



DL.org: Coordination Action on Digital Library Interoperability, Best Practices and Modelling Foundations

Funded under the Seventh Framework Programme, ICT Programme – “Cultural Heritage and Technology Enhanced Learning”

Project Number: 231551

Deliverable Title: *D5.3b - Dissemination and Training Activity Report Year 2*

Submission Due Date: *28/02/2011*

Actual Submission Date:

Work Package: *WP5 Dissemination and Training*

Responsible Partner: *TRUST-IT*

Deliverable Status: *Final*



Document Information

Project	
<i>Project acronym:</i>	DL.org
<i>Project full title:</i>	Coordination Action on Digital Library Interoperability, Best Practices & Modelling Foundations
<i>Project start:</i>	1 December 2008
<i>Project duration:</i>	24 months + 3-month extension
<i>Call:</i>	ICT CALL 3, FP7-ICT-2007-3
<i>Grant agreement no.:</i>	231551
Document	
<i>Deliverable number:</i>	D5.3b
<i>Deliverable title:</i>	Dissemination and Training Activity Report Year 2
<i>Editor(s):</i>	Stephanie Parker, Trust-IT
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<i>Work package no.:</i>	WP5
<i>Work package title:</i>	Dissemination and Training
<i>Work package leader:</i>	TRUST-IT
<i>Work package participants:</i>	CNR; NKUA; UG; TRUST-IT
<i>Est. Person-months:</i>	2
<i>Distribution:</i>	Public
<i>Nature:</i>	Report
<i>Version/Revision:</i>	V5.0
<i>Draft/Final</i>	Final
<i>Total number of pages: (including cover)</i>	88
<i>Keywords:</i>	Librarians, information scientists, computer scientists, dissemination; events; publications; social networking; strategic alliances; interviews

Change Log

Issue	Date	Description	Author/Partner
V0	15/02/2011	ToC	TRUST-IT
V1.0	24/02/2011	First content insertion and editing	TRUST-IT
V2.0	09/03/2011	Editing of initial content and inserting new content	TRUST-IT, CNR-ISTI, University of Athens, University of Glasgow
V3.0	24/03/2011	Insertion new content	TRUST-IT, CNR-ISTI, University of Athens, University of Glasgow
V4.0	31/03/2011	Insertion new content and final editing, internal review adjustments	TRUST-IT, University of Glasgow, University of Athens, CNR-ISTI,
V5.0	04/04/2011	Final	CNR-ISTI

Record Log

Reason for change: Issue 2, Revision 1	Page(s)	Paragraph(s)
Main objectives, main outputs (scope), web, branding, 2 nd DL.org Workshop, events, publications, training (Moodle)	9, 10-16, 17-24, 25-38, 39, 40	Initial content provision (all)
Reason for change, Issue 3, Revision 2	Page(s)	Paragraph(s)
Social networks 1 st draft, Parma Seminar draft, Athens Workshop draft, London Workshop draft, publications, THATCamp overview	17, 26-27, 28-29, 30-31, 46, 45	Initial content provision (all)
Reason for change, Issue 4, Revision 3	Page(s)	Paragraph(s)
Final outputs (inserts), web statistics, national events (final), publications (revised), strategic alliances (final)	12, 22-24, 33-47, 80-84	All
Reason for change, Issue 5, Revision 4	Page(s)	Paragraph(s)
London workshop feedback, Autumn final, KPI analysis, conclusions – new inserts and final edits	46-47, 72-73, 86-89,	All

Document Approval

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Disclaimer

This document contains information on the core activities, findings, and outcomes of the EC-funded project, DL.org, and in some instances, distinguished experts forming part of the project's Liaison Group, Working Groups and External Advisory Board. The document may contain references to content in the DELOS Digital Library Reference Model, which is under copyright. Any references to content both documents should clearly indicate the authors, source, organisation and date of publication.

This publication has been produced with the funding of the European Commission. The content of this publication is the sole responsibility of the DL.org consortium and cannot be considered to reflect the views of the European Commission.



European Commission Information Society and Media

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DL.org is funded by the European Commission under the 7th Framework Programme (FP7).

Glossary of Key Terms

DELOS Digital Library Reference Model	DELOS, an EC-funded Network of Excellence, has played an instrumental role in shaping digital library development and supporting the community over the past decade. One of its key outputs is the DELOS Digital Library Reference Model, under copyright, serving as a conceptual framework by drawing on the expertise of an international team.
DL.org	Co-ordination Action on Digital Library Interoperability, Best Practices and Modelling Foundations funded by the European Commission under the 7 th Framework Programme. By harnessing a group of researchers with a proven track record and the expertise that exists globally, DL.org has focused on enhancing and consolidating the DELOS Reference Model. DL.org has also produced a Technology and Methodology Digital Library Cookbook alongside a set of community support tools, and educational and training modules as spin-outs of the Autumn School held in October 2010.
DL.org Experts	DL.org has brought together over 50 international experts to support the project's investigations and outputs in three different ways. DL.org has coordinated six Working Groups investigating the core concepts captured in the Reference Model: content, functionality, user, policy, quality and architecture to enhance the Reference Model and pinpoint interoperability solutions. Members of the Liaison Group has provided input on the outputs through position statements and direct interaction. The strategic direction of the project has been shaped by the members of the External Advisory Board, ensuring value-add outputs with target groups firmly in mind.
ECDL	The ECDL (European Conference on Digital Libraries) conference series is a key event in the digital library space, providing an important setting for the two DL.org international workshops. The 1 st DL.org Workshop took place on 1 October 2009 during the 13 th European Conference on Digital Libraries in Corfu, Greece. The 2 nd DL.org Workshop was held 9-10 September 2010 during the 14 th European Conference on Digital Libraries in Glasgow, Scotland, UK.
LIS community	Library and Information Science, the main target community for DL.org followed by the computer science community of developers and researchers.
KPI	Key Performance Indicator. A diverse set of metrics used to measure the impact of DL.org in terms of community building, visibility and successful educational and training services, knowledge exchange through events, promotional campaigns and interviews.

Table 1 – Glossary of Key Terms

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Summary

The second year of DL.org with the three-month extension period has been an intense period of dissemination and outreach particularly to the library and information science community and next-generation professionals, and to a lesser extent, the computer science and research community. DL.org has engaged with these groups through the 2nd DL.org Workshop (September 2010), two national events, one in Athens (December 2010) and one in London (February 2011), hosted sessions at external events, such as the 8th European Conference on Digital Archiving (April 2010), the Open Repository conference (July 2010), ICT2010 Networking Session (September 2010), alongside twelve presentations at external events throughout the same period. The Proceedings of the 2nd DL.org Workshop have been accepted for a forthcoming publication in Springer's *Lecture Notes on Computer Science*, while another 14 papers, several of which are peer-reviewed, have been produced as a direct outcome of core dissemination activities. Additionally, DL.org has furthered its educational and training programme through the Autumn School (October 2010), engagement with young library professionals during the Parma Seminar (November 2010) by leveraging an alliance with the Erasmus Mundus Master Programme entitled Digital Library Learning (DILL), as well as module contributions hosted on the Digital Library section of Wikiversity in synergy with the U.S. Digital Library Curriculum Development.

Key outcomes include:

- Five events and 3 sessions hosted in addition to 12 presentations at external events.
- 20 papers, including forthcoming publication in *Lecture Notes in Computer Science*, Springer.
- Revamped, dynamic website with over 650 web pages created and updated featuring DL.org talks, demos, recorded Round Tables, a suite of filmed talks, interviews and video clips, 4 Virtual Goody Bags for events and a Virtual Reading List for the Autumn School.
- Over 16 external testimonies on the value-add of DL.org, selected also for regularly updated promotional material.
- 45 position statements and testimonies from participants at the 2nd DL.org Workshops, the Autumn School, the Athens and London Workshops.
- 16 new strategic alliances, totalling 40 over two years. 6 EC Directorate General Units are represented alongside EU27 and U.S. national initiatives.
- A consolidated community directly engaging with DL.org through events and alliances, enabling DL.org to analyse the different drivers and priorities of this community with the aim of shaping the final outputs in synergy with advisors and experts.
- Twitter with over 90 tweets directly linked to the website, a blog with over 50 posts, while leveraging other social networks for the final project outputs, reinforcing project branding and visibility.
- A focused campaign to disseminate the final suite of branded DL.org publications offering diverse community-focused tools.
- Post-project visibility through a Reference Model presentation (March 2011), a workshop on digital libraries in research and education (May 2011) and a DL.org tutorial (June 2011).

1. Summary of Year Two Objectives

Much of the focus of year two and a three-month extension period has been on disseminating the main project outputs and findings of the investigations conducted in synergy with the Working Groups for each of the six domains captured by the Reference Model: content, functionality, user, policy, quality and architecture. Special emphasis has been placed on the main target group of DL.org, that is, librarians and information scientists with diverse professional roles and from an educational and research perspective. The second target group is made up of computer scientists and researchers taking up new research challenges coupled with initiatives funded at national, European and international level to whom interoperable digital library systems are important. These stakeholders comprise people using the main outputs to develop or enhance a digital library system, addressing interoperability challenges based on current solutions and best practices. Stakeholders also include educationalists and their students at various stages in their career who can draw on DL.org outputs for curricula development or benefit from an understanding of the DL.org conceptual framework.

To this end, DL.org has organised a 2nd Workshop (September 2010), three national events (November and December 2010; February 2011) together with a number of sessions within larger events, as well as delivered talks at digital library conferences based on abstracts and papers delivered prior to the event. Additionally, DL.org has hosted a one-week Autumn School (October 2010) bringing together librarians and software developers to foster a coherent and practical understanding of the main DL.org outputs. Core activities have focused on:

- Focused promotional campaigns to target groups, including event announcements and press releases, eNewsletters and eAnnouncements, news items, tweets and blog postings.
- Identifying events and sessions of relevance to DL.org and its target groups, preparing abstracts, papers and proposals to maximise outcomes.
- Agenda and programme development, in several instances drawing on the support of Working Group members and strategic alliances forged.
- Launching a Call for Papers for the 2nd DL.org Workshop to broaden the scope of discussions with the support of an international programme committees.
- Producing a suite of Virtual Goody Bags, promotional material, such as fliers, posters and pre-proceedings booklets for the 2nd Workshop and a Virtual Reading List for the Autumn School.
- Encouraging feedback and contributions to outputs such as the Technology and Methodology Digital Library Cookbook through targeted messaging, fliers and events.
- Collecting position statements from event participants for selected events and evaluating the outcomes of the Autumn School through a dedicated survey.
- Fostering interactive debate through Round Table discussions.
- Promoting the outcomes of events through eNewsletters, interviews, blog postings, tweets, updated web pages and video recordings.

- Interacting with members of the Working Groups, particularly the All Working Group Meeting attended by the entire Consortium (May 2010) and members of the External Advisory Board to gain feedback on outputs and plan the final publications.
- Engaging with target groups, including next-general library professionals and young researchers in order to gain a better understanding of their priorities and needs.
- Seeking new alliances to ensure effective knowledge exchange, pinpoint shared priorities and interest, build the community and disseminate outcomes and next steps.
- Monitoring outcomes in terms of impact achieved, including web usage and new knowledge gained and shared across the board.

2. Main DL.org Outputs

Interaction with the digital library community and feedback from members of both the External Advisory Board and Working Groups have been conducive in shaping the final outputs of DL.org. In particular, expert feedback has determined the production of additional outputs with a clear scope and focus. The main outputs are:

- Enhanced and consolidated Digital Library Reference Model, building on the work of the DELOS Network of Excellence.
- Technology and Methodology Digital Library Cookbook.
- DL.org Reference Model Check List.
- DL.org Digital Library Manifesto (abridged).
- DL.org Reference Model – In a Nutshell (abridged).
- Technology and Methodology Digital Library Cookbook (abridged).
- DL.org Flier for the Library and Information Science Community.



Figure 1 – Sample of Publications

The main goal is to provide target communities with a broader set of tools supporting the development of digital libraries, to address interoperability challenges, and enhance educational curricula and outcomes. The main driver behind the abridged versions of the Reference Model, Cookbook along with the flier is to offer a first introduction to the digital library space, facilitating both an understanding of

the main concepts governing a digital library and defining a roadmap for development. The Reference Model Check List serves to guide developers playing different roles in assessing the extent to which the solutions chosen comply with the DL.org Reference Model. Real-world examples, including interoperability solutions, are also provided by a suite of demos produced in synergy with pertinent initiatives, spanning D4Science, DRIVER-II, Europeana, and OpenAIRE. Target communities are thus well placed to leverage document(s) of most value to them at any given time, facilitating a step-by-step process that meets their specific needs and priorities as they evolve over time.

Promotion of Final Outputs

In addition to three national events aimed at promoting the project's outputs, DL.org will continue dissemination activities between mid-February and mid-April 2011. A focused campaign at national, European and international levels will include targeted messaging to:

- European library and information science communities: national archives and libraries; LIS Europe, LIS mailing lists, national mailing lists and institutions in partner countries, drawing on the community database, including experts, and channels used to promote DL.org events, as well as selected strategic alliances.
- European Association for Library and Information Education and Research (EUCLID).
- European Computer Science communities: selected contacts in the community database, including experts, as well as institutions and departments in partner countries already targeted for event promotion and pertinent strategic alliances.
- European media channels, including CORDIS News and Wire services, selected web-based journals and project newsletters.
- International library, information and computer science communities, particularly in India, the South Pacific and North America by drawing on consolidated partner databases and networks, including experts and global initiatives.
- Social networks.
- Mailing of selected published outputs in a DL.org branded envelope:
- DL.org event participants where mailing addresses are available, experts and key associates. Outputs mailed will be selected based on the specific interests of individual recipients.

Promotion at post-project events with circulation of the flier:

- European Library Automation Group (ELAG 2011), 25-29 May 2011, Prague, Czech Republic
- DL.org Tutorial on Digital Libraries Foundations and Interoperability, Extended Semantic Web Conference, 29 May-2 June 2011, Heraklion, Crete
- Workshop at the 1st International Conference on Theory and Practice of Digital Libraries 2011 (TPDL2011), 25-29 September 2011, Berlin, Germany

3. Website Evolution & Impact

3.1 New Design

The new design of the home page of the DL.org website consists in four main, scrollable boxes, dedicated to **Mission, Outcomes, Experts & Technical Work, Events** with related core messaging and links to horizontal menu bars. Five smaller tabs, dedicated to **News & Events, Interviews & Videos, Tech Wiki, Twitter** and **Follow us** appear under these four main boxes. The logos of the Strategic Alliances appear as a rolling feature on the right of the page. Partner logos appear at the bottom of the screen. The new design is shown below.



Figure 2 – New Design of DL.org home page

Samples of other web sections and pages are provided below.

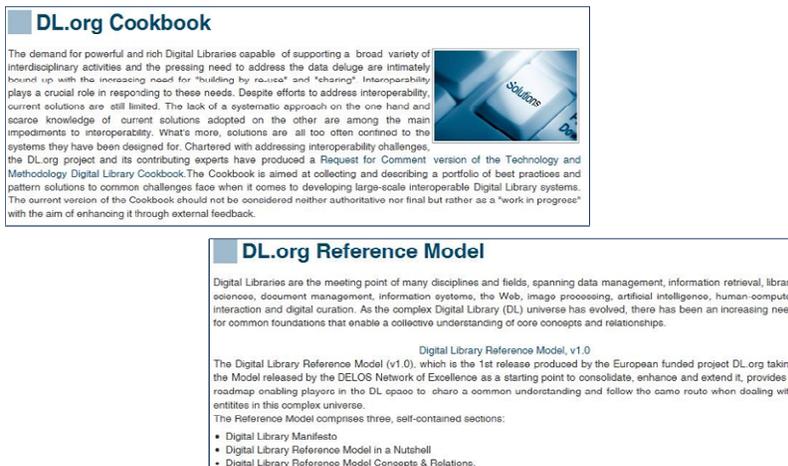


Figure 3 – Outcomes Section

More information has been published on the **expert groups** and core **technical work** coordinated by the project. For example, all the profiles and photographs of members of the Liaison Group and Working Groups have been published in expandable boxes, as illustrated below.

Policy - Experts

Kevin Ashley, Director, Digital Curation Centre, UK



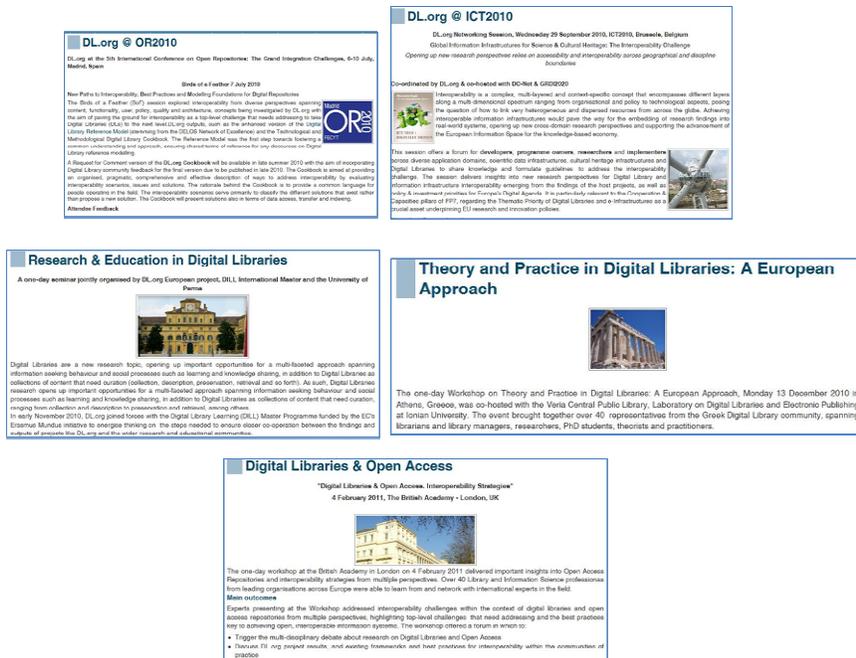
Kevin Ashley has recently been appointed director of the UK Digital Curation Centre. He was formerly Head of Digital Archives Department, University of London Computer Centre (ULCC). For the past ten years, Kevin's group has worked on the preservation of digital resources on behalf of other organisations. In many cases this has included providing descriptions of those resources and managing access to them. Most of these resources are archival, whether born digital or as digital surrogates, and have involved many types of information (databases, text, video and audio) with different access patterns and cataloguing requirements. Kevin represents ULCC on the board of the Digital Preservation Coalition, was a member of the Advisory Council for Erpanet and part of the RLG-NARA task force seeking to develop an audit and certification mechanism for trusted digital repositories. He speaks frequently on matters related to digital preservation and management of digital content and has contributed to training through the Society of Archivists and the DPC, as well as other organisations.

Mackenzie Smith, Associate Director for Technology, MIT Libraries, U.S.



Mackenzie Smith is the Associate Director for Technology at the MIT Libraries, where she oversees the Libraries' use of technology and its digital library research programme. She was the MIT project director for DSpace, MIT's collaboration with Hewlett-Packard Labs to develop an open source digital repository for scholarly research material in digital formats, and is the Principal Investigator on a number of digital library research projects including SIMILE and FACADE. She was formerly the Digital Library Program Manager for the Harvard University Library where she managed the design and implementation of their Library Digital Initiative, and she has held positions in the library IT departments at Harvard and the University of Chicago. Her research interests are in technology applications for libraries and academia, and digital libraries and archives in particular.

Figure 4 – Working Group Members Expandable Boxes



The figure displays five event posters from DL.org:

- DL.org @ OR2010:** A poster for the 5th International Conference on Open Repositories, held in Madrid, Spain, from 6-10 July 2010. It features the OR2010 logo and text about the 'Bells of a Future' theme.
- DL.org @ ICT2010:** A poster for the DL.org Networking Session at ICT2010 in Brussels, Belgium, on Wednesday 29 September 2010. It discusses the 'Openness of new research perspectives' and mentions the 'Digital Library Reference Model'.
- Research & Education in Digital Libraries:** A poster for a one-day seminar organized by DL.org, the European project DILL, and the University of Parma. It includes a photo of a building and text about research topics like learning and knowledge sharing.
- Theory and Practice in Digital Libraries: A European Approach:** A poster for a one-day workshop held in Athens, Greece, on Monday 13 December 2010. It was co-hosted by the Vania Central Public Library and the Greek Digital Library community.
- Digital Libraries & Open Access:** A poster for a one-day workshop at the British Academy in London on 4 February 2011. It focused on 'Interspersibility Strategies' and the challenges of open access.

Figure 5 – DL.org Events on the website

Dedicated registration pages and on-line forms have been created for the Autumn School (October 2010) and the Workshop on Digital Libraries and Open Access (February 2011) with Terms and Conditions as an obligatory check box. The on-line forms include information on the participant for the sole purpose of event registration, payment of fees and dietary requirements with reference to the name, affiliation, country, position, and address, helping the project map engagement by professional roles and institutions against the main communities targeted. Information collected has been manually recorded by both Trust-IT and the University of Glasgow.

Registration	Terms & Conditions
<p>"Digital Libraries and Open Access, Interoperability Strategies" Workshop, 4 February 2011, British Academy, London, UK</p>	<p>"Digital Libraries and Open Access, Interoperability Strategies" Workshop, 4 February 2011, British Academy, London, UK</p>
<p>Registration fees include:</p> <ul style="list-style-type: none"> • Workshop attendance • Presentation & materials • Lunch • Morning and afternoon coffee breaks <p>Registration for the workshop is limited by the venue capacity. Early registration is highly recommended.</p> <p>Early registration deadline and fees: before and on 5 January 2011: £50 (GBP) Regular registration deadline and fees: from 6 January 2011: £75 (GBP) Students (doctoral, masters): registration fees are £50 (GBP)</p>	<p>Registration Terms & Conditions</p> <ol style="list-style-type: none"> 1. DL.org can only accept bookings accompanied by a guarantee of payment. DL.org cannot accept bookings by telephone or "provisional" bookings. Should no confirmation of registration occur after three working days, it is the responsibility of the participant to contact DL.org. 2. Submission of a booking form indicates the participant agrees to the terms and conditions set out and will be charged the appropriate Workshop fee. 3. We rely on your attendance to make important arrangements for the Workshop. If a participant wishes to withdraw from the event, he/she must inform us no later than 15 days prior to the day of the scheduled Workshop. Registration fees will then be refunded. Refunds cannot be made for withdrawals initiated within 10 days of the day of the scheduled Workshop. Refunds cannot be made for participant no-shows. 4. If you are unable to attend the DL.org Workshop but have a substitute at the appropriate level, please inform us by email (london@dlorg.eu) at least 14 calendar days prior to the event, indicating all the information provided in the Registration Form. 5. If the Workshop is cancelled due to low enrolment or unforeseen circumstances, participants will be notified as soon as possible and registration fees refunded. DL.org cannot be held responsible for non-refundable costs incurred such as travel and accommodation.

Figure 6 – Registration and Terms and Conditions

3.2 Content Provisioning

Content provisioning has focused on the delivery of multimodal content around the project's initiatives and outcomes. Value propositions have evolved over time with core activities have ranged from event promotion and pay-offs, drawing attention to main achievements and outputs, making requests for community feedback, to taking on board advice and input from external experts and complementing activities through social networks. In addition to regular updates on project initiatives and DL.org outputs, content provision includes but is not limited to:

- 658 web pages created and updated.
- Over 60 news items and event announcements.
- Over 16 external testimonies on the value-add of DL.org.
- 56 expert profiles in expandable boxes plus 3 short profiles for the External Advisory Board members.
- 40 Strategic Alliances with summaries and logos.
- Over 30 from the 1st and 2nd DL.org Workshops and selected national events.
- 7 eNewsletters: on-line texts plus downloads.
- 8 interviews with 2 forthcoming; 2 recorded Round Tables and a suite of filmed talks and video clips.
- Dedicated and detailed sections for 6 workshops, 2 event sessions plus 2 post-project events (1 tutorial and 1 workshop) with main outcomes, talks, agendas, and speaker profiles, as well as a dedicated page for the 2nd DL.org Workshop Call for Papers. Registration modules and terms and conditions for the Autumn School (October 2010, Athens) and London Workshop (February 2011, London) with email help desks for enquiries.
- 4 Virtual Goody Packs populated for DL.org events plus 1 Virtual Reading List for the Autumn School.
- Over 50 talks, 5 demos and 3 student group presentations uploaded.
- Over 20 papers (links and downloads) that have been published in conference proceedings and journals.
- 12 presentation overviews at external events.
- Over 10 external publications of relevance to target communities.

3.3 Blog & Social Networks

The DL.org Blog comprises four different types of posts: **DL.org On the Road**; **Event Blogs**; **Expert Views** and **Off the Wire** with the tagging of key words related to specific posts. Over 50 blogs have been posted. The figure below shows a sample of postings featuring DL.org participation in external events.



Figure 7 – DL.org On the Road Blogs

The figure below shows a sample of Event Blogs.



Figure 8 – DL.org Event Blogs

Additional examples of event blogs include promoting the outcomes of the DL.org Autumn School with special emphasis on the main outcomes, sharing testimonies from the participants with peers from the digital library space.

Students hail DL.org Autumn School a huge success

October 20th, 2010

Feedback collected from the participants of the DL.org Autumn school, which ran 3-8 October 2010 in Athens, underscores the different levels of quality of the event, from the lecturers, background material, expectations, and addressing the main topic to organisational aspects. All participants are interested in attending similar events in the future and almost everyone felt that the cost is acceptable. Here is how the Autumn School fared out of a total score of 5: speaker effectiveness: 4.41; structure of the event: 4.5; value of background documentation: 4.45; organization: 4.83 and addressing the main topic: 4.58.

DL.org Autumn School

Views from Librarians & Library Managers at the School

"The competence of trainers, good explanations of the field are the two things I liked best about the Autumn School. The wide view of DL's and requirements that have to be discussed for interoperability is my take-home message."

"The topics for the user domain and architecture domain are my favourite workshop features."

"The expertise of the speakers is what impressed me most. I take home general knowledge about the requirements needed."

"I take away with me a method, a complete list of points to take in count, some sites or applications on which I'd like to find more information after the School."



Students & Lecturers at the Autumn School

Figure 9 – Outcomes of the Autumn School Blog

The DL.org all-partner meeting with members of the Working Groups in late May 2010 offered an important opportunity to share feedback on the main outputs foreseen with pragmatic suggestions, as well as offer insights on the evolving digital library space. Interactive discussions helped to generate a number of blogs covering:

- Antonella De Robbio on Organisational Interoperability with references to key papers as well as insights into the three levels of interoperability: technical, semantic, organisational
- Edward Fox on Credible Interoperability Requirements with reference to the Networked Digital Library of Theses and Dissertations
- Sarantos Kapidakis on Interoperability, Policy & Quality with reference to commonalities and how these concepts relate to other domains and challenges
- Antonella De Robbio on the Digital Agenda for Europe with reference to interoperability

A sample of the blogs published as Expert Views is illustrated below.

Expert View – Antonella De Robbio on Organisational Interoperability

August 12th, 2010

In *Digital Libraries* (MIT Press, January 2000 – rev-ed June 2005), William Arms defines interoperability (OI) as "the task of building coherent services for users when the individual components are technically different and managed by different organizations".

In other words, Arms sees the problems of getting a wide variety of computing systems to work together as a fundamental challenge to all the aspects of digital libraries. In its complete form, interoperability would be synonymous with the seamless integration of disparate collections held by different organizations. I believe that this outlines very well organizational interoperability.

Christine Borgman (*From Gutenberg to the Global Information Infrastructure: Access to Information in the Networked World*, Cambridge, MA: The MIT Press, 2000) identifies three main aspects, relevant for digital libraries, relating to interoperability:

- Getting systems to work with one another in real time.
- Enabling software to work on different systems (portability)
- Enabling data to be exchanged among different systems



Expert View – Antonella De Robbio

Expert View – Sarantos Kapidakis on Interoperability, Policy & Quality

August 12th, 2010

On Interoperability: Policy versus Quality

I am in the Quality Working group, and have found a close relation of our issues with policy:

- The Policy expresses what the goal of a Digital Library is.
- The policy can cover technical issues, like the maximum response time of a system.
- The definition of a realistic policy is a very difficult task.

Quality is the degree that the DL conforms to the specified policy. So, quality serves to measure the effective behaviour and to compare it with the desired behaviour of the DL. This makes quality and policy to be described using the same language: Quality is described as a pair of the current and the desired behaviour.

On Interoperability: Quality and Policy v.s. other issues

Quality (and policy) are not in parallel but intersect with other issues. There is content quality, functionality quality, architecture quality, etc., that in the other core domains characterising a Digital Library as captured by the DELOS Reference Model.

Each individual quality could be examined in the examination of its own issue. For example content quality could be examined with content. And the total quality could deal with the combined quality, and the effects of the individual quality factors to the overall quality. For example, how the timeouts from the system architecture – that make some of the results inaccessible) and the quality of the sources affects the quality of the results.

This overall quality is also a very difficult problem.

sarantos kapidakis, professor of informatics, Department of Informatics & Library services, ionian university, Corfu, Greece



Expert View – Sarantos Kapidakis

Expert View – Edward Fox on Credible Interoperability Requirements

August 08, 2010

In addition to *Europeana*, it would help to have a number of examples where interoperability is sought. One is the *National Science Digital Library* in the U.S. whose different Pathways and other projects manage sub-areas of Science, Technology, Engineering, and Mathematics education. Do we have in Europe some interoperability, or user experience is far from consistent, for example, never knowing what will come up when a metadata record is brought forth. Nor is it possible to do browsing on more than a very superficial set of facts.

The *Networked Digital Library of Theses and Dissertations* has interesting interoperability issues. Inquiries: can students, their work with their mentors/counselors, their graduate program administrators, their library, the national library, the NDLTD Union Catalog, etc.

- Again, how can we browse on topic?
- What happens when metadata records are complete or erroneous?
- How can over time we deal with all types of content?
- What about policies of the department, college, university, nation?
- What about access restrictions, especially if for a fixed time period (e.g. 1 year)?

Another challenging example is the *Crisis, Trajectory, and Recovery Network*. We have many stakeholder groups with different needs: those affected, their families, their friends, their care givers, emergency workers, volunteers helping professionals, mental health professionals, health care professionals, policy makers, students, researchers and so on. There are many types of content: papers, news stories, videos, help manuals, emergency preparedness plans, testimonials, blogs, tweets, emails, cell phone messages, reports, law suits, government reports, survey data. This needs to be in a coordinated way, working with different languages and cultures, modes in each location, but sharing data. There needs to be data mining across the distributed collection, indexing, searching, GIS coordinates, visualization, data analysis, etc.

Edward Fox, Professor of Computer Science, Virginia Tech, U.S.



Expert View – Edward Fox

Figure 10 – Sample of Expert Blogs

Finally, a number of blogs have drawn on external sources, such as event announcements and surveys targeting librarians and information sciences. These “Off the Wire” posts have been sourced from European Commission announcements, strategic alliances and interviewees. A sample is illustrated below.



Figure 11 – Sample Off the Wire Blogs

Twitter

The DL.org twitter account is <http://twitter.com/EUDLorg>, where over 90 tweets have been posted. Tweets automatically appear on the dedicated tab on the home page of the website.



Figure 12 – DL.org on Twitter

DL.org has 17 followers, including Johann Oomen, Head of Research at the Netherlands Institute for Sound and Vision; Diane Goldenberg Hart, Communications Coordinator at the Coalition for Networked Information; Michael Day, UKOLN – University of Bath and Kevin Ashley, Director of the Digital Curation Centre and member of the Policy Working Group.

While most effort has focused on twitter, DL.org has accounts on LinkedIn, Facebook, Slideshare and flickr to promote the main final outcomes and build on connections particularly with regard to the availability of the project’s outputs.

<http://www.facebook.com/pages/DLorg-Project/298493747668>
<http://www.linkedin.com/pub/dl-org-project/1a/451/696>
<http://www.flickr.com/photos/dlorgproject/>

3.4 Impact

The impact of the website has been measured on a quarterly basis with particular reference to visits, unique visits and page views, analysing country spread and most popular pages.¹ The figure below shows the number of visits from December 2009 to February 2011. Visits grew significantly in early March 2010 with the new website design and have maintained similar figures up until February 2011, totalling 16244.

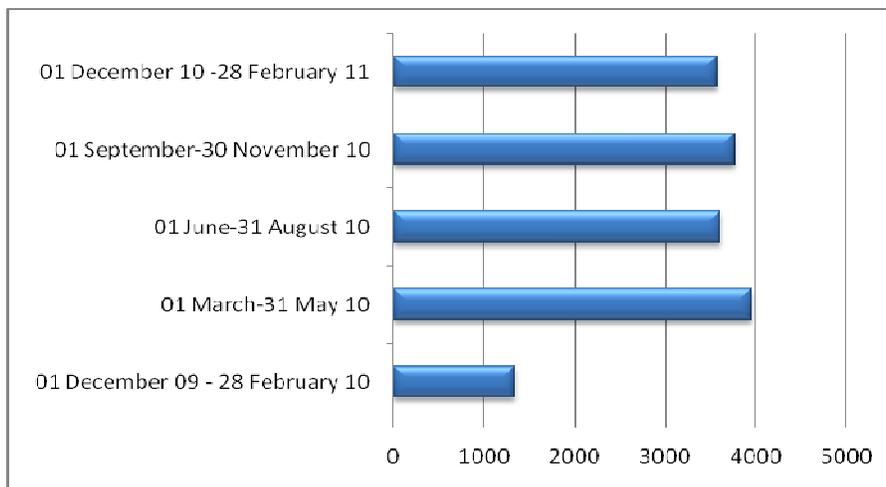


Figure 13 – Visits to the DL.org website in year two

The growth in the number of unique visitors is consistent with the trends identified above with a peak between September 2010 and November 2010 as a direct outcome of the high concentration of events

¹ The open-source web analytics, Piwik, used to monitor website impact was replaced with Google Analytics in early June 2010 for technical reasons and to facilitate monitoring on a quarterly basis.

organised. The figure below illustrates the number of unique visits for the second year of the project, totalling 7964.

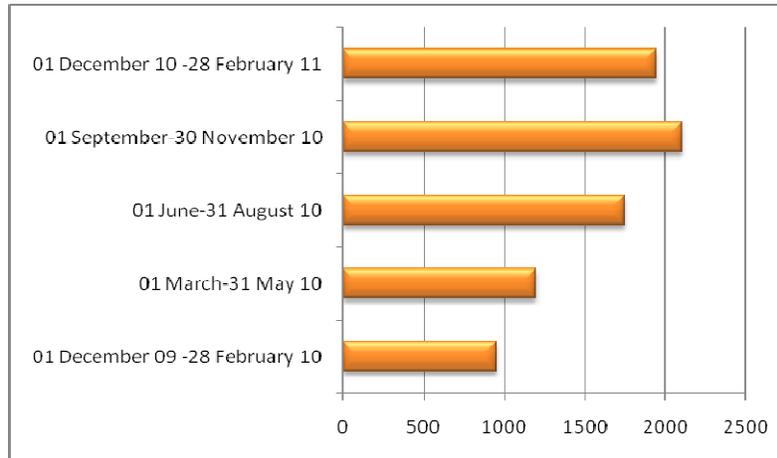


Figure 14 – Unique visits in year two

The figure below shows the trends in page views during the second year with a peak between June and August 2010.

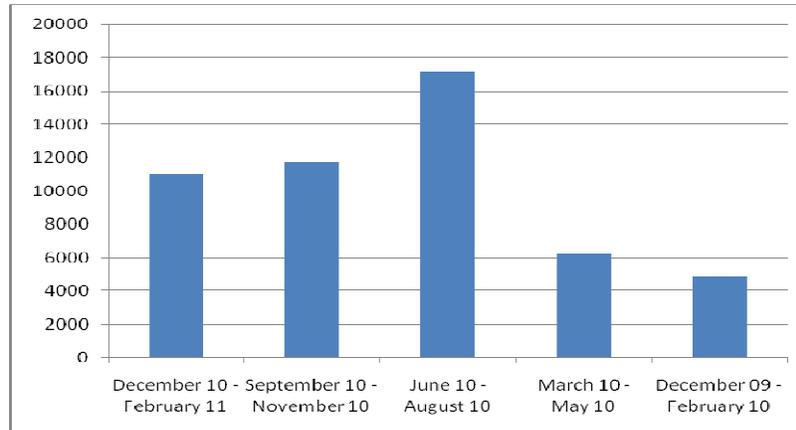


Figure 15 – Page views in year two

The sections dedicated to the project's events have proved to be the most popular. The top events are Autumn School, 2nd DL.org Workshop, London Workshop, Parma Seminar and Athens Workshop. Top ten country visits are: Greece, Italy, UK, U.S., Germany, Spain, India, Netherlands and Slovakia. Visit trends illustrate that referring sites play an important in bringing people to the website (average 35% since June 2010) followed by direct access (33%) and search (32%). The average length of stay on 3:21 minutes.

It is interesting to note that the DL.org overview published on EUPractice has attracted over 1460 views (<http://www.epractice.eu/en/cases/dlorg>) to date.

3.5 Branding and Promotional Material

Web and project branding have been consolidated during the second year with the design and circulation of regularly updated project fliers featuring testimonies from both experts and DL.org target communities. Six different versions of the project flier, plus an Autumn School flier and an updated poster have been produced. There has been an excellent return on investment for flier production with a successful circulation rate of around 95%.

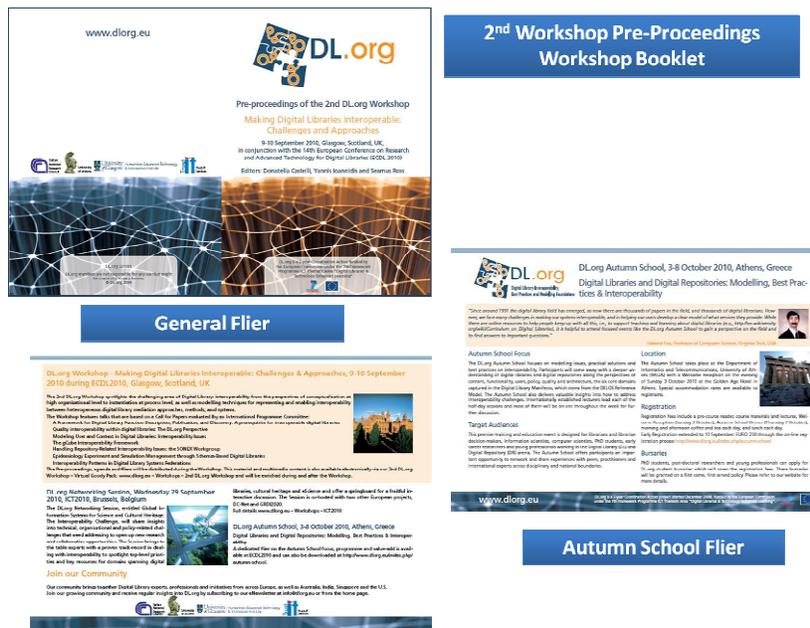


Figure 16 – Sample of DL.org branding in Year 2

Branding has also been reinforced by the production of Virtual Goody Bags for DL.org events and a Virtual Reading List for the Autumn School.



Figure 17 – Virtual Goody Pack Logos

and enabling interoperability between heterogeneous digital library mediation approaches, methods, and systems, exploring current approaches and new research directions.

Target Audience

The workshop aimed to provide researchers, practitioners and digital library developers with a forum fostering a constructive exchange of ideas on interoperability in digital libraries. With a venue capacity of between 40 and 50 participants, workshop promotion targeted representatives from the Digital Library research and application communities, scientific communities interested in developing and managing large interoperable digital library infrastructures, as well as library professionals and decision makers.

Programme Committee

An International Programme Committee was set up to evaluate the Call for Papers and define the final workshop programme. Members of the Programme Committee include:

- Tiziana Catarci, Professor of Computer Science, Sapienza University of Rome - Member of DL.org's User Working Group
- Jane Hunter, Professor at the School of Information Technology & Electrical Engineering, University of Queensland, Australia - Member of DL.org's Liaison Group
- Ronald Larsen, Dean of the School of Information Sciences, University of Pittsburgh, U.S. - Member of DL.org's Liaison Group
- John Mylopoulos, Professor of Computer Science, University of Toronto, Canada
- Fabio Simeoni, Research Assistant, University of Strathclyde, Scotland, UK
- Dagobert Soergel, Dean of the Library & Information Studies, University at Buffalo, U.S. - Scientific Chair of DL.org's Functionality Working Group

Open Call & Promotion

The **Call for Papers** was targeted at two different types of contributions: Research Papers and Project Papers. The request for research papers focused on: Theoretical Foundations of Interoperability in Digital Library; Emerging interoperability issues; Standard-based approaches toward interoperability; Technologies promoting interoperability; Mediator-based approaches toward interoperability; Concrete implementations and exploitations of interoperability solution; Evaluation of interoperability approaches and solutions; Interoperability Models; Ontology driven interoperability; Metadata interoperability and Interoperability levels. The request for project papers centred on digital library interoperability approaches and solutions adopted and lessons learned when implementing interoperable DL systems in the context of European, international and national projects.

The Call for Papers was promoted by the Consortium through a range of channels, spanning a dedicated CFP wiki, projects forming part of the strategic alliances and targeted messaging to the digital library stakeholder community.

Specifically the Call for Papers and Workshop has been promoted through the following channels and mailing lists:

- www.wikicfp.com - a dedicated website for Calls for Papers
- www.elearningeuropa.info

- OpenAIRE email-list and webpage (<http://www.openaire.eu/en/about-openaire/news-a-events/174-call-for-papers-2nd-dlorg-workshop-making-digital-libraries-interoperable.html>)
- D4Science email-list and webpage (<http://www.d4science.eu/node/507>)
- National Documentation Center (<http://www.ekt.gr/en/index.html>)
- National Library of Greece (<http://www.nlg.gr/english/default.htm>)
- Union Catalog of Greek Academic Libraries (<http://www.unioncatalog.gr/ucportal/>)
- Central Library of NTUA (<http://www.lib.ntua.gr/>)
- Department of Archives and Library Science (<http://tab.ionio.gr/?q=en>)
- Library of University of Piraeus (http://www.unipi.gr/eng_site/default.php)
- University of Macedonia (<http://www.lib.uom.gr/>)
- GRL2020 (<http://www.grl2020.org/index.php/call-for-papers---2nd-dl-org-workshop>)
- GRDI2020 (<http://www.grdi2020.eu/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=20&cntnt01returnid=64>)
- Web4Lib: <http://lists.webjunction.org/web4lib/>
- ABDS-INFO list
- LIS-UKEIG: <https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=LIS-UKEIG>
- AIB-CUR (Italian librarians): <http://list.cineca.it/archives/aib-cur.html>
- Lista Archivi 23 (University of Padua): <http://www.unipd.it/archivio/archivi23/>
- SWISS-LIB: <http://lists.switch.ch/mailman/listinfo/swiss-lib>
- ERIL-L: (Electronic Resources in Libraries): <http://listserv.binghamton.edu/archives/eril-l.html>
- IFLA DIGLIB: <http://infoserv.inist.fr/wwsympa.fcgi/info/diglib>
- AIB list (Association of Italian Librarians): <http://www.aib.it/aib/aib-e.htm3>
- DBWorld (Association for Computing Machinery): <http://www.cs.wisc.edu/dbworld/>

Personalised messages were also sent to all pertinent initiatives, particularly the Europeana family of projects. Additionally, an announcement was added to the discussion board of the "YEP! Young European Professionals subgroup of LIBER (Association of European Research Libraries)" on LinkedIn and messages were sent to all the subscribers of the DL.org eTraining. The figure below provides a sample of CFP announcements published.



Figure 19 – Call for Papers: 2nd DL.org Workshop

Programme

In addition to the papers accepted through the Call for Papers, the Workshop programme featured an invited talk and a Round Table on Linked Data.

Thursday 9 September 2010	
2:30 - 3:00	Welcome and introduction Donatella Castelli, Yannis Ioannidis, Seamus Ross
Session #1: Invited Talk Chair: Donatella Castelli	
3:00 - 4:00	Digital Library Interoperability: An Industrial Perspective Alex Wade, Microsoft Research, UK
4:00-4:30	Networking Coffee Break
Session #2: DL Interoperability Principles and Practice Chair: Yannis Ioannidis	
4:30 - 5:00	<i>The gCube Interoperability Framework</i> Leonardo Candela, George Kakaletis, Pasquale Pagano, Giorgos Papanikos and Fabio Simeoni
5:00 - 5:30	<i>Handling Repository-Related Interoperability Issues: the SONEX Workgroup</i> Peter Burnhill, Pablo deCastro, Jim Downing, Richard Jones and Mogens Sandfaer
5:30 - 6:00	<i>Epidemiology Experiment and Simulation Management through Schema-Based Digital Libraries</i> Jonathan Leidig, Edward A. Fox, Madhav Marathe and Henning Mortveit
6:00 - 6:30	<i>Interoperability Patterns in Digital Library Systems Federations</i> Paolo Manghi, Leonardo Candela and Pasquale Pagano
Friday 10 September 2010	
Session #3: The DL.org Approach to DL Interoperability Chair: Costantino Thanos	
9:00 - 9:30	<i>Framework for Digital Library Function Description, Publication, and Discovery: A prerequisite for interoperable digital libraries</i> George Athanasopoulos, Katerina El Raheb, Edward Fox, George Kakaletis, Natalia Manola, Carlo Meghini, Andreas Rauber and Dagobert Soergel
9:30 - 10:00	<i>Quality interoperability within digital libraries: the DL.org perspective</i> Giuseppina Vullo, Genevieve Clavel, Nicola Ferro, Sarah Higgins, René van Horik, Wolfram Horstmann, Sarantos Kapidakis
10:00 - 10:30	<i>Modeling Users and Context in Digital Libraries: Interoperability Issues</i> Anna Nika, Tiziana Catarci, Akrivi Katifori, Georgia Koutrika, Natalia Manola, Andreas Nürnberger and Manfred Thaller
10:30-11:00	Coffee Break
Session #4: Digital Libraries and Linked Data Chair: Seamus Ross	
11:00 - 12:30	BRAINSTORMING - ALL
<i>Participant Position Statements</i>	
12:30 - 1:00	<i>Conclusions</i> Donatella Castelli, Yannis Ioannidis, Seamus Ross

Table 2 – 2nd Workshop Programme**Virtual Goody Bag & Participant Packs**

- The Virtual Goody Bag for the 2nd DL.org Workshop contains:
- eNewsletter Summer 2010.
- DL.org Interviews with key figures in the landscape.
- Project Flier.
- Autumn School Flier.
- Filmed interviews from our 1st Workshop in 2009: Geneva Henry, Rice University and Ronald Larsen, University of Pittsburgh.
- Talks: Welcome & Introduction; The gCube Interoperability Framework; Interoperability Patterns in Digital Library Systems Federations; Quality interoperability within digital libraries: the DL.org perspective; Handling Repository-Related Interoperability Issues: the SONEX Workgroup; A Framework for Digital Library Function Description, Publication, and Discovery: A prerequisite for interoperable digital libraries; Modelling Users and Context in Digital Libraries: Interoperability Issues.

Each participant received a copy of the Workshop Pre-proceedings, the promotional flier for the Autumn School, as well as the DL.org general promotional flier in addition to the delegate pack provided by the University of Glasgow as conference hosts.

Outcomes & Participants

Eleven DL.org representatives participated in the 2nd Workshop:

- National Research Council, Italy: Leonardo Candela, Donatella Castelli, Costantino Thanos
- University of Glasgow: Perla Innocenti, Giuseppina Vullo with the participation of Seamus Ross, University of Toronto acting on behalf of the UK educational institution.
- University of Athens: George Athanapolous, Katerina El Raheb, Yannis Ioannidis, Anna Nika.
- Trust-IT: Stephanie Parker.

The Workshop was attended by over 40 people from nine countries (6 European countries; North America and Latin America). Participant names, affiliations and country details are provided in the table below.²

² A preview list of attendees was provided by the University of Glasgow based on registration checks. This information provided names, affiliations and country but not the professional roles. The figures cited above are based on three head counts: workshop start and end on 9 September and morning session on 10 September. While an attendee form was circulated during the event, a more detailed overview is impeded by the fact that not every participant completed the form; due to a) some attendees arrived late due to travel delays; b) some attendees only took part in one day due to either overlapping workshops or registration options. Finally, some of the information on the attendee form is difficult to decipher, making it hard to process.

Name	Affiliation	Country
Kevin Ashley	Digital Curation Centre	Scotland, UK
Ritta Autere	Finnish National Gallery	Finland
Marianne Backes	Virtual Centre for Knowledge on Europe	Luxembourg
Peter Burnhill	EDINA National Data Centre	Scotland, UK
Pablo de Castro	Carlos III University Madrid	Spain
Ed Fox	Virginia Tech	U.S.
Geneva Henry	Rice University	U.S.
Sarantos Kapidakis	Ionian University	Greece
Laszlo Kovacs	MTA SZTAKI	Hungary
Jonathan Leidig	Virginia Tech	U.S.
Benoit Lesuisse	Virtual Centre for Knowledge on Europe	Luxembourg
Martin Lhotak	Academy of Science	Czech Republic
Paolo Manghi	National Research Council	Italy
Hannu Markkanen	Jyvasky University Library	Finland
Lukasz Mesek	Jagiellonian University	Poland
Edwin Montoya	EAFIT University	Colombia
Pasquale Pagano	National Research Council	Italy
Guadish Sandhu	University of East London	UK
Chloe Vicente	University Adolfo Ibañez	Chile
Alex Wade	Microsoft Research	UK
Marcin Werla	Poznan Supercomputing & Networking Center	Poland

Table 3 – 2nd DL.org Participants

The box below summarises the main drivers behind attending the 2nd DL.org Workshop noted at the beginning of the event following an invitation by the session chair.

Reasons for participating
Building digital library (Chile, Poland); building national digital library (Finland; U.S.). Drivers also include hands-on experience of digital libraries and interoperability; gaining an understanding of all aspects of digital libraries; DL.org External Advisor – interoperability as a critical area where the project is focused; member of a DL working group; DL.org External Advisor with involvement in the EU integration process – mainly from the practitioner’s point of view; Head of ICT (GVCE) interested in interoperable functionalities with regard to re-building a digital library. Additional drivers include specific interests in the repository space, shared geo and data share; scholarly communication and its links to interoperability; search expert; practitioner’s viewpoint, such as dealing with systems and especially when the different parts don’t fit together; member of a digital library team aggregating metadata and trying to re-use it.
Specific institutional interest
The Digital Curation Centre is now responsible for Data Research Services in the UK, which brings an increasing interest in organisational aspects and interoperability.

Box 1 – 2nd DL.org Workshop Participation drivers

The Workshop offered an opportunity to:

- Share industrial perspectives on digital libraries with references to data-intensive scientific discovery, the fourth paradigm, as well as initiatives aimed at addressing current challenges, such as the Trident project and myexperiment, depositmo, Zentity – a Research Output Repository Platform and Planets - Preservation and Long-term Access through NETWORKED Services. The keynote explored interoperability from different perspectives, including Cloud computing.
- Inform participants on interoperability with regard to the six core concepts captured by the Reference Model with the possibility of further analysis in the Pre-proceeding papers.
- Bring perspectives external to DL.org through the accepted papers from the SONEX Work Group and Virginia Tech with the possibility of further analysis in the Pre-proceeding papers distributed during the Workshop.
- Offer a forum to discuss digital library interoperability and a springboard for discussion on Linked Data.
- The following position statements from both participants, partners and experts were collected during the workshop with particular reference to Linked Data.

Pablo de Castro – Carlos III University Madrid, Spain

Interesting discussion on linked data! Suggested ORE-OAI would be worth taking a look at as precedent specification for digital object linking (and particularly research datasets). If this standard was widely-enough implemented, it might make up for a good starting point for further work.

Great workshop! Looking forward to having future opportunities for cooperation with DL.org from the Sonex Workgroup! Thank you!

Geneva Henry – Rice University, USA

The discussions throughout the workshop were interesting but sometimes seemed to focus on concepts tangential to the key topic of interoperability. It would be good to continually tie the discussions to the main theme so that the workshop is more coherent.

Perla Innocenti – University of Glasgow, UK

Re: Digital Libraries and Linked Data Session

I think it is useful that we address linked data from a digital library perspective, in particular regarding the ever increasing importance of Unique Resource Identifiers (URIs) and the implications for their reference and accessibility; the formalisms that will inform a new generic metadata-driven structure and interfaces for linked data; responsibilities and validation in a web-centric environment; the possibilities opened by e.g. the open annotation framework and memento for persistent web centric annotations and analysis of time series referencing a single URI; and finally sustainability of linked data.

Sarantos Kapidakis – Ionian University, Greece

Interoperability has many aspects, the data and controlled vocabularies interoperability is attached with linked-data. Linked-data is crucial for all next generation Digital Libraries. There is a debate on simplicity vs. functionality and linked data serves the functionality perspective. The linking is not simple, as the context has to be considered.

Jonathan Leidig – Virginia Tech, U.S.

The work in functionality descriptions should be leveraged to produce a collection/repository/registry of DL functions for developer discovery and reuse. The topic of linked data internal and external to a Digital Library is worth perusing in the community.

Lukasz Mesek – Jagiellonian University, Poland

The issue of linked data should be discussed in the context of practical solutions. It would be useful to try to apply the linked data model to some of existing and working digital libraries and find out how the model works in reality.

Edwin Montoya – EAFIT University, Colombia

Discussions about the relation between interoperability and lack of standards!

What about standardisation in Digital Libraries?

How to build best practices in Digital libraries in order to apply those?

Stephanie Parker – Trust-IT Services, UK

Many of the challenges around Linked Data are context specific and thus hard to define. Linked Data is both a friend and foe of data provenance with the risk of losing it on the one hand but also with the potential to start to describe it on the other. There are a number of horizontal challenges also at play here that are not just related to Linked Data: access, authority and ownership, search and search filtering, and the evolution of schema across distributed resources in the future. Horizontal actions addressing these issues might prove to be a valuable asset. Some important next steps are defining different types of data, investigating areas such as modelling data and ontologies, as well as the role of standards groups (e.g. W3C and Dublin Core) coupled with use cases, policy and roadmaps for broader uptake. It will be interesting to see how this field evolves in general and the digital library and repository space in particular.

Giuseppina Vullo – University of Glasgow, UK

I really trust the feedback Digital Library research community can have from the community of practice to face the interoperability challenges. As for the linked data issue, I think Digital Libraries can benefit from the advances of Semantic Web without forgetting the active role of users and society and the values implicit in open access to information.

Box 2 – Position Statements from the 2nd DL.org Workshop**4.2 National Event - Italy**

The Seminar on Research & Education in Digital Libraries, 9 November 2010, Parma, Italy was a one-day event underpinned by a strategic alliance with the Digital Library Learning (DILL), an international master programme funded under the Erasmus Mundus initiative of the EC's Research Directorate.

Main Drivers & Objectives

Digital Libraries are a new research topic, opening up important opportunities for a multi-faceted approach spanning information seeking behaviour and social processes such as learning and knowledge sharing, in addition to Digital Libraries as collections of content that need curation, ranging from collection and description to preservation and retrieval, among others. A key driver behind the seminar was to ensure closer links between the research community and educational programmes to share knowledge on DL.org's conceptual framework and current educational programmes such as those provided by DILL with the ultimate goal of understanding what role the Reference Model should play in research and educational curricula and what value add DL.org outputs might bring.

Specifically, the seminar aimed to:

- Gain a better understanding of how to implement a pan-European mechanism for exchanging, sharing and integrating research results into education in digital libraries.
- Define research topics of most value to PhD students so as to facilitate the integration of research in European projects on the one hand and research conducted by universities on the other.
- Explore ways in which DL.org's findings and outputs on interoperability can be transferred to education in Digital Libraries.

Programme

To achieve these goals, the seminar programme was structured to ensure that new knowledge conveyed covered both the main DL.org concepts captured in the Reference Model with talks on content, functionality, user, policy and quality coupled with education in digital libraries. The Round Table served to offer additional insights and foster interactive discussion. The table below provides a snapshot of the seminar programme.

09.00 – 09:30	Welcome and Introduction Giovanni Galli, Anna Maria Tammaro, Donatella Castelli, Ragnar Audunson
09:30– 10:00	The DL.org Reference Model Donatella Castelli, National Research Council of Italy
10:00 – 10:45	DL.org Functionality & Content Concepts Carlo Meghini, National Research Council of Italy
10:45 – 11:15	<i>Networking Coffee Break</i>
11:15 – 12:00	DL.org Policy & Quality Concepts Giuseppina Vullo, University of Glasgow
12:00 – 12:30	The DL.org User Concept Vivi Katifori, University of Athens
12:30 – 14:00	<i>Lunch</i>
14:00 – 14:30	Education in DL Anna Maria Tammaro, University of Parma
14:30 – 15:00	Education in DL Mirna Willer, University of Zadar
15:00 – 15:30	<i>Networking Coffee Break</i>
15:30 – 16:30	Round Table & Future Steps: How to link research in DL to education in DL Ragnar Audunson, Marcial Batiacila, Vittore Casarosa, Pierluigi Feliciati, Sue Myburgh
16:30 – 17:00	<i>Conclusions and Future Actions</i>

Table 4 – Programme for the Parma Seminar

Promotion of the Seminar

While the DILL initiative ensured the attendance of master students on internships, targeted messages were circulated to the DL.org community using the branded electronic template. Additionally, the announcement of the seminar was published by International Science Grid This Week (iSGTW), a weekly web-based journal targeting an international, multi-disciplinary audience.



Figure 20 – Announcement of the Parma Seminar

Virtual Goody Bag and Participant Packs

The Virtual Goody Bag for the event contains:

- Event Hand-out Programme produced by the University of Parma
- DL.org Flier
- DILL Brochure
- Reference Model (v1.0)
- Cookbook (RFC version)
- 7 Talks

Each participant received a copy of the Seminar Hand-out Programme and the two fliers.

Outcomes & Participants

Donatella Castelli, National Research Council, and Giuseppina Vullo, University of Glasgow, represented DL.org at the Seminar, which was attended by over forty people from fifteen countries (6 European, 9 outside Europe), a truly international scope ensured by the alliance with DILL. The table below shows the list of Seminar participants.

Name	Country	Affiliation	Position
Agnese Perrone	Italy	Cilea	Librarian
Vivi Katifori	Greece	University of Athens	Member of the User Working Group
Alberto Gaetti	Italy	Martlab	Professor
Amma Naningrum	Indonesia	DILL	Master Student
Andrea Zanni	Italy	DILL-Alumni	Master Student
Andrew Wabwezi	Uganda	DILL	Master Student
Anna Maria Tamaro	Italy	DILL-Parma	DILL National Coordinator
Carlo Meghini	Italy	National Research Council	Member of the Functionality Working group
Caterina Barazia	Italy	University of Pavia	DILL National coordination
Chau Van Do	Vietnam	DILL	Master Student
Chiara Consonni	Italy	DILL	Master Student
Christin Mollenhauer	Germany	DILL-Parma	Assistant – DILL National coordination

Corrado Di Tillio	Italy	Biblioteche Roma	Librarian
Donatella Castelli	Italy	National Research Council	Partner, Scientific Chair of the Content Working Group & member of the Architecture Working Group
Elena Corradini	Italy	DILL-Parma	Assistant – DILL National coordination
Elisa Tirabosco	Italy	University of Bologna	Master Student
Ezerea Kulisooma	Uganda	DILL	Master Student
Federico Monaco	Italy	DILL-Parma	Assistant – DILL National coordination
Getnet Lemma Tefera	Ethopia	DILL	Master Student
Giada Costa	Italy	University of Parma	Librarian
Gianni Conte	Italy	University of Parma	Professor
Giovanni Galli	Italy	Biblioteca Civica	Director
Giuseppina Vullo	Italy	University of Glasgow	Partner, Coordinator of the Quality Working Group
Haseeb Ahmad Piracha	Pakistan	DILL	Master Student
Hsin Ju Lee	Taiwan	DILL	Master Student
Jasper Ipskamp	Netherlands	DILL	Master Student
Phuong Thi Thy Le	Vietnam	DILL	Master Student
Marcial Batiancila	Philippines	DILL	Master Student
Marco Molina	Italy	DILL-Parma	Assistant - DILL National coordination
Margareta Lundberg-Rodin	Sweden	University of Boras	Professor
Maurizio Lunghi	Italy	Fondazione Rinascimento. Digitale	Director
Md Anisur Rahman	Bangladesh	DILL	Master Student
Mirna Willer	Croatia	University of Zadar	Professor
Nadine Messerschmidt	Germany	DILL	Master Student
Nafiz Zaman Shuva	Bangladesh	DILL	Master Student
Patience Agabirwe	Uganda	DILL	Master Student
Pierluigi Felciati	Italy	University of Macerata	Professor, Information Science
Ragnar Audunson	Italy	Oslo University College	Professor, Library Management
Silvia Tecchio	Italy	University of Bologna	Librarian
Stanislava Gardasevic	Serbia	DILL	Master Student
Sue Myburgh	Australia	University of South Australia	Senior Lecturer
Tadele Tedla Damessie	Ethopia	DILL	Master Student
Vittore Casarosa	Italy	DILL-Parma	Associate Researcher
Yalda Kontratchi	Iran	DILL	Master Student

Table 5 – Parma Seminar Participants

The Seminar offered an opportunity to:

- Engage with the next generation of Library and Information Science professionals.
- Explore digital library education and research with particular reference to the DL.org Reference Model alongside perspectives on the content, functionality, user, policy and quality concepts.
- Bring a wider understanding of the Digital Library Learning 2-year Master Programme, including its focus, goals, range of international students, modules and future actions needed in the field.
- Explore digital library education and research programmes in Europe with reference to the European Association for Library and Information Education and Research and the Department of Library and Information Science at the University of Zadar, Croatia.
- Provide a forum for interactive debate on current challenges and opportunities together with proposed approaches to take digital library education and research to new levels.
- Foster the co-organisation of future events, such as the Workshop on Research and Education in Digital Libraries during the European Library Automation Group (ELAG 2011), 25-29 May 2011, Prague, Czech Republic.

Additional outcomes of the Seminar include:

- Video recordings of each of the 7 talks and the Round Table.
- Two interviews: Prof. Anna Maria Tammaro, University of Parma University of Parma, Italian coordinator of the Digital Library Learning (DILL), EC's Erasmus Mundus programme and expert speaker at the Seminar and Marcial Reyes Batiancila, Philippines, Master student of the Digital Library Learning (DILL), EC's Erasmus Mundus programme and round-table participant of the Parma Seminar on Research and Education on Digital Libraries.

4.3 National Event - Greece

The workshop on Theory and Practice in Digital Libraries: A European Approach Workshop, which took place on Monday 13 December 2010 in Athens, Greece, was co-hosted with the Veria Central Public Library and the Laboratory on Digital Libraries and Electronic Publishing at Ionian University. The strategic alliances with the Veria Library and Ionian University were valuable in connecting a consolidated network of library professionals with representatives from DL.org and European initiatives such as Europeana, DRIVER-II, OpenAIRE, TEL/TELplus, and Access IT.

Main Drivers and Objectives

Explore current and potential challenges in the digital library space from a European perspective by drawing on the focus of DL.org and other initiatives of relevance to the field. Taking interoperability as the core theme, the Workshop was aimed at fostering understanding of reference modeling and its value to the library and information science community with emphasis on the DL.org Reference Model. The Workshop also sought to deliver insights into the patterns and solutions for interoperability presented in the DL.org Cookbook. To ensure hands-on experience, demos on the functionalities of a number of existing digital libraries were a key feature before wrapping up with an interactive discussion.

Programme

As a national event much of the programme was conducted in Greek.

09:00-09:45	Welcome and Introduction Yannis Ioannidis, University of Athens & DL.org
09:45-10:30	What is a Digital Library? Modeling things is making our life easier: the Reference Model Yannis Ioannidis, University of Athens & DL.org
10:30-11:15	Are there any tools available? The DL.org Cookbook Leonardo Candela, National Research Council of Italy & DL.org
11:15-11:30	Discussion
11:30-11:45	Networking Coffee Break
11:45-12:30	Heterogeneity in European Digital Libraries: The Europeana Challenge Vaggelis Banos, Yannis Trohopoulos, Veria Central Public Library. In Greek.
12:30-13:15	Interoperability approaches on metadata Sarantos Kapidakis, Laboratory on Digital Libraries and Electronic Publishing, Ionian University. In Greek.
13:15-13:30	Discussion
13:30-14:30	Lunch
14:30-15:30	Demo Session 1 D4Science - Leonardo Candela, National Research Council of Italy & DL.org Europeana - Sarantos Kapidakis, Laboratory on Digital Libraries and Electronic Publishing, Ionian University. In Greek. TEL/TELplus - Maria Vayanou
15:30-15:45	Networking Coffee Break
14:45-16:30	Demo Session 2 Access IT (training on DLs) - Ioannis Trohopoulos DRIVER & OpenAIRE – Natalia Manola
16:30-17:00	Discussion and Closing Remarks – All

Table 6 – Programme for the Athens Workshop

Promotion

The Athens Workshop was widely promoted mainly to the national Library and Information Science community through mailing lists and event announcements, generating the following clippings:

- Athens Workshop announcement on Future Library portal:
<http://www.futurelibrary.gr/events/theory-and-practice-in-digital>.
- Athens Workshop announcement on Official blog of opencarchives.gr:
http://openarchives.blogspot.com/2010_12_01_archive.html.
- Athens Workshop announcement on website of the Laboratory on Digital Libraries and Electronic Publishing, Ionian University:
- http://dlib.ionio.gr/index.php?option=com_content&view=article&id=58:theory-and-practice-in-digital-libraries-a-european-approach.

- Athens Workshop announcement Eleftherotytia, one of the most popular daily newspapers in Greece:
- <http://www.enet.gr/?i=news.el.article&id=226901>.
- Athens Workshop announcement on Greek news portal:
- http://www.greeknews.biz/index.php?option=com_content&view=article&id=84990&catid=18&Itemid=239.
- Athens Workshop announcement on leximania.gr:
- <http://www.leximania.gr/en/confevents/icalrepeat.detail/2010/12/13/44/-/-/-.html>.
- Athens Workshop announcement on Blog of the Greek Libraries and Librarians:
- http://e-scriptorum.blogspot.com/2010_09_01_archive.html.
- <http://tuxlibrary.blogspot.com/2010/11/theory-and-practice-in-digital.html>.
- Athens Workshop announcement on Blog Library Science and Information:
- <http://lisgreece.blogspot.com/2010/11/theory-and-practice-in-digital.html>
- Athens Workshop announcement on website of Access IT:
- <http://www.access-it.org/tur/Events2/Workshop-Theory-and-Practice-in-Digital-Libraries>

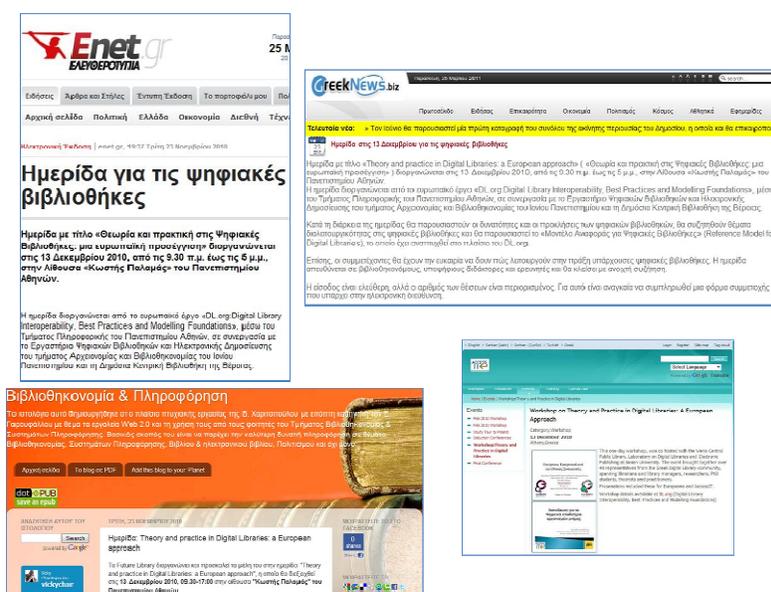


Figure 21– Athens Workshop Promotion

Virtual Goody Bag and Participant Packs

The Virtual Goody Bag contains:

- Workshop Agenda.
- DL.org Flier with Autumn School Testimonies.
- DL.org Reference Model (V1.0).
- DL.org Cookbook (Ready for Comment Version).
- Talks in English and Greek: The Reference Model; The DL.org Cookbook; Heterogeneity in European Digital Libraries: The Europeana Challenge; Interoperability approaches on metadata.
- Demos : D4Science; Europeana; AccessIT - training on DLs; DRIVER and OpenAIRE).

- Participant testimonies and position statements.
- DL.org Interviews, including interviews from the Parma Seminar on Research and Education in Digital Libraries and the filmed interviews with Geneva Henry, Rice University and Ronald Larsen, University of Pittsburgh.

Each participant received a delegate bag containing the agenda, DL.org flier and other goodies provided by the University of Athens.

Outcomes & Participants

DL.org was represented by 5 partners:

- University of Athens: Katerina El Raheb, Yannis Ioannidis, Anna Nika, Eleni Toli.
- National Research Council: Leonardo Candela.

The Workshop was attended by 48 external participants all from Greece, as detailed in the table below.

Name	Country	Affiliation	Position
Fotini Aravani	Greece	National Museum of Contemporary Art	Librarian
Athina Athanasopoulou	Greece	National Library of Greece	Librarian
Georgios Avgoustidis	Greece	AthensArchbishop Library	Computer Programmer/ Developer
Vagelis Banos	Greece	Public Central Library of Veria	Chief Librarian
Aristea Boti	Greece	National Library of Greece	Librarian
Leonardo Candela	Italy	National Research Council	Partner, Architecture and Content Working Groups
Irini Chryssadakou	Greece	Music Library of Greece “Lillian Voudouris”	Librarian
Katerina El Raheb	Greece	Department of Informatics, University of Athens	Partner, PhD candidate
Filon Filonos	Greece	Greek organization of Reproduction Rights	Manager
Iro Frantzi	Greece	Department of Philosophy, NKUA	Librarian-Linguist
Eleni Galiotou	Greece	Technological Educational Institute of Athens	Associate Professor
Georgios Gasias	Greece	University of Crete	PhD Candidate of Modern History
Niki Hatzipanagiotou	Greece	Department of Philosophy, University of Athens	Librarian -Archaeologist
Rena Horemi-Thanopoulou	Greece	<i>Not recorded</i>	Librarian-Director
Anna Houndala	Greece	National Library of Greece	Librarian
Yannis Ioannidis	Greece	Department of Informatics, University of Athens	Partner, Scientific Chair of User Working Group, Member of Functionality Working Group

Diamando Kada	Greece	National Library of Greece	Librarian
Sarantos Kapidakis	Greece	Ionian University	Member of Quality Working Group
Ourania Karipidou	Greece	University of Athens	Librarian
Marilena Kokonaki	Greece	"Aikaterini Laskaridis" Foundation	Librarian
Katerina Koroneou	Greece	City Library of Preveza	Librarian
Athina Kostarakou	Greece	Technological Educational Institute of Athens	Librarian
Zafiria Kourkouta	Greece	Technological Educational Institute of Athens	Librarian
Ageliki Malafouri	Greece	Technological Educational Institute of Athens	Librarian
Natalia Manola	Greece	Department of Informatics, University of Athens	Member of Functionality Working Group
Stefania Merakos	Greece	Musical Library of Greece "Lillian Voudouris"	Musicologist Library Manager
Anna Nika	Greece	Department of Informatics, University of Athens	Partner, Member of User Working Group
Niki Niniraki	Greece	"Aikaterini Laskaridis" Foundation	Librarian
Kiriaki Papadopoulou	Greece	School of Philosophy, University of Athens	Librarian
Katerina Paschaliou	Greece	School of Science, University of Athens	Librarian
Giannis Patelis	Greece	Technological Educational Institute of Athens	Student
Efi Paza	Greece	National School of Public Health	Librarian
Asimina Perri	Greece	University of Athens	Librarian
Artur Poghosyan	Greece	"Aikaterini Laskaridis" Foundation	IT System Administrator
Katerina Poulou	Greece	Public Central Library of Veria	Librarian
Panteleimon Prassas	Greece	Not recorded	Librarian
Eva Semertzaki	Greece	Bank of Greece Library	Librarian -Director
Feni Schortsaniti	Greece	Public Power Corporation	Librarian
Evangelos Stergiou	Greece	Technological Educational Institute of Athens	Librarian
Matheos Stratis	Greece	National Bank of Greece	Librarian
Eleni Toli	Greece	Department of Informatics, University of Athens	Partner
Katerina Toraki	Greece	Technical Educational Institute	Librarian
Anna Trikalinou	Greece	University of Athens	Student
Ioannis Trohopoulos	Greece	Public Central Library of Veria	Chief Librarian
Konstantina Troutpegli	Greece	Public Central Library of	Librarian

Eleutheroupolis			
Katerina Tzima	Greece	KLC Law Firm	Librarian
Maria Vagianou	Greece	Department of Informatics, University of Athens	Computer Scientist
Valsamis Valsamakis	Greece	School of Science Library, University of Athens	Librarian/Director
Theodora Vourou	Greece	National Library of Greece	Librarian
Valia Vraka	Greece	Music Library of Greece “Lillian Voudouris”	Musicologist
Efthalia Zoidi	Greece	National Library of Greece	Librarian
Chara Zotou	Greece	University of Athens Library	Librarian

Table 7 – Athens Workshop Participants

The Workshop offered an opportunity to:

- Engage with and educate the Greek library community on the main outputs of DL.org: the Reference Model and Cookbook with the aim of advancing digital library development and interoperability.
- Share insights on challenges in the field such as the heterogeneity facing Europeana, as well as interoperability approaches to metadata with reference to the Europeana Data Model and Dublin Core.
- Demonstrate real-life functionalities in digital libraries with examples from D4Science, Europeana, Access IT, DRIVER, OpenAIRE and TEL/TELPlus.
- Offer a springboard for debate with the national library community, bringing into sharp relief the need for continuous education and training in the field.
- Testimonies from ten participants, as shown in the Box below.

Participant testimonies

Librarian, Bank of Greece

*A pure scientific, compact and comprehensive workshop. I really liked the interactive nature of the seminar, as most of the presentations led to fruitful discussions on interesting topics e.g. “What is Digital a Library” or “Education on Digital Libraries”. These sessions underlined the need **for future educational activities** for DLs and also the importance of DL in **collecting, preserving and disseminating cultural heritage** among different countries of Europe.”*

Librarian, TEI Piraeus

*“In future I would like to see **more tutorials** and **educating videos** about DL, as I believe this would motivate and inspire DL students. Copyright versus Open Access, issues related to organisational aspects such as government or institutional support, financial coverage and continuous education of librarians are some of the hot topics that I would like to see in future workshop agendas. Finally, **cross-country collaboration** of Librarians and organisations within Europe is very important in building the “know-how” and exchanging knowledge and ideas.”*

Librarian Public Central European of Eleftheroupolis

<p><i>"Very interesting presentations, as they focused on the state of the art in the DL domain. I hope to see more similar collaborative workshops in future, which bring together different organisations of the DL community"</i></p>
<p>Computer Scientist BSc, Department of Informatics and Telecommunications, University of Athens <i>"I would prefer a more detailed analysis of the technical part. Thank you for letting me to participate."</i></p>
<p>Librarian, School of Philosophy, Department of Linguistics, University of Athens <i>"A remarkable workshop! I've also attended the workshop of EuropeanaLocal (Athens October 2010) and really liked the connection between these events. As a Librarian, I express the need for more events of this kind, as I find them really useful important for our continuous education process. Interesting talks presented by competent speakers, with different backgrounds from Technical focused to more Conceptual/Organisational oriented."</i></p>
<p>Librarian, MSc., Music Library of Greece Lilian Voudouri <i>"Interesting and compact presentation of the DL.org project and its parts. The real time demo session was extremely useful. Excellent presentation the educational role of the DL Reference Model and its usage as a guidance in future DL and Repositories applications. The one-day workshop was perfectly organised."</i></p>
<p>Librarian National School of Public Health <i>"This workshop gave me the opportunity to see in real time how the theory and concepts which I've been studying as a Librarian, are implemented in practice. Especially for people who have finished their studies, but still didn't have the chance to practice their profession, such workshops provide them the opportunity to remain up-to-date. Thank you!"</i></p>
<p>Librarian, Aikaterini Laskaridis Foundation <i>"Congratulations! Thank you very much for the wonderful organisation and constructive presentations."</i></p>
<p>Librarian, MSc <i>"Very useful event, not many opportunities to discuss about these things."</i></p>
<p>Librarian <i>"It was not only an event but an interactive seminar, where you had the opportunity to learn more than expected. The educational aspect should be further strengthened."</i></p>

Table 8 – Testimonies from the Athens Workshop

4.4 National Event - UK

The UK national workshop was dedicated to Digital Libraries & Open Access. Interoperability Strategies Workshop and took place on 4 February 2011 at the British Academy in central London, offering an excellent venue for the European and international audience targeted.

Main Drivers and Objectives

This one-day workshop at the British Academy in London on 4 February 2011 was aimed at practitioners and professionals operating in the digital libraries and open access repository (OAR) space, as well as researchers in the field. Specific objectives include:

- Trigger a multi-disciplinary debate about research on Digital Libraries and Open Access.
- Shine the spotlight on the main outputs of DL.org, as well as on existing frameworks and best practices for interoperability within the communities of practice.
- Propose common strategies for interoperability by fostering debate on how to implement a mechanism for exchanging, sharing and integrating results between digital libraries and open access repositories.

- Create new connections and partnerships, and explore ways for a closer co-operation between researchers and the communities of practice.

Programme

The agenda for the Workshop is provided in the table below.

08:45 – 09:15	Registration and Welcome Coffee & Tea
09:15 – 09:30	<i>Introduction</i> Prof. Seamus Ross, University of Toronto (CA)
09:30 – 10:00	<i>The DL.org Reference Model</i> Vittore Casarosa, National Research Council of Italy (IT)
10:00 – 10:30	<i>Interoperability best practices and solutions: the DL.org Cookbook</i> Leonardo Candela, National Research Council of Italy (IT)
10:30 – 11:00	<i>The Policy & Quality Interoperability Surveys. Lessons learned from the OAR community</i> Giuseppina Vullo, HATII - University of Glasgow (UK)
11:00 – 11:30	Networking Coffee Break
11:30 – 12:00	<i>Data Libraries: A matter of trust, reliability, quality</i> Hans Pfeiffenberger, Alfred Wegener Institute (DE)
12:00 – 12:30	<i>The Sonex Workgroup on Interoperability</i> Pablo De Castro, Universidad Carlos III de Madrid (ES)
12:30 – 13:45	Lunch
13:45 – 14:15	<i>Open Repositories and interoperability challenges in the UK</i> Peter Burnhill, EDINA - University of Edinburgh (UK)
14:15 – 14:45	<i>The "many ways" to interoperability. Outcomes and challenges within DRIVER and OpenAIRE</i> Wolfram Horstmann, University of Bielefeld (DE)
14:45 – 15:15	<i>Future scenarios on Open Access</i> Heather Joseph, SPARC (U.S.)
15:15 – 15:45	Networking Coffee Break
15:45 – 16:45	Round Table <i>Common strategies for interoperability</i> Chair: Prof. Seamus Ross, University of Toronto (CA) Michael Day, UKOLN – University of Bath and Stuart Jeffrey – University of York
16:45 – 17:00	Conclusions and Future Opportunities

Table9 – London Workshop Agenda

Promotion

The London Workshop was promoted through targeted eAnnouncements and registration reminders to the DL.org community, as well as community channels:

- DuraSpace:
<http://expertvoices.nsd.org/duraspace/2011/01/18/dlorg-workshop-on-digital-libraries-and-open-access/>
- Food & Agriculture Organisation, UNO:

- <http://aims.fao.org/events/dlorg-workshop-digital-libraries-and-open-access-interopability-strategies>
- Liber Europe:**
<http://www.libereurope.eu/node/598>
 - Higher Education Academy, UK:**
<http://www.medev.ac.uk/event/5819/view/>
 - GRL2020:**
<http://www.grl2020.org/index.php/dl-org-workshop-on-digital-libraries-open-access-interopability-strategies>
 - Open Access Directory:**
<http://oad.simmons.edu/oadwiki/2011>
 - National Documentation Center, Greece:**
http://www.ekt.gr/content/display?ses_mode=rnd&ses_lang=el&prnbr=4159
 - Open Access Portal:**
http://openaccess.gr/news_events/events/details.dot?id=18053
 - GRL2020:**
<http://www.grl2020.org/index.php/dl-org-workshop-on-digital-libraries-open-access-interopability-strategies>
- Trust-IT:**
<http://www.trust-it-services.com/news/26/72/DL-org-Workshop-on-Digital-Libraries-Open-Accesspage>

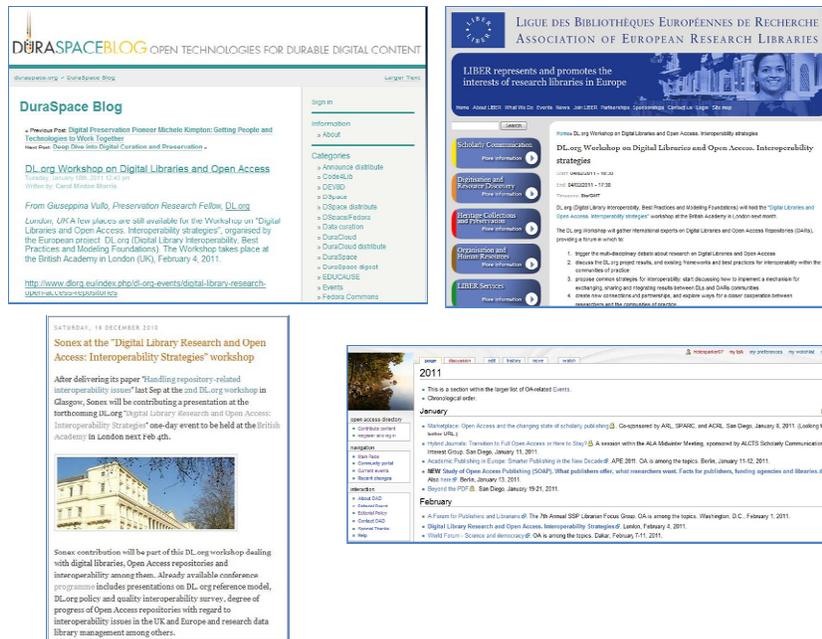


Figure 22 – London Workshop Promotion

Virtual Goody Bag & Participant Pack

The Virtual Goody Bag contains:

- The Workshop Agenda
- Chair & Speaker Profiles
- DL.org Special Workshop Flier with expert insights on Open Access
- DL.org Digital Library Reference Model (v1.0)
- DL.org Technology & Methodology Cookbook (ready for comment version)
- The DRIVER Guidelines to European Repositories
- Talks (Introduction followed by alphabetical order of speakers)
- List of participants

Each participant received the agenda, the speaker profiles, a USB stick, a notepad and pen, the flier in a transparent plastic envelope.

Outcomes & Participants

Four DL.org representatives attended the London workshop:

- University of Glasgow: Giuseppina Vullo and Seamus Ross on behalf of UK of Glasgow;
- National Research Council: Leonardo Candela;
- Trust-IT: Stephanie Parker.

The workshop was attended by over 45 people, as detailed in the table below in terms of affiliation, country and professional role.

Name	Affiliation	Country	Position
Fereshteh Afshari	Imperial College	UK	Team Leader, Central Library
Haider Ali	Yanbu Industrial College	Saudi Arabia*	Lecturer Library & Information Specialist
Vladimir Blagoderov	Natural History Museum	UK	Research Assistant to Keeper of Entomology
Claire Bundy	Repository Specialist	UK	Repository Specialist
Peter Burnhill	EDINA National Data Centre	Scotland, UK	Director
Vittore Casarosa	National Research Council	Italy	Professor, Associate Researcher
Gaetana Cognetti	Regina Elena National Cancer Institute	Italy	Chief librarian
Michael Day	UKOLN, Bath University	UK	Research and Development Team Leader
Stella Dextre Clarke	Luke House	UK	Consultant
Pablo de Castro	Carlo III University of Madrid	Spain	University librarian: e-Archivio
Rosa Di Cesare	National Research Council (Library)	Italy	Librarian
Rogan Dixon	Independent consultant	UK	Independent
John Drew	University of Buckingham	UK	Senior Lecturer
Ilaria Fava	CASPUR (Inter-University Consortium for the Application of Super-Computing for Universities and Research)	Italy	Librarian

Jim Fitzsimons	University of Ulster	Northern UK	Ireland, Sub-Librarian
Sunil Gorla	G.B. Pant University of Agriculture & Technology Library	India	Assistant Librarian
Michael Guthrie	Biomedical Open Repository	UK	Manager
Gabriella Harangi	University and National Library University of Debrecen	Hungary	IT Specialist/Software Engineer
Mark Hedges	Kings College London	UK	Deputy Director, Centre for e-Research
Stephen Hitchcock	University of Southampton	UK	Project Manager
Wolfram Horstmann	Bielefeld University	Germany	CIO Scholarly Information
Titilayo Ilesanmi	Middlesex University	UK	Commonwealth Fellow
Callum Land	BioMed Central	UK	Head of Sales
Stuart Jeffrey	University of York	UK	User services manager
Huw Jones	Cambridge University Library	UK	Digital Library Metadata Specialist
Heather Joseph	Scholarly Publishing and Academic Resources Coalition (SPARC)	U.S.	Executive Director
Stephen Keegan	Trinity College Library Dublin	Ireland	Analyst Programmer
Benoit Lesuisse	Virtual Centre for Knowledge on Europe	Luxembourg	Head of ICT department
Ross MacIntyre	University of Manchester	UK	Mimas Service Manager
Andrew Mclean	Imperial College London	UK	DSpace administrator
Farooq Muhammad	Middlesex University	UK	Commonwealth Fellow
Daina Ostrovska	Riga Technical University	Latvia	Project Manager
Hans Peiffenberger	Alfred Wegener Institute	Germany	Deputy Head of the data processing centre
Ludmila Penicina	Riga Technical University	Latvia	Systems Analyst
Elisabetta Poltronieri	Istituto Superiore di Sanità	Italy	Chief Technology Officer
Sally Rumsey	Bodleian Library, University of Oxford	UK	ORA Service & Development Manager
Raffaella Santucci	Sapienza University of Rome	Italy	R&D Co-ordinator
Francesco Saverio Nucci	Engineering - Ingegneria Informatica	Italy	Director European Projects
Non Scantlebury	Open University Library	UK	Head of Research and Innovation
Elin Stangeland	Cambridge University Library	UK	Repository Manager
Dominic Tate	Bedford Library - Royal Holloway University	UK	Repository & Digital Assets Manager
Graham Triggs	Open Repository	UK	Technical Architect
Karol Vandas	Charles University in Prague	Czech Republic	Technical administrator of DSpace
Alex Wade	Microsoft Research	UK	Director, Scholarly Communication
Kazu Yamaji	National Institute of Informatics	Japan	Professor

Uldin Zarins	Riga Technical University	Latvia	Student
Zigmunds Zitmanis	Riga Technical University	Latvia	Director of IT Department

Table 10 – London Workshop Participants

The Workshop offered an opportunity to:

- Engage with the digital library and repository community in Europe and beyond.
- Shine the spotlight on the main DL.org outputs: Reference Model, Cookbook and the findings of the survey to Open Access Repositories.
- Deliver insights on trust, reliability, and quality, as well as interoperability in relation to DRIVER and OpenAIRE thanks to the active support of two Working Group experts.
- Bring external perspectives through the activities of the SONEX Work Group and Scholarly Publishing and Academic Resources Coalition (SPARC).
- Offer a springboard for discussion on strategic approaches to open access and interoperability, highlighting the need to address data management, including the data diversity that exists even within the same discipline. While data management is implemented in several large collaborative infrastructure projects, ownership of preservation and transfer of content remain important questions. The debate concluded by underscoring the key role of a policy push to enforce the actions required while fostering effective dialogue across a spectrum of organisations alongside technical developments.

Additionally, the Workshop has led to:

- An article on the Workshop, co-authored by Stephanie Parker and Giuseppina Vullo, submitted to ERCIM News for its forthcoming publication, Issue 85, copies of which will also be circulated during the Future Emerging Technologies (FET) Conference, 4-6 May 2011, Budapest, Hungary (<http://www.fet11.eu/>)
- An interview with Heather Joseph, Executive Director of the Scholarly Publishing and Academic Resources Coalition (SPARC), U.S.
- Event Blogs, as listed below:

DL.org Workshop: Digital Libraries & Open Access. Interoperability Strategies
 DL.org London Workshop off to a great start
 Vittore Casarosa on the DL.org Reference Model
 Leonardo Candela on the DL.org Cookbook
 Giuseppina Vullo on Policy Interoperability Survey
 Hans Pfeiffenberger on Trust, Reliability & Quality
 Giuseppina Vullo on Quality Interoperability Survey
 Pablo De Castro on the SONEX Work Group
 Peter Burnhill on Open Access in the UK
 Wolfram Horstmann on the many ways to interoperability
 Heather Jones on Future scenarios for Open Access

Table11 – Blogs on London Workshop

Participant Testimonies

<p>Librarian, UK <i>"I thoroughly enjoyed the workshop."</i></p>
<p>Assistant Librarian, India <i>"I would like to thank and congratulate to the DL.org staff for the efforts in organising such an important and useful event on Digital Libraries. Many experts shared their technological experience on digital libraries in the workshop. Thanks to all the experts for sharing their expertise in the workshop and through documents. The Reference model and Cookbook are excellent tools for all the people associated in the field of digital library. These tools will be useful for both digital library developers as well as Digital Library System/software developers. Almost all the DL areas are covered in these tools. The workshop was very useful and covered most of the aspects of Digital Library development."</i></p>
<p>Systems Analyst, Latvia <i>"Very useful information for institutions that consider OAR implementation, especially SONEX Workgroup results. Useful information about existing Open Access projects and programs as well as success stories. The Reference Model is a potential Open Access system standard."</i></p>
<p>Chief Technology Officer at national health institute, Italy <i>"Very productive workshop, great opportunity for networking."</i></p>
<p>Director of IT department at academic institution, Latvia <i>"The seminar provided in-depth perspectives of current and future Open Access developments. The Reference Model is a very good foundation for DL development."</i></p>
<p>Student, Latvia <i>"Wonderful and inspiring event, useful documents. Probably the most useful part of the event was some in-depth information how the ideas of Reference Model can be applied in real life."</i></p>
<p>Repository Manager, Latvia <i>"All presentations were very useful and I gained a lot of information which could be used when creating the Open Access repository at my institution."</i></p>
<p>Librarian, Spain <i>"Interesting meeting and careful organisation."</i></p>
<p>Repository Manager, UK <i>"Excellent workshop."</i></p>
<p>Researcher, Czech Republic <i>"Thank you for organising such an interesting workshop. I liked the workshop organisation, presentations were really interesting and the discussion was quite nice. Lunch was extraordinary as well as the service. Maybe a few more examples of usage might be introduced, but that is the decision of the presenters."</i></p>
<p>Chief Librarian, Italy <i>"The meeting was interesting. I suggest for the future meetings to accept theoretical papers (models, standardisation etc) and papers on the state of art of the evolution of the Digital Libraries in the world with some interesting samples on metadata standardisation, interoperability and other similar topic. This part was less focused during this event but may be very important in order to put the theory into practice. Also the role of Libraries in building, disseminating, maintaining and preserving knowledge should be better explored."</i></p>

Table12 – London Workshop Testimonies

5. External Sessions & Presentations



Figure 23 – DL.org Poster at Cultural Heritage Online

During the Cultural Heritage Online conference, 15-16 December 2009 in Florence, DL.org promoted the project with a stand displaying the project poster alongside the distribution of the project flier. The event was attended by over 300 people. Over 50 fliers and 25 Booklets from the 1st DL.org Workshop were distributed. The conference also offered opportunities to network with representatives from Europeana and EuropeanaConect, DARIAH, the Library of Congress, university librarians and publishers.

Web link: <http://www.rinascimento-digitale.it/conference2009-exhibitionarea.phtml>

5.1 ICT Networking Session

The ICT2010 Networking Session was both proposed and authored by Stephanie Parker, Trust-IT, in synergy with senior members of the Consortium. In parallel, Costantino Thanos, CNR, provided a visionary article on the role of mediation in addressing interoperability challenges. Creating new alliances with two initiatives funded by the GÉANT and e-Infrastructure Unit of the European Commission, GRDI2020 and DC-Net, the Networking Session aimed to explore the value-add of a coordinated approach to interoperability addressing the highly complex technical, organisational and policy-related challenges. The Networking Session targeted programme owners, researchers and implementers from diverse communities to share knowledge and formulate guidelines for addressing the interoperability challenge. It is particularly relevant to the Cooperation & Capacities pillars of FP7, regarding the Thematic Priority of Digital Libraries and e-Infrastructures as a crucial asset underpinning EU research and innovation policies.

Documents uploaded at the time of submitting the proposal include links to the three host projects, DL.org Interviews conducted before April 2010 and an article authored by Costantino Thanos on interoperability challenges. These documents were subsequently replaced with:

- Session Agenda
- DL.org Talk
- Talks from GRDI2020 and DC-Net.

ICT 2010 :: Networking sessions	
Welcome, dear Guest	
Global Information Infrastructures for Science & Cultural Heritage: The Interoperability Challenge	
1102, 29/09/2010 (9:00-10:30)	
Opening up new research perspectives relies on accessibility and interoperability across geographical and discipline boundaries.	
<p>Antonella FRESA (ICCU Italian Ministry of Culture, Italy), 29/07/2010 19:53</p> <p>I support this section that is an interesting opportunity, not only to hear about the new technology-powered solutions to interoperability of services, systems and data, but also to discuss about the actual inter-operation of different sectors, different areas of research and different communities.</p>	
<p>Alexandru STAN (IN2 search interfaces development ltd, United Kingdom), 13/08/2010 19:57</p> <p>I am very interested to hear about the lessons learned during these projects. A very good topic indeed</p>	
<p>Guy-Noel MARECHAL (PROSIP SCS, Belgium), 16/08/2010 16:34</p> <p>Indeed, interoperability is a very complex problematic. One of the best way of addressing the issue is to use "Conceptual Reference Models" based on semantics. By such a level of abstraction, the implementation of concrete "Interoperability Wickets" become easy (fully automatic in the simple cases to template guided in the most complex situations). Such CRM's exist already; the most well known is the FRBR-CRM (in the bibliographic sector). I have contributed to the definition of the AXIS-CRM which is more general covering, in particular the layered construction of the interoperability. An introduction to the AXIS-CRM is visible at: http://www.semanticuniverse.com/articles-axis-conceptual-reference-model-concepts-and-mplementation.html. Unfortunately the links to the figures are temporarily missing (they were present in the previous version). I am ready to contribute to the debate on the interoperability methodology guy.noel.marechal@gmail.com</p>	

Figure 24 - ICT2010 Networking Session

Web Link: http://ec.europa.eu/information_society/events/cf/ict2010/item-display.cfm?id=3479

Programme

Expert Panel Session	
09:00 – 09:05	DL.org presentation Donatella Castelli, Institute of Information Science and Technologies, National Research Council (ISTI-CNR), Italy
09:05 – 09:10	DC-Net presentation Antonella Fresa, ICCU-Italian Ministry of Culture, Italy
09:10 – 09:15	GRDI2020 presentation Hilary Hanahoe, GRDI2020 Coordinator - Trust-IT Services Ltd., UK
09:15 – 09:30	The Interoperability Concept <i>Costantino Thanos, Institute of Information Science and Technologies, National Research Council (ISTI-CNR), Italy</i>
09:30 – 09:45	Interoperability from the Digital Library Perspective <i>Donatella Castelli, Institute of Information Science and Technologies, National Research Council (ISTI-CNR), Italy</i>
09:45 – 10:00	Interoperability from the Cultural Heritage Perspective <i>Stefanos Kollias, National Technical University of Athens, Greece</i>
10:00 – 10:15	Interoperability from the e-Science Perspective <i>Yannis Ioannidis, ATHENA RC / IMIS, Greece</i>
Q&A	
10:15 – 10:30	Fifteen minutes of interactive debate offering a springboard for the further exchange of knowledge, experiences and ideas.

Table 13 - ICT2010 Networking Session Agenda

The agenda was structured to cover approaches to Digital Library Interoperability, enabling technologies for Global Research Data Infrastructures & Cultural Heritage Infrastructures respectively, with an interactive discussion sharing insights into the most effective way of achieving interoperability. The Session was co-ordinated by DL.org in synergy with DC-Net and GRDI2020. DL.org representatives were Donatella Castelli and Costantino Thanos, CNR. The Session co-ordinator was Hilary Hanahoe, Trust-IT, co-ordinator of GRDI2020 and chaired by Yannis Ioannidis, University of Athens in representation of GRDI2020.

Promotion

DL.org led the promotion of the ICT2010 session through eNewsletters and targeted messages in the run-up to the event, an example of which is provided below.

DL.org, DC-Net & GRDI2020 Networking Session @ ICT2010

Global Information Infrastructures for Science & Cultural Heritage: The Interoperability Challenge
Wednesday 29 September 2010, 9:00-10:30, Room 1102

http://ec.europa.eu/information_society/events/cf/ict2010/item-display.cfm?id=3479

Brussels Expo
27-29 September 2010

DL.org (Digital Library Interoperability, Best Practices & Modelling Foundations: www.dlorg.eu), DC-Net (Digital Cultural Heritage NETWORK: www.dc-net.org/) and GRDI2020 (Towards a 10-Year Vision for Global Research Data Infrastructures: <http://www.grdi2020.eu/>) have forged a strategic alliance that places interoperability centre stage.

Opening up new research

ICT 2010 : DIGITALLY DRIVEN

Figure 25 - eAnnouncement on the ICT2010 Networking Session

Outcomes

- The Networking Session brought insights on the complex concept of interoperability. The ability of two entities to work together very much depends on the working environment in which these two entities are embedded (Web services, Digital Rights Management, Digital Libraries, Data Infrastructures, Control and Command systems, etc.) and the nature of the interoperable entities (people, software components, firms, organisations, etc.).
- The Session addressed the interoperability problem from the perspective of three different environments: Representatives from three application environments, Science, Digital Libraries, and Cultural Heritage, illustrated interoperability scenarios, challenges, and solutions, followed by a lively debate.
- The Session was attended by about 30 people.
- A press release on the ICT2010 was produced and circulated to selected media channels during ICT2010. The following clips were tracked:
 Web Science:

http://www.lswn.it/en/conferences/2010/global_information_structures_for_science_and_cultural_heritage

Supercomputing Online:

<http://www.supercomputingonline.com/latest/dl-org-dc-net-grdi2020-networking-session-ict2010>

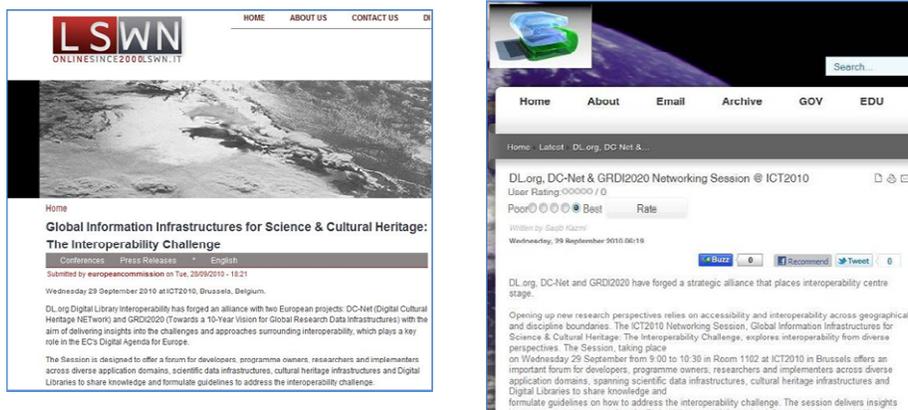


Figure 26 – ICT2010 Networking Session Clippings

5.2 DL.org Workshop on Policy and Quality Interoperability, ECA 2010, 28-30 April 2010

The 8th European Conference on Digital Archiving (ECA 2010) took place in Geneva from 28 to 30 April 2010, with Federal Councillor Didier Burkhalter, Head of the Federal Department of Home Affairs, and Neelie Kroes, Vice-President of the European Commission responsible for the digital agenda, as its patrons. The conference was organised by the Swiss Federal Archives together with the Section of Professional Associations and the European Regional Branch of the International Council on Archives (ICA).

Within this high-profile context, on 29 April 2010, DL.org hosted a Workshop dedicated to *Policy and Quality Interoperability: an organisational approach for digital archives and digital libraries*. The workshop, which was led by Giuseppina Vullo, University of Glasgow, focused on an organisational approach to policy and quality interoperability, presenting an overview of how DL.org is investigating a shared policy and quality framework between diverse digital repositories. The interim outcomes of this research were described, including how external parties may also benefit from the findings. The Workshop also delivered insights into core policy and quality aspects affecting information systems; the DL.org policy and quality interoperability frameworks; formal policy languages; quality guidelines and criteria. Giuseppina Vullo presented a talk entitled *Policy & Quality Interoperability* during the workshop, also distributing the survey produced by the respective Working Groups.

Web links: <http://www.bar.admin.ch/eca2010/index.html?lang=en>

<http://www.bar.admin.ch/eca2010/00732/00911/index.html?lang=en>

Outcomes

- Delivering insights into core policy and quality aspects affecting information systems; the DL.org policy and quality interoperability frameworks; formal policy languages; quality guidelines and criteria.

- Almost 700 registered participants were made up of specialists and individuals with archiving responsibilities from both the public and private sectors. The majority (80%) came from Europe, with Switzerland accounting for more than one third (240), followed by France (71), Germany (41), the UK (40), Belgium (33), the Netherlands (33), Canada (17), Sweden (16) and Poland (16). The remaining 190 attendees came from more than 50 countries around the world, including Asia and Africa.

5.3 OR2010 Birds of a Feather



WEDNESDAY 7.

DL.org - New paths to interoperability: best practices and modelling foundations for digital repositories

Organizers: Giuseppina Vulo, University of Glasgow; Paolo Manghi, ISTI-CNR; Natalia Manola, University of Athens; Stephanie Parker, TRUST-IT Room Reino Unido A, 11.00-12.30

The EU-funded DL.org project proposes new approaches to interoperability, gathering the expertise of six international Working Groups and grounding its research on the DELCS DL Reference Model. The main project outputs will include an enhanced, community-driven version of the Reference Model and a Technology & Methodology Cookbook, which will consist of a portfolio of interoperability best practices, approaches and solutions. This BoF will give the digital repositories community a chance to broaden the discussion started in the talk "Interoperability for digital repositories: towards a policy and quality framework" (Vulo, Innocenti, Ross) by extending the interoperability challenge to the six project core domains captured by the Reference Model (Content, Functionality, Policy, Quality, User and Architecture) and by allowing a fruitful exchange of experiences and proposing potential ways of collaboration. _

Figure 27 – OR2010 Birds of a Feather Web Page

DL.org hosted a Birds of a Feather Session during the 5th International Conference on Open Repositories, which was dedicated to the Grand Integration Challenges, 6-10 July, Madrid, Spain. The BoF session was held on 7 July. All four partner affiliations were involved in shaping the agenda and focus of the session. Additionally, Glasgow University delivered a presentation on Policy and Quality, as detailed in 5.4 below. The session was organised following the invite from Wolfram Horstmann, Bielefeld University, OR2010 Programme Chair and expert in the Quality Working Group, during the Expert Gathering in Rome (May 2010, Rome).

The BoF session, entitled *New Paths to Interoperability, Best Practices and Modelling Foundations for Digital Repositories*, aimed at outlining interoperability challenges from the perspective of the six core domains investigated by DL.org and foster an effective two-way dialogue with stakeholders through an informal format designed to pinpoint common priorities and interests. The opening DL.org presentation provided a summary of the six core concepts alongside interoperability scenarios for each one.

Web link: <http://or2010.fecyt.es/Publico/Home/index.aspx>

Participant Feedback

OR2010 in general and the interactive discussions triggered by the BoF session in particular were valuable opportunities to shed light on shared priorities of computer science and library communities from a repository development perspective and explore challenges from diverse perspectives. The BoF session yielded the following feedback.

Library engagement with computer scientists over the last few years has been valuable in addressing the challenges emerging in an evolving landscape more effectively. A good case in point is the interaction enabled by research initiatives bringing together different players and skill sets.

While some universities are at the early stages of Digital Repository developments, they need to chart a course for creating domain-specific tools so researchers can manage their data more effectively, as well as for long-term

goals like transforming a university library into a data management centre.

Key challenges include metadata. A good case in point is the 50 terabytes of content that has been digitised at one U.S. university. However, at the time metadata was not high on the priority list. In contrast, today metadata standards and tools are needed upfront and thus a top priority. One of the main issues is that current descriptions are not discoverable.

The focus and investigations conducted by DL.org are very interesting as academic and other types of institutions are tackling many similar challenges. Knowledge exchange at multiple levels is key.

Box 3 - BoF Discussions at OR2010

5.4 Presentations at External Events

DL.org and working group experts serving as testimonials have taken part in a spectrum of external events targeting the digital library and developer community.

REPRISE Workshop, 5th International Digital Curation Conference, 2-4 December 2009, London UK

Kevin Ashley, Digital Curation Centre and member of the Policy Working Group served as a DL.org testimonial at the REPRISE (Repository Preservation Infrastructures) Workshop, which was co-hosted by OGF-Europe, D-GRID/WISSGRID and DReSNet during the 5th International Digital Curation Conference in London, 2-4 December 2009. Workshop speakers include internationally renowned experts in the digital repository space, such as Andrew Treloar, Australian National Data Services (ANDS); John Kunze, Californian Digital Library; Ross King, Austrian Institute of Technology and representative of the European Planets project; Paolo Missier, University of Manchester, as well as Kevin Ashley.

The Workshop, which was chaired by Andreas Aschenbrenner, Göttingen University, Germany, focused on responsibilities of trusted repositories that embrace both technical & organisational aspects, in order to discuss organisational requirements for technical infrastructure and foster discussion between the e-Infrastructure & Curation communities. Specifically, the workshop investigated digital repository interoperability, architecture and metadata challenges to inform an Architecture Study and Metadata Use Case Collection in the drive towards interoperable digital repositories and facilitate their exploitation in distributed environments. The Study has been published by the Digital Repository Research Group within the Open Grid Forum.

Web Links:

<http://www.dcc.ac.uk/events/conferences/5th-international-digital-curation-conference/programme>

Outcomes

- Workshop attended by over 25 people from the e-Infrastructures and curation communities, library and repository developers and managers bringing insights on repository preservation infrastructures.
- Talk entitled *Audit, outsourcing and interoperability* delivered by Kevin Ashley, highlighting how interoperability has a much broader scope than metadata, APIs and wire protocols, encompassing policies, comparability and markets. Consumers and depositors alike thus need to compare services and gauge value-add in terms of trustworthiness, security and openness. Return on Investment (RoI) and the long-term usability of digital content are extremely important factors particularly for

funding agencies and collection holders. Policy interoperability is of utmost importance. Effective ways of assessing the value of Digital Repositories (DRs) is through external audits in standard forms and formal certification processes, citing a number of audit mechanisms. The talk placed emphasis on the DL.org Policy Working Group, chartered with identifying and investigating crucial policy interoperability issues arising in the implementation of large-scale DLs, evaluating the state of the art in policy solutions implemented in diverse contexts and proposing both policy solutions on the one hand and future research needed on the other.

- Event Report in the January issue of the DL.org eNewsletter circulated to the DL.org community.
- Visibility in the Workshop Executive Summary produced by OGF-Europe and circulated to over 150 representatives from the repository space in a dedicated eAnnouncement. The workshop was also summarised on a dedicated web page produced by the Workshop Chair, Andreas Aschenbrenner.

6th Italian Research Conference on Digital Libraries - IRCDL 2010, 28-29 January 2010, Padua, Italy

IRCDL is a yearly event designed specifically for Italian researchers on Digital Libraries (DL) related topics. As DLs mature, more emphasis needs to be placed on a more effective and personalised access to information for users, while improving interoperability between the different systems available. In particular, special attention needs placing on organisational aspects for advanced access to truly interoperable systems. Now a self-sustainable event, IRCDL conferences were originally launched and sponsored by DELOS, an EU FP6 Network of Excellence on DLs together with the Department of Information Engineering at the University of Padua.

Building on close relations with the Department of Engineering at the University of Padua, DL.org actively contributed to the 2-day 6th Italian Research Conference on Digital Libraries in late January 2010. Two talks were delivered by DL.org representatives. The talk on *Making DL Content Interoperable* was co-authored by Leonardo Candela, Donatella Castelli and Costantino Thanos, National Research Council, Italy, while the talk entitled *An event-centric Provenance Model for DLs* was co-authored by the three DL.org representatives cited above along with Paolo Manghi, Pasquale Pagano and Cristina Tang from the same institution. Paolo Manghi is an expert in the Content Working Group; Pasquale Pagano is Scientific Chair of the Architecture Working Group. Costantino Thanos served as General Chair, while Leonardo Candela was part of the Programme Committee.

Web link: <http://ims.dei.unipd.it/websites/archive/ims2009/events/2010/ircdl/program.html>



Figure 28 – DL.org Talks at IRCDL

Outcomes

- Event bringing together digital library researchers, computer scientists and students to foster knowledge exchange on the advances in the landscape with particular reference to content interoperability and provenance models.
- The talk on *Making DL Content Interoperable*: The demand for powerful and rich Digital Libraries able to support a large variety of interdisciplinary activities has increased the need for “building by re-use” and sharing, especially when dealing with the content space. Interoperability is a central issue to satisfy these needs. Despite its importance, and the many attempts to address it done in the past, the solutions to this problem are today, however, still very limited. The main reasons for this slow progress is the lack of a systematic approach for addressing the issue and a scarce knowledge of the adopted solutions. Too often these remain confined to the systems they have been designed for. In order to overcome this lack, this paper proposes an Interoperability Framework for describing and analysing interoperability problems and solutions related to use of content resources. It also discusses the many facets content interoperability has and provides a comprehensive and annotated portfolio of existing approaches and solutions to this challenging issue.
- The talk on *An event-centric Provenance Model for DLs*: Provenance is intended as the description of the origin and/or of the descendant line of data. In the last decade, keeping track of provenance has become crucial for the correct exploitation of data in a wide variety of application domains. The rapid evolution of Digital Libraries (DLs), which become today advanced systems for the integration and management of cross-domain digital objects, recently called for models capturing the aspects of data provenance in this application field. However, there is no common definition of DL provenance and existing solutions address the problem only from the perspective of specific application scenarios. In this paper we propose a provenance model for digital libraries, inspired by approaches and experiences in the e-Science and cultural heritage worlds and based on the notion of event occurred to an object. The model aims at capturing the specificities of provenance for DL

objects in order to provide practitioners and researchers in the field with common DL-specific provenance description languages.

- The continuous support from the Italian National Research Council, specifically the DL.org co-ordinating institutes bodes well for the future, ensuring that research at national level is brought to bear and showcased at IRCDL conferences in the years to come

2nd International Conference on Qualitative and Quantitative Methods in Libraries (QQML2010),

25-28 May 2010, Chania, Greece

The 2nd International Conference on Qualitative and Quantitative Methods in Libraries offered a very important opportunity to shine the spotlight on DL.org investigations from an all-partner perspective. Specifically, the Consortium worked in synergy to produce a paper on the focus of the project with particular reference to investigations on the six core concepts for inclusion in the Conference Proceedings. The talk - *Paving the way for Interoperability in Digital Libraries: The DL.org Project* – was delivered by Katerina El Raheb, University of Athens. In parallel, Perla Innocenti, Seamus Ross and Giuseppina Vullo, University of Glasgow, produced a paper on *Policy and Quality Interoperability of Digital Libraries: an organisational perspective*, for inclusion in the Conference Proceedings. This second talk was delivered by Giuseppina Vullo, University of Glasgow with emphasis on organisational perspectives with regard to the digital library concepts of policy and quality and working group investigations focusing on a shared policy and quality framework between diverse digital libraries.

Web links: http://www.isast.org/images/QQML_Final_Program.pdf
<http://www.isast.org/finalprogramabstracts.html>

Outcomes

- The conference brought together Librarians, Library and Information Science Researchers, Students and PhD candidates.
- *Paving the way for Interoperability in Digital Libraries: The DL.org Project:* While Digital Libraries (DLs) are moving towards universally accessible collections of human knowledge, considerable advances are needed in DL methodologies and technologies to make this happen. Interoperability between DLs is a crucial requirement to achieve this goal. The European project, DL.org, is focused on advancing the state of the art in this area by proposing solutions, fostering best practices and shared standards, drawing on the knowledge acquired during the DELOS Network of Excellence, and harnessing the expertise of DL domain stakeholder communities. By serving this goal, DL.org is paving the way for the embedding of new research achievements into real-world systems, opening up new cross-domain research perspectives and supporting the advancement of the European Information Space for the knowledge-based economy.
- *Policy and Quality Interoperability of Digital Libraries: an organisational perspective:* Interoperability is a property referring to the ability of diverse systems and organisations to work together. Today interoperability is considered a key step in the shift from isolated digital archives and digital libraries towards a common information space that enables users to browse through different resources within a single integrated environment. Approaches to policy and quality within digital information system are often ad hoc and based on a single institution focus. They frequently fail to take into consideration the interoperability requirements needed to allow digital repositories to co-operate and to exchange their digital objects. The talk proposes an organisational perspective to policy and quality interoperability, presenting an overview of how the European funded DL.org

and international experts are investigating a shared policy and quality framework between diverse digital libraries. The interim outcomes of this research are described, including how external parties may also benefit from the findings. DL.org is identifying interoperability issues preventing digital libraries from working together and addressing the most immediate challenges to interoperability.



Figure 29 – DL.org at QQML2010

Archiving 2010 Preservation Strategies and Imaging Technologies for Cultural Heritage Institutions and Memory Organisations, 1-4 June 2010, The Hague, Netherlands

On 2 June 2010, the DL.org Policy and Quality Working Group co-ordinators presented Digital Library organisational perspectives and how their respective Working Groups are defining a shared framework for interoperability. Perla Innocenti, University of Glasgow delivered a talk entitled *Towards Policy and Quality Interoperability: Challenges and approaches for Digital Libraries*. The paper was authored by Giuseppina Vullo, Perla Innocenti, Humanities Advanced Technology & Information Institute (HATII), University of Glasgow and Seamus Ross, Faculty of Information, University of Toronto. The focus is on policy and quality within the enhanced & expanded Digital Library Reference Model; core policy and quality aspects affecting information systems; the DL.org policy and quality interoperability frameworks and real-world cases on policy and quality interoperability.

Web links:

<http://www.imaging.org/ist/conferences/archiving/Archiving%202010%20Preliminary%20Program.pdf>

<http://www.imaging.org/ist/store/phypub.cfm?seriesid=28&pubid=941>

Outcomes

- Visibility for DL.org at a key forum for the Library and Information Science community through two talks and paper submissions for the conference proceedings.
- Fostering understanding of DL.org investigations into the main concepts captured by the Reference Model and of the project's comprehensive approach to interoperability.
- Direct interaction with the Library and Information Science community: digital archivists, librarians, researchers and PhD candidates.

39th LIBER Annual Conference - Re-Inventing the Library: The Challenges of the new information environment, 29 June-2 July 2010, Aarhus, Denmark

On 30 June 2010, Giuseppina Vullo delivered a presentation entitled *A Global Approach to digital library Evaluation* at LIBER2010. The talk described digital library definitions, DELOS contributions and its conceptual framework with regard to DL.org, highlighting the need to look at digital library evaluation models, comparing them with an integrated approach coupled with a feasible and simple, qualitative framework to enable comparisons and co-operation. The talk also underscored the need to link theoretical models to reality, taking into account a digital library as a unique entity, qualitative evaluation, holistic models of digital library evaluation and system versus perspectives. The talk also raised questions in terms of the feasibility of a global approach to evaluation, the players involved, end-users of the evaluation, as well as the need to ensure quality procedures are routine and enable interoperability between qualitative DL evaluations. In any information system, quality can be measured from a System perspective (internal view), focused on design and operation. The user perspective (external view) is focused on use and value.

Web Links: <http://www.libereurope.eu/node/434>

<http://www.statsbiblioteket.dk/liber2010/conference-programme-day-2>

Outcomes

- Visibility particularly of the investigations conducted by the DL.org Quality Working Group at an international conference attended mainly by institutions of higher education and university libraries, as well as library managers, Librarians, archivists, Library and Information Science Researchers and PhD candidates.
- The talk offered an opportunity to bring into sharp relief the drivers behind a common, interoperable approach to digital library evaluation. Firstly a shared approach would help avoid duplication of efforts and facilitate the exchange of materials. Secondly, librarians, researchers and society at large all benefit evaluation from a funding perspective, transparency and accountability. Thirdly, qualitative evaluations would be more effective as a regular activity. Fourthly, evaluation experiences should be comparable and interoperable. However, currently there is no common agreement on how to globally evaluate digital libraries and evaluation is generally unfunded with quality generally being a low priority. Furthermore, general models have yet to be embraced with a small fraction of work dedicated to digital library evaluations.

Open Repositories Conference (OR2010), 6-9 July 2010, Madrid, Spain

The aim of OR2010 was to explore grand integration challenges as repositories become increasingly complex and dispersed with a very broad provider scenario encompassing research publications, research data, bibliographic data and administrative data linked to the world wide web and diverse applications. The main targeted audience for OR2010 included repository developers and managers, software providers, repository initiatives, and repository service development.

Perla Innocenti and Giuseppina Vullo, Humanities Advanced Technology & Information Institute (HATII), University of Glasgow and Seamus Ross, Dean of the Faculty of Information, University of Toronto author a paper submitted for the session dedicated to Interoperability Policy. Paper acceptance for the

conference was around 40% due to the high number of papers submitted. The talk, entitled *Interoperability for Digital Repositories: Towards a Quality and Policy Framework*, was delivered by Giuseppina Vullo.

Web link: <http://or2010.fecyt.es/Publico/GSession/index.aspx>

Outcomes

- OR2010 was attended by over 400 people from 36 countries, offering good networking opportunities and interaction with the repository community.
- Insights into the DL.org Policy and Quality framework. Showcasing the focus and outcomes of the Policy and Quality Interoperability Survey citing examples of organisations in Europe and interoperability that have provided their feedback.

The talk focused on organisational interoperability. Organisational interoperability, which refers to co-operation between and within organisations, business goals and process modelling, is the most challenging level of interoperability, especially at machine-readable and automation level. The talk explained the Policy and Quality interoperability issues and approaches adopted by the respective Working Groups in DL.org with particular reference to the Interoperability Framework that has been defined. The organisations that have taken part in the Policy Interoperability Survey were cited along with Quality Case Studies template.

8th International Workshop on Adaptive Multimedia Retrieval – (AMR'2010), 17-18 August 2010, Linz, Austria

The Workshop and Programme was aimed at intensifying the exchange of ideas between different research communities by providing an overview of current activities in this area and highlighting connections between the diverse research communities targeted: multimedia retrieval and artificial intelligence with particular reference to feature extraction techniques, computer linguistic approaches, dynamic data analysis methods, interactive machine learning, visualisation methods as well as user interface design.

The User Working Group produced a paper entitled *A Survey of Context-aware Cross-Digital Library Personalisation* for presentation at the Workshop on 17 August 2010. The authors of the paper are Anna Nika, Yannis Ioannidis, Natalia Manola and Akrivi Katifori from the University of Athens; Tiziana Catarci from the Sapienza University of Rome; Andrea Nürnberger, Otto-von-Guericke University Magdeburg; Manfred Thaller, University of Cologne and Georgia Koutrika from Stanford University.

Web link: <http://amr.dke-research.de/amr2010/amr2010program.pdf>

Outcomes

- The session was attended by over 35 people mainly from the research community.
- The presentation triggered a lively discussion exploring topics such as user privacy, ontologies, standardisation issues, user profiling, and multimedia retrieval.
- Visibility particularly for the User Working Group investigations. Workshop interactions and discussions over two days provided valuable input to enhance the Reference Model and raise awareness around DL.org and its main outputs.

Europeana in Greece: Adding Greek Cultural Content to the European Digital Library, 19 October 2010, Athens, Greece

The workshop on Europeana in Greece was held in conjunction with the EuropeanaLocal National Meeting in Greece. The main aim of this event was to bring together providers of local and regional content for Europeana. It addressed the economic and organisational challenges that these institutions are facing, in their effort to collect, digitise and aggregate Cultural content. The activities of EuropeanaLocal and AccessIT were presented and the role and future of the Greek National Aggregator was analysed.

Outcomes

- DL.org partner participation in the event, distributing project fliers and raising awareness of the project and its goals.
- Direct interaction with EuropeanaLocal coordinators at national level, leading to a fruitful collaboration and the successful co-organisation of the DL.org Workshop in Athens.
- Discussions with the AccessIT speaker focused on the DL.org e-Training. This exchange has been maintained after the event and a number of follow-up activities have been carried out.
- Direct interaction with Greek content providers, such as libraries, museums and archives, as well as librarians, information scientists, computer scientists and archivists.

Web links: <http://www.access-it.org/tur/Events2/Induction-Conferences/Greece>

CODATA 2010 Conference, 24-27 October 2010, Cape Town, South Africa

The sea change in data storage, dissemination, preservation and management has brought with it a number of challenges such as data quality, access and archiving calling for concerted efforts on a global scale. The aim of the 22nd International Conference on Scientific Information for Society: From Today to the Future (CODATA 2010) aimed to provide an international forum for scientific communities and policy makers to deliberate how such challenges can be addressed as effectively as possible.

On 25 October 2010 Costantino Thanos, National Research Council, presented a talk co-authored by Leonardo Candela and Donatella Castelli from the same institution with the title *Towards Global Data Interoperability*. The talk was delivered during the Session hosted by GRDI2020 - Towards a 10-Year Vision for Global Research Data Infrastructures, a strategic alliance of DL.org.

Web links:

<http://www.codata2010.com/scientific-program.php>

http://www.grdi2020.eu/Pages/SelectedDocument.aspx?id_documento=edea68b7-cf51-41d1-a074-bfd8bfa64c10

Outcomes

- The CODATA Conference addresses mainly the requirements of scientific disciplines, offering an opportunity to share insights with specialists from different domains and share insights with members of GRL2020 and GRDI2020 experts in attendance.

- The paper, which reported findings to help address interoperability challenges in the Digital Library space, helped to pinpoint a number of common approaches to content interoperability challenges.
- Visibility on the CODATA conference pages and through the GRDI2020 web channel.

EuroMed – International Conference on Cultural Heritage, 8-13 November 2010, Lemesos, Cyprus

The aim of EuroMed 2010 was to share and exchange know-how and experiences about the e-Documentation of the Past, how to preserve and manage Cultural Heritage, whether books, drawings, architectural, archaeological and/or natural and discuss future methodologies and plans for the local and global cooperation in this area. The main goal of the event was to illustrate programmes underway, whether organised by public bodies (e.g. UNESCO, European Union, National States, etc.) or by private foundations (e.g. Getty Foundation, World Heritage Foundation, etc.) in order to promote a common approach to the tasks of recording, documenting, protecting and managing World Cultural Heritage. The conference targeted representatives from public and private Cultural heritage national and international associations, researchers and domain specialists. Costantino Thanos, Leonardo Candela and Donatella Castelli, National Research Council, co-authored a paper entitled *Building Large Heterogeneous Interconnected Digital Library Infrastructures: The Interoperability Challenge* for presentation at the event.

Web link: <http://www.euromed2010.eu/>
<http://www.euromed2010.eu/e-proceedings/proceedings.html>

Outcomes

- The talk and paper focused on interoperability scenarios. As technology becomes more far-reaching and interconnected, interoperability has become critical to making more resources available and opening up new opportunities for cross-disciplinary research. However, interoperability is complex, ranging along a wide multi-dimensional spectrum, encompassing technical and organisational concepts. At one end of the spectrum we have data and metadata interoperability while at the other end there is organisational, legal and policy interoperability. This paper describes a number of application scenarios where several interoperability issues are outlined, as well as defining interoperability with particular reference to impediments for interoperability between federated Digital Libraries. The paper also describes different types of interoperability and a number of approaches to achieving it. The final section is dedicated to best practices for implementing interoperability solutions.

6th International Digital Curation Conference - DCC 2010, 6-8 December 2010, Chicago, U.S.

Members of the Policy Working Group, MacKenzie Smith, Kevin Ashley, Perla Innocenti, Seamus Ross, Hans Pfeiffenberger, John Faundeen & Antonella De Robbio, co-authored a paper entitled *Towards a holistic approach to policy interoperability in digital libraries*, which was presented on Wednesday 8 December 2010 during the session dedicated to National Perspectives on Curation Policy.

Web Links:

<http://www.dcc.ac.uk/events/conferences/6th-international-digital-curation-conference/programme>

<http://www.ijdc.net/index.php/ijdc>

Outcomes

- DCC2010 was attended by over 270 people with additional participants at satellite events. Attendance was the largest to date. The conference brought together institutional repositories managers, project managers, librarians, archivists, LIS researchers, students and PhD candidates. Keynotes were delivered by members of the Policy Working Group, such as Kevin Ashley, Director of the Digital Curation Centre in the UK and Mckenzie Smith, Director of MIT Libraries.
- The talk shared DL.org's investigation into policy interoperability levels and the experimental survey on policy interoperability conducted with real-life digital libraries, as a contribution towards the definition of a Policy Interoperability Framework. Underpinning every digital library and digital repository there is a policy framework, which makes the digital library viable - without a policy framework a digital library is little more than a container for content. Policy governs how a digital library is instantiated and run. It is therefore a meta-domain which is situated both outside the digital library and any technologies used to deliver it, and within the digital library itself. Policy is also a key aspect of digital library and digital repository interoperability in a common and integrated information space. Policy interoperability - that is the exchange and reuse of policies - is a step beyond policy standardisation. Furthermore, effective and efficient policy frameworks are also one of the Digital Curation Center (DCC), DigitalPreservationEurope (DPE), nestor and Center for Research Libraries (CRL) core criteria for digital repositories.

Open Access: Research, Education and Public Data, 16-17 December 2010, Athens, Greece

The aim of the conference was to present the role of Open Access in an emerging environment that promotes research and scholarly communication, competitiveness, innovation, the learning and educational processes, transparency and a participatory culture among citizens. Presentations included national and European policies, initiatives and Open Access infrastructures, international collaborations and current trends in scholarly communication and content management, as well as Open Access initiatives by the National Documentation Centre.

Outcomes

- DL.org partner participation, distributing project fliers and networking with professionals from Greece to raise awareness around DL.org.

5.5 Post-Project Presentations, Tutorials and Workshops

In order to maintain the momentum around DL.org outputs, the project will be presenting at conference and hosting a tutorials and a workshop at three external events taking place between March and June 2011.

THATCamp, 23-26 March 2011, Florence, Italy

THATCamp (The Humanities and Technology Camp), focuses specifically on the Digital Humanities and Digital History. Described as an “un-conference” organised for the first time in Italy, THATCamp places emphasis on pro-active participation, sharing knowledge and experiences gained from day-to-day research activities, with the aim of fostering peer-to-peer co-operation on common interests and priorities. THATCamp is aimed at bringing together Italian and European Digital Humanists to deliberate digital scholarship and methods used today. THATCamp is hosted by the Department of History and Civilisation of the European University Institute in Florence, Italy, and is supported by several European scholarly institutions, including the Institute of Science & Information Technologies (ISTI), National Research Council of Italy (CNR), the co-ordinating partner of DL.org.

Presenter: On Wednesday 23 March, Vittore Casarosa, National Research Council (Italy), is presenting the DL.org Reference Model as a key tool stemming from the DELOS Network of Excellence, enhanced and expanded by working in synergy with an international team of experts.

Web links: <http://www.thatcampflorence.org/programme/>

European Library Automation Group (ELAG 2011), 25-29 May 2011, Prague, Czech Republic

Building on the successful outcomes of the Seminar on the same theme held on 9 November 2011 in Parma, this Workshop aims to establish a forum for discussion on how to better exploit the results of research and education in Digital Libraries. The main thread of discussion will be interoperability in digital libraries, which means that research has to consider not only the technical dimension, but also other dimensions that may be affected by interoperability issues, such as policy, quality, user profiles, legal aspects, and so forth. The discussion will focus not just on the content that should be included in Library and Information Science programmes, but will also explore the many implications, both conceptual and practical, that arise when working in the “information field”, very broadly defined.

Workshop Goals

- Trigger a discussion aimed at understanding which aspects of research in Digital Libraries impact most on education in Digital Libraries.
- Energise thinking on how results of research in Digital Libraries can be timely transferred to education in Digital Libraries, e.g. how to implement a European scale mechanism for exchanging, sharing and integrating research results into education.
- Outline the content of a report to be distributed to the research and education communities interested in Digital Libraries, for furthering the discussion of those topics.

Workshop presenters: Donatella Castelli and Vittore Casarosa, National Research Council; Anna Maria Tamaro, University of Parma.

Web links: <http://elag2011.techlib.cz/en/>

<http://elag2011.techlib.cz/en/852-05-research-and-education-in-digital-libraries/>

DL.org Tutorial on Digital Libraries Foundations and Interoperability, Extended Semantic Web Conference, 29 May-2 June 2011, Heraklion, Crete

Drivers & Objectives

The digital age is inextricably bound up with ever-growing amounts of information, frequently referred to as the “data deluge”. Digital Libraries are chartered not just with storing, organising and disseminating data but also play a vital role as "keepers" of human knowledge. Building and maintaining scientific e-Infrastructures, preserving cultural heritage, and supporting educational processes are just some examples of the value-add of Digital Libraries. Semantically enhanced models are important enablers in terms of content organisation, user personalisation and high-quality functionality in interoperable Digital Library systems. The multi-perspective nature of Digital Libraries offers important opportunities to foster fertilisation across cutting-edge approaches to research and applications. Modelling foundations provide important building blocks in developing and enhancing Digital Libraries, by ensuring that a set of core concepts underpin all systems.

Tutorial Objectives

One of the key outputs of DL.org is an enhanced and expanded Reference Model intended as a Roadmap to enable the wider Digital Library community to follow the same route and share a common understanding when dealing with the entities of the Digital Library universe. The aim of this tutorial is to introduce the audience to the state-of-the-art of Digital Libraries with special emphasis on the Reference Model as a conceptual framework documenting the significant effort towards building a common language to express key issues surrounding interoperability.

The tutorial covers the core concepts characterising Digital Libraries: content, functionality, user, policy, quality and architecture. The tutorial features a rich mix of presentations, interactive discussion, demos and hands-on with comprehensive examples of existing systems that apply semantic technologies to help exemplify abstract concepts. Participants will come away with a conceptual framework and new knowledge on DL.org's approach to Digital Library Interoperability, Best Practices and Modelling Foundations enhancing their research and professional practices. To ensure maximum impact, DL.org will provide tutorial attendees with a Virtual Reading List and pointers well ahead of the event.

The tutorial is designed for researchers and practitioners dealing with different aspects of semantic technologies, specifically Information Scientists, PhD candidates, Engineers, Digital Library Designers and Administrators, as well as Digital Libraries Managers, Librarians and Information Scientists attending ESWC 2011.

Web links: <http://www.eswc2011.org/> and <http://www.eswc2011.org/content/tutorials>

Programme

The current programme is shown in the table below.

09:00 – 09:45	<i>Digital Libraries: Definitions, Systems</i> Donatella Castelli, National Research Council, Italy
10:45 – 12:30	DIGITAL LIBRARY MODELLING
10:45 – 11:00	<i>Organisation</i> Yannis Ioannidis, University of Athens, Greece
11:00 – 11:15	<i>Content</i> Leonardo Candela, National Research Council, Italy
11:15 – 11:30	<i>User</i> Yannis Ioannidis, University of Athens, Greece
11:30 – 11:45	<i>Functionality</i> Katerina El Raheb, University of Athens, Greece
11:45 – 12:00	<i>Policy</i> Yannis Ioannidis, University of Athens, Greece
12:00 – 12:15	<i>Quality</i> Katerina El Raheb, University of Athens, Greece
12:15 – 12:30	<i>Architecture</i> Leonardo Candela, National Research Council, Italy
12:45 – 13:30	HANDS-ON Demos and examples, such as Europeana, D4Science, TELplus, OpenAIRE
13:30 – 14:00	<i>Digital Library Interoperability: Challenges & Solutions</i> Donatella Castelli, National Research Council, Italy

Table 14 – Tutorial Programme at ESWC 2011

6. Publications

6.1 Publications for the 2nd DL.org Workshop

In early September 2010, the Pre-proceedings of the 2nd DL.org Workshop - *Making Digital Libraries Interoperable: Challenges and Approaches* were published as ISBN 978-88628014-0 and distributed at the Workshop (9-10 September 2010, ECDL2010). Core messaging around the Workshop is also captured in the Preface of the Pre-proceedings, which was co-authored by Donatella Castelli, Yannis Ioannidis and Seamus Ross.

DL.org Papers: 5

- G. Athanasopoulos, E. Fox, Y. Ioannidis, G. Kakalettris, N. Manola, C. Meghini, A. Rauber, D. Soergel, 'A Functionality Perspective on Digital Library Interoperability'.
- Nika, T. Catarci, A. Katifori, G. Koutrika, N. Manola, A. Nürnberger, and M.Thaller, 'Modelling User and Context in Digital Libraries: Interoperability Issues'.

- G. Vullo, G. Clavel, N. Ferro, S. Higgins, R. Van Horik, W. Horstmann, S. Kapidakis, 'Quality interoperability within digital libraries: the DL.org perspective'.
- L. Candela, G. Kakalettris, P. Pagano, G. Papanikos, F. Simeoni, 'The gCube Interoperability Framework'.
- P. Manghi, L. Candela, P. Pagano, 'Interoperability Patterns in Digital Library Systems Federations'.

Other papers from the workshop include: P. Burnhill, P. de Castro, J. Downing, R. Jones, and M. Sandfær, 'Handling Repository-Related Interoperability Issues: the SONEX Workgroup' and J. Leidig, E. A. Fox, M. Marathe and H. Mortveit, 'Epidemiology Experiment and Simulation Management through Schema-Based Digital Libraries'.

Springer Proceedings of the 2nd DL.org Workshop: 5 papers (as above)

The five papers cited above will be published in *Lecture Notes in Computer Science* (LNCS), Springer, whereby meeting the criteria set in terms of international relevance and timeliness.

6.2 Conference Proceedings & Journals: 14 papers

- K. El Raheb, G. Athanasopoulos, L. Candela, D. Castelli, P. Innocenti, Y. Ioannidis, A. Katifori, A. Nika, S. Parker, S. Ross, C. Thanos, E. Toli, G. Vullo, 'Paving the Way for Digital Library Interoperability: The DL.org Project', *Quantitative and Qualitative Methods for Libraries Conference (QQLM 2010) Proceedings*, 25-28 May 2010, Chania, Crete (Greece).
- P. Innocenti, G. Vullo, and S. Ross, 'Policy and Quality Interoperability of Digital Libraries: an organisational perspective', *Quantitative and Qualitative Methods for Libraries Conference (QQLM 2010) Proceedings*, 25-28 May 2010, Chania, Crete (Greece).
- P. Innocenti, M. Smith, K. Ashley, S. Ross, A. De Robbio, H. Pfeifferberger, J. Faundeen, 'Towards a Holistic Approach to Policy Interoperability in Digital Libraries', *International Journal of Digital Curation* Vol. 5 (2), ISSN 1746-8256.
- P. Innocenti, G. Vullo, and S. Ross, 'Towards a Digital Library Policy and Quality Interoperability Framework: the DL.org Project', Invited paper for the New Review of Information Networking, Volume 15, Issue 1 May 2010, pp. 29 - 53, ISSN 1361-4576.
- G. Vullo, 'A global approach to DL evaluation', *LIBER Quarterly*, Volume 20, Issue 2, 2010, ISSN 1435-5205.
- P. Innocenti, 'Policy & Quality Interoperability: an organisational approach for digital archives and digital libraries', *Abstract book of the 8th European Conference on Digital Archives (ECA 2010)*
- G. Vullo, P. Innocenti and S. Ross, 'Towards Policy and Quality Interoperability: Challenges and Approaches for Digital Libraries', *IS&T Archiving 2010 Preservation Strategies and Imaging Technologies for Cultural Heritage Institutions and Memory Organisations Conference Proceedings*, ISBN 978-0-89208-290-2.
- Nika, T. Catarci, Y. Ioannidis, A. Katifori, G. Koutrika, N. Manola, A. Nürnberger, M. Thaller, 'User-Centric Perspective on Digital Library Interoperability', *Information Technology Section Newsletter of the International Federation of Library Associations and Institutions (IFLA)*, July 2010
- Thanos, L. Candela, D. Castelli, 'Building large heterogeneous interconnected digital library infrastructures: the interoperability challenge', *eProceedings of EuroMed 2010*, Digital Heritage,

3rd International Conference dedicated to Digital Heritage, Short Papers, M. Ioannidis, D. Fellner, A. Georgopoulos, D. Hadjimitsis (eds), ISBN 978-963-9911-16-1.

- L. Candela, D. Castelli, C. Thanos, 'Making DL Content Interoperable' and L. Candela, D. Castelli, P. Manghi, P. Pagano, C. Tang and C. Thanos 'An event-centric Provenance Model for DLs', RCDL Proceedings, *Communications in Computer and Information Science*, n°. 91, Springer.
- Forthcoming publication on the outcomes of the Open Access Repository surveys.

7. Community Messaging & Leadership Interviews

Effective community messaging has been a key goal particularly in the second year of DL.org as the main outputs have taken shape and as the project has increased its outreach especially to the library and digital library educational community. DL.org value propositions have been created and updated as part of an on-going process, around the project in general and its specific goals and outputs in particular. Core activities range from designing and delivering focused eAnnouncements and eNewsletters alongside multimodal content and interviews with key figures in the landscape and the next generation of library professionals with the aim of also enhancing web-based content.

7.1 eAnnouncements & eNewsletters

Given the focus on DL.org events, as well as visibility at external events, focused messaging has been produced both for project eNewsletters keeping the community abreast of achievements and initiatives and eAnnouncements dedicated to promoting a specific event:

- 10 branded eAnnouncements and 5 branded eNewsletters circulated to the DL.org community database and national libraries, museums and archives in addition to Call for Papers messages and announcements circulated by partners to their networks. The eAnnouncements have mainly focused on promoting the 2nd DL.org Workshop and the three national events, as well as the ICT2010 Networking Session.
- The London Workshop was also promoted through a dedicated message circulated by INSFO-DIGICULT in early January 2011.



Figure 30 – Focused eAnnouncements

eNewsletters have been more detailed covering event promotion and outcomes, as well as interviews conducted:

- **DL.org Out & About, January 2010** – DL.org event attendance, knowledge exchange and visibility.
- **Interoperability in Focus, April/May 2010** – Interview with Tobias Blanke, Kings College London, UK, member of the Liaison Group and DARIAH, 2nd DL.org Workshop Call for Papers, new strategic alliances forged.
- **DL.org Outreach & Training, Summer 2010** – Promotion of 2nd DL.org Workshop, ICT2010 Networking Session, and Autumn School. Interview with Wolfram Horstmann, member of the Quality WG and Chair of OR2010.
- **Winter 2010** – Interviews with Anna Maria Tammaro, Parma University and DILL national coordinator and Marcial Batiancila, DILL Master Student. Promotion of the London Workshop, testimonies from the Athens Workshop.
- **Spring 2011, forthcoming** – Final DL.org outcomes, main outputs available to the community and interviews.

7.2 Interviews & Videos

In the second year, interviews have been conducted not only with leading figures in the landscape but also a next-generation library professional as a direct outcome of the Parma Seminar. Interview topics have ranged from the importance of interoperability with special emphasis on the role played by DL.org, information systems for the humanities, the evolving open repository landscape, digital library education and research, and open access. A round table has explored digital libraries, cultural identity and annotation. The interviews and round table are detailed below:

- Interview with Heather Joseph, Executive Director of the Scholarly Publishing and Academic Resources Coalition (SPARC), U.S.
- Interview with Anna Maria Tammaro, University of Parma, Italian coordinator of the Digital Library Learning (DILL), EC's Erasmus Mundus programme and speaker at Parma Seminar on Research and Education on Digital Libraries in November 2010.
- Interview with Marcial Reyes Batiancila, Philippines, Master student of the Digital Library Learning (DILL), EC's Erasmus Mundus programme and round-table participant of the Parma Seminar on Research and Education on Digital Libraries in November 2010.
- Round Table on Digital Libraries in Research and Education, Parma Seminar, November 2010.
- Round Table featuring Kevin Ashley, Digital Curation Centre (UK) with partners Yannis Ioannidis and Seamus Ross on national digital libraries, cultural identity and annotation.
- Interview with Wolfram Horstmann, CIO, Bielefeld University Library & Expert in the DL.org Quality Working Group, the grand integration challenges addressed by the 5th International conference on Open Repositories in July 2010.
- Interview with Tobias Blanke, Kings College London and member of the DL.org Liaison Group on the importance of interoperability for the Arts and Humanities community. This interview is back-linked from the DARIAH website.

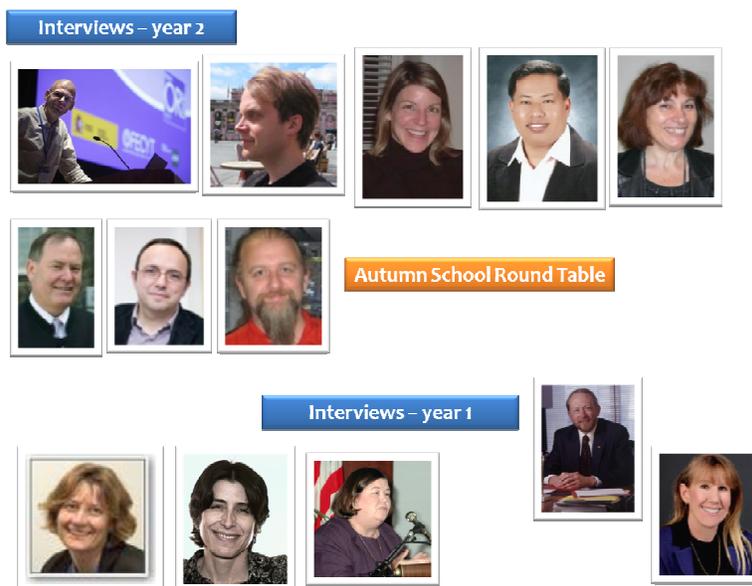


Figure 31 – DL.org Interviewees

8. Training

In the second year of the project, training has focused on two key activities, that is, the **Autumn School** and contributions to web-based modules, **Wikiversity**, through the alliance with the U.S. Digital Library Curriculum Development, while maintaining the **Moodle-based eCourses** without further effort dedicated. The value proposition around the DL.org training and educational programme has been revisited accordingly.

eLearning is a significant feature of education and training for librarianship and information science. While there are countless papers and web-based content in the field, we face many challenges in making our systems interoperable and in helping users develop a clear model of what services they provide. To support teaching and learning about digital libraries with these challenges firmly in mind, the DL.org training and educational programme focuses on three key components:

- *The lectures, demos and student group presentations of the DL.org Autumn School in October 2010. These resources shed light on reference modelling, interoperability patterns and solutions with real-life examples and particular reference to the DL.org Digital Library Reference Model and Technology and Methodology Cookbook.*
- *DL.org modules hosted on Wikiversity.*
- *Induction courses and modules on the DL.org Reference Model with self-assessment leveraging Moodle.*

All of these resources aim to assist a spectrum of digital library professionals and information scientists, whether they be practitioners, teachers, students or researchers. All the resources can be selected and used at the professional's own pace, in a cost-effective way, and irrespective of geographical location.

Box 4 – eTraining Value Proposition

8.1 Autumn School

Due to low participation in the Summer School scheduled for early June in Tirrenia near Pisa, Italy despite an intense campaign, the event was cancelled and efforts focused on the organisation of an Autumn School. The DL.org Autumn School on Digital Libraries and Digital Repositories: Modelling, Best Practices & Interoperability took place from 3 to 8 October 2010 in Athens, Greece, hosted by the University of Athens and led by the University of Glasgow. This one-week intensive school comprised nine half-day sessions led by established lecturers drawn from the project and its working groups. Hands-on sessions featured every day. Learning experiences were reinforced by means of a report dedicated to the six domains captured by the Reference Model coupled with lectures on interoperability challenges, produced by participants and presented at the end of the Autumn School. The programme was developed by the Consortium and supported by a number of experts from the Working Groups, defining the main objectives, learning outcomes, reading material and course content.

Programme

The programme for the Autumn School is shown in the table below.

Sunday 3 October 2010	18:30: <i>Overview of the Autumn School and Introduction to the Lecturers</i> 19:30: <i>Welcome Reception</i>
Monday 4 October 2010	9:00 - 12:45: <i>Introduction to DL.org, digital libraries modelling and the DL Reference Model</i> , Donatella Castelli 14:00 - 17:30: <i>Interoperability challenges for digital libraries</i> , Yannis Ioannidis & Seamus Ross
Tuesday 5 October 2010	9:00 - 12:45: <i>Content domain</i> , Leonardo Candela 14:00 - 17:30: <i>Functionality domain</i> , Carlo Meghini & George Athanasopoulos
Wednesday 6 October 2010	09:00 - 12:45: <i>Policy domain</i> , Kevin Ashley & Perla Innocenti 14:00 - 15:30: <i>Architecture domain</i> , Pasquale Pagano and Leonardo Candela 16:00 - 17:30: <i>DL project demo showcase</i>
Thursday 7 October 2010	09:00 - 12:45: <i>User Domain</i> , Yannis Ioannidis & Akrivi Katifori 14:00 - 17:30: <i>Quality domain</i> , Nicola Ferro & Giuseppina Vullo 20:00 - 22:00: <i>Social Dinner</i>
Friday 8 October 2010	09:00 - 10:30: <i>Student Groups Presentations Wrap-Up</i> 11:00 - 12:00: <i>Presentation of the Student Groups Outcomes with Minute Madness</i> 12:00 - 12:45: <i>Closing of the Autumn School</i>
(All morning and afternoon session timings include 30 minutes for coffee or tea breaks)	

Table 15 – Autumn School Programme

Promotion

In order to ensure participation in the Autumn School, the promotional net was widely cast across the largest possible pool of pertinent target groups. To this end, Autumn School press releases were produced in summer 2010 and circulated to the following target groups:

- **Library & Information Scientists mailing lists:**

Associazione Italiana Bibliotecari (AIB-WEB): <http://www.aib.it/aib/aib-e.htm3>

LIS-UKEIG: <https://www.jiscmail.ac.uk/cgi-bin/webadmin?AO=LIS-UKEIG>

AIB-CUR (Italian librarians): <http://list.cineca.it/archives/aib-cur.html>

ERIL-L (Electronic Resources in Libraries): <http://listserv.binghamton.edu/archives/eril-l.html>

Lista Archivi 23 (University of Padua): <http://www.unipd.it/archivio/archivi23/>

IFLA DIGLIB (librarians and information scientists):

<http://infoserv.inist.fr/wwsympa.fcgi/info/diglib>

LIBER: <http://www.libereurope.eu/>

SWISS-LIB: <http://lists.switch.ch/mailman/listinfo/swiss-lib>

Web4Lib: <http://lists.webjunction.org/web4lib/>

- **Mailing lists in Greece:**

National Documentation Center: <http://www.ekt.gr/en/index.html>

National Library of Greece: <http://www.nlg.gr/english/default.htm>

Union Catalog of Greek Academic Libraries: <http://www.unioncatalog.gr/ucportal/>

Central Library of NTUA: <http://www.lib.ntua.gr/newsite/en/eindex.htm>

Department of Archives and Library Science: <http://tab.ionio.gr/?q=en>

Library of University of Piraeus: http://www.unipi.gr/eng_site/default.php

Public Central Library of Serres: http://www.serrelib.gr/index_en.php

University of Macedonia:

AUTH Library System <http://www.lib.auth.gr/site/en>

Library of Panteion University of Athens:

<http://library.panteion.gr/index.php?sid=Dq1PDC2HeozKCPm8iRN2etPVmsPwE3iIMDyQGUyletVGeDgmvu&lang=en&id=1>

Library of University of Ioannina: <http://www.lib.uoi.gr/en/index.php>

Main Library of Duth: <http://www.lib.duth.gr/en/>

Distance library and information services of the Hellenic Open University:

<http://lib.eap.gr/en/index.html>

Aegean University Library:

http://portal.lib.aegean.gr/portal/dt?AegeanLib/Body/Home/HomeBody.setSelected=AegeanLib/Body/Home/HomeBody/HomeHidden&last=false#portal_txt.phtml?prnbr=1198053923197

Library of Verria (Bill & Melinda Gates Foundation): <http://www.libver.gr/>

- **European national libraries and archives:**

Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Malta, Montenegro, Netherlands, Norway, Portugal, Republic of Macedonia, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, UK.

- **National, European and International Initiatives:**

Messages chiefly targeted at computer scientists and repository developers and managers:

University of Athens (NKUA): <http://en.uoa.gr/>

National Technical University of Athens: <http://www.ntua.gr/>

Athens University of Economics and Business: <http://www.aueb.gr/>

University of Piraeus: <http://www.unipi.gr/>

Aristotle University of Thessaloniki: <http://www.auth.gr/home/>

IONIO University: <http://www.ionio.gr/central/>

University of Peloponnesse:

http://www.uop.gr/index.php?option=com_content&view=article&id=261&Itemid=1&lang=el

University of Ioannina: <http://www.uoi.gr/gr/>

University of the Aegean: <http://www3.aegean.gr/>

Technological Educational Institute of Athens: <http://www.teiath.gr/>

Technological Educational Institute of Lamia: <http://www.teilam.gr/>

DELOS: <http://www.delos.info/>

- **Promotion at Events:**

Promotional fliers and a dedicated DL.org Autumn School flier were circulated at:

ARM2010, August 2010

OR2010, July 2010

ECDL2010, September 2010

A sample of the main promotional outcomes are illustrated in the figure below.

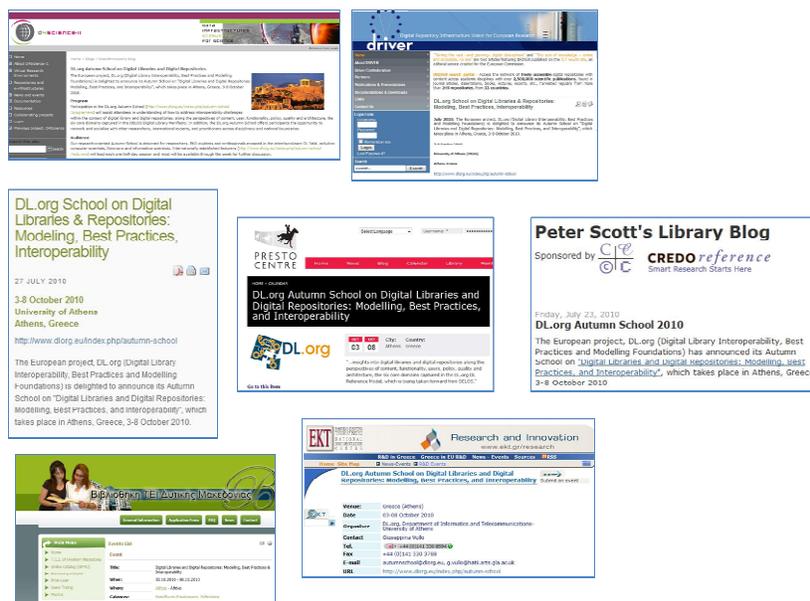


Figure 32 – Autumn School promotion

A sample of links to the web announcements is provided below:

- DRIVER-II: <http://www.driver-repository.eu/DL.org-School-on-Digital-Libraries-Repositories-Modeling-Best-Practices-Interoperability.html>
- Presto Centre: http://www.prestocentre.eu/calendar/%5Bfield_date_shared-yyyy%5D/%5Bfield_date_shared-mm%5D/%5Bfield_date_shared-dd%5D/dlorg-autumn-school-
- National Documentation Center, Greece:

- http://www.ekt.gr/content/display?ses_mode=rnd&ses_lang=en&prnbr=4146
- Library of the Technological Educational Institute of Western Macedonia:
- http://library.teikoz.gr/index.php?view=details&id=50:dlorg&option=com_eventlist&Itemid=56&lang=en
- Peter Scott Digital Library Blog: <http://xrefer.blogspot.com/2010/07/dlorg-autumn-school-2010.html>
- OpenAIRE: <http://www.openaire.eu/en/about-openaire/news-a-events?start=15>
- D4Science: <http://www.d4science.eu/node/541>
- Trust-IT: <http://www.trust-it-services.com/news/18/72/DL-org-Autumn-School-on-Digital-Libraries-and-Repositoriespage>

Virtual Reading List

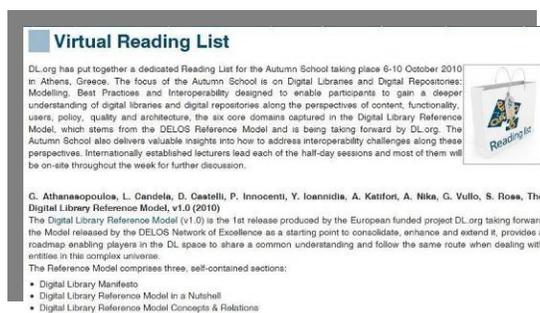


Figure 33 – Autumn School Virtual Reading List

Well ahead of the Autumn School, participants received a detailed Virtual Reading List to help them prepare for the lectures and activities planned. The virtual format chosen makes the reading list widely available to DL.org target groups through the project website.

- L. Candela et al, *The Digital Library Reference Model*, v1.0 (2010), http://www.dlorg.eu/uploads/DL%20Reference%20Models/The%20Digital%20Library%20Reference%20Model_v1.0.pdf

The Digital Library Reference Model (v1.0) is the 1st release produced by the European funded project DL.org taking forward the Model released by the DELOS Network of Excellence as a starting point to consolidate, enhance and extend it, provides a roadmap enabling players in the DL space to share a common understanding and follow the same route when dealing with entities in this complex universe. The Reference Model comprises three, self-contained sections: Digital Library Manifesto, Digital Library Reference Model in a Nutshell, Digital Library Reference Model Concepts & Relations

- *The DL.org Interoperability State-of-the-art Survey*: https://workinggroups.wiki.dlorg.eu/index.php/State_of_the_art

This state-of-the-art survey has been produced by the DL.org Working Groups to start their research on different perspectives on digital libraries' interoperability, and is a work in progress.

- Paepcke, C. K. Chang, T. Winogard, H. Garcia-Molina, 'Interoperability for digital libraries worldwide', *Communications of the ACM*, 1998, 41(4), 33-42: <http://portal.acm.org/citation.cfm?id=273035.273044>

This paper presents a broad introduction to the issues of interoperability, suggesting factors that may be used in evaluating related solutions and providing an overview of solution classes.

- C. L. Borgman, 'Challenges in building digital libraries for the 21st century', *Lecture Notes in Computer Science*, 2002, 2555, 1-13:

<http://www.springerlink.com/content/u92w39qx2gcy8fhg/>

The author summarises the key-challenges of 21st century digital libraries taking into account the technical, social and organisational context.

- IDABC, *European Interoperability Framework for Pan-European eGovernment Services*, v1.0, EC (2004), <http://ec.europa.eu/idabc/servlets/Doc?id=19529>

This document provides recommendations and defines generic standards with regard to organisational, semantic and technical aspects of interoperability, offering a comprehensive set of principles for European cooperation in eGovernment.

- M. A. Goncalves, E. Fox, L. T. Watson, N. A. Kipp, 'Streams, Structures, Spaces, Scenarios, Societies (5S): A Formal Model for Digital Libraries', *ACM Transactions on Information Systems (TOIS)*, ACM Press, 2004, 22, 270-312:

<http://portal.acm.org/citation.cfm?id=984321.984325>

The authors propose the fundamental abstractions of Streams, Structures, Spaces, Scenarios, and Societies (5S), which allow us to define digital libraries rigorously and usefully. Streams are sequences of arbitrary items used to describe both static and dynamic (e.g., video) content. Structures can be viewed as labeled directed graphs, which impose organisation.

- Tony Hey, Stewart Tansley, Kristin Tolle (eds.), *The Fourth Paradigm: Data-Intensive Scientific Discovery*, Microsoft Corporation (2009). Part 4 "Scholarly communication" 175-220:

http://research.microsoft.com/en-us/collaboration/fourthparadigm/4th_paradigm_book_part4_complete.pdf

Increasingly, scientific breakthroughs will be powered by advanced computing capabilities that help researchers manipulate and explore massive datasets. The speed at which any given scientific discipline advances will depend on how well its researchers collaborate with one another, and with technologists, in areas of eScience such as databases, workflow management, visualisation, and cloud computing technologies. Research is evolving from small, autonomous scholarly guilds to larger, more enlightened, and more interconnected communities of scientists who are increasingly interdependent upon one another to move forward.

- Duncan Birrell, Gordon Dunsire and Kathleen Menzies, *Online Catalogue and Repository Interoperability Study (OCRIS)*, Final Report (2009):

http://ie-repository.jisc.ac.uk/430/1/OCRIS_Report.pdf

The aims of this study are to investigate and report on the extent to which academic repository content is already held in On-line Public Access Catalogue (OPACs); interoperability of OPAC and repository software for the exchange of metadata and other information; various services offered to institutional managers, researchers, teachers and learners respectively by OPACs and by repositories; potential for improvements in the links from repositories and/or OPACs to other institutional services, such as finance or research administration; development of possible further beneficial links between library OPACs and institutional repositories.

Outcomes and Participants

DL.org was represented by nine partners plus five members of the Working Groups.

- National Research Council: Leonardo Candela and Donatella Castelli.
- University of Glasgow: Perla Innocenti, Seamus Ross and Giuseppina Vullo.
- University of Athens: Karerina El Raheb, Yannis Ioannidis, Anna Nika and Eleni Toli.

Lecturers from the Working Groups include Kevin Ashley, Digital Curation Centre (UK), Nicola Ferro, University of Padua (Italy); Carlo Meghini, National Research Council (Italy); Akrivi Katifori and Natalia Manola, University of Athens (Greece).

The Autumn School brought together an enthusiastic group of students from cross-disciplinary backgrounds and spanning roles, such as: librarians, DL managers, DL designers and Software developers. Registered participants came from nine countries (8 European countries plus India) as shown in the Table below, while twelve people attended the event.

Name	Affiliation	Country	Position
Françoise Mironneau	Pina- Bibliothèque Interuniversitaire de la Sorbonne	France	Head of IT Department
Desislava Marinova, Maxim Goynov (bursary)	Paneva- Institute of Mathematics and Informatics, Bulgarian Academy of Science	Bulgaria	Researcher
Andrea Fojtu	Charles University of Prague	Czech Republic	System administrator/digital preservation specialist
Francesca (bursary)	Launaro David Lubin Memorial Library, Food and Agriculture Organisation (FAO – UNO)	Italy (Headquarters)	Document specialist
Anastasia Tsoubrakou	Hellenic Organisation of Telecommunications	Greece	Librarian
Michael Byrant	King's College, Centre for E-Research, London	UK	Software developer
Eirini Chryssadakou	Music Library of Greece	Greece	Librarian, MSc., Department of Cataloguing
<i>George Tsatsanifos</i>	National Technical University of Athens	Greece	Researcher
Ioanna Ydraiou	Organisation of Tourism Education and Training	Greece	Librarian
Giame Ginesu	Regione Autonoma della Sardegna	Italy	Project developer/Manager
Agnieszka Lewandowska and Marcin Mielnicki	Poznań Supercomputing and Networking Center, IBCh PAS	Poland	Computer systems analyst
Sandhya Maharnor*	University of Pune	India	Lecturer
Jurate Kupriene (bursary)	Vilnius University Library	Lithuania	Director for Economics and Development & PhD student

Table 16 – Autumn School Registrants

The main learning outcomes span:

- An appreciation of the issues surrounding interoperability within the context of institutions working with digital documents and data.
- A grasp of the core research in the area of digital library interoperability.
- A coherent and practical understanding of activities surrounding interoperability from an organisational, technical and methodological point of view.
- Experience with issues surrounding digital library modelling and digital library management.
- Appreciation of the different approaches to Content, User, Policy, Quality, Functionality and Architecture.
- Knowledge of the approaches to digital library and repository design and deployment.
- Knowledge of the techniques and practices that underlie digital library management in the light of interoperability. Gained an understanding of how interoperability requirements can be integrated into approaches to digital library development.

Multimodal content: recorded Round Table featuring Kevin Ashley, Director of the Digital Curation Centre (UK), Yannis Ioannidis, professor at the University of Athens and Seamus Ross, Dean of the Faculty of Information, University of Toronto and short video clippings with the students.

Blogs on the Autumn School: Students hail the Autumn School a huge Success; Interoperability Challenges: One Perspective; Seamus Ross on Digital Libraries.

Participant Feedback: feedback collected from the participants served to measure the diverse levels of quality provided by the Autumn School ranging from the lecturers, background material, expectations to addressing the main topics and organisational aspects. All participants are interested in attending similar events in the future and almost everyone felt that the cost is acceptable. The Autumn School fared out of a total score of 5:

- Speaker effectiveness: 4.41
- Structure of the event: 4.5
- Value of background documentation: 4.45
- Organisation: 4.83
- Addressing the main topic: 4.58.

Views from Librarians & Library Managers

“The competence of trainers, good explanations of the field are the two things I liked best about the Autumn School. The wide view of Digital Libraries and requirements that have to be discussed for interoperability is my take-home message.”

“The topics for the user domain and architecture domain are my favourite workshop features.”

“The expertise of the speakers is what impressed me most. I take home general knowledge about the requirements needed.”

“I take away with me a method, a complete list of points to take into account, some sites or applications on which I’d like to find more information after the School.”

"I liked the part of the practical hands-on exercises, as well as the part where various researchers presented the steps that they are undertaking such as the DRIVER project. The Autumn School was very helpful in understanding matters that are related to the implementation of a digital library, especially the ones that are related with the matter of interoperability."

"Collaboration by working on problem solving solutions, the participation of the speakers during the lessons and presentations scenarios based on real-life cases is what I liked best. Additional practices solutions and best methods in order to organise or reorganise digital libraries and repositories is what I am taking away with me."

"What I liked most was the D4Science demo, bringing a different perspective. For me the main take-away is new knowledge on conceptualisation and generalisation of Digital Library model, as well as interoperability guidelines."

"I really liked the extensive and thorough presentation of all aspects of Digital Libraries, Digital Library Systems and Digital Library Management Systems. I take back with me new know-how on the DL.org Reference Model and the Cookbook."

Views from DL Designers, Software Developers, Technology Coordinators & Project Managers

"I most liked the user interactive study approach of Prof. Yannis Ioannidis. I take away with me the systematisation of DL research."

"Perfect organisation, good lecturers, interesting topics, and team working exercises are the best things about the Autumn School. I take away some best practices about Digital Libraries and interoperability."

"Meeting nice people, the social dinner, and an informative well-structured series of lectures are what I liked best. A better understanding of DL interoperability issues and some general knowledge of the DL.org Reference Model is what I am taking away with me."

"The organisation into the various fundamental "domains", how they have been treated and explained to us, so as to understand the essential importance and role of each of them to achieve interoperability is what I liked best. Useful theoretical as well as practical references to promote some Digital Libraries ideas for future projects in the Organisation is what I am take back with me."

Box 5 – Autumn School Feedback

8.2 Wikiversity

During the Meeting with the Working Groups in late May 2010, Professor Edward Fox from Virginia Tech and a member of the Functionality Working Group, invited DL.org to provide contributions to the web-based modules supported by the Digital Library Curriculum Project, which is funded by the National Science Foundation (NSF, U.S.) as a collaborative research project that builds upon an alliance between Virginia Tech and the University of North Carolina, Chapel Hill.

During the three-month extension period of the DL.org project, effort has focused on defining and producing material on important concepts of Digital Libraries with particular reference to the curriculum topic entitled **Conceptual Frameworks, Models, Theories, Definitions** hosted on the section dedicated to Digital Libraries on Wikiversity. The DL.org module is aimed at providing a high level yet comprehensive knowledge of a number of conceptual frameworks and models, gaining familiarity with a complete and unifying terminology, and understanding an overall scheme that helps to classify further reading and analysis.

The module provides an introduction to a number of core conceptual models characterising the digital library space:

- The DL.org Digital Library Reference Model.

- Streams, Structures, Spaces, Scenarios and Societies (5S), a unified formal theory for Digital Libraries.
- The DELOS Classification and Evaluation Scheme.
- CIDOC Conceptual Reference Model.
- DOLCE-based Ontologies for Large Software Systems.

Additionally, the reference section includes pointers on a large selection of recommended reading material. In order to motivate learning and assessment, the module comprises a diverse set of exercises. The figure below illustrates the DL.org module on Wikiversity Digital Libraries - Conceptual Frameworks, Models, Theories, Definitions.

The figure shows a screenshot of a Wikiversity module page on the left and a summary box on the right. The screenshot displays the Wikiversity logo, a navigation menu, and a table of contents for the module 'Conceptual frameworks, models, theories, definitions'. The table of contents lists 14 sections, including '1 Module name', '2 Scope', '3 Learning objectives', '4 5S characteristics of the module', '5 Level of effort required (in-class and out-of-class time required for students)', '6 Relationships with other modules (the reference model)', '7 Prerequisite knowledge/skills required (completion optional)', '8 Introductory seminar or lecture (completion optional: the body of knowledge for the prerequisite recognitions require)', '9 Body of knowledge (Theory + Practice)', '9.1 The Digital Libraries Reference Model', '9.2 Streams, Structures, Spaces, Scenarios and Societies: The 5S Framework', '9.3 Comparison: Reference Model and 5S', '9.4 The DELOS Classification and Evaluation Scheme', '9.5 The CIDOC Conceptual Reference Model', '9.6 DOLCE-based Ontologies for Large Software Systems', '10 Reference Materials, required and optional readings for instructors and students', '11 Concept Maps', '12 Concrete Learning activities', '13 Evaluation of learning objective achievement', '14 Glossary', and '15 Additional resources'. The summary box on the right is titled 'The Digital Libraries Reference Model' and contains the following text:

The Digital Libraries Reference Model

What is a Reference Model

- A reference model is an abstract framework for understanding sign specifications supporting that environment
- A reference model is based on a small number of unifying concept
- A reference model is not directly tied to any standards, technology unambiguously across and between different implementations.

Objective and structure of the Digital Libraries Reference Model

Sets the foundations and identifies the cornerstone concepts within the appropriate systems. Reflecting the structure of the DL universe the C Functionality, Quality, Policy and Architecture domains. Concepts from next.

In terms of document structure the DLRM consists of 3 parts:

- Digital Library Manifesto
- Digital Library Reference Model in a Nutshell
- Digital Library Reference Model Concepts & Relations.

Figure 34 - DL.org Module on Wikiversity Digital Libraries

Related web links

Digital Library Curriculum Project: <http://curric.dlib.vt.edu/>

Wikiversity Digital Libraries: http://en.wikiversity.org/wiki/Digital_Libraries, part of the Wikiversity

Initiative: http://en.wikiversity.org/wiki/Wikiversity:Main_Page

8.3 Moodle-based eCourses

The DL.org's web-based training courses, designed in year one, are tailored to respond to the needs of the broadest possible Digital Library audience, spanning digital library professionals, information scientists and researchers. The main input for the courses has been drawn from the DELOS Digital Library Reference Model and early investigations into the six core concepts of content, functionality, user, policy, quality and architecture. The eCourses have been structured to facilitate knowledge acquisition on these core concepts, particularly as a first approach, as well as test knowledge acquisition through quizzes and self-assessment.

The eTraining environment, which is underpinned by Moodle, comprises eight courses:

- An introduction to the digital library and interoperability context.
- A course on the main concepts of the Digital Library Reference Model.

- Six courses dedicated to each one of the core domains, that is, content, functionality, user, policy, quality and architecture.

9. Strategic Alliances

Strategic Alliances have proved to be a valuable means for the exchange of knowledge to pinpoint patterns, solutions, shared priorities, thus contributing the project's goal of avoiding duplication. Alliances has also been forged to underpin dissemination activities and co-host events on topics of mutual interest and broaden the debate across stakeholder communities.

Twenty-four alliances were established in the first year have continued to ensure knowledge exchange and outreach support include: D4Science, CASPAR, Data Archiving and Networked Services (DANS) – Royal Netherlands Academy of Arts and Sciences (KNAW), Digital Preservation Coalition (DPC), Digital Curation Centre, DRAMBORA (Digital Repository Audit Method Based On Risk Assessment), E-Prints in Library and Information Science (E-LIS), DRIVER-II, EU-Provenance, Europeana, EuropeanaConnect, European Film Gateway, EUScreen, Italian Open Access Working Group (CRUI), Library of Congress, Open Access Working Group of the Helmholtz Association, OGF-Europe – Digital Repositories, Papyrus, PLANETS, PLEDGE (Policy Enforcements in Data Grid Environments), PROMISE (Participative Research labOratory for Multimedia and Multilingual Information Systems Evaluation), SHAMAN (Sustaining Heritage Access through Multivalent Archiving), STERNA (Semantic Web-based Thematic European Reference Network Application), TebleCLEF (Evaluation, Best Practices and Collaboration for Multilingual Information Access).

Sixteen new Strategic Alliances have been forged in the second year of the project, bringing the total to 40 synergies at multiple levels. On a European level, strategic alliances stem from six different Directorate General Units of the European Commission:

- Cultural Heritage and Enhanced Technology Learning, e.g. SHAMAN
- GÉANT and e-Infrastructures, e.g. DC-Net, GRDI2020, OpenAIRE, VENUS-C.
- Education and Culture DG - Erasmus Mundus programme, e.g. DILL
- eContentPlus: e.g. Europeana, EUScreen
- Research and Development, e.g. Scientix
- ICT for Sustainable Growth, e.g. ENVISION.

DL.org has also established synergies with initiatives supported by the European Strategy Forum on Research Infrastructures (ESFRI), e.g. DARIAH - Digital Research Infrastructure for the Arts & Humanities and LIFEWATCH - eScience & technology infrastructure for biodiversity data & observatories.

- National initiatives include the Veria Central Library (Greece) and three US-based initiatives:
- Digital Library Curriculum Development: Virginia Tech and the Library & Information Science Graduate School, University of North Carolina at Chapel Hill
- Memento
- Streams, Structures, Spaces, Scenarios and Societies (5S)

Of particular importance is the alliance with Virginia Tech and Library & Information Science Graduate School, University of North Carolina at Chapel Hill in that it has helped to shape and deliver a set of training modules now published on Wikiversity, which has ensured education on Digital Libraries stemming from DL.org is widely available.

9.1 European Initiatives

The new alliances forged with European initiatives are outlined below.

Advanced Service Search & Enhancing Technological Solutions for the European Digital Library, ASSETS, aims to improve the usability of



Europeana by developing, implementing and deploying large-scale services focusing on search, browsing and interfaces. These services are applicable to all digital libraries. ASSETS representatives are experts in the Functionality Working Group.

Website: <http://www.assets4europeana.eu/>

CHORUS+ - Audio-visual Search is a Coordinative Action which objectives is to coordinate national and international projects and initiatives in the Search-engine domain and to extend this Coordination in non-European countries, now in its second phase. Representatives are members of the Functionality Working Group. **Website:** <http://www.ist-chorus.org>



Digital Research Infrastructure for the Arts & Humanities -

DARIAH is a project supported by the European Strategy Forum for Research Infrastructures (ESFRI) aimed at providing a framework for pan-European co-operation in the Arts and Humanities. DARIAH's governance model is highly distributed



and based on four core competency centres covering scholarly content expertise, technology expertise, research expertise and outreach. A representative from DARIAH has served as an expert in the DL.org Liaison Group. **Website:**

Digital Cultural Heritage NETWORK - DC-Net brings together eight Ministries of Culture engaged in preparing a plan of joint activities for the implementation of European digital cultural heritage of e-Infrastructure. DC-Net co-ordinates national and European programmes to enable the use and development of e-Infrastructures for pan-European cultural heritage research by defining the interface between cultural heritage and e-Infrastructures nationally and internationally to foster co-operation in the long term. DL.org co-hosted the ICT2010 Networking Session with DC-Net to share insights on interoperability from a multi-disciplinary perspective. **Website:** <http://www.dc-net.org/>



Digital Library Learning – DILL is a two-year Master Programme for information professionals who intend to work in the complex world of digital libraries. DILL is offered in cooperation between Oslo University College (Norway), Tallinn University (Estonia), and Parma University



(Italy). Students spend at least one semester at each institution. Learning Objectives include gaining knowledge of digital librarianship by studying the cutting edge of digital library research as well as real world applications and best practices; developing research skills through supervised independent research projects within the digital environment, using relevant methods and analytical approaches; understanding the impact of digital environments on the role of information professionals in the knowledge society. DILL is a Master Programme under the European Union's Erasmus Mundus Programme. **Website:** <http://dill.hio.no/>

ENVISION (ENVironmental Services Infrastructure with ONTologies) is aimed at enabling an infrastructure for spatial information in Europe, to the benefit of environmental policies. Mandatory actions to be taken



by Member States to make metadata and harmonised spatial datasets available via online services will have a strong link with the field covered by ENVISION pilots and scenarios. The current agenda and organisation developed concerning the specification of INSPIRE data themes, a vital component of the implementing rules, is an opportunity that ENVISION has to take. Representatives serve in the Functionality Working Group. **Website:** <http://www.envision-project.eu/>

GRDI2020 – Towards a Vision for Global Research Data Infrastructures is a Coordination Action aimed at delivering a framework of technological, organisational and policy recommendations to guide the development of a GRDI



ecosystem. Its final output will be a Roadmap informed by the input of two expert groups, an External Advisory Board and feedback particularly from the scientific data infrastructure community. GRDI2020 has also supported the EC's High Level Group on Scientific Data, the authors of *Riding the Wave – How Europe can gain from the rising tide of scientific data*. DL.org co-hosted the ICT2010 Networking Session with GRDI2020 and has participated in the project's workshop during the CODATA conference. **Website:** www.grdi2020.eu

Heritage of the People's Europe, HOPE, links important digital collections from social history and the history of the labour movement from the late 18th to the beginning of the 21st century. 11 institutions from 10 European countries are linking their digital collections with the multilingual Europeana portal as well as making these collections accessible through the Labour History Portal. The ultimate goal is to



ensure that digitised documents of all types can be searched and researched: audio, video, text and

image documents. HOPE representatives are experts in the Content and Architecture Working Groups.

Website: <http://www.peoplesheritage.eu>

LIFEWATCH - eScience & technology infrastructure for biodiversity data & observatories – is focused on constructing and bringing into operation the facilities, hardware, software and governance structures for all



aspects of biodiversity research. It will consist of: facilities for data generation and processing; a network of observatories; facilities for data integration and interoperability; virtual laboratories offering a range of analytical and modelling tools; and a Service Centre providing special services for scientific and policy users, including training and research opportunities for young scientists. The infrastructure has the support of all major European biodiversity research networks. Lifewatch is supported by the European Strategy Forum on Research Infrastructures (ESFRI). **Website:** <http://www.lifewatch.eu/>

Open Access infrastructure for Research in Europe, OpenAIRE is a project encouraging and supporting free on-line access to knowledge generated by researchers with grants from the Seventh Framework Programme (FP7) and the European Research Council (ERC). OpenAIRE shared insights on interoperability challenges and possible solutions at the DL.org workshop on Digital Libraries and Open Access. Interoperability



Strategies, 4 February 2011, London, UK. OpenAIRE representatives are experts in the Content, Functionality, User, Quality and Architecture Working Groups. **Website:** <http://www.openaire.eu/>

Scientix – The Community for science education in Europe is a web-based community for science education launched by the European Commission to ensure access to teaching materials, research results and policy documents from European science education projects financed by the European Union and by various national initiatives. Scientix targets teachers, researchers,



policy makers, local actors, parents and anyone interested in science education. Scientix is operated by European Schoolnet, which brings together 31 EU Ministries of Education. The Alliance with DL.org has been forged to foster the project's training and educational programme.

VENUS-C (Multidisciplinary Environments Using Cloud Infrastructures) is developing, testing and deploying a Cloud computing service for European research communities and small businesses. VENUS-C is aimed at providing an industry-quality Platform as a Service, striving for interoperability, to empower research groups through the easy deployment of end-user services.



Current user communities involved are: bioinformatics, systems biology, drug discovery, civil

engineering, civil protection and emergencies and marine biodiversity data. An Open Call is designed to extend current scenarios. The Scientific Chair of the DL.org Architecture Working Group leads the VENUS-C scenario on marine biodiversity data. **Website:** www.venus-c.eu.

9.2 National Initiatives

The Digital Library Curriculum Project is funded by the National Science Foundation (NSF, U.S.) as a collaborative research project that builds upon an alliance between Virginia Tech and the University of North Carolina, Chapel Hill. Digital Libraries Curriculum Project representatives from this initiative serve as experts in the Functionality Working Group. The alliance has been instrumental in shaping training modules for Wikiversity, ensuring DL.org's educational role is broadcast widely.



Website: <http://curric.dlib.vt.edu/>

Memento proposes a technical framework aimed at better integrating the current and past Web. The framework adds a time dimension to the HTTP protocol and, inspired by content negotiation, introduces the notion of date-time negotiation. Besides leading to more Web browsing fun as old versions of Web resources (e.g. in Web Archives and in Content Management Systems) become easier to access, it also suggests a generic approach for versioning Web resources that can help bootstrap a variety of novel, temporal Web applications. Memento representatives are experts in the Architecture Working Group. **Website:** <http://www.mementoweb.org>



Streams, Structures, Spaces, Scenarios and Societies (5S), is project underpinned by a unified formal theory for Digital Libraries. With 5S, digital library abstractions such as digital objects, metadata, collections, services, etc., can be rigorously and usefully described through compositions of basic and higher level mathematical objects. Representatives of the 5S Framework for Digital Libraries serve as experts in the Functionality Working Group. The alliance has been instrumental in shaping training modules for Wikiversity, ensuring DL.org's educational role is broadcast widely.



Website: <http://www.dlib.vt.edu/projects/5S-Model/#intro>

Veria Central Library is a public institution in Northern Greece, serving the city of Veria, the county of Imathia and two neighboring counties, covering a total population of 180,000 inhabitants. It is operated as a central library, two mobile libraries and a network of branches. The library's main achievements include on-site and on-line services, and a strong focus on services for educational services, particularly at pre-school and

Veria Central Public Library
a smart library  an open approach

elementary levels, thus transforming the library into a unique centre for creativity, innovation and edutainment. Veria Central Library co-hosted with the Workshop on Theory and Practice in Digital Libraries: A European Approach.

10. Community Development

The core DL.org community has been developed chiefly through direct engagement with target groups at two international workshops, the three national events, and the Autumn School, in addition to external events attended. With a community of just under 100 people at the end of the first year, the DL.org community has grown significantly in year two to comprise 280 members. The vast majority of people (52%) are from the Library and Information Science (LIS) Community, such as representatives of national and institutional/university libraries, including banks and legal firms, as well as educationalists, researchers and students involved in LIS programmes. Engagement with this group of professionals is inextricably bound up with the three national events, two of which have benefitted from strategic alliances that have ensured participation from this primary target community. The London Workshop enhanced these outcomes, bringing on board a number of decision-makers from the LIS community. The second group of stakeholders comes from the computer science community (17%), particularly members of the expert groups. The remaining community is made up of project co-ordinators, mainly from the Europeana family of projects and initiatives recruited through the Strategic Alliances, as well as domain specialists. The category "other" covers specialists and researchers that fall outside the main groups defined above but with a stake in digital library development and services.

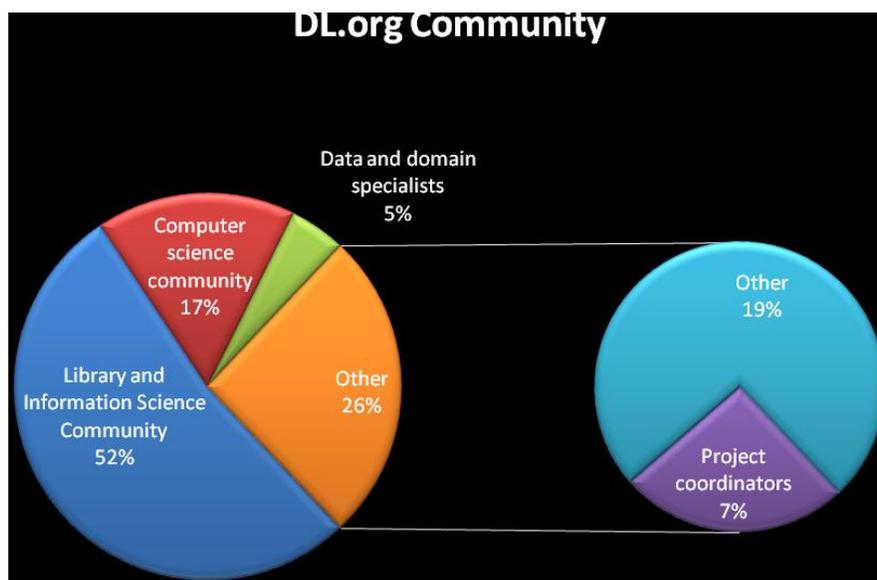


Figure 35 - DL.org Community

The DL.org community is truly international with representatives from 47 countries.

- Twenty-three European countries: Austria, Bulgaria, Croatia, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Netherlands, Norway, Poland, Serbia, Slovakia, Spain, Sweden, Switzerland, UK.
- Twenty-four countries around the world: Australia, Bangladesh, Belarus, Burundi, Canada, China, Colombia, India, Indonesia, Iran, Japan, Malawi, New Zealand, Nigeria, Pakistan, Philippines, Russian Federation, Saudi Arabia, Singapore, South Africa, Taiwan, Uganda, U.S., Vietnam.

A broader pool of contacts, which has been developed for promotional purposes, includes national libraries and archives in EU27, the European Association for Library and Information Education and Research (EUCLID), selected contacts from European Computer Science communities, international library, information and computer science communities, particularly in India, the South Pacific and North America.

11. Key Performance Indicator Analysis

The targets for the second year of DL.org were set in the revised Dissemination and Training Plan before the three-month extension period was proposed. Opportunities emerging from the extension together with event presentations and sessions over the past 15 months has meant that some adjustments to the original plans and effort focus have been necessary. Interaction with project advisors has also entailed a shift of focus particularly with regard to the publication of final outputs. In this section, we concisely analyse the key performance indicators with reference to the rationale adopted.

Measure & Approach		Target	Achieved Year Two
Website visits	Web search and increased community synergies	Increase by 10% between December 2009 and February 2010. Increase by a further 15% between March and May 2010. Increase by a further 25% between June and August 2010. Increase by a further 30% between September and November 2010.	With just over 2000 visits in year one, in year two figures have increased to a total of 16244 overall visits with 7946 unique visits from 123 countries (68 in year 1). Promotion of events has proved an important activity and will continue for the post-project events.

Measure & Approach		Target	Achieved Year Two
External links and back-links to DL.org website	Focused synergies and social networking	Increase by minimum of 2 per reporting period, total 10 including extension period.	Minimum 62 back-links have been tracked. 1 link has generated over 1460 views. Back-links span event announcements, articles, the call for paper, interviews, project

overviews. Referring sites have played an important part in bringing visitors to the website.

Measure & Approach	Target	Achieved Year Two
Interviews and videos Invites to identified internal and external experts and increased dissemination effort	1 phone or live video monthly, totalling 12	6 conducted with one forthcoming. Time-lines have been dependent on interviewee availability. Video suite of talks and 2 round tables. No response for 2 interview requests.

Measure & Approach	Target	Achieved Year Two
Newsletters Increased dissemination effort, focused synergies and event promotion	Every two months, considering possible break of 1 month in summer 2010	Given the project and external event calendars, the 5 eNewsletters have been produced and distributed on a seasonal basis with interim eAnnouncements for specific community messaging.

Measure & Approach	Target	Achieved Year Two
Blog postings Identifying pertinent topics and planning of posts on a monthly basis. Contributions to external blogs	Minimum 2 blogs monthly on DL.org Blog, total 30. Minimum of 1 blog every two months on external blogs, totalling 6	Over 50 blog postings published, spanning event blogs, external presentations, expert views and "off the wire" posts. Focus was shifted to the project blog, also encouraging expert contributions.

Measure & Approach	Target	Achieved Year Two
Strategic Alliances Networking at events and via focused synergies	5 new alliances by end of year 2	16 new alliances forged on multiple levels.

Measure & Approach	Target	Achieved Year Two
Social Networking Setting up and maintaining networks and linking up with pertinent external networks	5 new social networks with contributions starting in March, minimum 2 contributions per month and increasing around events. Minimum 5 tweets for DL.org events. Minimum 20 quality photos on flickr	Pages and accounts: twitter, LinkedIn, Facebook, Slideshare, flickr. Effort has mainly focused on twitter with tweets automatically downloaded on the project website. Over 90 tweets posted and 17 followers. Main output promotion on other networks planned.

Measure & Approach	Target	Achieved Year Two
Testimonies in diverse formats Closer synergies with internal external experts, event organisation	6 testimonies on the value-add of DL.org outputs, 4 testimonies on events organised: workshop and summer school as both videos and quotes	16 testimonies collected and published on the website and fliers. Over 30 position statements have been collected at events.

Measure & Approach	Target	Achieved Year Two
Technical papers at conferences and for peer-reviewed journals Planning of paper submission and of papers for journals	1 technical paper for each interoperability domain at conferences. 1 paper for each domain in a peer-reviewed journal	Springer publication for the 2 nd DL.org Workshop Proceedings forthcoming, Pre-proceedings publication. 14 conference papers have been produced. All domains have been covered with particular reference to the policy and quality domains.

Measure & Approach	Target	Achieved Year Two
Articles and press releases for popular channels Increased dissemination effort, planning of contributions, tracking of clippings	Minimum 3 press releases, minimum 5 articles and reports published	2 press releases for the Autumn School, 1 for the ICT2010 Networking Session, 1 article for ERCIM News, 1 article for IFLA newsletter coupled with event announcements clippings and Call for Papers clippings. Final project press release and campaign forthcoming.

Measure & Approach	Target	Achieved Year Two
Promotional material such as brochures, posters and pop-up banners, achievement booklet Enhancing core messaging around project focus and achievements effectively conveyed in 2 brochures, 1 general poster for each partner, 1 Summer School poster, 1 pop-up banner, 1 achievement booklet	Distribution at events of promotional material with targets to be given on a case-by-case basis depending on attendance numbers.	Six flier updates produced with testimonies. 500 fliers printed, of which around 20 have remained uncirculated. The project poster has also been updated for external events where requested. The focus for project outputs has shifted to cover abridged publications of the main outputs.

Measure & Approach	Target	Achieved Year 2
Number of completed eTraining courses Increasing dissemination of courses through channels identified and social networks	Increase by 5-10% in each reporting period	The focus of the project's training and educational programme has shifted to the Autumn School and DL.org contributions to the Digital Library section on Wikiversity. The revised section on the website with revisited value proposition and the final promotional campaign will highlight these achievements. Social networks will also be leveraged for this purpose.

Measure & Approach	Target	Achieved Year 2
Autumn School attendees Increased dissemination efforts, monitoring registrants and social networking	25 attendants	13 registered participants and 12 attendees. While the target of attendees was lower than the target, the event received high satisfaction scores and generated valuable multimodal resources for the website.

Measure & Approach	Target	Achieved Year 2
New material created Effort allocated to create Autumn School material	Tailored material for each of the 6 domains	All 6 domains covered. Virtual Reading List made available before the event to wider community. 12 lecturers presenting talks and demos alongside student group presentations.

Measure & Approach	Target	Achieved Year 2
Testimonies Encouraging feedback from the Autumn School attendants	Minimum 2 testimonies in either video or quote format	Ten written statements and selected video clippings in addition to the student evaluation. 1 testimony from member of the Functionality Working Group and 1 video recorded testimony from a member of the Policy Working Group.

12. Lessons Learnt & Next Steps

The outcomes and final outputs of DL.org have undergone a number of modifications from the Plan produced in February 2010, impacting on the project's core dissemination activities, and, to some extent, on the key performance indicators. Flexibility has thus proved to be an important driver behind core dissemination and training activities that have resulted from:

- New opportunities that have arisen over the course of the second year, such as talks and sessions at external events. Two events are cited by way of example. The Birds of a Feather Session at OR2010 was suggested by the Conference Chair, Wolfram Horstmann, a member of the Quality Working Group, during the All Working Group Meeting in late May 2010. The ICT2010 Networking Session, while proposed in the Dissemination Plan, was subject to a competitive call for contributions at EC level. The Session has helped to ensure that new synergies established build on shared interests and priorities cutting the 7th Framework Programme, while also pinpointing experts who can further contribute to DL.org efforts. Clearly, it is hard to predict the potential number and impact of such events in a general dissemination plan. What is clear, however, is that DL.org has been instrumental in connecting European projects of relevance while also leveraging opportunities emerging from interaction with the project's experts.
- The extension period with its emphasis on three national events, which led to a high concentration of event delivery between September 2010 and February 2011. The 2nd DL.org Workshop, ICT2010 Networking Session, Autumn School and Parma Seminar were promoted and delivered in two months with planning and promotion also underway for the second and third national events. All these events have been highly valuable in building the DL.org community, particularly members of the Library and Information Science community, while also drawing on timely synergies. Given this high concentration of events, dissemination has necessarily focused on core activities around them to ensure active community engagement.
- Proactively populating the project blog and social networks has been considered a key activity to ensure initiatives, as outcomes and expert views are easily and quickly consumable by visitors.
- Feedback from the External Advisory Board in September 2010 has led to a shift in the final suite of outputs for publication, with the aim of enhancing DL.org outcomes with abridged versions of the Reference Model along with the Manifesto and Check List, as well as the Cookbook, each one with its specific scope and target audiences.
- Close interaction with experts on multiple levels by the entire Consortium is extremely valuable in ironing out areas for improvement and new dissemination and training opportunities, as well as shaping outputs to better serve the needs of the project's target groups. This type of cross-fertilisation should be an obligatory activity in any Coordination Action to ensure all perspectives are taken on board and action agendas involving the entire Consortium can be set.

- The strong presence of librarians and educationalists underpinned by strategic alliances and focused campaigns have been valuable in effectively engaging with the prime target community of DL.org. Interaction has demonstrated a real need for educational courses that deliver value-add through both physical events and web-based courses combining multi-modal content and practical, real-world examples. Additionally, interaction has brought to light gaps at both educational and research level that need addressing in future curricula and initiatives.

Another important lesson learnt is that physical training events serve as a more valuable first step to delivering a training and educational programme on digital libraries, particularly web-based courses. The Autumn School has not only helped to pinpoint drivers for participation but has also generated a suite of value-add resources with real-world examples and contributions from participants. The experiences gained alongside the resources generated have been valuable in shaping contributions to the Digital library section on Wikiversity. Such an approach, coupled with the time-line for delivery, have proved more conducive in serving trainee target groups with up-to-date resources that have been enhanced through close interaction with both experts and educationalists and validated by members of the community at a number of project and external events.

In conclusion, the communities targeted by DL.org are now better placed to gain tangible benefits from the suite of publications and resources produced by the project. The final campaign aimed at circulating and highlighting these outcomes is an important next step in terms of fostering the project's legacy beyond its funded life-time. In order to underpin the work achieved, DL.org could gain further endorsement from a keynote or invited talk at an international conference, whether directly or by way of a testimony by one of the project's experts.