each consortium member initiated and accomplished will be presented in this section.

- The annex contains copies of the letters of intent and screenshots of websites as proof of dissemination activities.

2 MATERIALS TO SUPPORT DISSEMINATION ACTIVITIES

For a broad dissemination on different channels, several digital and physical materials were produced to represent the project: corporate identity, website, leaflet, poster, handouts and video tutorials. Depending on the purpose, as direct talk, event, conversation, presentation, lecture, or keynote, these various materials supported the personal activities of the partners and the dissemination of HarmoSearch at all.

2.1 CORPORATE IDENTITY (CI)

Right after the Kick off meeting in December 2010 the projects CI was developed. This includes a logo, a word template and the design for the projects website.

2.2 WEBSITE

In January 2011 the website was technical and graphical built up. Content was added and the website was launched on 15th February 2011. Since that time the website is updated regularly to provide the current state of the project.

In addition to providing important information and latest news about HarmoSearch the website offers all public deliverables and documents of the project. The current event calendar gives an overview about important and interesting conferences and fairs. Links to twitter and Facebook, the HarmoSearch YouTube channel and the *digitalmeetsculture* project are available as well as the HarmoSearch video tutorials and a link to the HarmoSearch platform. (*Figure 1*)

2.3 PRINTS

Beside the digital materials to promote and introduce HarmoSearch, different printed materials were produced. This enables the consortium members to "give" information about HarmoSearch for different purposes. In this way information about HarmoSearch could be spread within the potential partners´ teams. It “places a trace” of HarmoSearch.

As in D9.1 *Dissemination plan* described these are:

- Word template
- Power Point Template
- Leaflet
- Poster

2.4 NEW MATERIALS: HANDOUTS AND VIDEO TUTORIALS

Handouts

The production of handouts in different languages was the result of discussions within the consortium. For the quick provision of summarised information for the non technical interested persons in the target group, this is very helpful material. Especially in the sector of museums and cultural institutions, which often have a lack of deeper technological knowledge. In such cases it was necessary and useful to present the project with the intelligible handouts.

The handouts are available in English, French, Italian and German language. The basic English content was edited and translated by the consortium members.

Using the handout, the partners have a fast way to print out the basic information. It is prepared for printing at an A4 sheet, so the handout is easy to use and cost-efficiently. (*Figure 2-5*)

Video tutorials:

The two video tutorials are the cinematic realization of using the HarmoSearch platform. This was an idea since the kick off meeting of the project, to produce those very attractive “step by step instruction” with audiovisual help. On the one side this makes the use of a complex system much easier; on the other it is an "up to date" method for the use in video portals.

Video tutorial 1 is titled:
XML Data integration with HarmoSearch

This video tutorial focuses on XML Data integration using the HarmoSearch mapping tool. The example shows the simple mapping from one xml schema to another xml schema.

Video tutorial 2 is titled:
Exporting a mapping project with HarmoSearch

This video tutorial illustrates how existing mapping projects can be exported to an archive file using the HarmoSearch mapping tool. The resulting archive file can than be shared among other users.

Both videos show in detail, how you can use the mapping tool of HarmoSearch to easily convert your data-structure to the HarmoSearch platform. The videos show step by step, how to use the mapping. The users can choose between different video quality (resolution) and formats, for every need.

To spread the video tutorials as far as possible they are available on the following different channels and in different file sizes:

- On the website with its own menu option *Video Tutorials*. Here the tutorials are available in flash format. Under *Downloads* you can choose between flash and high quality (mp4). (*Figure 6*)

Links on the HarmoSearch website:

XML Data integration with HarmoSearch

http://www.harmosearch.com/fileadmin/public/downloads/create_mapping_ful.flv

http://www.harmosearch.com/fileadmin/public/downloads/create_mapping_full.mp4

Exporting a mapping project with HarmoSearch

http://www.harmosearch.com/fileadmin/public/downloads/export_project_full.flv

http://www.harmosearch.com/fileadmin/public/downloads/export_project_full.mp4

- Furthermore the video tutorials are available on the HarmoSearch YouTube channel. to benefit from the visibility and social features of this platform. (*Figure 7*-*8*)

Links to YouTube channel:

XML Data integration with HarmoSearch

http://www.youtube.com/watch?v=v952_qwhHtk

Exporting a mapping project with HarmoSearch

http://www.youtube.com/watch?v=6Vk5ltFAm3Y

2.5 THE HARMOSEARCH PLATTFORM

At http://harmosearchdev.harmonet.org/landing-search-qualified-events. the running prototype of the HarmoSearch platform is available. Since HarmoSearch is visible and usable, it was possible to show the functions and options directly. This was very helpful in discussions and guidance with potential partners who had no technical support staff or knowledge. (*Figure 9*)

3 PHASES OF THE DISSEMINATION ACTIVITIES

Based on D9.1 *Dissemination Plan* and the sustainability considerations of the consortium members, the approach to reach the defined goals was divided into three phases:

Introducing the project to potential partners

During this phase the members tried to find as many potential partners as possible, and introduced HarmoSearch to them. This took place, in direct talks, in Skype or live meetings. In addition to these targeted and focused actions on one partner the consortium members were present e.g. on conferences, (trade) fairs, and exhibitions. The emphasis of spreading HarmoSearch into the interested community was not only from consortium member to one interested partner but to distribute it into a wider group of potential users.

In this context the dissemination materials *website*, *leaflet, poster handouts* and *video tutorials* had an important function. They are easy to show and to spread, and they could give an overview or really detailed information of the use of HarmoSearch if needed.

Introducing the project to potential partners is a work that is still going on, as a goal of the sustainability considerations.

Involving of external partners to take part

This was one of the emphasis phases, when the consortium members involved selected partners, to take part in the HarmoSearch project in advance and within the evaluation period. Apart from Euromuse as a big content-provider with its data, Biella Tourism Office was another involved content provider.

The intense collaboration between this content providers and HarmoSearch was mainly organized and supported by CTRL Solutions and Stiftung Preußischer Kulturbesitz (SPK).

Supporting interested partners

Other interested partners and “no content providers” were introduced in HarmoSearch with personal assistance of the consortium members.

The activities in the three phases were held not purely chronological, rather, the phases built on each other. This took and takes place over more or less some month depending of the potential partner, their interest, needs and possibilities.

The monthly skype meetings and physical consortium meetings were a good possibility to discuss the ongoing of the described activities of each member, next actions to perform, and see how or if the members could collaborate in those.

3.1 LETTERS OF INTENT

Some of the potential HarmoSearch partners who were involved in the second and third phase showed great interest in HarmoSearch technology. In order to provide a basis for a further continuation of the relationship and as a document of the carried out activities and the seen opportunities, the consortium members got several Letters of Intent from different potential partners.

In alphabetical order, these are the Letters of Intent:

- Adriamuse, IPA Adriatic Cross Border Cooperation (*Figure 10*)
- Berlin's online platform for museums (*Figure 11*)
- EGMUS European Group on Museum Statistics (*Figure 12*)
- Foundation German Resistance Memorial Center (GDW) (*Figure 13*)
- Memorial Museums Department as Part of the Foundation Topography of Terror and the Memorial Museums Database (*Figure 14*)
- Museums Association of Federal State Saarland (SMV) (*Figure 15*)
- Museums of the Greater Region of Saarland, Lorraine, Luxembourg, Wallonia, Rhineland Palatinate (AMGR) (*Figure 15*)
- Library Service centre Baden-Wuerttemberg (BSZBW) (*Figure 16*)

4 LISTING OF ACTIVITIES BY EACH MEMBERS OF THE CONSORTIUM

The following tables of dissemination activities describe detailed the various measures to introduce HarmoSearch to potential partners and to whom the members of the consortium introduced it. Many opportunities were taken to make HarmoSearch on different channels known. The HarmoSearch consortium of SMEs and research partners operating in different domains. The tourism sector, the cultural and the research sector are presented in the project.

As a result of these different and diverse sectors of work of the consortium, HarmoSearch was presented at trade fairs and conferences with different items; it was explained to working groups in the tourism sector and museums organisations or academic staff in institutions with cultural and scientific background. At TU Vienna (one of the research partner in the project) HarmoSearch was content of lectures and seminars at Institute of Software Technology and Interactive Systems.

4.1 ECTRL SOLUTIONS

Method	Description	Notes
Presentation on Website	HarmoSearch is mentioned on the company website www.ectrlsolutions.com/	HarmoSearch is mentioned on a dedicated page. (*Figure 17*)
Inform customers directly	Meeting with representative of Adriamuse project	Presentation took place in 16-9-2011. Preparation of presentation, further discussion for supporting the evaluation phase for their adoption. Further discussion then in 2012 and 2013.
	Biella Tourism Office: explanation of the HarmoSearch project and results to the director and a member of the board.	Meeting in March 2012; then further exchange of material. Biella then became content provider for HarmoSearch.
	Meeting in Tel-Aviv presenting HarmoSearch to some innovative companies: SPORTS EVENTS 365, PERSONYZE,	The meeting took the 26/27-3-2012 in Tel Aviv; it was organized by a Trentino public local agency for supporting cooperation Trentino-Israel. In that meeting, HarmoSearch

Method	Description	Notes
	BIZZYDESK, HipDealz, WIX.	project was presented to Tel Aviv based hi-tech companies.
	Contacted the Italian Touring Club and the University of Bergamo (as supporter)	Exchange of information in September 2012 for adopting HarmoSearch as a tool for interoperability.
	Presentation of HarmoSearch to representatives of a country tourism board.	2013, January and February. Skype meeting with representatives of a country tourism board for the adoption of HarmoSearch as interoperability tool.
	Introducing HarmoSearch to Trentino tourism office.	Meeting in December 2012 with Trentino tourism office representative.
(Trade) Fairs	BTO (Buy Tourism Online) 2011. Introducing HarmoSearch within the IFITT Italian Chapter.	1-2 December 2011, Stazione Leopolda, Florence: In a talk, introducing HarmoSearch as a solution to the interoperability problem
Conferences	Enter 2013.	Disseminating HarmoSearch ideas within the Enter 2013 conference, in Innsbruck.
	Venezia 2019 – Salone europeo della cultura http://www.venezia2019.eu	In a talk, introducing HarmoSearch as a solution to the interoperability problem.

4.2 AFIDIUM

Method	Description	Notes
Presentation on Website	HarmoSearch is mentioned on the company website http://www.afidium.com	The website was redesigned in August 2012. Since, HarmoSearch is present on several pages: : - a logo on the homepage, - a short description in the references (2nd most viewed page) with a link for details, ANNEX figure 3 - a complete dedicated page, - an introduction in the parent page of this dedicated page. (*Figure 18-21)*
Social media (Facebook, LinkedIn, Twitter, etc)	Direct contacts acquisition	The company has no social media profile. Yet, its employees use Twitter, Viadeo & LinkedIn to contact professionals and plan further discussion
Inform customers directly	Quick introduction of the possibilities of HarmoSearch	Many companies and institutions were contacted in order to present HarmoSearch, such as tourism offices, the Exchange for Travel association, media (TV, radio, press…), company related to tourism and edition…
	Dedicated calls & meetings with several companies to present the functionalities and possibilities of HarmoSearch	Among the company Afidium contacted, further presentation has been performed (calls, Skype or live meetings) with the following : - Offices de Tourisme de France (the French federation of tourism offices) - Cibul (new web open data platform for events) - ESC Dijon (Burgundy School of Business) - Madmagz (Magazine creation website) - JbDevelopment (communication for cultural non-profit and companies) - Les Maisons du Voyage, tour operator specialised in high quality culture oriented tours with a new business with short

Method	Description	Notes
		breaks in Europe, - Voyageurs du Monde, same type of tour operator as Les Maisons du Voyage
	Informal presentation to the XFT association members	Afidium is in charge of the secretary of the XFT association, which gathers more that 40 companies of the tourism & travel industry. The members gather on a regularly basis and Afidium presented HarmoSearch to many of its members (http://www.exchangefortravel.org/en/association/membres) such as Kuoni, Travelport, Amadeus…
Conferences	XFT Association Public Congress 2012	During the XFT Congress in Hammamet in 2012 (http://www.exchangefortravel.org/rendez-vous/07-06-2012-congres-decouverte-xft), Afidium CEO made a presentation on the benefits of a common central information platform adapted to each user's specificities. This presentation led to more discussion on the opportunities of the HarmoSearch services with the public (about 70 applicants, XFT members but also Sabre, Giata…)

4.3 PROMOTER

Method	Description	Notes
Presentation on Website	HarmoSearch is mentioned on the company website www.promoter.it	HarmoSearch is present on the Homepage and on a dedicated page. (*Figure 22*)
	HarmoSearch showcase on digitalmeetsculture.net online magazine www.digitalmeetsculture.net	An important web dissemination tool exploited by HarmoSearch is Digitalmeetsculture, an important online magazine in the digital cultural heritage area. Digitalmeetsculture.net is an interactive online magazine dedicated to the themes of the digital technologies applied to cultural heritage and the arts. Articles, information and events about the projects and initiatives in the field of digital cultural heritage, on a truly global scale, make digitalmeetsculture.net both a valuable information tool and an advertising showcase with a uniquely sharp focus on a very selected and high-profile audience. The portal is becoming well known among the community of digital cultural heritage and the visibility that the portal offers towards a selected and interested audience is an added value in terms of dissemination and advertising: more than 350 published articles; information about more than 50 projects and organizations who operate in the sector; more than 30,000 visitors in one year and more than 300 registered users.

Method	Description	Notes
		It already indexes its content with more than 50 assigned categories, 30 relevant topics and keywords, and 1,000 assigned tags that enhance the search features of the platform. HarmoSearch project is advertised on the portal www.digitalmeetsculture.net through a button which is present on the home page of the portal and in the “digital heritage” section of the portal. Clicking on this button, the page dedicated to the HarmoSearch *showcase* is shown with general information, link to each partner’s website, contacts, and auto-refreshing news via RSS that rebound the news appearing in the HarmoSearch website. This showcase aims at supporting the dissemination activities of the project and enhances the web traffic towards the official HarmoSearch website. (*Figure 23*)

Method	Description	Notes
Other digital channels, e.g. Newsletter/ rss feed	Newsletter as part of the December 2012 edition of the "digitalmeetsculture.net newsletter"	An article presenting the project and its achievements has been produced and inserted as part of the December 2012 edition of the digitalmeetsculture.net newsletter which is distributed to a mailing list of 1,300 readers. The newsletter aimed to inform and remind about the project, and also to foster new visits to the showcase and to the official website. The database of email addresses to be reached by the newsletter is formed by the lists of contacts from the HarmoSearch partners, the whole group of digitalmeetsculture.net registered users plus a target selection of email addresses, belonging to specific people working in the sector of digital cultural heritage. (*Figure 24-26*)

4.4 TU VIENNA

Method	Description	Notes
Presentation on Website	HarmoSearch is mentioned on ISIS Website: http://www.isis.tuwien.ac.at/node/13904	Institute of Software Technology & Interactive Systems informs about HarmoSearch via the institutes' website: (*Figure 27*)
Conferences	Information Paper for conference I-Semantic in Austria, http://i-semantics.tugraz.at/	With more than 400 participants every year I-SEMANTICS is one of the largest conferences in Europe in the field of semantic systems and the Semantic Web. It is held concurrently with the I-KNOW Conference on Knowledge Management and Knowledge Technologies. The combination represents a unique approach bridging the gap between highly affiliated communities and complementary research fields. "Simplifying Creation and Maintenance of Mappings in the HarmoSearch Framework" was the submitted paper to that conference. (*Figure 28-31*)
Research and Teaching	Seminars and Lectures in 2012 at Institute of Software Technology and Interactive Systems at the Vienna University of Technology	Research Seminar for Ph.D. Students: https://tiss.tuwien.ac.at/course/courseDetails.xhtml?windowId=86c&semester=2012W&courseNr=188423 . (*Figure 32*) HarmoSearch was content in the context of course E Commerce *Business Models, Market and networks and mobile commerce*. https://tiss.tuwien.ac.at/course/courseDetails.xhtml?windowId=f42&semester=2012W&courseNr=188427. (*Figure 33*)

4.5 MUSEUMSMEDIEN

Method	Description	Notes
Presentation on Website	HarmoSearch is mentioned on the company website www.museumsmedien.de	Since December 2010 the project is on the website. After relaunch in spring 2012, the project is accentuated on the homepage. Detailed information about HarmoSearch is given at “projects”. (*Figure 34*)
Inform customers directly	EGMUS European Group on Museum Statistics core group meeting in August 2012 and a meeting in, November 2011 in Berlin	The EGMUS group was established in 2002. At present 27 European countries, from within and outside the European Union, are represented in this group. The EGMUS core group meets on a regular basis to coordinate EGMUS activities and prepares the annual plenary meetings. In the context of the activity as webmaster of www.egmus.eu, Museumsmedien took the opportunity to inform the group about possible benefit for EGMUS and their organisations in the represented countries. This activity led to an Letter of Interest. Mr. Guy Frank co-coordinator in the Ministry of Culture of Luxembourg is signatory of the letter of intent for using HarmoSearch.(*Figure 12*)

Method	Description	Notes
	Presentation and introducing HarmoSearch to the managerial staff and scientific assistants of the Foundation German Resistance Memorial Center (GDW). Two Meetings in April and November 2012 in Berlin	GDW is a site of remembrance, political studies, active learning, documentation, and research. An extensive permanent exhibition, a series of temporary special exhibitions, events, and a range of publications document and illustrate resistance to National Socialism. The center's goal is to show how individual persons and groups took action against the National Socialist dictatorship from 1933 to 1945 and made use of what freedom of action they had. In the function as media consultant Museumsmedien informed the GDW deeply about HarmoSearch and its possibilities in use. Prof. Dr Johannes Tuchel manager of Foundation German Resistance Memorial Center is signatory of the letter of interest for using HarmoSearch. (*Figure 13*)

Method	Description	Notes
	Presentation and introducing HarmoSearch to the managerial staff and scientific assistants of Memorial Museums Department as Part of the Foundation Topography of Terror and the Memorial Museums Database, in August and December 2012	The Memorial Museums Department's Website offers Additional information on events, news articles, books and projects. The homepage is available on http://www.gedenkstaettenforum.de/ The Memorial Museums Database is an overview of institutions throughout the world that deal with the history of the Holocaust has been created by the Topography of Terror Foundation. The collection of the material is partly supported by the Foundation Memorial to the Murdered Jews of Europe. The homepage is also used by the 'Task Force for International Cooperation on Holocaust Education, Remembrance and Research. As webmaster of the two above mentioned institutions Museumsmedien could support the clients and present the function and possibilities of HarmoSearch. Dr Thomas Lutz head of unit of Memorial Museums Department in the Topography of Terror Foundation is signatory of the letter of interest for using HarmoSearch. (*Figure 14*)

Method	Description	Notes
	Meeting with the head of department for museums, archives and repositories in the context of 100th German Librarian Day in June 2011 in Berlin Presentation and introducing HarmoSearch to the managerial staff and research assistants of the Bibliotheksservice-Zentrum Baden-Württemberg (BSZ) (library service centre Baden-Wuerttemberg) in June 2012, in Constance	BSZ is an IT-service provider for academic and public libraries, archives, and museums; it offers databases, portals, support, hosting, and other services. The BSZ is a facility in the business area of the Ministry of Science, Research and Art (Ministerium für Wissenschaft, Forschung und Kunst) of Baden-Württemberg in the legal form of a dependent public agency, headquartered in Constance. It was founded in Constance in 1996, resulting from a merger of the Südwestdeutscher Bibliotheksverbund, the central catalogue of Baden-Württemberg and the development group for an integrated library management system (LMS). Further tasks that were included in the bylaws are support for museums and archives and development of internet-supported services. The BSZ has four departments: Südwestdeutscher Bibliotheksverbund Baden-Württemberg, Saarland, Sachsen (SWB, Library Systems Digital Library Museums and Archives) Dr. Marion Mallmann-Biehler director of BSZW, is signatory of the letter of interest for using HarmoSearch. (*Figure 16*)

Method	Description	Notes
	October 2012 Presentation and introducing HarmoSearch to the board of Directors and selected members of Museums Association of Federal State Saarland (SMV)	SMV has 105 members, including Associations and Institutions, cities and towns, counties, individual members. SMV is working close with the Saarland Tourism. Both institutions publish their extensive range of events though out their websites http://www.museumsverband-saarland.de
	October 2012 Presentation and introducing HarmoSearch to the chairman of AMGR (Museums of the Greater Region of Saarland, Lorraine, Luxembourg, Wallonia, Rhineland Palatinate)	Launched in 1999 as an informal grouping the AMGR eV is since 2002 an association. The target is to bring together and promote the corporation of the museums of the Greater Region across all borders (Saarland - Wallonia Lor - Lux - Rheinland-Pfalz). To achieve these goals, the association relies on dialogue, professional meetings, drawing up and carrying out cross-border activities of museum. Members include museums, art centers, Memorial, excavation and cultural sites, museum associations, and individuals in the greater region. The AMGR represents 5 regions, 4 States, 3 languages, 11 million inhabitants and more than 800 museums. Mr. Rainer Raber is manager of Museums Association of Federal State Saarland and president of AMGR, is signatory of the letter of interest for using HarmoSearch. (*Figure 15*)

Method	Description	Notes
(Trade) Fairs	CeBIT 2012 Hannover, 06 to 10 March 2012, Hannover	CeBIT is the world's largest trade fair showcasing digital IT and telecommunications solutions for home and work environments. The key target groups are users from industry, the wholesale/retail sector, skilled trades, banks, the services sector, government agencies, science and all users passionate about technology. CeBIT offers an international platform for comparing notes on current industry trends, networking, and product presentations. In direct talks with representatives of companies with which there is cooperation, and which can be viewed as multipliers, Museumsmedien presented and discussed the HarmoSearch Project.
	ITB Berlin - World's Leading Travel Trade Show 7.-11. March 2012, Berlin	ITB Berlin is THE B2B-Platform for trade visitors – an excellent opportunity to meet business partners and to do business. For all other visitors ITB Berlin is a wonderful possibility to discover the whole world within a few hours Museumsmedien were on a technical discussion with participants from museums association of the federal state Saarland, Tourism organisation of Saarland and AMGR (Museums of the Greater Region of Saarland, Lorraine, Luxembourg, Wallonia, Rhineland Palatinate). fairgrounds during the three days, 93% of them were professionals.

Method	Description	Notes
	MUTEC International Trade Fair for Museum and Exhibition technology, 22.-24.11.2012 Leipzig, Germany	MUTEC – International Trade Fair for Museum and Exhibition Technology took place alongside denkmal – European Trade Fair for Conservation, Restoration and Old Building Renovation in Leipzig for the second time from 22nd-24th November 2012. 13.600 visitors gathered in hall 2 of the Leipzig. 1.048 visitors said that MUTEC was the reason for their visit; in addition, approximately the same number stated they had decided to visit both denkmal and . MUTEC. Museumsmedien used the opportunity in a direct talk for quick introduction of the possibilities of HarmoSearch with several exhibitors.

4.6 X+O

Method	Description	Notes
Presentation on Website	HarmoSearch is mentioned on the company website: www.xpluso.com	Link to the project on homepage (*Figure 35*)
Other digital channels, e.g. Newsletter/ rss feed	Newsletter and news flash on website	
Inform customers directly	ORF (Austrian Broadcasting Coorporation), A1 Telekom, Unitechno Group, Wiener Stadtwerke	Presentations to Customers demanding a platform for data exchange
(Trade) Fairs	World Travel Market 7 - 10 November 2011 ExCeL – London	Staged annually in London, World Travel Market - the premier global event for the travel industry - is a vibrant must attend four-day business-to-business event presenting a diverse range of destinations and industry sectors to UK and International travel professionals
Conferences	Enter Conference on Information Technology and Travel & Tourism, 26.-28.01.2011, Innsbruck, Austria	ENTER eTourism Conference will bring together international experts in all aspects of Information and Communication Technologies in Travel and Tourism – the technologies which are changing the world of tourism and hospitality
	Enter eTourism Present and Future Services and Applications, 24.-27.01. 2012, Helsingborg Sweden	Organized by the International Federation for Information Technology and Travel & Tourism (IFITT), ENTER 2012 offers a worldwide and unique forum for attendees from academia, industry, government, and other organizations to actively exchange,

Method	Description	Notes
		share, and challenge state-of-the-art research and industrial case studies on the application of information and communication technologies to travel and tourism. Manfred Hackl - project coordinator of HamoSearch - held a keynote on "Monitoring Hotel Prices from the Internet", a scenario planned for HarmoSearch sustainability
	BÖTM – TOP Seminar (Bundesverband Österreichischer Tourismusmanager), 3.-5- October 2012, Velden, Austria	http://www.boetm.at is the main conference on trends and developments in tourism for the Austrian destination managers
Research and Teaching	15.-16.09.2011, Modul University,Vienna Seventh TourMIS Users' Workshop	International Seminar on New Media Analysis and Strategies for Tourism Marketing Organizations Organized by the European Travel Commission, European Cities Marketing & MODUL University Vienna. Manfred Hackl - project coordinator of HamoSearch - held a keynote on "Monitoring Hotel Prices from the Internet - A destination benchmarking approach", as part of the session1, "media monitoring, web mining and Visualization".

4.7 SPK STIFTUNG PREUßISCHER KULTURBESITZ

Method	Description	Notes
Presentation on Website	HarmoSearch participation on this website: www.euromuse.net	Link to the project on homepage (*Figure 36-38*)
Inform museums directly	The cultural heritage sector was addressed with the euromuse.net network with around 500 museums from all over Europe participating. The museums within this network exchange information on their exhibitions and publish them on the European euromuse.net exhibition portal. The interest of the euromuse.net network is to reduce the effort in data exchange by using easy data exchange techniques which work without additional editorial effort.	
Inform regional portals	Portals During the project it was observed, that rather than museums, a growing number of regional cultural portals where more pre-disposed and technically better prepared to connect to harmonise, that is why we consulted with some portals that have stated interest in using the HarmoSearch solutions.	These institutions (portals) were addressed and will be presented the final portal when there this is possible to show. After Release 5. Hamburger Kunstmeile www.kunstmeile-hamburg.de/en/ with a network of 5 art museums in Hamburg. Museumsportal Berlin, with exhibitions in Berlin from around 200 museums presented in www.museumsportal-berlin.de (interest in reciprocal exchange). Mr. Carsten Hein project manager of Museumsportal Berlin is signatory of the letter of interest for using HarmoSearch. (*Figure 11*) Landschaftsverband Rheinland. LVR-Fachbereich Kultur, is interested, not only in connecting http://www.rheinischemuseen.de/ to euromuse.net, but also to further tourism offerings. The exhibition calendar from the

Method	Description	Notes
		Finnish Museum Association (Museoliitto) under www.museot.fi. A mapping was developed with the use of the mapping tool as showcase and test-trial during the term of the HarmoSearch project.
Conferences	Participation in the ENTER Conference 2011 in Innsbruck, Austria (27.01.2011)	
	“Conference of working group documentation” of German Museums Association (11.05.2011)	Presentation of the harmonise ontology in the spring conference where representatives from Museums of the federal states were present
	"Conference of working group documentation” of German Museums Association " (16.10.2012)	Status Report to the same group of representatives of Museums the federal states with focus on presentation of the Mapping tool’s functionalities.
Other		
Adriamuse	Adriamuse, IPA Adriatic Cross Border Cooperation Programme 2007-2013 Participation in their kick-off meeting in Cattolica (Rimini, IT) presentation of the harmonise alternative and invitation to participate in the developement. (27.05.2011) Participation in a focus	During the two meetings the objective of the collaboration between the Adriamuse and euromuse project was defined. It was clear that one of the partners in the project had the technical capacity to help the development of the HarmoSearch services. Following statement was gathered (August 2012) from the Adriamuse Partner responsible for this task: Description of collaboration up to date (what was achieved / what is intended): we will use HarmoSearch for retrieving by programming the Adriamuse Events inside Euromuse

Method	Description	Notes
	meeting organised by the project in Croatia. (30.10.2011)	database. Other comments / questions about the services: it would be very useful to have the organization information by HarmoSearch, specifically to have the profile of Adreimuse's museums. Further feedback will be provided after a session planned for the 31.01.2013. Mr. Eng. Enzo Finocchiaro project coordinator of the AdriaMuse Project is signatory of the letter of interest for using HarmoSearch. (*Figure 10*)
Europeana awareness	Euromuse.net participated on a project-related survey that aimed to have an overview of portals gathering cultural event and venue information.	This survey included a section about automatic and semi-automatic system of data ingestion/collection. Specifically if content via API or XML interface was being collected. Survey results have not been published yet.

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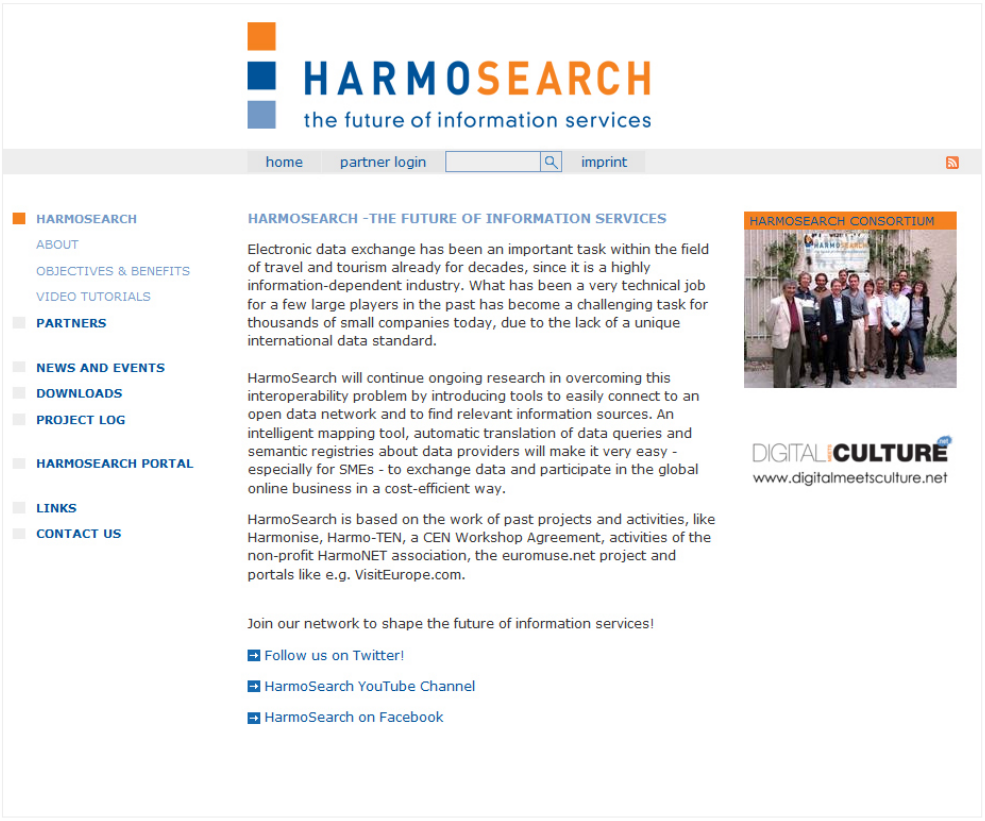
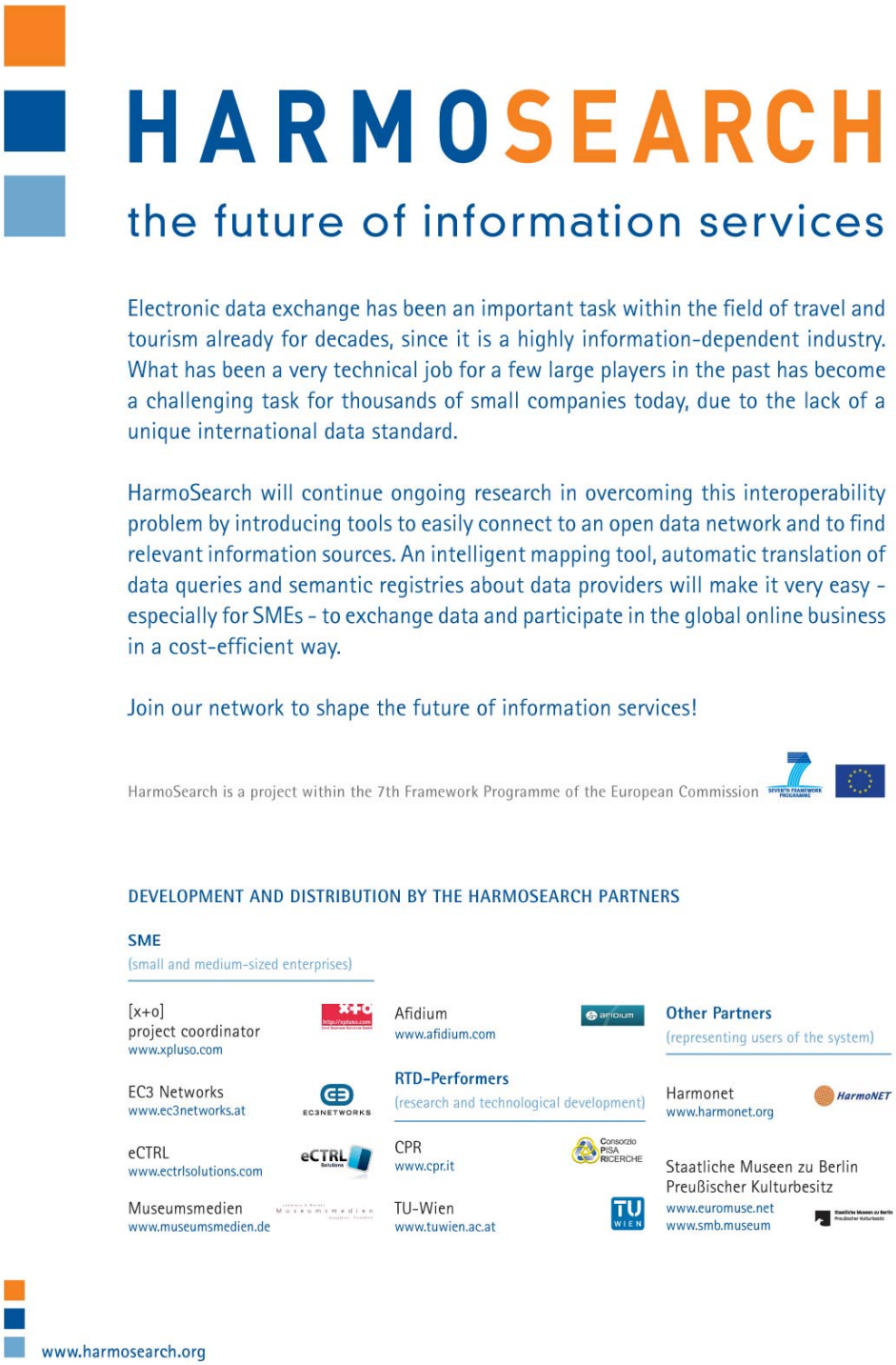


Figure 1: HarmoSearch Website



HARMOSEARCH

the future of information services

Electronic data exchange has been an important task within the field of travel and tourism already for decades, since it is a highly information-dependent industry. What has been a very technical job for a few large players in the past has become a challenging task for thousands of small companies today, due to the lack of a unique international data standard.

HarmoSearch will continue ongoing research in overcoming this interoperability problem by introducing tools to easily connect to an open data network and to find relevant information sources. An intelligent mapping tool, automatic translation of data queries and semantic registries about data providers will make it very easy - especially for SMEs - to exchange data and participate in the global online business in a cost-efficient way.

Join our network to shape the future of information services!

HarmoSearch is a project within the 7th Framework Programme of the European Commission

DEVELOPMENT AND DISTRIBUTION BY THE HARMOSEARCH PARTNERS

SME
(small and medium-sized enterprises)

[x+o]
project coordinator
www.xpluso.com

Afidium
www.afidium.com

EC3 Networks
www.ec3networks.at

eCTRL
www.ectrlsolutions.com

Museumsmedien
www.museumsmedien.de

RTD-Performers
(research and technological development)

CPR
www.cpr.it

TU-Wien
www.tuwien.ac.at

Other Partners
(representing users of the system)

Harmonet
www.harmonet.org

Staatliche Museen zu Berlin
Preußischer Kulturbesitz
www.euromuse.net
www.smb.museum

www.harmosearch.org

Figure 2: Handout in English

HARMOSEARCH

the future of information services

Depuis des décennies déjà, l'échange électronique de données est primordial dans le domaine des voyages et du tourisme. En effet, cette industrie est très dépendante des échanges d'informations en général. Ce qui a été par le passé un travail très technique pour quelques acteurs majeurs est devenu aujourd'hui un véritable challenge pour des milliers de petites entreprises, en raison de l'absence d'une norme internationale d'échange de données.

HarmoSearch continue les recherches en cours pour surmonter ce problème, en particulier en introduisant des outils d'interopérabilité. Ceux ci vont permettre de se connecter facilement à un réseau ouvert afin d'accéder à des sources d'information pertinentes. Un outil intelligent de mapping des données, la traduction automatique des requêtes, la mise en place de registres sémantiques vont permettre, - en particulier pour les PMEs - d'échanger facilement des données et de participer à l'activité mondiale en ligne, le tout à un coût très raisonnable.

Rejoignez notre réseau afin de façonner l'avenir des services et de l'échange d'informations!

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www.smb.museum

www.harmosearch.org

Figure 3: Handout in French

HARMOSEARCH

the future of information services

De molti anni lo scambio di dati in formato elettronico è un'attività fondamentale per il settore del turismo on line, data la sua natura altamente dipendente dall'informazione. Quello che in passato era uno specifico compito per pochi grandi attori è diventato ora un'attività necessaria per migliaia di piccole imprese, resa complessa della mancanza di standard internazionali.
Harmosearch prosegue una serie di attività di ricerca mirate a superare il problema dell'interoperabilità introducendo strumenti che consentono di collegarsi facilmente ad una rete di dati condivisi e trovare le sorgenti di informazione rilevanti.

L'impiego di nuovi strumenti per la mappatura dei dati e per la traduzione automatica delle ricerche e di un registro semantico relativo ai vari fornitori di contenuti della rete mirano a rendere più semplice possibile, soprattutto per le PMI, lo scambio di dati e la partecipazione al mercato globale on line, minimizzando i costi di integrazione.

Unisciti alla nostra rete per disegnare il futuro dei servizi informativi!.

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www.euromuse.net
www.smb.museum

www.harmosearch.org

Figure 4: Handout in Italian

HARMOSEARCH

the future of information services

Elektronischer Datenaustausch ist schon seit Jahrzehnten, eine große Herausforderung im Tourismus-Sektor, denn gerade diese Branche ist vom Austausch aktueller, sich ständig ändernder Daten abhängig. Was einmal die Entwicklungsarbeit für einige der großen Software-Firmen war, ist heute die Herausforderung für tausende kleiner Firmen: das Überwinden fehlender internationale Standards für den Datenaustausch.

Ergebnisse des laufenden Forschungsprojektes HarmoSearch werden helfen diese Interoperabilität im Datenaustausch zu verbessern. Mithilfe eines intelligenten Mapping-Tools, einer automatischen Übersetzung von Daten Abfragen und einer logische Zuordnung der Ergebnisse durch den Datenprovider wird es zukünftig einfacher – vor allem für kleine und mittlere Firmen – sich am Austausch im globalen Online-Geschäft in einer kosteneffektiven Weise zu beteiligen.

Treten Sie unserem Netzwerk bei und gestalten Sie mit uns die Zukunft der Informations-Dienstleistungen!

HarmoSearch is a project within the 7th Framework Programme of the European Commission

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Preußischer Kulturbesitz
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www.smb.museum

www.harmosearch.org

Figure 5: Handout in German

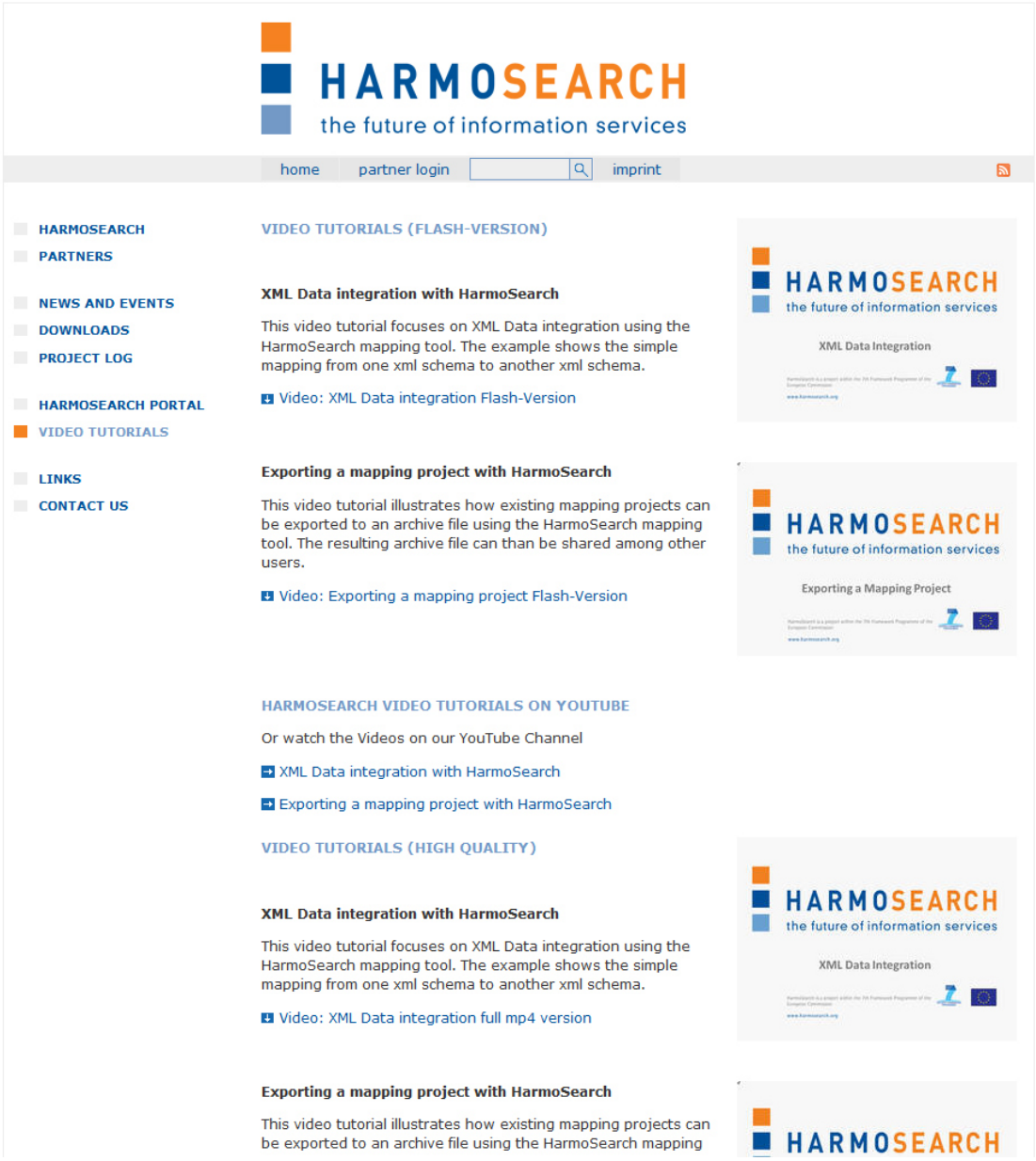


Figure 6: HarmoSearch website with links to video tutorials

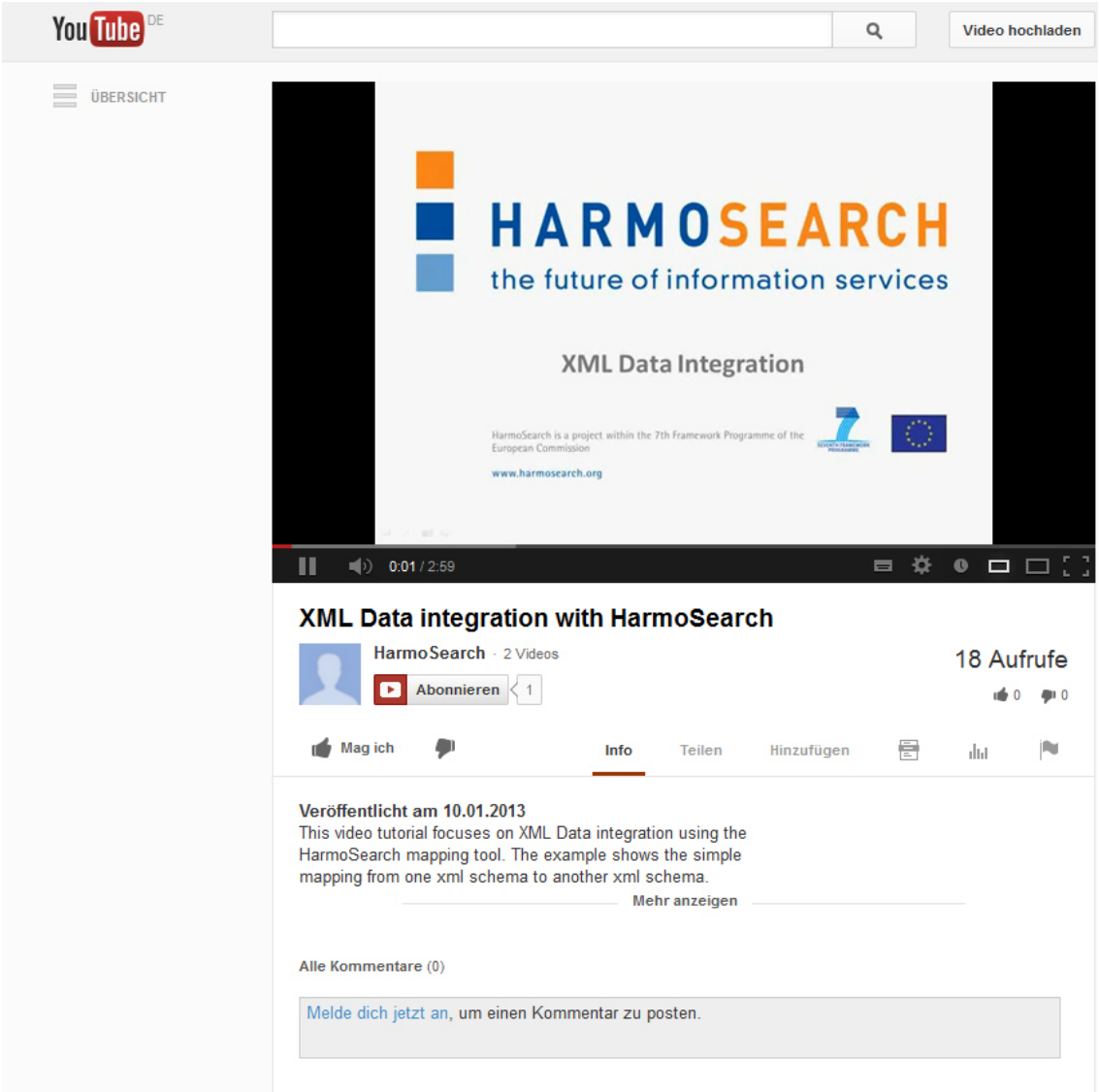


Figure 7: HarmoSearch You Tube channel with video tutorial 1: XML Data integration with HarmoSearch

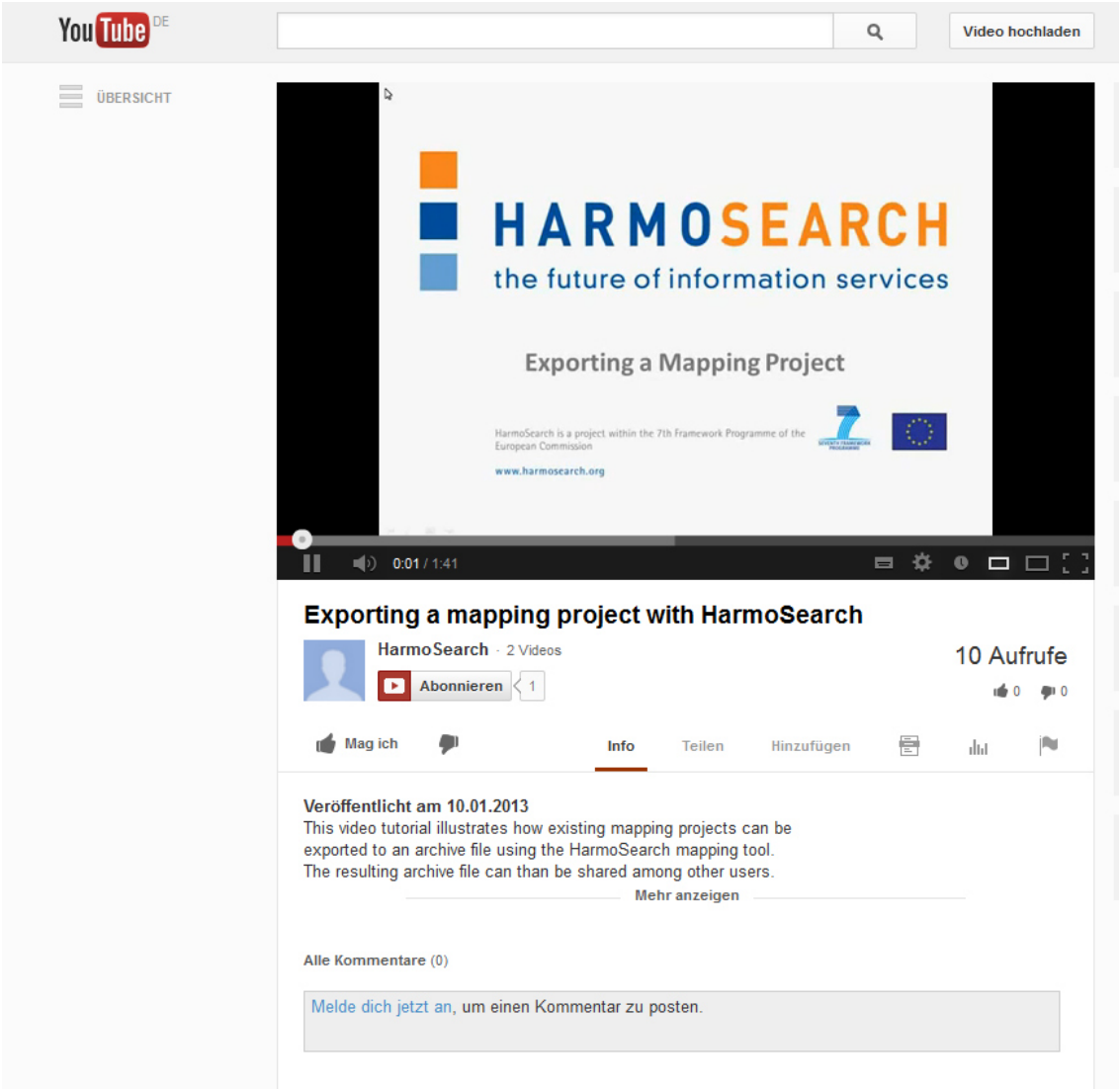


Figure 8: HarmoSearch You Tube channel with video tutorial 2: Exporting a mapping project with HarmoSearch

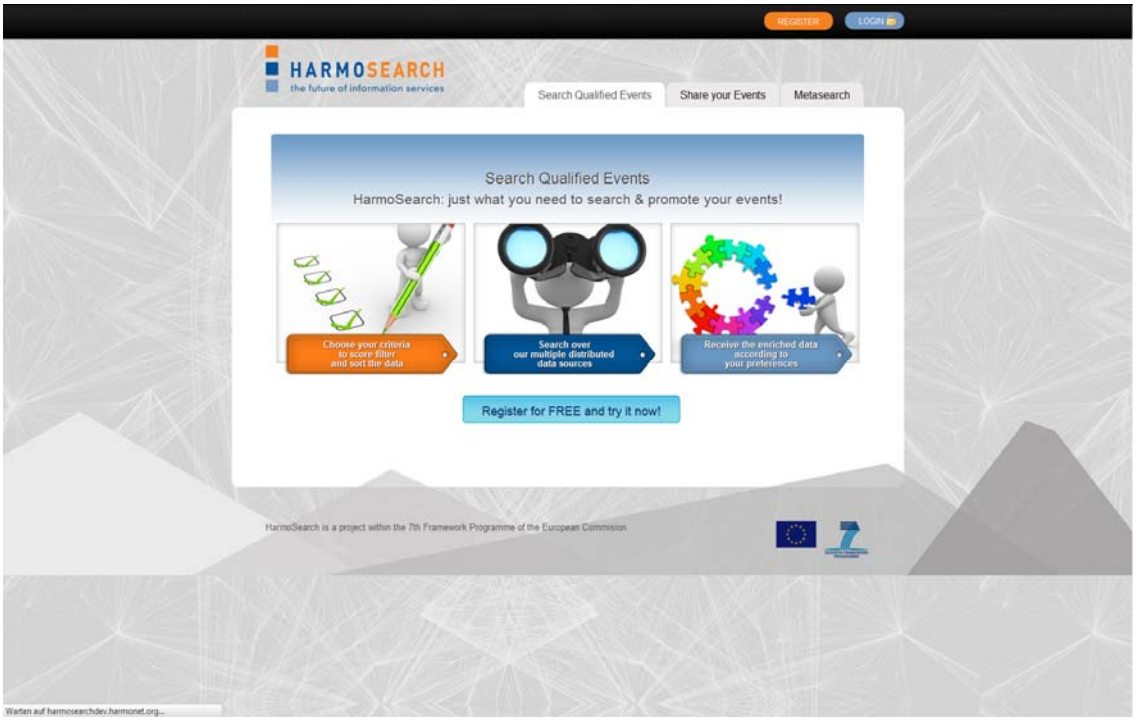


Figure 9: The HarmoSearch platform landing page "search-qualified-events"

Provincia di Rimini

Rimini, 13/02/2013
Prot. Nr. 6378/C1701
Classifica 02.06.01
Fascicolo 000002-01

HarmoSearch project /
Euromuse.net – The exhibition portal
for Europe

Institut für Museumsforschung – Staatliche
Museen zu Berlin
In der Halde 1
14195 Berlin
GERMANY

Letter of Interest

Usage of the HarmoSearch services

The project HarmoSearch supported by the European Commission in the research seventh framework programme for investigation and technology development offers a great opportunity to share data.

Considering the services developed that can ease the task of sending and retrieving exhibition information among partners, we see a great potential in the deployment of HarmoSearch in the framework of the collaboration between euromuse.net and IPA - AdriaMuse Project.

We are aware of the current developments and are very interested in being kept informed of results and participation possibilities.

We look forward to remain in contact.

Project Coordinator
Eng. Enzo Finocchiaro

Figure 10: LOI from IPA Adriatic Cross Border Cooperation Programme Adriamuse

KULTUR PROJEKTE BERLIN

KULTURPROJEKTE BERLIN GMBH
KÖGELHEIDSTRASSE 36, 10179 BERLIN
TELEFON +49 (0)30 247 49 - 700
TELEFAX +49 (0)30 247 49 - 709
INFO@KULTURPROJEKTE-BERLIN.DE
WWW.KULTURPROJEKTE-BERLIN.DE

KULTURPROJEKTE BERLIN GMBH · KÖGELHEIDSTRASSE 36 · 10179 BERLIN

Harmosearch Project
Euomuse.net - The exhibition portal for Europe

Institut für Museumsforschung
Staatliche Museen zu Berlin - Preußischer Kulturbesitz
In der Halde 1
14195 Berlin

Berlin, 14.02.2013

Absichtserklärung
Einsatz von HarmoSearch

Sehr geehrte Damen und Herren,

Das von der Europäischen Union im Rahmen des siebten Rahmenprogramms für Forschung und technologische Entwicklung (FP7) geförderte Projekt HarmoSearch, bietet mit seinen Möglichkeiten zur Datenveröffentlichung und Nutzung enorme Chancen.

Im Hinblick auf einen Datenaustausch zwischen dem Museumsportal Berlin (www.museumsportal-berlin.de) und dem europäischen Austellungsportal euromuse.net sehen wir großes Potenzial für den Einsatz von HarmoSearch. In der jetzigen Phase der Entwicklung von HarmoSearch wäre ein Informationsaustausch und Test der Software für uns sehr interessant.

Weiteren Gesprächen mit Ihnen sehen wir mit Freude entgegen.

Carsten Hein
Projektmanager beim Museumsportal Berlin

GESCHÄFTSFÜHRUNG MORITZ VAN DULMEN ANDRÉ SCHMITZ · VORSITZENDER DES AUFSICHTSRATES · AMTSGERICHT CHARLOTTENBURG HRB 91078 B · STEUER-NR. 27/620/02897 · UMSATZSTEUER-ID-NR.: DE 197502214 · BERLINER VOLKSBANK BLZ 100 900 00 · KONTO 1261 [illegible]

Figure 11: LOI from Museumsportal Berlin

EGMUS
European Group on Museum Statistics

European group on museum statistics
Ministry of Culture
4, boulevard F.D. Roosevelt
LU-2912 Luxembourg

Lehmann & Werder Museumsmedien (GbR)
An der Kleinbahn 1
14715 Kriele

Letter of Intend
Using HarmoSearch

The project funded by the European Union under the Seventh Framework Programme for Research and Technological Development (FP7) project HarmoSearch offers, with its possibilities for data publication and use enormous opportunities.

In view of the data to European museums, we see great potential for the use of HarmoSearch for EGMUS (European Group on Museum Statistics). At the current stage of development of HarmoSearch an information exchange and testing of the software would be very interesting for us.

Further discussions with you, we look forward with joy.

Guy FRANK
Co-coordinator

Figure 12: LOI from EGMUS European Group on Museum Statistics

Gedenkstätte
Deutscher Widerstand

im Geschäftsbereich des
Regierenden Bürgermeisters
von Berlin – Senatskanzlei –
Kulturelle Angelegenheiten

Stauffenbergstraße 13-14
D-10785 Berlin
Telefon 030-26 99 50-00
Telefax 030-26 99 50-10
Internet: gdw-berlin.de

GDW D-10785 Berlin Stauffenbergstraße 13-14

Museumsmedien
Lehmann und Werder
An der Kleinbahn 1
14715 Kriele

Datum 29.01.2013
Zeichen GDW/Ltr.
Bearbeiter/in Herr Prof. Dr. Tuchel
Durchwahl 26 99 50 04
E-mail Tuchel@GDW-Berlin.de

Absichtserklärung für den Einsatz von HarmoSearch

Das von der Europäischen Union im Rahmen des siebten Rahmenprogramms für Forschung und technologische Entwicklung (FP7) geförderte Projekt Harmo-Search bietet mit seinen Möglichkeiten zur Datenveröffentlichung und Nutzung enorme Chancen.

Die Stiftung Gedenkstätte Deutscher Widerstand sieht ein großes Potenzial im Einsatz von HarmoSearch für Gedenkstätten mit ihren umfangreichen Angeboten an Veranstaltungen. In der jetzigen Phase der Entwicklung von HarmoSearch wäre ein Informationsaustausch und Test der Software für uns sehr interessant.

Weiteren Gesprächen mit Ihnen sehen wir mit Freude entgegen.

Mit freundlichen Grüßen

Prof. Dr. Johannes Tuchel
Leiter der Gedenkstätte

Figure 13: LOI from Foundation German Resistance Memorial Center

STIFTUNG TOPOGRAPHIE DES TERRORS

GEDENKSTÄTTENREFERAT

STIFTUNG TOPOGRAPHIE DES TERRORS
RECHTSFÄHIGE STIFTUNG
DES ÖFFENTLICHEN RECHTS
NIEDERKIRCHNERSTRASSE 8
10963 BERLIN
TELEFON 030 254509-0
FAX 030 254509-99
INFO@TOPOGRAPHIE.DE
GEDENKSTÄTTENREFERAT
TELEFON 030 254509-45
FAX 030 254509-33
GEDENKSTAETTENREFERAT@TOPOGRAPHIE.DE
AUSSTELLUNG UND DOKUMENTATION
TELEFON 030 254509-50
FAX 030 254509-55
AUSSTELLUNG@TOPOGRAPHIE.DE
DOKUMENTATIONSZENTRUM
NS-ZWANGSARBEIT BERLIN-SCHÖNEWEIDE
BRITZER STRASSE 5 | 12439 BERLIN
TEL 030 6390289-0 | FAX 030 6390288-99
SCHOENEWEIDE@TOPOGRAPHIE.DE
WWW.TOPOGRAPHIE.DE

TOPOGRAPHIE DES TERRORS [illegible]

Lehmann & Werder Museumsmedien (GbR)

An der Kleinbahn 1

14715 Kriele

UNSER ZEICHEN

DURCHWAHL 030 254509-

DATUM 31.01.2013

Einsatz von HarmoSearch - Absichtserklärung

Sehr geehrte Frau Lehmann, sehr geehrter Herr Werder!

Das von der Europäischen Union im Rahmen des siebten Rahmenprogramms für Forschung und technologische Entwicklung (FP7) geförderte Projekt HarmoSearch, bietet mit seinen Möglichkeiten zur Datenveröffentlichung und Nutzung auch für die Stiftung Topographie des Terrors großartige Chancen.

Im Hinblick auf die Daten zu Gedenkstätten und deren Veranstaltungen sehen wir ein großes Potenzial für einen Einsatz von HarmoSearch für das Gedenkstättenforum und die internationale Gedenkstättenübersicht. In der jetzigen Phase der Entwicklung von HarmoSearch wäre ein Informationsaustausch und Test der Software für uns sehr interessant.

Weiteren Gesprächen mit Ihnen sehen wir mit Freude entgegen.

Mit freundlichen Grüßen

Dr. Thomas Lutz

VORSITZ IM STIFTUNGSRAT:
DER REGIERENDE BÜRGERMEISTER VON BERLIN,
SENATSKANZLEI
KULTURELLE ANGELEGENHEITEN
BANKVERBINDUNG: BERLINER SPARKASSE
KONTO 730038360 | BLZ 100 500 00

Figure 14: LOI from Memorial Museums Department as Part of the Foundation Topography of Terror and the Memorial Museums Database

ASSOCIATION DES MUSÉES DE LA GRANDE RÉGION
VEREINIGUNG DER MUSEEN DER GROSSREGION

Vereinigung der Museen der Großregion
Wilhelm-Heinrich-Str. 39, D-66564 Ottweiler

Rainer Raber
Präsident

Lehmann & Werder
Museumsmedien (GbR)
An der Kleinbahn 1
14715 Kriele

Ottweiler, den 30.01.2013

Ihre Zeichen/Ihre Nachricht vom	Unsere Zeichen/unsere Nachricht vom	Telefon	Telefax
	Raber/Sch	(0049) 6824/8161	(0049) 6824/700505

Absichtserklärung

Einsatz von HarmoSearch

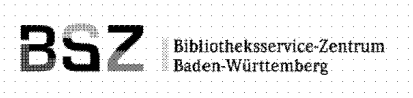
Das von der Europäischen Union im Rahmen des siebten Rahmenprogramms für Forschung und technologische Entwicklung (FP7) geförderte Projekt HarmoSearch, bietet mit seinen Möglichkeiten zur Datenveröffentlichung und Nutzung enorme Chancen.

Im Hinblick auf die Daten zu Museen und Veranstaltungen im Saarland und in der Großregion, sehen wir ein großes Potenzial für einen Einsatz von HarmoSearch für den Saarländischen Museumsverband und die Vereinigung der Museen der Großregion AMGR. In der jetzigen Phase der Entwicklung von HarmoSearch wäre ein Informationsaustausch und Test der Software für uns sehr interessant.

Weiteren Gesprächen mit Ihnen sehen wir mit Freude entgegen.

Rainer Raber
(Präsident der AMGR und geschäftsführendes Vorstandsmitglied des SMV)

Figure 15: LOI from Museums Association of Federal State Saarland (SMV) and AMGR Museums of the Greater Region of Saarland, Lorraine, Luxembourg, Wallonia, Rhineland Palatinate (AMGR).



Telefon: (07531) 88-2352
Telefax: (07531) 88-3703
EMail: zentrale@bsz-bw.de

Datum: 31.01.2013
AZ:

Frau Beatrix Lehmann
Lehmann & Werder Museumsmedien (GbR)
An der Kleinbahn 1
14715 Kriele

Letter of intent
Einsatz von HarmoSearch

Sehr geehrte Frau Lehmann,
das von der Europäischen Union im Rahmen des siebten Rahmenprogramms für Forschung und technologische Entwicklung (FP7) geförderte Projekt HarmoSearch, bietet mit seinen Möglichkeiten zur Datenveröffentlichung und Nutzung enorme Chancen.
In unserer langjährigen Arbeit im Bereich überregionaler, regionaler und lokaler Portale (www.bam-portal.de, www.leo-bw.de, www.bodenseebibliotheken.de) müssen wir ständig unsere Methoden fortentwickeln, Daten aus Bibliotheken, Archiven und Museen zu sammeln und zur Nutzung durch Dritte bereitzustellen. Hierbei sehen wir ein großes Potenzial für einen Einsatz von HarmoSearch für das Bibliotheksservice-Zentrum Baden-Württemberg (BSZ). In der jetzigen Phase der Entwicklung von HarmoSearch wäre ein Informationsaustausch und Test der Software für uns sehr interessant.
Weiteren Gesprächen mit Ihnen sehen wir mit Freude entgegen.

Mit freundlichen Grüßen

Dr. Marion Mallmann-Biehler

Postanschrift
Bibliotheksservice-Zentrum Baden-Württemberg
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Besuchsadresse
Felix-Wankel-Straße 4
Konstanz (Industriegebiet)

Figure 16: LOI from Library Service Centre Baden-Wuerttemberg

Figure 17: Website eCTRL: dedicated page for HarmoSearch

Figure 18: Website Afidium: HarmoSearch logo on homepage

Figure 19: Website Afidium: HarmoSearch is mentioned on credentials

Figure 20: Website Afidium: dedicated page for HarmoSearch

Figure 21: Website Afidium: parent page for dedicated page

Figure 22: Website Promoter: HarmoSearch logo on homepage

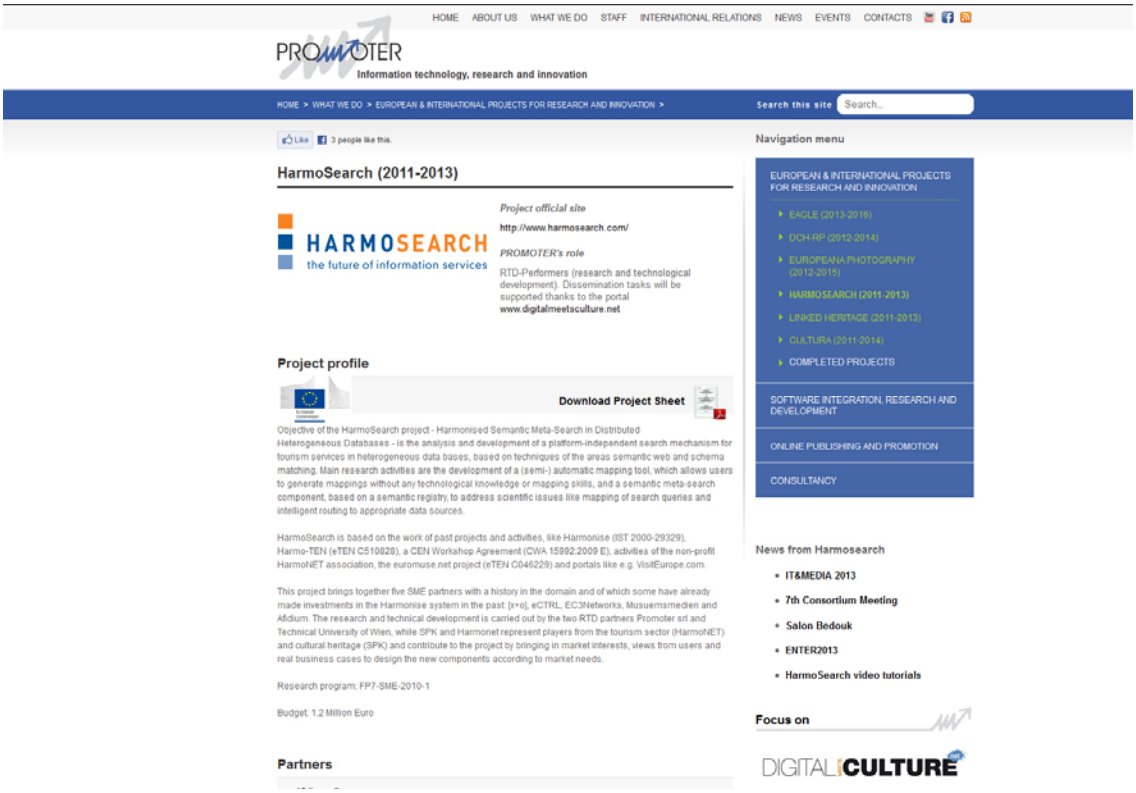


Figure 23: Website Promoter: dedicated page for HarmoSearch

Figure 24: Website digitalmeetsculture.net: homepage

Figure 25: Website digitalmeetsculture.net: showcase of HarmoSearch

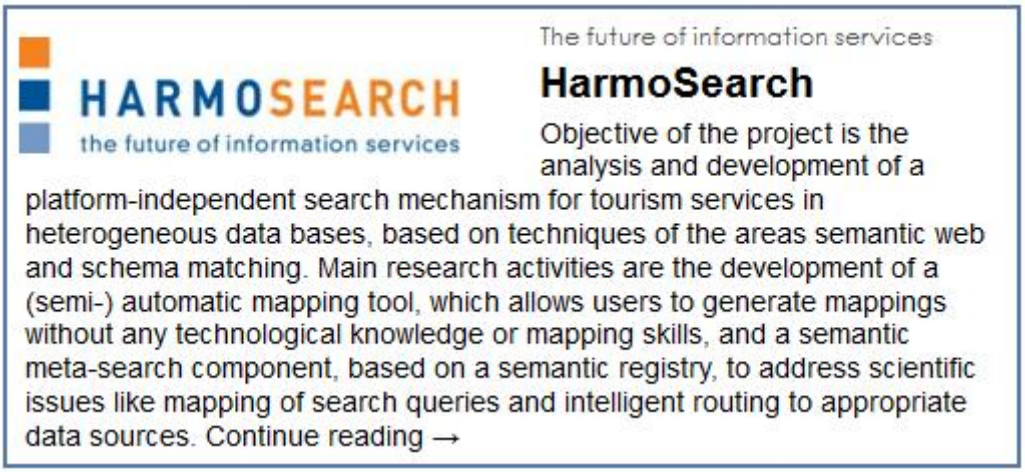
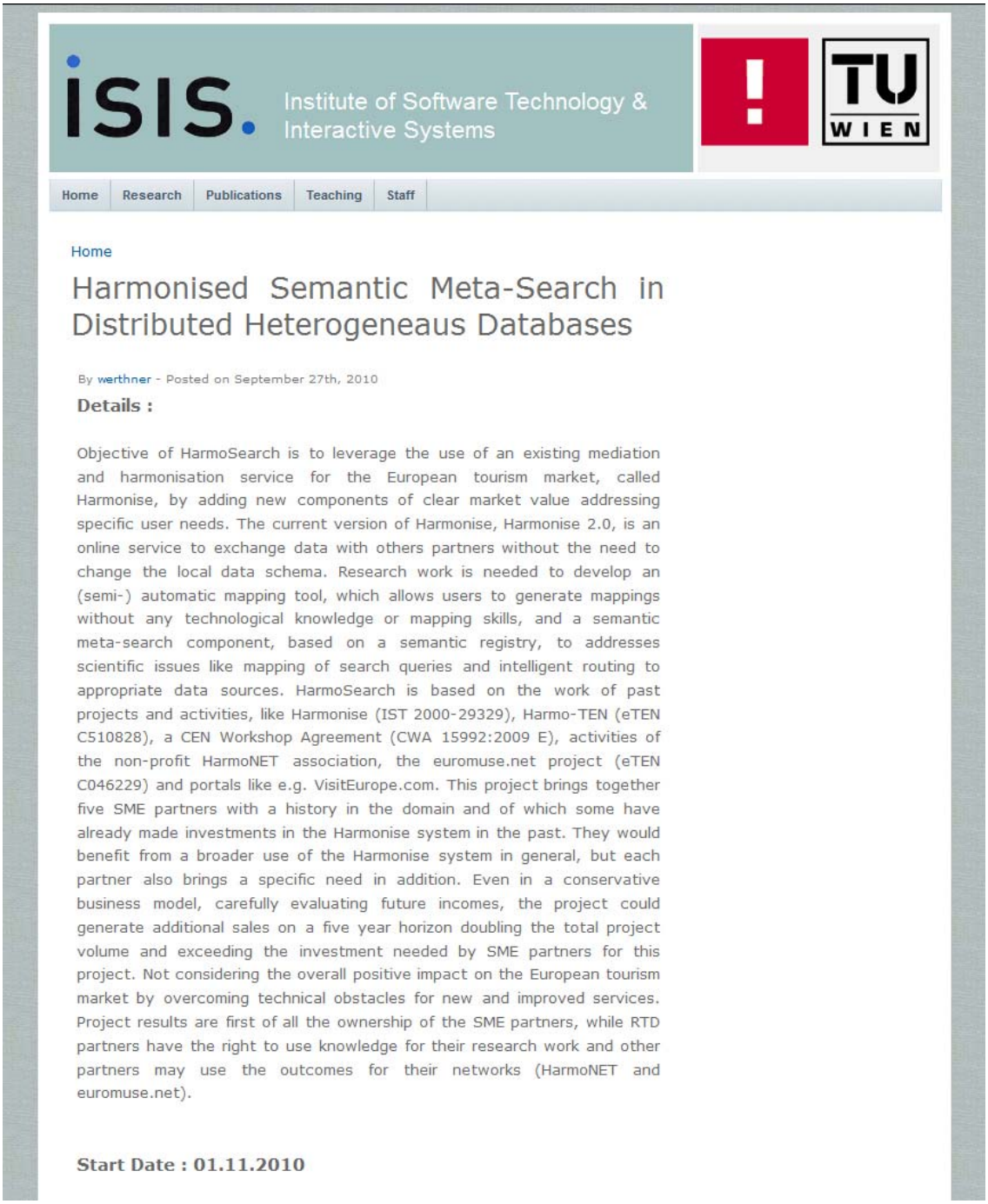


Figure 26: Excerpt from Digital Meets Culture newsletter, December 2012 edition



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Harmonised Semantic Meta-Search in Distributed Heterogeneaus Databases

By werthner - Posted on September 27th, 2010

Details :

Objective of HarmoSearch is to leverage the use of an existing mediation and harmonisation service for the European tourism market, called Harmonise, by adding new components of clear market value addressing specific user needs. The current version of Harmonise, Harmonise 2.0, is an online service to exchange data with others partners without the need to change the local data schema. Research work is needed to develop an (semi-) automatic mapping tool, which allows users to generate mappings without any technological knowledge or mapping skills, and a semantic meta-search component, based on a semantic registry, to addresses scientific issues like mapping of search queries and intelligent routing to appropriate data sources. HarmoSearch is based on the work of past projects and activities, like Harmonise (IST 2000-29329), Harmo-TEN (eTEN C510828), a CEN Workshop Agreement (CWA 15992:2009 E), activities of the non-profit HarmoNET association, the euromuse.net project (eTEN C046229) and portals like e.g. VisitEurope.com. This project brings together five SME partners with a history in the domain and of which some have already made investments in the Harmonise system in the past. They would benefit from a broader use of the Harmonise system in general, but each partner also brings a specific need in addition. Even in a conservative business model, carefully evaluating future incomes, the project could generate additional sales on a five year horizon doubling the total project volume and exceeding the investment needed by SME partners for this project. Not considering the overall positive impact on the European tourism market by overcoming technical obstacles for new and improved services. Project results are first of all the ownership of the SME partners, while RTD partners have the right to use knowledge for their research work and other partners may use the outcomes for their networks (HarmoNET and euromuse.net).

Start Date : 01.11.2010

Figure 27: Website of Institute of Software Technology & Interactive Systems at Technical University Vienna: dedicated page on HarmoSearch

Simplifying Creation and Maintenance of Mappings in the HarmoSearch Framework

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ABSTRACT

With the lack of an industry-wide accepted standard, mappings between proprietary data formats play an essential role in data integration and data exchange. SMEs often do not have the necessary resources and technical expertise to create and manage such mappings properly. In this paper we present a solution that alleviates these tasks using a standard XML transformer and Semantic Web techniques. In the transformation process the transformer tries to reconcile instance data by connecting to a triple store and querying for proper matches. Missing matches are reported in the triple store. Domain experts can then review unmapped entities and decide about proper mappings. We show how this solution is applied within the HarmoSearch framework in the cultural event domain.

Categories and Subject Descriptors

H.3.1 [**Content Analysis and Indexing**]: Thesauruses

General Terms

Management, Languages, Human Factors, Standardization

Keywords

HarmoSearch, SPARQL, Mapping, Data Reconciliation

1. INTRODUCTION

The problem of heterogeneous data spaces and therefore the need of data alignment in order to communicate successfully with other actors can be a troublesome burden for networked enterprises. In particular, Small and Medium Enterprises (SMEs) often neither have the technical expertise nor the resources to perform the tedious and time consuming data mapping task. While they know their domain well they lack in general personnel experienced in data structure, XML, XSLT, transformation processors, and the handling of a full-fledged mapping tool. In addition, a SME typically does not perform data mapping at regular time intervals and therefore it does not pay to invest much time and money in order to train in-house personnel accordingly. As a consequence, mapping projects are either outsourced to specialized service providers generating communication and coordination overhead, or it is done in-house in an inefficient way, see e.g. [5], where the authors give a good overview to the problem and name a number of open research issues.

In order to alleviate this problem a number of components are developed as part of the HarmoSearch[1] project that pay special attention to this situation. HarmoSearch addresses in particular inexperienced users in trying to minimize manual intervention by simplifying many inter-organizational communication tasks thus giving SMEs the opportunity for networking with little effort. While simplification of the problem has a number of facets, in this work we focus on the support for mappings of domain-specific values which forms one main part of an overall mapping project management.

In our approach, mappings are stored at a web-accessible platform. Participating organizations may use this platform for various Use Cases [13]. An example is the rather simple Publish Use Case for cultural events: A museum acting as data source provides an XML document encoded in its own proprietary format to the data integration service euromuse.net[2] that collects data about art exhibitions from various sources. It sends the document to the platform and denotes the intended receiver. The document is then transformed to the appropriate data format and handed over to the receiver. From the technical point of view the transformation is performed by a component termed Reconciliation Engine that basically employs an XSLT processor in two steps: The first step processes the input document and translates it to an intermediary format [10] using the appropriate mapping file(s). At the second step the processor

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I-SEMANTICS 2012, 8th Int. Conf. on Semantic Systems, Sept. 5-7, 2012, Graz, Austria Copyright 2012 ACM 978-1-4503-1112-0 :.$10.00.

[1]HarmoSearch is funded by the EU within FP7, it started in December 2010 and runs over 24 months. Project homepage: http://www.harmosearch.org
[2]euromuse.net is an exhibition portal for Europe that employs the HarmoSearch portal for data integration. Homepage: http://www.euromuse.net

Figure 28: Contribution to the call for papers of I Semantics conference in September 2012 in Graz Austria, pages 1-4.

transforms from the intermediary format to the final format of the receiver curomusc.net employing again appropriate mapping file(s). A part of such a source document to publish exhibition events is depicted in Listing 1.

Listing 1: Event instance data with proprietary art categories (<category_id>).

```
<exhibitions >...
  <exhibition>
    <museumid/>
    <locationid/>
    <name>ADOLF BOCK JA ... </name>
    <name_en>ADOLF BOCK AND ... </name_en>
    <shortdescription/>
    <description/>
    <date_start/>
    <date_end/>
    <permanent/>
    <link/>
    <opening_time/>
    <tickets/>
    <categories>
      <category_id >172</category_id >
      <category_id >8</category_id >
    </categories>
    <images/>
  </exhibition >...
</exhibitions>
```

It is (relatively) easy to create the mappings for the structure and for some commonly agreed and stable terms. For instance, begin and end date as well as the title and description elements of an exhibition have typically different element names (e.g. sdate, startDate for begin date) and the date format may differ but the alignment can be done once by technical experts using an appropriate mapping tool or even created by hand with any text-based editor.

The main problem stems from the heterogeneity of instance data for domain specific values such as exhibition categories or city names. These values have to be reviewed by domain experts who subsequently decide on proper mappings. An example is shown in Listing 2 that depicts part of a (PHP array) mapping between art categories on two different databases[3]. As shown, art categories have internal identifiers stemming from auto-generated primary keys. The labels are used only as comments for documentation purposes.

Listing 2: Partial mapping of art categories created by domain experts. The identifiers are keys in two different data bases.

```
113 => 28,//Musik->Theater, Literatur, Musik
183 => 24,//Restaurierung->Naturwissenschaft und
    Technik
118 => 30,//Europ. Kulturgeschichte->
    Kulturgeschichte
34 => 18,//Europ. Kunst vor 1800->Kunst bis 1900
184 => 30,//Weltreligionen->Kulturgeschichte
```

The remainder of this document is concerned with showing how mapping of such domain specific concepts is supported in the HarmoSearch framework.

[3]Database one: Staatliche Museen zu Berlin - Preußischer Kulturbesitz, http://www.smb.museum
Database two: http://curomusc.net

2. BACKGROUND & RELATED WORK

The Harmonise ontology [10, 8] defines a large number of concepts especially for the tourism and leisure domain with its top-level concepts Event, Accommodation, Attraction, and Gastronomy. However, while it is useful as an intermediary language to translate schemes it lacks proper means to represent domain specify values since it defines just an enumeration of possible values and does not support importing concepts from other thesauri.

XSLT (Extensible Stylesheet Language Transformations) is developed by the World Wide Web Consortium W3C and is used for the transformation of XML documents. XSLT is widely used in the domain of semantic web [7]. Especially in the field of ontology alignment and matching, where several approaches make use of XSLT to translate artifacts from one representation to another. Some approaches dealing with the mapping of XML to RDF and OWL are presented in [6, 2, 4]. XSLT is also employed as the transformation language of choice in the HarmoSearch architecture where an XSLT processor is part of the reconciliation component - a component responsible for model transformations and data harmonization.

The Simple Knowledge Organization System (SKOS) [11] is a vocabulary for representing knowledge organization systems, such as thesauri, taxonomies, and classification schemes. These representations are machine-readable and can be exchanged between applications and published on the World Wide Web.

One central issue, which was raised with the upcome of the Resource Description Framework (RDF) standardization initiative, was the issue of querying and manipulating RDF-based data models [1]. One of the most promising candidates is the SPARQL querying language, which has been standardized by the W3C in 2008 [14]. SPARQL has been designed for managing triples within an RDF graph similar to the popular relational database querying language SQL. Several RDF triple store implementations such as Sesame[4] or Fuseki[5] provide SPARQL endpoints that allow accessing the stored data. Thus, SPARQL has also been considered as relevant in the context of the HarmoSearch framework.

The ISO/IEC 11179 standard[6] (in particular Part 6: Registration) covers a wide range of metadata management. Various user roles and various states of so called Administered Items are defined. Submitters propose new items and in an iterative review process an item progresses through a multi-stage life-cycle. The standard is rather complex and does not fit well to the task of mapping management with its large number of proprietary domains but it may be used as a guide for the management of a metadata standard, e.g., a SKOS thesaurus of art categories.

Skosification denotes the process of generating a SKOS representation from an existing terminology. Domain experts, especially in the cultural heritage sector, are in general more familiar with a SKOS representation of thesauri than the

[4]Sesame: http://www.openrdf.org/
[5]Fuseki: http://incubator.apache.org/jena/
[6]ISO /IEC 11179: http://metadata-standards.org/11179/

Figure 29: Contribution to the call for papers of I Semantics conference in September 2012 in Graz Austria, pages 1-4.

more technical representation in XSLT. Proprietary data can be transformed to a corresponding SKOS representation in order to allow better reasoning and interlinking. In [12] the authors outline a single step SKOS representation transformation written in SWI-Prolog and Perl. This is different from our approach where translation can take place as an ongoing process.

3. MAPPING REALIZATION

In order to translate between different concepts typically some kind of dictionary is used. In its simplest form a table with related terms. An agent can then look up a term in the dictionary and may infer corresponding terms (e.g. translations into other languages). A very basic approach engages the XSLT processor to perform the term mapping as shown in Listing 3.

Listing 3: Simple term mapping using XSLT.

```
<xsl:choose>
 <xsl:when test="$input='3'">
  <xsl:value-of select="'exhibition history'"/>
 </xsl:when>
 <xsl:when test="$input='4'">
  <xsl:value-of select="'exhibition archeology'"/>
 </xsl:when>
 <xsl:otherwise> <!--fall-back solution -->
  <xsl:value-of select="$input"/>
 </xsl:otherwise>
</xsl:choose>
```

This simple approach is easy to implement but has a number of shortcomings: First of all, it requires a corresponding XSLT-style-sheet in order to realize round-trip translations. For instance, it needs something like 'exhibition archeology' maps to '4' in the example above. In fact, this is the actual situation at the HarmoSearch portal. A change on one side has to be reflected on the other side, too.

Furthermore, evolution is not easily achieved, adding, and removing entries needs access to the style-sheets on the server which is typically granted only to system administrators or other trusted personnel. As a consequence, domain experts have to inform technical experts about change requests and a process to validate the change has to be implemented.

3.1 Skosification

SKOSification of these thesauri can be done using the existing HarmoSearch environment. Basically it works as follows:

- As a prerequisite an organization has to provide a suitable and unique namespace, e.g., `http://www.euromuse.net/`.
- For elements that need to be harmonized a special XSLT function is called during the transformation process that connects to a SPARQL endpoint and queries for appropriate mapping(s).
- If a mapping has been found the retrieved value is added to the result document.
- If no mapping has been found a SPARQL UPDATE expression is generated and sent to a SPARQL endpoint. The expression represents a SKOSified skeleton of the concept in question. The skeleton comprises the SKOS concept definition, a preferred label with no language tag to hold the key, and an identifier for the creator of the concept (example shown in Listing 4, in Turtle notation).
- The management service of the HarmoSearch platform allows reporting of unmapped entries. Domain experts may then create proper concepts from the skeleton and proper mappings to other concepts.

Listing 4: Generated SKOS skeleton from an unmapped concept during the transformation process.

```
<http://www.smb.museum/184>
  rdf:type skos:Concept;
  skos:prefLabel '184';
  dc:creator 'http://www.smb.museum/'.
```

The SKOS standard defines a number of matching relations from which we have chosen `skos:exactMatch` as mapping construct.

```
<http://www.smb.museum/184>
skos:exactMatch <http://www.euromuse.net/30>.
```

Main reason for this choice is that it best substitutes the original XSLT constructs `<xsl:when test="...">` used so far to represent mappings in HarmoSearch . Discussion on how to best represent identity between concepts is still ongoing in Semantic Web community (see e.g. the `owl:sameAs` problem discussed in [9]). Other semantic relations such as `skos:closeMatch`, `skos:broadMatch`, or `skos:narrowMatch` denote a certain degree of similarity but it may not be clear to what extent. Different domain experts could come up with different recommendations.

3.2 Validation of XSLT/SPARQL Mapping

A major advantage of the triple based approach compared to the simple XSLT style is that the SKOS mappings are symmetric, i.e., reverse translations can use the same mapping artifact by interchanging subject and object. This feature is of particular importance when Use Cases other than the simple push scenario described above are considered, For instance, in a Meta-search scenario the requester is interested in results from a number of data providers that have certain properties such as art categories. Here mapping has to work in both directions.

In addition, evolution of mappings is greatly improved; unknown terms are recorded at run-time and domain experts can review and edit mappings in a simple and concise manner. This is of great importance when data are delivered "as is" with little support and documentation from data providers to data consumers.

4. IMPLEMENTATION

As briefly outlined above, HarmoSearch is realized by a web-accessible platform. Organizations can register for participation, deposit mapping artifacts, and let the platform do the harmonization process.

Combining SPARQL and XSLT follows partly the approach taken in [3] using a Http GET request with a SPARQL SELECT expression as payload within the XSLT style-sheet.

Figure 30: Contribution to the call for papers of I Semantics conference in September 2012 in Graz Austria, pages 1-4.

The request returns a standardized XML document holding the content of the query[7]. This result document can then be processed by the XSLT processor like any other XML source.

As an extension to this approach, unmapped terms are recorded at the triple store. This is performed using a Http POST request from a function added to the XSLT processor. The function takes two parameters; One denotes the SPARQL endpoint and the other is an URI-encoded UPDATE expression as payload of the request. This function may then be used in a style-sheet as outlined in Listing 5.

Listing 5: Update request to SPARQL endpoint using the http-post function

```
<!--when mapping then do insert -->
<xsl:otherwise>
<xsl:variable name="payload" select="concat(
    xsltsparql:commonPrefixes(), $update)"/>
<xsl:variable name="response" select="eg:http-post
    ($updateendpoint, $payload)"/>
</xsl:otherwise>
```

4.1 Implementation Components

The implementation consists of the following main components:

- The Reconciliation Engine plays a major part in the HarmoSearch framework and is responsible for the process of harmonization of heterogeneous data. It can chain together several transformation steps using an industry-standard XSLT processor.
- The Mapping Store is in effect a general data storage component with predefined access functions that allow to store and retrieve mapping artifacts. In addition, it provides functions to manage the life-cycle and access rights of artifacts. Artifacts are either XSLT files or mappings between domain specific values (RDF artifacts).
- SPARQL endpoint is employed to retrieve mappings and to store created SKOS skeletons in a triple store.
- A registry holds information about content of data providers and the services they offer. Mappings are an important source of information about focus and capabilities of data providers.
- The Management service has access to triple store and can create reports about unmapped entities. In addition, it is used to manage mapping artifacts at the Mapping Store

5. CONCLUSION AND FUTURE WORK

We have shown how the creation and management of mappings can be simplified in the HarmoSearch framework. Moving from a pure XSLT solution to a combination of XSLT and the Semantic Web techniques SKOS and SPARQL can improve management of inter-organizational communication processes. This is of particular interest for networked SMEs that have little resources for the alignment of heterogeneous data.

Future work will concentrate on improving the management service. In particular, defining strategies for fallback solutions, reporting, and support for (semi-)automatic mapping creation based on the context of the communication are in the focus.

[7]SPARQL Query Results XML Format at http://www.w3.org/TR/rdf-sparql-XMLres/

6. ACKNOWLEDGMENTS

Our thanks to euromuse.net for allowing us to use data examples to validate our approach.

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Figure 31: Contribution to the call for papers of I Semantics conference in September 2012 in Graz Austria, pages 1-4.

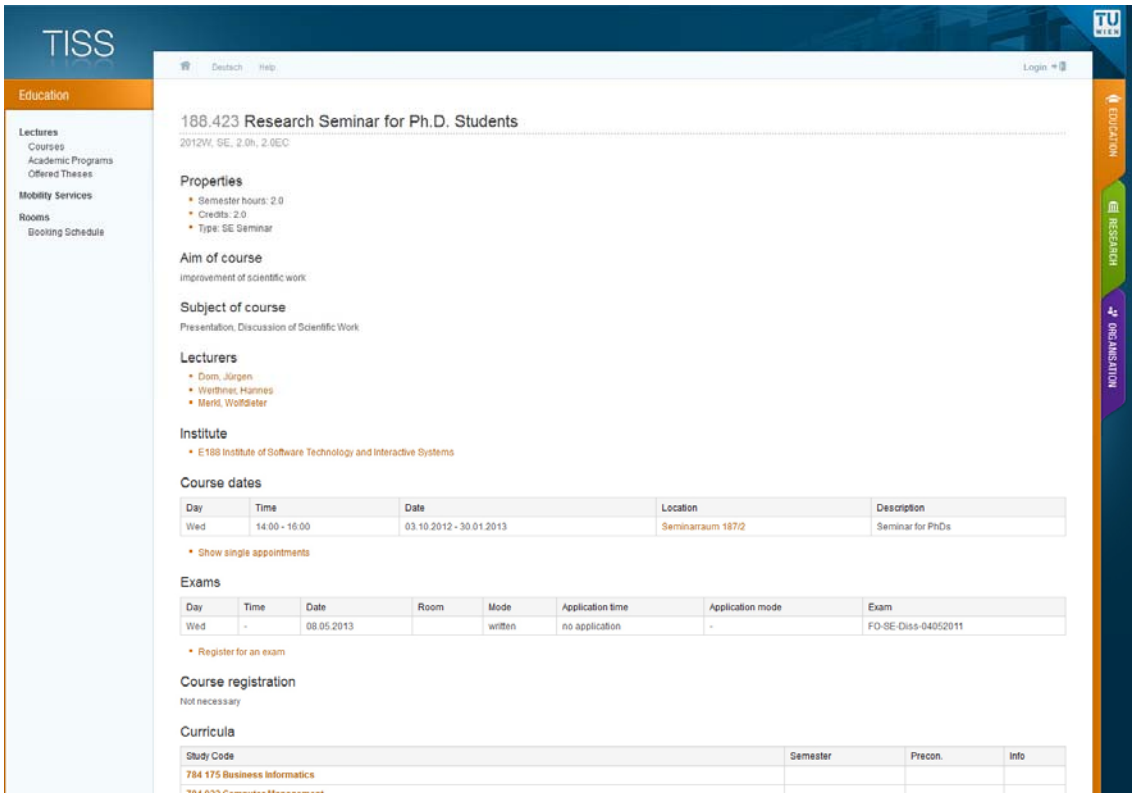

Figure 32: Website Technical University Vienna: research seminar for Ph.D. Students

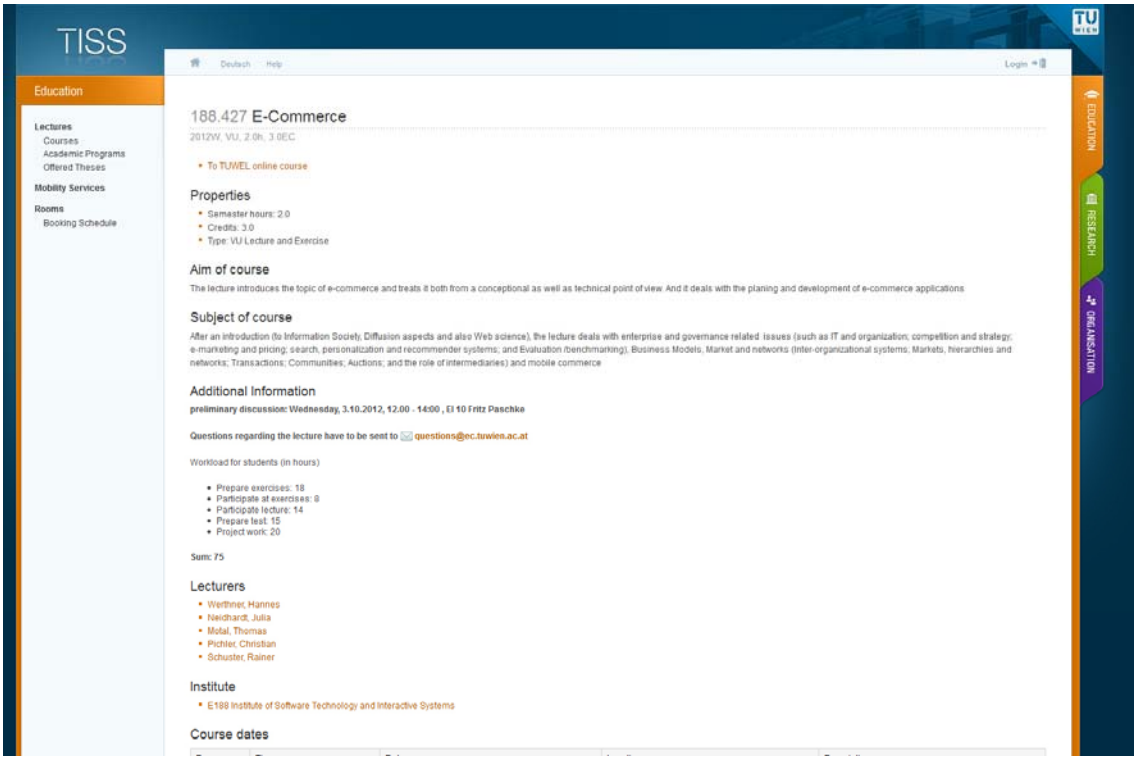

Figure 33: Website Technical University Vienna: Lecture in e-commerce

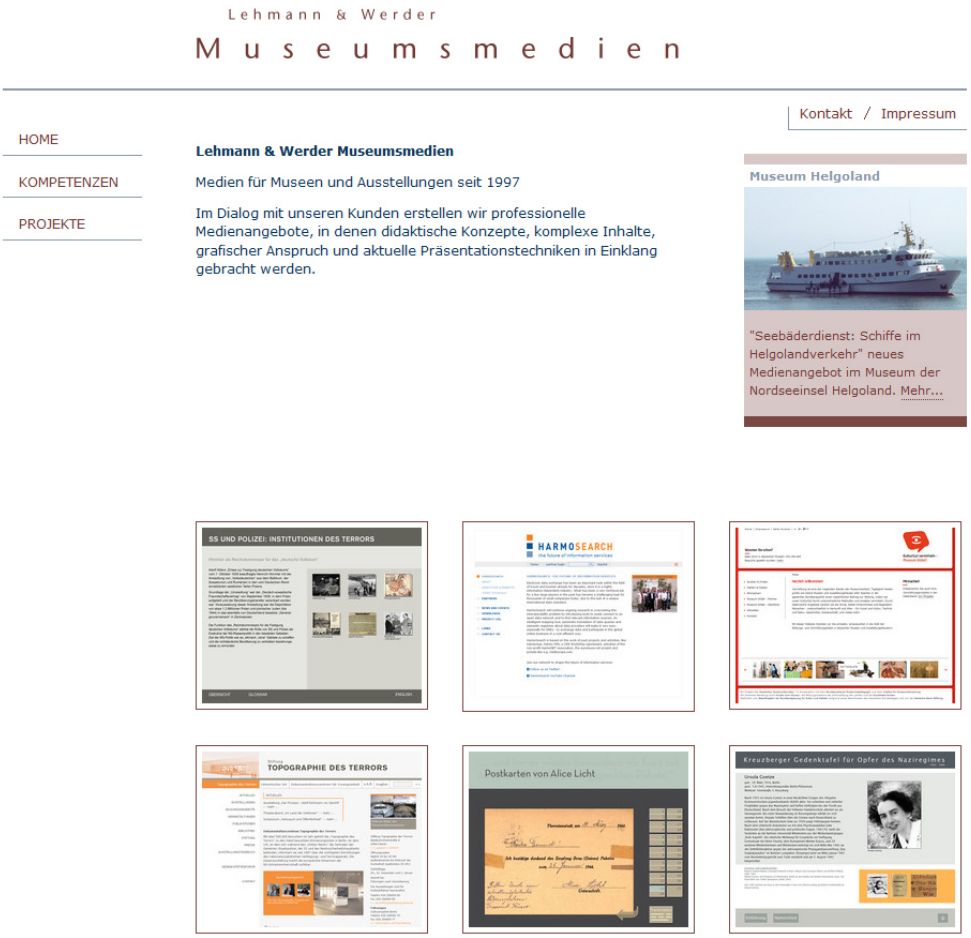

Figure 34: Website Museumsmedien: HarmoSearch on Homepage

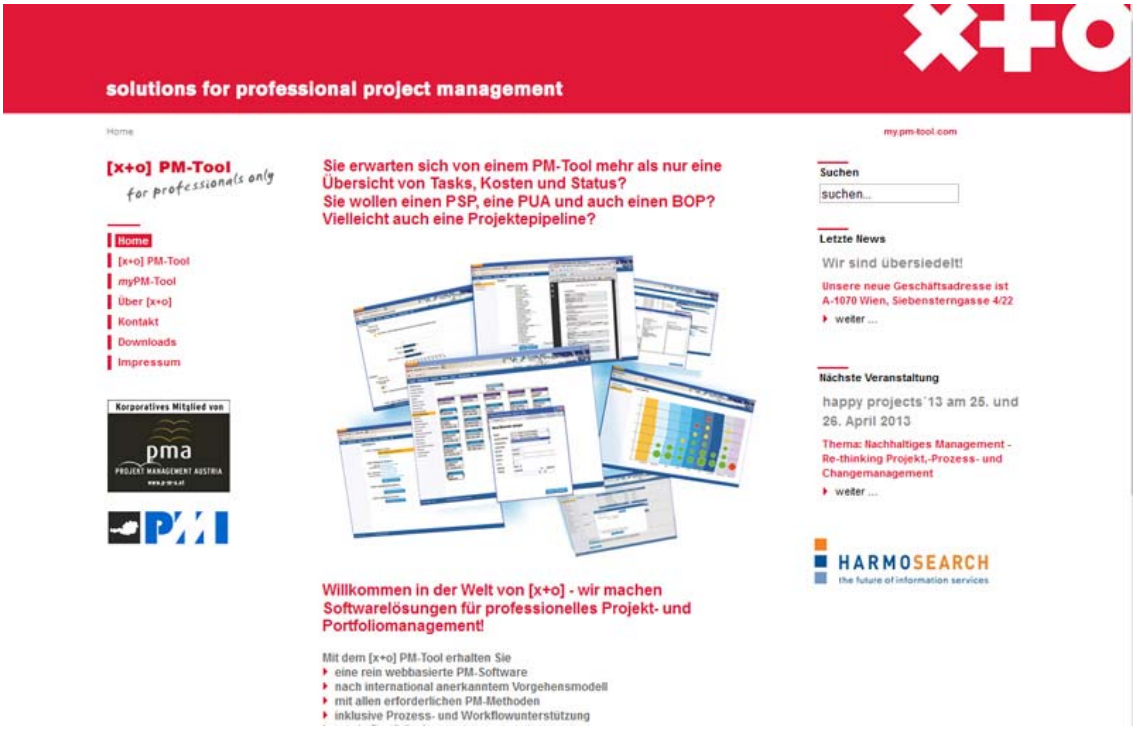

Figure 35: Website xpluso: HarmoSearch logo on homepage

Figure 36: Website euromuse.net: HarmoSearch logo on Homepage

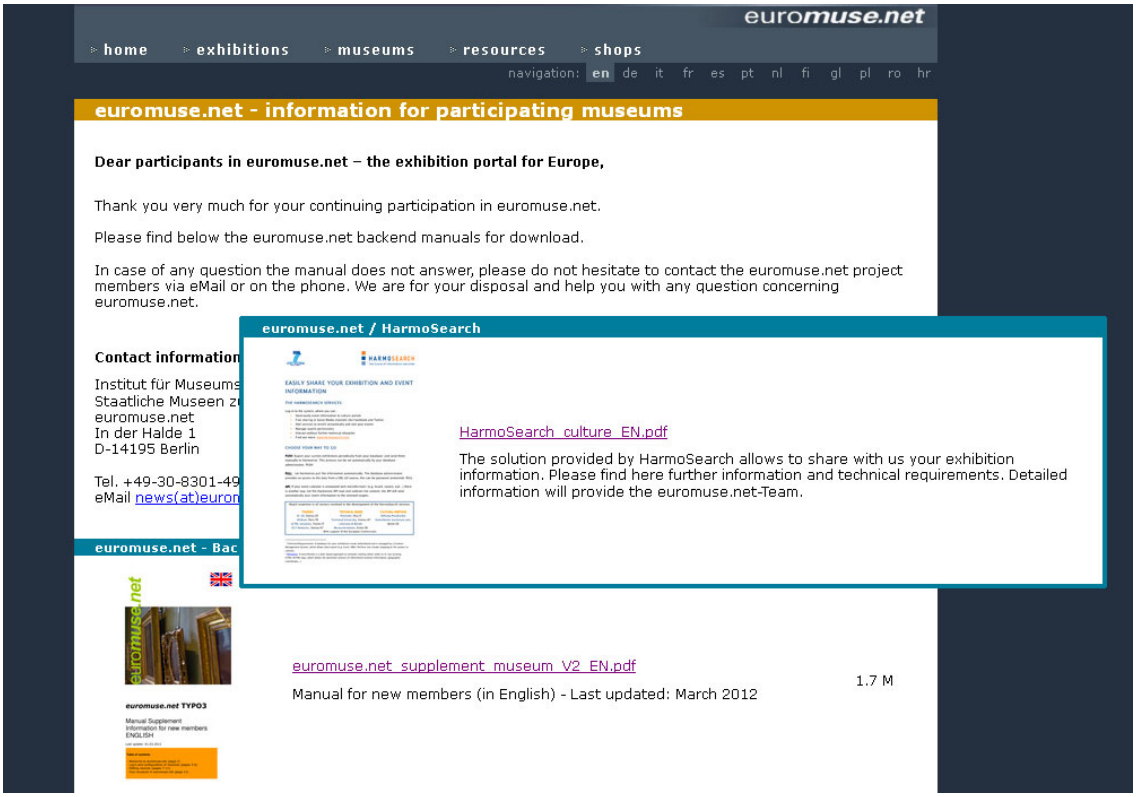

Figure 37: Website euromuse.net: Information for participating museums

SEVENTH FRAMEWORK PROGRAMME

HARMOSEARCH
the future of information services

EASILY SHARE YOUR EXHIBITION AND EVENT INFORMATION

THE HARMOSEARCH SERVICES

Log in to the system, where you can...

- Send easily event information to culture portals
- Free sharing in Social Media channels like Facebook and Twitter
- Add services to enrich semantically and rate your events
- Manage search permissions
- Interact without further technical obstacles
- Find out more: www.harmosearch.com

CHOOSE YOUR WAY TO GO:

PUSH: Export your current exhibitions periodically from your database[1] and send them manually to Harmonise. This process can be set automatically by your database administrator. PUSH

PULL : Let Harmonise pull the information automatically. The database administrator provides an access to the data from a URL (of course, this can be password protected). PULL

API: If your event calendar is annotated with microformats[2] (e.g. hcard, vevent, ical...) there is another way: Let the Harmonise API read and subtract the content, the API will send automatically your event information to the selected targets.

Reach expertise in all sectors involved in the development of the HarmoSearch services.

TOURISM	TECHNICAL ISSUES	CULTURAL HERITAGE
[X+O], Vienna AT	Promoter, Pisa IT	Stiftung Preußischer
Afidium, Paris FR	Technical University, Vienna AT	Kulturbesitz (euromuse.net),
eCTRL Solutions, Trento IT	Lehmann & Werder	Berlin DE
EC3 Networks, Vienna AT	Museumsmedien, Kriele DE	

With support of the European Commission

[1] Technical Requirements: A database for your exhibitions exists beforehand and is managed by a Content Management System, which allows data export (e.g. Excel, XML). Perform one simple mapping to the system to connect.

[2] Wikipedia: A microformat is a web-based approach to semantic markup which seeks to re-use existing HTML/XHTML tags, which allows the automatic process of information (contact information, geographic coordinates...)

Figure 38: Information sheet about HarmoSearch service "share your data"