1 OPEN ARCHIVES FORUM: PROJECT DELIVERABLE

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Abstract	This *FinalProject report* outlines the progress of the Open Archives Forum project. Achievements of the project include the design and implementation of the OA-Forum website, information databases and public mailing list, a successful workshop series and the participation of project partners in a number of other dissemination and concertation activities. Deliverables in the form of reports were also completed, including some substantial publicly available reviews and reports.
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PART II - MANAGEMENT OVERVIEW

EXECUTIVE SUMMARY

This Final Project Report outlines the progress and activities of the Open Archives Forum project - a Europe-based focus for dissemination of information about activity related to open archives and the Open Archive Initiative (OAI) - during its whole period of existence. The aims of the Open Archives Forum (OA-Forum) are to facilitate clustering of IST projects, national initiatives and other parties interested in the open archive approach; to stimulate European involvement in the OAI; to encourage new service provision; and to exploit synergies between projects.

Highlighted achievements for the project include the design and implementation of the OA-Forum website, information databases and public mailing list, four successful workshops and the participation of project partners in a number of other dissemination and concertation activities. All of the project deliverables in the form of reports were completed, including some substantial publicly available articles, reviews and reports. The project also produced three important community specific expert reports. Given that one of the most significant challenges faced by the project is the high level of demand placed on the OA-Forum due to wide-spread interest in the open archive approach, we decided to commission an online self-learning tutorial on the Open Archives Initiative Protocol for Metadata Harvesting (OAI PMH) in part as a response to this level of demand. This was completed just before the final workshop in the OA-F series was held at the University of Bath, and was introduced to those attending this event in a presentation by the tutorials' principal author, Leona Carpenter.

Technical validation activities support communities and developers in reaching agreements on common solutions and facilitating the development of an open archives infrastructure in Europe as part of an international infrastructure. In addition to the realisation of the OA-Forum information source on open archives, achievements in this area include information gathering through questionnaires and workshop breakout sessions, participation in OAI-PMH testing and implementation, and several reviews of technical issues. Participants in the workshops were encouraged to submit information to the database maintained by the project partners at Humboldt University, and a substantial amount of data is now available as a result. All of this material is available from the OA-F website. Challenges along the way included the need to build up implementation knowledge and experience across various communities, organisations, initiatives and projects, and participation in the knowledge-sharing facilitated by the information made available via the online database.

Organisational validation activities support European organisations ability to benefit from the added value that may be gained through open archive technology by developing and sharing an improved understanding of organisational issues related to the open archives approach. Achievements included a stimulating breakout session on organisational issues at the first OA-Forum workshop, and the drafting of an interim review of organisational issues, followed a prominent article by the HUB partners (Dobratz/Matthaei) published in D-Lib magazine, and by a final review of these issues which is now available from the OA-F website. Project partners also participated in the European Organisational Issues working group that was formed as a result of the first workshop breakout discussions, adding detail and recommendations in appropriate areas and providing additional topic discussions.

The OA-Forum Workshop series provided opportunities for face-to-face exchange of information and experience and specially commissioned expert reviews. All four workshops - Pisa (May 2002), Lisbon (December 2002), Berlin (March 2003), and Bath (September 2003) were successful, attracting a broad range of participants from Europe and North America in particular, but also some from the CEE countries and Africa. We also commissioned three community specific expert reports on issues which emerged as of some importance to the community (IPR, Open Archives ideas for traditional archivists, and the use of the OAI Protocol for Metadata Harvesting within the Cultural Heritage community. The workshops interacted synergistically also with the activities in the technical and organisational strands of the project, as can be seen from the summaries of those strands, above. The project explored ways to support attendance at the workshops by those from areas where lack of funding for travel to and subsistence at such events is a barrier to participation. We secured funding from the OSI to help us bring six people to the Berlin event from CEE countries.

Dissemination activities were central to the OA-Forum, as was the aim is to spread knowledge of the project and the open archives approach through out Europe, and also to liase with OAI leadership based in the United States. A number of the achievements in the other activity strands can be seen also as dissemination achievements. In addition, project partners have given presentations at numerous events and written articles or shorter items for several web-based and print publications (these are comprehensively listed elsewhere in this document. These items are also made available on or via links from the OA-Forum website.

SCOPE STATEMENT

This report is the *Final project report* (D1.3), which is a public document. This report is intended to highlight the achievements of the two-year project. In this context, it draws on material from other project deliverables, setting out key findings and issues. These other documents are referenced in the text and listed in the Bibliography.

PART III - DELIVERABLE CONTENT

INTRODUCTION

The Open Archives Forum is a Europe-based focus for dissemination of information about European activity related to open archives and the Open Archive Initiative (OAI). Given the potential of the open archive approach it was useful and important to have a European focus for related activity. The success of a number of e-print archives has illustrated the value of the open archive model, initially enabling the author to make resources (and associated metadata) available by means of the archive direct to the user. Work within the e-print community on establishing inter-working, interoperable e-print archives showed how services might be layered on top of individual archives. The OAI has promised much on the basis of this model, new pattern for scholarly communication being the most publicised. Perhaps more achievable are the goals of surfacing 'hidden resources' (a focus of the second Open Archive Forum Workshop in Lisbon) and low cost interoperability. Although the OAI protocol for metadata harvesting (OAI-PMH) is technically very simple, building coherent services that meet user requirements remains complex. The OAI-PMH gives a simple technical option for data providers to make their metadata available to services. Although this gives data providers a low-cost entry to interoperability, in the OAI model there are a number of actors involved in making the components of the overall framework. It is important for there to be good communication between the various parties involved in building services based on the open archives approach.

OA-Forum aimed to facilitate the clustering of IST projects, national initiatives and other parties interested in the open archive approach; to stimulate European involvement in the OAI; to encourage new service provision; and exploit synergies between projects and reinforce the combined efforts of projects. We feel we have been broadly successful in this. The project activities designed to meet these objectives were the development and provision of an internet-based channel for information-sharing; the organisation and delivery of a series of face-to-face workshops; the research, drafting and publication of a number of reviews; the establishment and maintenance of a liaison channel with the largely USA-based OAI organisation; and participation in other dissemination and concertation activities. The project partners were: UKOLN, University of Bath (project coordinator); Humboldt-Universität zu Berlin (Computing Centre), and Consiglio Nazionale delle Ricerche (Istituto di Elaborazione della Informazione).

1 HIGHLIGHTS OF THE PROJECT

1.1 OA-Forum in cyberspace, face-to-face, and documentation

The launch of the OA-Forum website was a major early milestone of the project, followed by other major milestones: the availability through the website of "information space" databases and then of a self-registering interface to those databases. These are discussed below in section 2 Technical Validation and section 5 Dissemination. Following demand expressed in the first OA-Forum, an email discussion list was set up, which, after an initial slow start over the first summer, saw an increase in membership beyond the original workshop participants and a picking up of discussions, especially in the area of organisational issues for open archives. The workshops were (from the first) over-subscribed and attracted a broad-range of

participants, most of whom seemed to leave with even more enthusiasm than when they arrived. A highlight of the first workshop was the spontaneous formation of an European Organisational Issues working group. The organisation and outcomes of the workshop are discussed below in section 4 Workshop Series.

Four successful workshops were organised altogether, on different themes within the open archives field, and the project partners participated in a number of other dissemination and concertation activities. Project partners prepared and delivered a surprisingly large number of presentations and articles about OA-Forum and open-archives-related matters in the course of the two year span of the project. A number of these are highlighted below in section 7 Dissemination. Most (if not all) of these are also available via links from the OA-Forum website. We also commissioned three community specific expert reports on issues which emerged during the life of the project as of some importance to the open archives community (these concerned IPR, Open Archives ideas for traditional archivists, and the use of the OAI Protocol for Metadata Harvesting within the Cultural Heritage community).

Since there was a high level of demand placed on the OA-Forum due to wide-spread interest in the open archive approach, with the agreement of the European Commission, instead of a fourth community specific expert report, we commissioned an online self-learning tutorial on the Open Archives Initiative Protocol for Metadata Harvesting (OAI PMH). This was completed just before the final workshop in the OA-F series was held at the University of Bath, and was introduced to those attending this event in a presentation by the tutorial's principal author, Leona Carpenter. In late January a translation of the tutorial into Japanese was completed.

A complete list of our contracted reports can be found in the Deliverables section of this report. Those having the status of public reports are available in one or more formats on the OA-Forum website.

1.2 OA-Forum challenges

The project faced a number of challenges. One happy challenge is related to the current widespread interest in the area of open archives, which means that there was a high level of demand for what OA-Forum had to offer, much of it from an audience new to open archives. The project was constrained by level of staffing resources (not much more than the equivalent of 3 full time staff), and had to work within the planned levels of provision, although it was tempting to try to do more to meet demand, for example in the number of people accepted as participants in the workshops, the number of invitations we accepted to speak or write about our project and related topics, the amount of work we put into providing information via the website in terms of events listing, and the amount of personal participation in the email discussion list. In addition, it was necessary to keep a balance between the positive promotion of means of achieving interoperability with a critical evaluation of any particular means of doing so.

Another area of demand had to think creatively about was encouraging the involvement of participants (for example those from Eastern European countries) who cannot easily find funds for participation in workshops. The success of OA-Forum is highly dependent on participation of many people and organisations beyond the project partners, so getting the balance right in all these areas is crucial. The project team welcomed ideas and advice from the peer reviewers and Project Officer in meeting these particular challenges, as well as other

suggestions which led to the refinement of our programme of work. We were able to secure funding from the OSI to cover the cost of six participants from CEE countries attending the Berlin Workshop, and were able to make a presentation to a meeting of the National Librarian's of CEE countries held by the DELOS network of excellence in Torun, Poland, in February 2003.

2 TECHNICAL VALIDATION

2.1 Objectives

Within the technical validation area, technical issues relating to a viable service delivery infrastructure were examined. A European portal for open archives information was set up. The most significant parts of this are an inventory of software products in use and under development, and a registry for European open archives, services and related projects. These resources remain available despite the fact the project has now reached its full term.

Those actions were carried out in order to facilitate building an open archives infrastructure within Europe as a part of an international infrastructure. The intention behind this was to help communities and developers to reach agreements on common solutions to technical issues. This work package's purpose was to validate and evaluate the piloting of the OAI specification for metadata harvesting.

2.2 First steps

An “information space” (D2.1 *Information source for Open Archives*) was designed and created. This consists of a database based on a purpose-designed database model, an input mechanism for self-registration of projects and other initiatives, and a database WWW management interface for database administration. Project partners and other projects and initiatives were beginning to add content to the database toward the end of the first year, and the content is now quite extensive. This includes information about several technical aspects of different repositories, services, projects and software tools. The design and implementation of appropriate user interfaces fulfilled an important role for the Open Archives Forum in that it assisted us in becoming a central point on the web where information about "Open Archives" technology is available for users and helps them to create virtual communities and discussion groups through re-use of existing technologies and standards developed within specialised communities.

A Technical Validation Questionnaire was designed and was circulated to participants before the first OA-Forum workshop. The questionnaire was designed to collect information about existing OAI and open archives implementations and usage in Europe. It can be viewed at http://www.oaforum.org/resources/tecvalquest1.php. The questionnaire had some questions common to all respondents, some questions for respondents who were repositories (data providers), and some questions for respondents who were service providers. The areas covered include information about software used; type, structure and integration of repository or service; implementation costs, experience and future plans. The full results of this first questionnaire are reported in D2.2 *Interim review of technical issues*.

The presentation of these results stimulated a lively discussion in the “technical issues” breakout session of the first workshop. This breakout session is reported in D2.2, and also in

D4.1 *Workshop report 1*. Key findings messages from the breakout session include the wide-spread need for introductory training in the implementation of open archives based on the OAI-PMH, and that many organisations are delaying implementation of OAI-compliant archives until they have more confidence that the use of OAI will be widely taken up and successful in future, pointing up the need for leadership from key organisations in evaluating OAI.

Project partner HUB took part in OAI-PMH 2.0 alpha testing, and the testing of several OAI tools. Results of the tool evaluation was later posted on the OA-Forum website. In addition, the website also carried news items and information about open-archives-related events of technical interest.

The OA-Forum public discussion list (info@oaform.org) was created to provide a European forum for the discussion of relevant technical issues. However, for technical queries and discussions going beyond the European context, the implementers list of the OAI remained the most appropriate forum.

2.3 Technical Validation Questionnaire:

2.3.1 1st Questionnaire about Technical Validation

• The first questionnaire can be read at: http://www.oaforum.org/resources/tecvalquest1.php
• Results: http://www.oaforum.org/otherfiles/pisa_techvalresult.pdf
• Presentation of the results: http://www.oaforum.org/otherfiles/pisa_techvalresult.ppt

The first questionnaire was designed to receive information about existing OAI and open archives implementations and usage in Europe. It was primarily aimed towards the participants of the first workshop. 18 people contributed, 6 from Germany, 5 from Italy, 2 from Belgium, 2 from the Netherlands, 1 each from France, Sweden and the UK. The results have been already described in detail in the "Interim Review of Technical Issues" (Deliverable Number D2.2) http://www.oaforum.org/otherfiles/oaf_d22_technical1.pdf.

2.3.2 2nd Questionnaire about Technical Validation

• The second questionnaire can be read at: http://www.oaforum.org/resources/tecvalq2.php

2.3.3 Changes and Developments between the Questionnaires

The second questionnaire about technical validation is based on the first questionnaire with some changes according to the feedback during the first workshop and to our own experiences with the initial attempt - some questions had been added or changed, the duration extended, the target audience expanded and the form was subdivided to account for those projects that have not yet integrated OAI-PMH in addition to those who are experienced implementers.

In the sessions at Pisa it was repeatedly brought up for discussion that despite all standardisation and protocols in the long run already available software and systems as well as individual targets and community selective demand determine the implementation of metadata and the pre-harvesting conversion of metadata. - Therefore in the new questionnaire the first emphasis "Technical conversion of the implementation of metadata" had been added by the following subjects: What tools do already exist before implementation? What is the present content? What has to be achieved?

The first questionnaire, designed for a numerable small target group, was based on a simple, easily to install HTML form, the analysis took place manually. For the second, somewhat more extensive questionnaire, we decided to accept a higher expenditure at the beginning – the programming of the binding to a database. Below are summarised the results of the information the participants gave about used software, implementation costs, offered spectrum and interoperability, experiences and expectations in different communities and in different countries.

This second, long-term survey continued through autumn 2003. Workshop participants of Lisbon, Berlin and Bath had been asked to fill out this questionnaire at the end of the online registration process for the workshop. This was the most successful way to encourage people to participate in the survey. Furthermore participants had been recruited by presentations at conferences (e.g. CERN, 2nd workshop on the Open Archives Initiative), articles (e.g. D-Lib Magazine, Jan. 2003), flyer at conferences (e.g. ETD 2003, EDCL 2003), infolists, mail invitations and a link on the homepage of the projects website.

2.3.4 Questions and Results of the Technical Validation Questionnaire:

• Summary of first results (Lisbon, Dec. 2002):
http://www.oaforum.org/otherfiles/lisb_tvq.ppt
• Interim results (Berlin, March 2003): http://www.oaforum.org/otherfiles/berl_tvq.ppt
• Summarising article: Open Archives Activities and Experiences in Europe. An Overview by the Open
Archives Forum • Susanne Dobratz, Birgit Matthaei • D-Lib Magazine, Vol. 9 no 1, January 2003
http://www.dlib.org/dlib/january03/dobratz/01dobratz.html

This second, long-term survey continued during approximately the period of one year – until the end of the project in autumn 2003. We asked for information about software used, implementation costs, coverage of the archive, and interoperability, experiences and expectations in different communities and in different countries. The focus of interest was on fundamental questions such as:

- Is there a common ground and therefore good conditions for cooperating and learning from each other, or are requirements so individual that it will be necessary for many isolated solutions to be developed?
- Do the existing instruments for implementation fulfill all requirements or should tools and protocols be developed to meet the needs of different communities?

Who has participated? To date, 33 repositories have participated in the survey. Eleven of the repositories are not yet OAI implementers, but they are considering becoming implementers. Up to now, clearly more data- than service providers have completed their OAI implementations. If one views the number of implementations under development or being planned, we soon will have many new services available. Many Data Providers used their implementation experiences to guide them in becoming Service Providers. It is remarkable that nearly half of the responders came from libraries or archives.

The first block of the survey is made up of questions about technical infrastructure and software solutions. Prior to OAI implementation, the dominant programming languages used by responders were PERL, Java and PHP, and the dominant databases were MySQL and Oracle. Practically no statements were made to interface and collection systems, so it is not possible to provide relevant information from the survey about those. However, it is significant that almost none of the organizations needed to replace existing software tools in order to become OAI compatible.

About 70 % of the tools used to become OAI compatible were self-developed by data providers and service providers. Most of the data providers and service providers make their tools and source code available for others to use. The programming languages used to develop these tools are mainly Java and PERL, and also used frequently are PHP and XML. A few implementers used the eprints software, which is for both data and service providers. The eprints system runs centralized although archives are distributed. Other tools like PERL implementations or DBUnion were mentioned once by survey respondents.

2.3.4.1 Implementation costs

After the questions regarding the software used, the next questionnaire subject block concerns implementation costs. With regard to the implementation skills needed, data providers as well as service providers focused on various combinations of the following five competencies:

- System administration
- Web server configuration
- Knowledge of databases and SQL
- Programming skill and knowledge
- Experience with metadata

The survey results showed that most implementations were concluded within one quarter (three months) and most implementations were managed by one programmer. The reason for bigger expenditures by a few of the implementers was not directly connected to the implementation of the OAI-specifications. The higher costs involved larger research projects or were due to construction of archives or the processing of greater amounts of data. When survey respondents estimated maintenance costs, these were limited to at most 5 person days, and most often were estimated to be one person day per month for stable protocol.

2.3.4.2 Resources offered and issues of interoperability

The next block on the survey questionnaire regards the range and kind of resources offered by the archive as well as interoperability. The range of the number of resources available from data providers includes a wide span of between 35 and several million documents. The occupied storage space ranged from between 15 megabytes to 2 terabytes. Looking at both these ranges, it is important to note that the storage capacity used has less to do with the amount of data than with the type of objects. In the list of the object types offered, it strikes one again that full text documents and metadata are what is mainly offered. The reason is due not only to longer experience with storing and evaluating data based on text. Of bigger concern is the cost of storing pictures and video files, which need stable, efficient databases.

The range of content types includes essentially the entire spectrum of scientific publications. There is a notably high interest in preprints, journal articles and theses. This provides evidence of a big need for a reasonable, fast way to access scientific information beyond conventional scientific publication forms. Other resources offered include library catalogues or video streams of university events.

The most-applied metadata format is Dublin Core. In addition, according to the respondents, library-specific formats are used, like MARC 21. However, there are a remarkably high number of formats that are mentioned only once, such as Dublin Core Library Profile, DiTeD, CEOS CIP, AMF, RIS, MAB, SPECTRUM, TEI, and one internal format.

Approximately half of the data providers are offering full text or extracts of documents. If the openness of the interface must be reduced, there are two access-limitation strategies: On the one hand, access control like control of the IP-addresses or licensing can be used, and on the other hand data output is limited.

2.3.4.3 Experiences and expectations

Data Provider

For data providers, the importance of the OAI technical framework is that it makes it possible to provide additional services to existing services, replace existing services through the OAI interface and offer better retrieval.

The advantages of OAI are to share scientific knowledge and to harvest other knowledge databases. OAI also enables the import of metadata into library software and major dissemination of the results of research. The OAI implementation is simple, cheap and easy to adapt for internal project usage. Last but not least, in comparison to more complex protocols, it is a simple-to-implement facility for exchanging metadata.

Service Provider

Concerning the experiences of service providers, some survey respondents indicated that standardization presented a problem: The heterogeneity of metadata record content requires the service provider to expend a lot of effort to normalize the data to make it usable. The service providers believe that metadata normalization can be done less expensively by data providers. A possible solution to this problem might be the development of middleware tools that service providers could use for data normalization.

In addition to listing those problems, the service providers who responded to the survey stated that they have future plans to do the following:

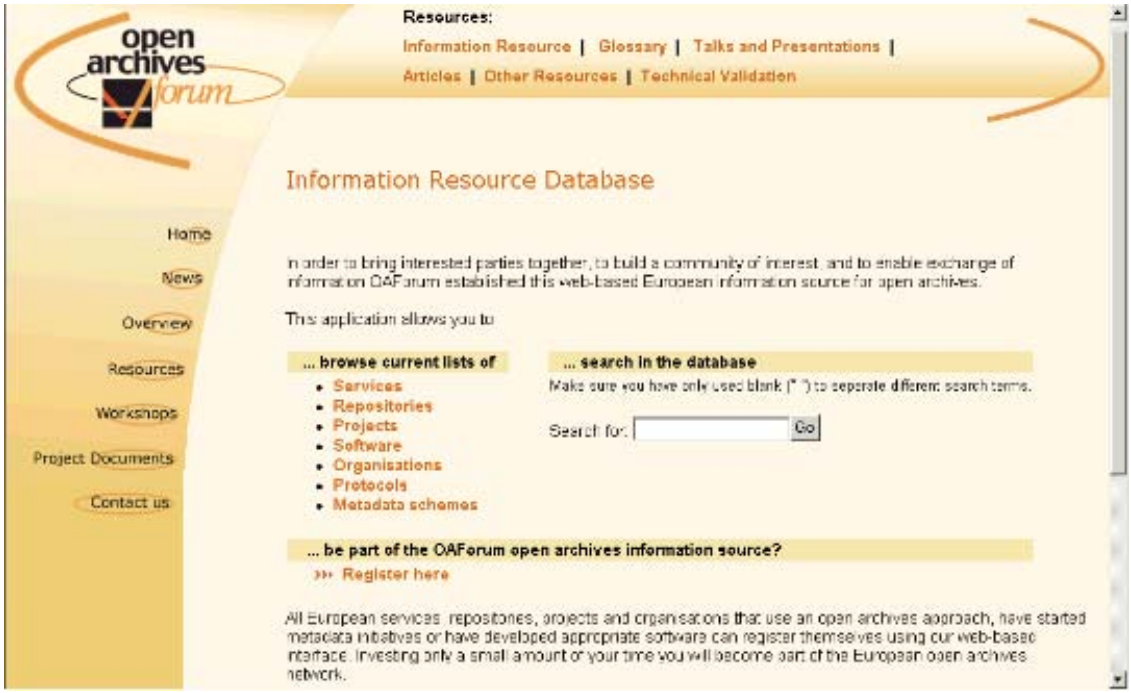
- Extend search and browse functions,
- Export data in other formats such as XML,
- Build document delivery services like print on demand,
- Establish collaborative environments for users and groups of users such as discussion forums, annotations, awareness,
- Extend existing services and build distributed services, and
- Establish an exchange of different library catalogues in order to integrate the information into a virtual union catalogue for the whole country.

One library is creating a single catalogue of all its library catalogues: library OPAC, archives database, image database and Internet gateways.

2.3.4.4 Information sources

Another of the survey questions focused on the quality of information sources. Many of the respondents who are not yet OAI-implementers say it takes too much effort to find good information about metadata, and especially difficult to find technical support. Some asked for an easy introduction to OAI-PMH.

2.4 Information Source for Open Archives: Information Resource Database



Public interface: http://www.oaforum.org/oaf_db/

The project has set up a European authority register for open archives, not only OAI-compatible archives, with additional information about the content. This supports collaboration and dissemination by giving information about OAI compliant data and service

providers, both EC funded initiatives and other national initiatives within Europe. The users themselves filled the database and will also do it in future.

The database includes for each provider details of scope of project, content, collection development policy, metadata formats, version of OAI or other protocol implemented, contact names, tools in use. It uses a self-registering interface with a priority on sustainability and automated input using techniques.

The database gives information on:

a) Services for Open Archives

b) Metadata Schemas and Interoperability

c) Open Archives Software Tools

d) OAI Current implementations in Europe

2.4.1 The Future

The option of the external data acquisition is a positive aspect for the further administration of the Information Resource Database: Nearly no expenditure arises from collecting new data. If an actualisation of data is necessary, then a clear and easy to learn work area is available for the administrator through a web based interface, whereby the expenditure is minimised.

For the future it remains to be seen however whether also without large marketing activities the willingness of projects and organisations exists to enter further input. A further problem may also result from the high quality standard in connection with a high safety requirement: the long-term data quality. To protect the database also those who entered the data have no direct access to the database. Therefore actualisations only can be indicated by mail to the administrator. If high measure of self initiative of many is necessary to keep data current, there may exist the danger that nothing happens and data becomes obsolete.

2.5 Remarks

In some communities it is hard to persuade key figures to devote a serious amount of attention to the OAI PMH. There are a number of reasons for this, including lack of resources where other activities are seen as having higher priority; lack of technical experience of available staff in the implementation of the OAI PMH or other technical components; lack of confidence in the longevity of the OAI PMH or its likely emergence as a standard in common use; lack of understanding of what the OAI PMH is and does. There is very little publicly available knowledge about problem areas being experienced by implementers. People and organisations need to establish relationships of trust before there is can be free and open discussion of some of the challenges they are facing.

3 ORGANISATIONAL VALIDATION

3.1 Objectives

Within organisational validation activities, OA-Forum aims to: recommend sustainable business models for open archives, explore incentives for participation, investigate IPR and

terms and conditions of use issues, examine the governance model of the OAI; and ensure European organisations benefit from the added value of open archive technology.

3.2 Achievements

Organisational issues was a "hot topic" of discussion at the first OA-Forum workshop, where the breakout session on the topic resulted in the spontaneous formation of a European Organisational Issues working group. At time of writing of this report, the working group had started structured discussions of organisational issues via the info@oaforum.org mailing list. The slate of issues initially identified for discussion includes:

- Barriers, Positive Factors, Institutional Culture
- Content Issues
- IPR (Intellectual Property Right)
- Who does what within the institution?
- Service design issues, including metadata standards
- Business Models and exit strategies

It appears that the working group will choose some priority areas for consideration, with proposed outcomes such as the development of scenarios and guidelines. At time of writing, we estimate that there are about twelve active members of the working group, with a good range of European countries represented in the membership.

It is notable that the list issues identified by the working group has considerable overlap with the issues identified by OA-Forum project partners when the project was proposed. Among these are:

- Business models for open archives
- IPR issues for open archives (based on outline of expert review D4.2)
- Quality assurance for open archives

3.3 Business models for open archives

Active participants in the Open Archives Initiative expect that in a few years time the OAI-PMH protocol will be embedded in the infrastructure of the Web, as taken-for-granted as the HTTP protocol now is. If this is to be so, it will be not only because of the relative simplicity of the OAI framework for interoperability and metadata sharing, but also because of uptake by:

- research organisations, including universities
  (as part of a change to the pattern of scholarly communication)
- publishers, especially learned society publishers
  (adding value to the process of dissemination)

- "memory organisations", i.e., libraries, archives, museums (extending access to the citizen)

3.4 Possible/emerging business models

3.4.1 What is a business model, especially in the context of the Internet?

The simplest definition of a business model is that it is the "method of doing business by which a company can sustain itself – that is, generate revenue" (Rappa, 2001). This does not mean that a business model is *only* concerned with revenue; it should also relate to the value of services and goods provided and the organisation's position in the product supply chain. Thus Mahadevan (2000, p. 59):

> *A business model is a unique blend of three streams that are critical to the business. These include the value stream for the business partners and the buyers, the revenue stream and the logistical stream. The value stream identifies the value proposition for the buyers, sellers, and the market makers and portals in an Internet context. The revenue stream is a plan for assuring revenue generation for the business. The logistical stream addresses various issues related to the design of the supply chain for the business.*

There is a wide range of business models in use. Rappa (2001) notes that some models are quite simple: a company "produces a good or service and sells it to customers. If all goes well, the revenues from sales exceed the cost of operation and the company realizes a profit." Others are more complicated and are based on organisations as intermediaries or facilitators. The recent growth in electronic commerce (e-commerce) means that at the moment there is quite a lot of interest in Internet business models, both new and traditional (e.g., Jutla, *et al*., 1999; Werbach, 2000; Feeny, 2001).

Table 1: Taxonomy of business models identified by Rappa (2001)

Business model:	***Brief description:***
Brokerage model	Those that bring buyers and sellers together and facilitate transactions (often fee based)
Advertising model	Supported by advertising revenue, a Web site will provide content and services together with advertising (e.g., banner ads)
Infomediary model	Collecting data about consumers and their purchasing habits and selling this information to other businesses
Merchant model	Selling of goods and services on the traditional retail model
Manufacturer model	Direct selling by the creator of a product or service to consumers, cutting out intermediaries
Affiliate model	Offering financial incentives to affiliated partner sites
Community model	Where users themselves invest in a site, e.g. by the contribution of content, money or time. This can be combined with other models, e.g. advertising or subscription

Business model:	***Brief description:***
Subscription model	Where consumers (users) pay for access to the site, usually for high added-value content, e.g. financial information, newspapers, journals
Utility model	A model based on metered usage or pay-as-you-go; depends on micropayments

Source: Rappa (2001)

Mahadevan (2000, p. 59) has commented that there have not been very many attempts to formally define and classify business models in the Internet context. However, there have been some recent attempts to organise and classify them. In one attempt, Rappa (2001) has arranged Internet business models into nine generic categories (Table 1). These include some traditional models that have been adapted for use on the Internet; e.g. those based on advertising, retailing or subscriptions, as well as models that have been developed specifically to support e-commerce.

An older taxonomy by Timmers (1998) classified eleven business models that were in use or being experimented with to support Internet e-commerce (Table 2). Timmers's classification of commercial business models in use on the Internet mentioned several potential revenue streams. He noted that some models would be able to raise revenue through membership fees (e.g. for 3rd party marketplaces or virtual communities), while others might be based on charging by service or transaction provided.

Table 2: Internet business models identified by Timmers (1999)

Business model:	***Brief description:***
E-shop	Marketing of a company or shop
E-procurement	Electronic tendering and procurement of goods and services
E-auction	Based on electronic bidding, on the traditional auction model but which may integrate contracts, payment and delivery
E-mall	A virtual collection of e-shops
Third party marketplace	Common marketing front-end and transaction support for multiple businesses
Virtual communities	Virtual communities based on communication and information exchange between members, e.g. customers or partners
Value chain service provider	Specialists in specific functions of the value chain
Value chain integrator	Integrator of multiple steps in the value chain
Collaboration platforms	Providers of tools and an information environment for collaboration
Information brokerage, trust and other services	Adding value to data available on the open networks, e.g. searching, customer profiling, etc.

Source: Timmers (1999), Pereira & Fife (2000)

Many of these models are broadly similar to (or are based on) those business models used in traditional (i.e., non-electronic) contexts, e.g. shops, auctions or advertising. The key difference is that the more innovative Internet business models are based on the existence of

cheap communication costs. There is, therefore, much interest in services that link different businesses or add some kind of value.

3.4.2 Which might be applicable to open archives?

Taking Rappa and Timmers's taxonomies together, many of these commercial (or quasi-commercial) business models will be familiar to those who work in the research community or in academic libraries and other cultural heritage organisations. For example, publishers have used subscription models for many years to provide journals or monographic series. Libraries have also used intermediaries (brokers) like subscription agents and, more recently, content aggregators like Stanford University's HighWire Press or CatchWord (e.g., Inger, 2001). It is possible also, that some of these commercial business models would be of interest to those cultural heritage organisations that are themselves creating digital content (e.g., Harvard Consultancy Services, 2000). However, the most interesting business models from an open archives perspective might be Rappa's 'community model' or Timmers's related idea of 'virtual communities.' These, as currently defined, are services that gain support from members contributing effort, content or money. Thus Timmers (1998, p. 6) writes that the ultimate value of virtual communities comes from "the members (customers or partners), who add their information onto a basic environment provided by the virtual community company." If we ignore the specifically commercial aspect, this is broadly similar to Rappa's more generic community model, one based on user investment. As an example of a community model, Rappa (2001) cites knowledge networks:

> *Sites are typically run like a forum where persons seeking information can pose questions and receive answers from (presumably) someone knowledgeable about the subject. The experts may be employed staff, a regular cadre of volunteers, or in some cases, simply anyone on the web who wishes to respond.*

This is broadly the type of model employed by the open-source software movement; described by Ljungberg (2000, p. 208) as "a loosely coupled community kept together by strong common values such that software should be free." The Open Archives Initiative itself could be seen as a similar type of virtual community. Other business models that may have relevance to open archives are Timmers's 'collaboration platforms' (a type of virtual community based on the existence of common tools) and value-added 'information brokers'. Certainly, the movement toward self-archiving and paradigm change in scholarly communication (which is well supported by, and the origin of the open archive approach) is a good fit with the virtual community model.

3.5 Recommendations for sustainable business models.

3.5.1 Why are business models important?

Business models are a method for reflecting real world processes and could be thought of as an intellectual exercise. It seems unlikely that an entrepreneur or strategic decision maker would think about what they do in terms of business models, more likely they would consider the future and functioning of their organisations in terms of the practicalities of supply and demand, of extending markets or perhaps their strategic goals or mission statement. They will clearly be aware that in order to convert their logistics stream into a revenue stream they will need to put forward a value proposition that will attract customers, funding or sponsorship.

An awareness of the model being used can be valuable in a number of ways - maintaining the relevance of business activities and focusing on aims and objectives. If the model works in the first place then "maintenance" of the model will help to sustain the business. However the world isn't static and broader knowledge of other possible business models will allow a company to adjust or even completely change it's model to better fit circumstances

3.5.2 Business models and Public Organisations

What is not clear so far is how business models might apply to public organisations such as universities, archives, libraries etc. Many if not most public organisations do nevertheless have extant business models, usually in the form of a mission statement or corporate strategy. In most cases these recognise the three streams (revenue, value and logistic) that underpin our definition of business models. A brief poll of mission statements on the internet of public organisations (primarily universities) both in the UK and Europe revealed all had a mission statement or strategic policy. Approximately 25% clearly indicated recognition of all three streams from our definition. Almost all recognised both value and logistics streams. The omission of the revenue stream is not entirely surprising given the considerably lower risk of loosing revenue stream in public when compared to private organisations.

Most public organisations, in common with large corporate bodies, tend to employ multiple concurrent business models. For example University Libraries will employ a merchant model in its dealings with publishers and a community model in it's dealings with students. Although some of the models, outlined in the taxonomies above, can be applied in part to public organisations they do to some extent fall short. The overriding *modus operendi* for UK public organisations, however, is a model that is essentially fixed by the community through the government. For Universities this model works something like this: The government collects taxes and gives part of that money to educators. The educators increase the potential value of the workforce by producing well educated students. The students join the workforce, earn money and pay tax to the Government. This type of model could be called a social subscription model.

3.5.3 Business models and Publicly Funded Projects.

A particularly difficult issue is the relationship between the OA movement, OAI-PMH and projects. Projects in this context are digitisation and research projects funded by governments or their surrogates, such as HEFC in the UK. Projects have a split personality from the point of view of business models in that there is a dilemma between the model of the hosting organisation and the model of the funding body. It can be argued that a project is a separate entity that is bound by contractual obligation agreed between the parent bodies. This assumes that clear requirements are given in the contract. In the UK, funding bodies increasingly require digitisation projects to make their digital materials available in "perpetuity". However, there is a lack of linkage between this and clear and consistent advice as to formats, metadata standards and data mark-up schema's. Furthermore, there is little or no strategic co-ordination between funding bodies to ensure cross disciplinary consistency between and within data repositories.

3.5.4 Business models and the OA movement.

Any organisation considering whether the open archives approach can be of use to them needs to consider how their existing business model is effected. Will this new approach form

a primary function of the organisation or will it only form one small part? In an organisation where the primary revenue stream is through selling information, it is unlikely that the OA approach would be embraced for data sharing. On the other hand the organisation could benefit from making metadata harvestable.

Public organisations should embrace the OA approach for the following reasons. Sharing knowledge is a primary function and as we have seen is already written into their business models. It provides one means of conforming to the freedom of information acts - enacted Europe wide in 2000 and 2001

3.5.5 Conclusions

Any organisation using a public subscription model is very likely to be both amenable to and gain benefit from integrating the OA approach. Many private organisations could benefit from the OA approach at some level. There needs to be more strategic level coherency between organisations.

3.6 Intellectual Property Right (IPR) issues for open archives

The relationship between Open Archives and Intellectual Property is complex, not least because of the complexity of definition of what "Open Archives" are. Any reader of the "Open Archives" literature will quickly discover that there are at least three (possibly more) views of what the "Open Archives" initiative is about:

- At its most straightforward, what is proposed is a set of technical standards for the "harvesting" and aggregation of simple descriptions of resources[1] (metadata). The supposition is that the controller of those resources wishes to make information about them more widely available (whether for commercial or other reasons) and is therefore willing to make the metadata available for harvesting in standardised form on a Web site. Through the aggregation of this metadata, new services (particularly but not exclusively resource discovery services) can be developed for users (perhaps targeted at a particular academic discipline, for example). This is entirely a technical protocol. The question of "open access" to the resources themselves is entirely separable from the metadata – as indeed is the question of access to the metadata that has been harvested.

- At another level, the Open Archives movement is seen as way of simplifying the process whereby academic institutions[2] can become publishers of the intellectual output of their own academic staff through the development of online repositories. This may, for example, involve the online publication of "e-prints", perhaps before or after more formal publication in the traditional literature (or perhaps without publication elsewhere). The Open Archives approach allows an efficient way of "co-operative marketing" of the content of those archives, encouraging the widest possible dissemination and exploitation.

[1] We use the term "resources" here deliberately – so far as we can tell, there is no reason why those resources described by metadata in an OAI metadata repository should themselves necessarily be digital resources – or (if they are) accessible on the Web.

[2] It is, of course, equally possible for authors to become their own publishers.

- At what may be regarded as the most contentious level, some supporters of the Open Archives movement see it as underpinning a strategy to develop what is being called "Free Online Scholarship" – a reversal of the typical scholarly journal publishing model, involving supply-side payment rather than demand-side. Authors (or those who stand proxy for them) pay for publication rather than readers (or those who stand proxy for them).

Although these three aspects of Open Archives are closely inter-related, the questions they raise about Intellectual Property Rights (IPRs) – and perhaps equally importantly the relationship between Open Archives and those businesses which depend on the exploitation of IPRs to support their business model – are significantly different. What are the significant IPR issues for each of these groups as they relate to Open Archives, and what might be the motivations for each group of stakeholders to co-operate in the development of Open Archives initiatives?

3.7 Implications for Open Archive Services

Implications for open archives services explored in the expert report include the following.

- What are the implications of IPRs for Open Archive Services?
- How might their operation be constrained by third party IPRs?
- What are the substantive risks that they may run related to IPRs and how might these be minimised?
- What are consequences for their own business models?

3.8 Quality assurance for open archives

The importance of quality assurance within the context of emerging web based information services is becoming more widely recognised. Experience has shown that often 'production services' emerge from projects, and indeed it is regarded as a sign of success if a project can translate to an on-going service. In order to ensure high quality services there needs to be consideration of quality assurance from the starting date of projects: projects need to consider quality criteria, to establish an evaluation process, and to ensure usability of system solutions.

In order to assist quality assurance the OA-Forum has attempted to identify dimensions of quality particularly relevant to the open archives approach, explore how implementations might address these quality issues, and consider who within the open archive framework is responsible for quality.

3.9 Quality assurance for open archives

The importance of quality assurance within the context of emerging web based information services is becoming more widely recognised. Within this section of the report we will explore particular quality issues facing implementations within the open archives context. It is important for projects taking an open archives approach to consider quality assurance, particularly as this approach involves collaboration between organisations and data exchange. In order to ensure high quality services there needs to be consideration of quality assurance

from the starting date of projects: projects need to ensure quality of their systems from a technical perspective, but also need to establish policies and evaluation processes which will encourage archive users to have trust in the the archive's service provision.

In order to support quality assurance the OA-Forum has identified dimensions of quality particularly relevant to the open archives approach, explored how implementations might address these quality issues, and considered where responsible for quality lies within the open archive framework.

3.10 Dimensions of quality

The open archive approach is characterised by separation of data provision and service provision, with data (both metadata and original resources) being passed between the data provider and the service provider. There may be a number of parties involved in the system both as 'users' of the data repository and the service(s) based on that data, as well as the providers themselves. This means that open archive implementations must be concerned with managing quality issues in a distributed system, typically a complex distributed system with a number of different stakeholders who have differing requirements.

3.11 Challenges

In considering organisational issues for open archives, there is a danger of getting side-tracked into a consideration of the issues of the open access movement, that is, those issues to do with a desire to effect a radical change in the flow of scholarly communication. While the open archive approach may well lend itself to the relatively easy provision of some of the infrastructure that would be needed to effect such a change, the goal of the OA-Forum is to explore and facilitate the open archive approach in a much broader range of possible business models and the issues related to them. The challenge of covering a broad range of stakeholders' issues must be met. The stakeholders include several types of organisations, from public sector to commercial, education and research to entertainment; although there are some common issues, there are also differences.

4 THE WORKSHOPS

4.1 Objectives

The project defined a plan for four workshops over two years. These workshops coveered the range of issues encompassed by the project. In particular they:

- provided a forum for exchange of experience between all European initiatives (whether EC, nationally and commercially funded)
- disseminated information on exemplar systems
- set priorities for exploitation within communities of interest

To broaden the debate for each workshop a review of the potential of the open archive approach (and the issues arising) was commissioned from a domain-specific expert. Domains include: archives,, IPR, and the OAI used in the Cultural Heritage arena.

4.2 Challenges

The 2nd, 3rd & 4th workshops, were postponed with respect to the planned dates as a consequence of the knock-on effect of the late scheduling of the first workshop. In organising these workshops we have always to choose between two objectives: i) creating the best conditions for people to learn about the open archive approach and ii) creating the best conditions for producing concrete results that make the open archive approach more viable. The first choice suggests we should have workshops with a large number of participants whilst the second suggests we should have a small number of selected participants. We made the former choice for the First Workshop since we wanted to start by creating an European Open Archive community but we chose the latter for the second and third.

Another challenge was to find a way to have representatives attending from all the European countries and from different communities of interest. In the first workshop we were very successful in this. However, we recognised that the participation of people from some countries, in particular, from Eastern Europe, is sometime difficult. We had interest from people from these countries who cancelled their registration at the very last moment since they had not been able to get the funding necessary for their participation.

4.3 General Overview of the 1st Workshop

The First Workshop brought together people with different backgrounds and set up the core of a forum for the exchange of experiences on the open archive issues. More than fifty registered participants attended this workshop, along with six invited speakers and nine OA-Forum project workers. Eleven European countries were represented: Belgium, France, Germany, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. The subject specialties included were agriculture, law, space, medicine and astrophysics. The types of organisation sending representatives included archives, universities, research bodies, national and research libraries, commercial organisations, and computing centres.

This Workshop created the foundation for collaboration on the technical evaluation of the OAI-PMH. The technical questionnaire, initially created as basis for discussion in one of the workshop break-out sessions and successively updated, has become an instrument for investigating the OAI implementations and for collecting experiences.

Some of the Workshop participants agreed to establish a European organisational issues working group that will carry out discussions and produce best practice guidelines in key areas. It will communicate via the OA-Forum discussion list in the first instance, and meet at upcoming OA-Forum workshops.

The first workshop also started the investigation of open archives requirements and solutions employed by other communities for different kind of information repositories. In particular exchange contacts where established with the Strasbourg Astronomic Data Center (CDS). This is a data center dedicated to the collection, homogenisation, preservation and distribution of astronomical information, for the usage of the whole astronomy community. CDS has a long experience on interoperability issues and currently is heavily involved in several international projects aimed at studying cost effective tools and standards for improving access and data exchange to/from astronomical data and documents archives and information services.

The result of the evaluation questionnaire highlighted that the invited presentations were much appreciated. In particular, the presentation by Michael Nelson on the new version of the OAI-PMH was considered extremely useful by many participants. It has also highlighted the importance of having small groups and well focused breakout sessions. Respondents made a number of suggestions for presentation and breakout session topics in future workshops. Coffee Breaks and lunches were considered extremely important to get people talking and mixing, to build a sense of community, and to encourage networking between people working in a particular area. The content and achievements of the First Workshop are documented in the *Workshop Report 1* (D4.1).

4.4 General Overview of the 2nd Workshop

The second workshop, titled Open Access to Hidden Resources was held on 6-7 December 2002 in Lisbon. The aim of this workshop was to explore whether and under what conditions the open archive approach is viable for libraries and archives. The Workshop looked at whether, and how, the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), which was initially proposed to solve the problems of interoperability among e-print repositories, is relevant to conventional archives and libraries. Requirements, standards, best practices, and solutions proposed by "conventional" archival and library communities to interoperability problems were analysed and compared with the features provided by the OAI-PMH. The challenges to be addressed in constructing harvesting and search services for library and archival material were also highlighted with the intention of establishing co-operation in setting out the conditions for a wider availability of the resources that are now hidden in European libraries and archives. Leading representatives of national libraries and historical archives will be invited to brainstorm on these topics.

Following feedback from the attendees of the previous workshop, a tutorial on how to implement the OAI-PMH was organised the day preceding the Workshop in order to introduce this approach to those that are not yet familiar with it.

4.5 General Overview of the 3rd workshop

There are now many different types of media in use, such as video, animation, audio, still images, etc. - both digitally-originated materials, and existing media resources which have been digitised - which digital libraries need to store and manage. The aim of the Berlin workshop was to explore which specific requirements and demands ought to be carefully weighed and considered before a digital media archive is made available via the Internet.

While traditional museums strive to become also digital museums, hosting virtual collections, plenty of new questions covering organisational as well as technical issues arise, such as copyright, collection policies, and open access demands.

In setting up subject gateways it makes sense to connect different media and information resources via standardised and interoperable network gateways that hide their technical specification from the users. Within this workshop we discussed different approaches to network media repositories, libraries, archives and other information resources using both the Open Archives Initiative technical framework for metadata harvesting and other approaches.

The workshop was organised, as the other workshops, in presentations and breakout sessions in order to better implement the project objectives, i.e. support a discussion forum. Five

break-out sessions were set up to discuss relevant issues. Some of these issues were chosen taking into account the suggestions indicated in the evaluation questionnaires of the previous workshops. In addition, a meeting of the Organisational Issues Working group, that was spontaneously created at the First OA-Forum workshop, took place.

The workshop had, as the previous workshops, a very good attendance, with more than fifty registered participants attending, along with five invited speakers, four tutorialists and six OA-Forum project workers. Most of the registered participants (84%) attended one of the two tutorials. There were representatives from many EU and Nationally funded projects. Fourteen countries were represented: Austria, Germany, Italy, The Netherlands, Norway, United Kingdom, Switzerland, Latvia, Romania, Moldavia, USA, Australia, Ukraine, Albania. Eight of the attendants were funded by Open Society Institute Zug Foundation, a part of the Soros Foundation network. Most of the attendants were project leaders, and technicians, but there were also librarians, archivists, researchers, etc.

As in the other workshops, a number of contacts and ideas for future collaborations were established. In particular, there was a lot attention dedicated to the experiences of institutional archives and to the merging of the OAI approach with automatic source description techniques.

4.5.1 Outcomes and Actions

The workshop saw a number of emerging themes and identified some future actions. There were common concerns among participants across the range of different kinds of projects and services, organisations, repositories, and subject and data or content types that were represented.

Balancing complexity with simplicity was one recurring theme. Herbert van de Sompel in his keynote presentation expressed the desire to see future OAI work to extend OAI in ways the would ease implementation for small organisations, reducing the requirement for technical skills within an implementing organisation. Many participants commented on the relative complexity of providing services based on harvested metadata, in comparison with the relative simplicity of becoming a data provider. It appeared that the ensuring the quality and standardisation of metadata could make far more work for organisations than any other aspect of exposing that metadata for harvesting.

Many projects and services, themselves often evolving from projects, experience difficulty in terms of sustainability at the end of initial start-up funding periods. Business models for long-term sustainability could prove elusive for some. Case studies showing what has worked in practice would be welcome, and OA-Forum should attempt to identify a number of these for future dissemination.

Over and over again, there was talk of the importance of open standards for interoperability. The usefulness of DC for base-level interoperability of metadata was acknowledged, while it was recognised that richer metadata should also be provided where available, and especially within specialist communities. OAI-PMH was accepted by many as a core interoperability standard. It is notable that respondents to the OA-Forum technical evaluation questionnaire, according to Birgit Mattheiu's presentation of results, judged the importance/advantages of OAI to: range from "to provide access to all of human knowledge" to "nothing other than political expediency".

In the NINCH Guide presentation, Ian Anderson spoke of how, once again, the problem arose of what subject scheme to use, and it was pointed out that the terms used in big standard schemes may provide interoperability but not provide the terms to express local cultures. Many spoke of the need for interoperable subject schemes, and also of the need for a single, simple scheme to provide base-level subject interoperability such as is provided by unqualified Dublin Core for item descriptions.

The need for guidance on good practice, perhaps especially in the area of metadata creation, was another recurring theme. The NINCH Guide has already been helpful for some participants, including ArtWorld. Participants can contribute to the drawing of guidelines in some areas of shared concern through the work of the Organisational Issues working group, and this will continue to be aired on the OA-Forum public mailing list, which all were encouraged to join and use. In addition to using the info@oaforum.org list to discuss organisational issues relating to the open archives approach, participants were encouraged to use the OAI's own implementers' mailing list for discussing technical issues. They were also asked to register information about their repositories, services and projects in the OA-Forum information resources. The 4th OA-Forum workshop was announced, with the title "In Practice, Best Practice: the future of Open Archives", to be held in Bath on 4-5 September.

4.5.2 Lessons Learned

One of the most interesting things to emerge from the workshop was the fact that some multimedia projects using the OAI PMH (still relatively few in number) are using the protocol for internal harvesting and administration purposes, without necessarily being interested in either other projects harvesting their metadata, or harvesting anyone else's metadata. These multimedia projects are in effect providing their own custom services (for themselves), using their own data resources. Using the OAI PMH leaves open the possibility of other uses and other services being developed in the future, which might involve the importing or exporting of both metadata and multimedia objects, and collaboration with other archives and services. In which case it appears to be the interoperability and flexibility afforded by adoption of the OAI PMH which is one of the main attractions of the protocol.

4.5.3 About the diffusion and use of OAI-PMH:

There are still very few multimedia archives that have moved towards the open archive model, but the protocol is an attractive proposition for them.

4.5.4 About the Workshop:

This workshop confirmed many of the impressions we have had for the other workshops.

The background of the participants was very different, as was their experience with open archives. They had different expectations about the workshop and the tutorials. Those who were just considering opening their archives and/or were at the beginning of the conversion process were looking for practical guidance, simple software solutions, and experiences from the practice of others with similar goals. Those who were working at technical and organisational solutions (eg. DARE) were looking for tips and discussions with more experienced communities. Finally, experienced implementers were willing to discuss special solutions, finding common grounds, and to offer their experiences to the community. This heterogeneity in the attendees risks creating some problems for the arrangement and design

of the presentations and needs to be carefully managed (not everyone necessarily wants the kind of technical detail available in the tutorials, for example). A similar heterogeneity was also noticed among the tutorial participants. This aspect must be taken into account in the preparation of the on-line tutorial.

Also in this workshop there were people that had attended one or both the previous workshops. It was interesting to notice that the long-term influence of the Open Archives Forum has now become concretely recognizable. One of the attendees commented on his participation in the workshop saying: "In Pisa my participation reason was noncommittal curiosity. In the meantime I became an OAI implementer. Therefore, in Berlin I could extract concrete benefit from the Workshop."

4.6 General Overview of the fourth Workshop

This workshop focused on good practice in the implementation of open archives, with an eye to future development of the technology. A particular theme of the workshop was the use of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) in the area of Cultural Heritage, where multimedia is an important issue. The workshop looked also at the use of the OAI-PHM protocol as a way of publishing information about university theses, and how that might contribute to developing useful content for institutional (as opposed to subject-based) e-print archives.

The workshop was built on issues discussed during the whole project. In particular,

- the European experience of open archives regarding technical issues, organisational issues and Intellectual Property Rights, were reviewed;
- a report on organisational issues written by an OA-Forum working group was discussed;
- an online tutorial, delivered as part of the OA-Forum activities, which gives guidance to those wishing to implement a project using the OAI-PMH was presented;
- breakout sessions offered the opportunity to discuss issues of practice with others working at the sharp end of implementation;
- a poster session provided the opportunity to disseminate information about existing projects in the field.
- a panel session closing the second day of the workshop offered the opportunity to exchange views about the future direction of open archives, and about our experience of the open archives approach so far.

This last workshop had, as all the previous workshops, a very good attendance, with more than seventy registered participants attending which included ten invited speakers,. There were representatives from many EU and Nationally funded projects. Eleven countries were represented: Austria, Germany, Italy, The Netherlands, Norway, United Kingdom, USA Portugal, Canada, Belgium, and France. The audience was quite heterogeneous, there were project managers, librarians, researchers, system developers, etc.

There was a significant number of presentations by projects working within the cultural heritage sector (the number was commented on favourably at the time by one of the participants), illustrated that the scope of the OAI PMH is much wider than it might have been imagined at the time it was conceived at the Santa Fe Convention in 1999. Much of the discussion during the workshop focussed on organisational issues and the sustainability of initiatives and programmes making use of the OAI Protocol for Metadata Harvesting. It was also interesting to hear Carl Lagoze speaking at some length on where he thinks the Protocol is going, and where metadata creation is going also.

It is likely that the Protocol will be used significantly beyond the library community, and also beyond the scholarly community - people from television companies have started to turn up to such events - they have large archives of material which they need to manage, and increasingly, to manage as part of a business process which involves making metadata about their holdings available to interested parties.

Organisational issues are also clearly of great significance. In Europe, take up is relatively slow because organisational issues are not yet granted the same importance as they are in the USA for example, where it is understood that the benefits of the OAI approach have to be sold to institutions and users.

Carl Lagoze made it clear that he thinks the battle has been lost for manually created metadata - no-one creates metadata for Google, and Google is, with some notable exceptions, how people find things. Services created on the basis of the OAI Protocol need to compete with that.

5 OAI-TUTORIALS: OAI AND OAI-PMH FOR BEGINNERS

Lisbon 2002 - Uwe Müller (HU Berlin), Andy Powell (UKOLN):
OAI and OAI-PMH for Beginners
http://www.oaforum.org/otherfiles/lisb_tutorial.ppt

Berlin 2003 - Uwe Müller (HU Berlin), Pete Cliff (UKOLN):
OAI and OAI-PMH for Beginners
http://www.oaforum.org/otherfiles/berl_oai-tutorial_e.ppt
Example of a DP implementation
http://www.oaforum.org/otherfiles/berl_oai-tutorial-dp_e.tar

Berlin 2003 - Heinrich Stamerjohanns (Univ. of Oldenburg), Bruno Klotz-Berendes (Univ. of Dortmund)
Tutorium - Die Open Archives Initiative und OAI-PMH
http://www.oaforum.org/otherfiles/berl_oai-tutorial_de.pdf

The tutorials gave an introduction to the Open Archives Initiative and the Protocol for Metadata Harvesting. After a brief outline of the protocol's genesis and its development the main ideas of the OAI-PMH, its general functioning and some protocol details had been introduced. Then special implementation issues for data providers and service providers were discussed including both the necessary steps for a local implementation and several examples of freely available and adaptable tools for implementations. The sessions also provided an overview on the implementation of a data provider metadata set.

The OAI tutorial included presentations as well as short breakout sessions with the possibility to discuss special implementation issues. Handouts including a glossary of terms had been provided. The target group of the tutorials had been persons who are interested in more technical aspects of the OAI Protocol for Metadata Harvesting.

The large need for OAI-Tutorials became clearly visible during the Pisa workshop. The fast realisation was only possible in cause of still existing competences at UKOLN and HU Berlin. Both times, at Lisbon and Berlin, the tutorials had been a great success with a surprising number of participants. Through a cooperation with DINI (German Initiative for Networked Information) we succeeded in Berlin to offer parallel tutorials in different languages (English and German). From the visibly large need and the positive feedback of participants finally the idea arose to provide an extended version that is available at any time and also on a long-term basis: A multilingual online tutorial.

The tutorial in English was held by Pete Cliff (UKOLN) and Uwe Muller (Humboldt University). It was a revised version of the tutorial presented at the second Workshop in Lisbon. Changes with respect to the previous editions were stimulated by suggestions and comments returned by the Lisbon participants. In particular, we extended its duration in order to have more time for introducing the different aspects of the OAI-PMH more gradually.

Some of the issues raised during the workshop were:

- need for base-level subject scheme to complement DC base-level metadata format
- need to make clear to decision makers that OAI provides
  - support for interoperability via a metadata sharing solution
  - metadata harvesting (gather from many servers to an aggregated database)
  - building services based on the harvested metadata is not part of OAI-PMH

This tutorial was attended by 60 people, and 14 countries were represented altogether.

The tutorial which was delivered in German was the responsibility of Heinrich Stamerjohanns (University of Oldenburg) and Bruno Klotz-Berendes (University of Dortmund).

The tutorials were attended by 84% of the regular workshop attendees (i.e., not OA-F participants or invited speakers).

As shown by the huge attendance, there is a strong interest in knowing more about the technical and organizational implications of the OAI-PHM protocol. To respond to this request we decided to create in the next months an on-line tutorial available on the Web, which can accessed by everyone, at any time, even after the end of the project.

5.1 Online-Tutorial: OAI and OAI-PMH for Beginners

In the conjunction with the workshops, and in response to requests from workshop participants and potential participants, two pre-workshop ‘Introduction to OAI’ tutorials were held. In the Open Archives Forum mid-project review, these tutorials were identified as a very successful output of the project. As a contribution to the understanding of the open archive approach in general and the implementation of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) in particular, and in order to reach continuity it was necessary to create the tutorial in a format which is long term available to the community (for as long as the Forum’s web site exists).

The online tutorial bases largely on the material prepared for presentation at the two OA-Forum pre-workshop tutorials; on currently-available project deliverables including the *Interim review of organisational issues*, *Interim review of technical issues*, the expert report on Intellectual Property Right (IPR) issues for open archives, and the Open Archives Forum web site.

The presenters designed the slides to be accompanied by their verbal exposition of the content. Thus it was necessary to write sections of continuous narrative based on material that exists in slide outline format. Content for interactive elements of the tutorial and at least a multiple-choice self-assessment quiz might be added. The first version is provided in English. A translation in more languages might follow by the OA-Forum project or in future other organisations engaged in the open archives approach.

The online tutorial has been realised by using the CALnet authoring tool that was developed by the Institute for Learning and Research Technology (ILRT) at the University of Bristol. The University of Bristol retains copyright and permits use of the tool free of charge provided that CALnet is not sold on. CALnet is designed to support the creation of Computer Aided Learning packages delivered by publishing on the Web.

6 COMMUNITY SPECIFIC EXPERT REPORTS

6.1 Open Archives and Intellectual Property: incompatible world views?

In this first Community specific expert report, Mark Bide (Rightscom) explores the relationship between open archives and Intellectual Property, and argues that there is ultimately no conflict between Open Archives and Intellectual Property – but open archives must work within the framework of Intellectual Property law.
It is, of course, possible that the most apocalyptic of visions of the future of Intellectual Property will come to pass. There are two extremes to this dystopia, depending on which "side" of the argument you find yourself. One is a world in which all "content" is locked up by its owners and made inaccessible – where the simplest of activities, like lending someone a book, becomes criminalised.[3] The other is a world where the whole concept of Intellectual Property is simply overwhelmed by the ease with which content can be copied and redistributed on the network – and those who depend financially on the protection of copyright in creating and disseminating content have to find some other way of earning their living.

We would suggest that, in all likelihood, neither of these extremes will ultimately be realised. The future will be a compromise, somewhere in the middle, although the loudest voices today are to be heard – as might be expected – from the farthest margins.

There is a complex relationship with readers. Readers will have to find the services provided through Open Archives useful and worthwhile if they are to be used. It is the market that will decide through their behaviour. The only significant model we have for this is the community which uses arXiv – and, so far at least, the message is that (for this community) Open

[3] See Richard Stallman's article "The Right to Read", originally published in *Communications of the ACM* February 1997 **40** No 2; available with an authors note updated in 2002 from www.gnu.org/philosophy/right-to-read.html

Archives have proved a useful *adjunct* to the published literature rather than a replacement for it. ArXiv is heavily used – but so is the equivalent paid for research literature.

In the meantime, what should the Open Archives Initiative do with respect to Intellectual Property issues? The report recommends that the following should be considered by the Open Archives Forum as activities which need to be undertaken:

- Open Archives (meta)data providers should provide explicit information about the uses to which they are comfortable that any metadata harvested from them can be put. Such information should be made available in both human readable and machine readable form. The development of a machine-readable form of this "permissions metadata" is probably not a very complex task, since the number of different alternative modes of use is probably limited.[4]

- Similarly, data providers should provide explicit rights and permissions data relating to the resources that are identified in the metadata. This might include a copyright notice relating to the resource, and information about the terms of access to the resource. Again, these should ideally be in a standardised, machine readable form; this could be a somewhat greater challenge, since the terms of access might themselves be more complex (for example, "free if your institution is a subscriber; pay per view if not").

- Any metadata scheme used in Open Archives should be extended as appropriate, to allow the inclusion of rights and permissions data relating to the metadata itself ("meta-metadata") and the resource described and identified by the metadata.

- It would clearly protect both data providers and service providers from misunderstanding and disagreement if an explicit form of licence were developed between them and formed the basis of their interaction. This could be entirely standardised.

- Those seeking to run Open Archive repositories, providing access to content (on any basis, whether free or paid for) would be well advised to ensure that their position (as publishers, which is what they are) is not compromised. With this in mind, we would strongly recommend that they put in place a standardised form of licence with the authors who post their content to the archive, warranting (for example) that the author is the copyright holder (or has the copyright holder's permission to post the content). Such licences will need to consider (for example) the position of an author who changes their post.

- At the same time, such repositories will need to have in place processes for dealing with "notice and takedown" procedures, if claims are made that the content which they are hosting is infringing of someone else's rights.

There is ultimately no conflict between Open Archives and Intellectual Property – but Open Archives exist within the framework of Intellectual Property law, and would be advised to recognise this in the way that they operate. [November 2002]

[4] Such a set of metadata permission values is a primary deliverable of the RoMEO project (op cit).

6.2 How Real Archivists can learn to love the OAI.

In this second report, George MacKenzie and Goran Kristiansson look at the potential for using the OAI-PMH as a simple means of disseminating and exchanging archive catalogues.

It also looks at the appropriateness of the term 'archive' as part of the description of the protocol. Problems with linkages between levels of description in different archives are explored, and the report also looks briefly at alternative means archivists are using for exchanging metadata, particularly the Z39.50 protocol.

The report concludes that OAI will be used by conventional archives only if three conditions are fulfilled. First, archivists must be confident that compliant descriptions will respect archival principles; second, descriptions must be produced with little effort from existing systems; and third, archivists must believe that the wider OAI user base contains sufficient numbers of potential users.

The importance of protecting sensitive intellectual property rights in catalogue descriptions is also discussed. The report suggests possible strategies in which archives would produce OAI compliant records for parts of their descriptions only. [March 2003]

6.3 Practices of the Cultural Heritage Actors.

Muriel Foullonneau and David Dawson:

The main interest of aggregated resources seems to lie in the possibility to build cross-collection services based on cultural heritage resources. The OAI model then offers an opportunity for memory organisations to build cooperation policies but it also contains the "roles" of new actors of the digital library field, whether aggregators or service providers which may not be traditional memory organisations. The overall opportunity the OAI architecture to facilitate the collaboration between institutions to for cross-domain resource discovery, is key to the integration of cultural heritage institutions in the digital networks.

Generally, the use of the OAI technology shall be invisible to the end-users who will only benefit from the development of new services based on cultural heritage resources. For data providers, that technology can constitute a rather simple solution to technical interoperability, but it is much more an organisational model which raises the opportunity to get involved in community-based services. The service providers which use OAI repositories face the challenge to show advantages of their service and community to the data providers and to the end-users.

The experiences related to cross domain services have demonstrated indirect organisational impact :

"Curators and librarians indicated that they were motivated to join the project because it provided them with the impetus to do a number of things that they considered were institutional priorities but often had been un-funded mandates, including:

- Focusing on a community outreach project;
- Forming new partnerships with previously un-served or under-served groups; and

- Identifying and assessing collections for digitization."[5]

The National Representatives Group on digitisation of cultural and scientific heritage (NRG), gathering representatives of all European ministries of culture has demonstrated a clear interest for the OAI-PMH technology and the Minerva project in charge of implementing the political decisions of the NRG, examines the way interoperability is handled in various countries and disseminates common standards for a European Information Environment, with notably a clear recognition of the major interest of the OAI-PMH for digital resource discovery. The development of that model in the cultural heritage sector could be implemented through the following suggestions raised by the Illinois tests[6] to integrate the OAI-PMH discovery architecture in the overall process of digital content creation, through setting the following actions :

- Build registry of collections with digital content;
- Guide funded projects to make their metadata available with OAI-PMH;
- Build a repository and search & discovery tools for integrated access to the content of those collections;
- Research best practices for sharing metadata about heterogeneous content in various user communities.

The report aims at describing interesting good practices, however, many issues are still to be more widely experimented and tools to be developed: notably guidelines for the use of DC for cross-domain cultural heritage metadata and guidelines for crosswalks, schemas for all metadata model only encoded as DTDs, schemas for the use of rights on metadata, EAD splitting or tagging for cross-domain applications (item-level or collection level), information retrieval through a mix of classical search engines and harvested content, cross-language heritage resource discovery, representation of data in various schema and data re-usability, use of push technologies to launch harvesters, and moreover, user interfaces to heterogeneous and aggregated content and validation of new types of agents, roles, financial models and users in the heritage information environment. The Mellon Foundation experiments conclude on the necessity to better study and adapt the cycle of "metadata gardening" to resource discovery[7].

A major problem is still the absence of proper standard schemas, rather than DTDs to encode cultural heritage metadata sets. The standardisation authorities have a clear role to play to facilitate this evolution. This is a challenge for funders and institutional stakeholders of digital heritage, to include the OAI model within the digital content creation framework, to anticipate the major initiatives for standardization within the cultural heritage sector and

[5] Bennet Nuala, Sandore Beth, Pianfetti Evangeline, « Illinois Digital Cultural Heritage Community – Collaborative s among libraries, museums and elementary schools », in D-Lib magazine vol 8-1, January 2002, http://www.dlib.org/dlib/january02/bennett/01bennett.html

[6] Cole Timothy W., 'Using OAI-PMH to aggregate metadata describing cultural heritage resources", presentation ALA/CLA annual meeting, 22 June 2003, Toronto, <http://dli.grainger.uiuc.edu/Publications/TWCole/ALA2003OAI/>

[7] Halbert Martin, Kaczmarek Joanne, Hagedorn Kat, "Findings from the Mellon Metadata Harvesting initiative", in Koch Taugott, Torvik Solvberg Ingeborg, "Research and Advanced Technology for digital libraries" 7th European conference, ECDL 2003, Trondheim Norway, August 17-22, 2003, Berlin 2003

ensure the involvement of major industrial heritage partners to implement OAI repositories for document management applications. [September 2003]

7 DISSEMINATION

7.1 Objectives

The Dissemination activity aims at spreading information about European open archives implementations and raising awareness of issues of deployment in Europe. It also intends to ensure good communication between initiatives in Europe and OAI in US and beyond.

7.2 Achievements

A project Web site was set up at the beginning of the project to disseminate the objectives of the project and to publicise produced information and activities. The Web site makes available all reports and public outputs of the projects. It also contains information produced and collected by the project. In particular:

- A glossary of open archives terminology. The current version has been revised taking into account the result of the terminology breakout session held at the first workshop.
- A searchable database that contains information about projects, organisations, products, etc. related to the open archive approach. This database is intended as a source of information that can be exploited by those people that need to find contacts and links to existing implementations of the open archive approach.
- A news list that reports the latest news about OAI and the other initiatives related to the open archives approach
- OA-Forum workshop programmes, and speakers' presentation slides and abstracts.
- Links to Web-accessible articles, reports and papers relating to open archives.

Several oral presentations at leading events were made by project representatives in order to disseminate the open archive approach not only within the e-print community but also in other contexts. The list of presentations and the corresponding slides are available at the address http://www.oaforum.org/resources/talkspres.php. These ranged from community specific events (e.g. Dublin Core Conferences (Tokyo), ICSTI Seminar on Digital Preservation, France, February 2002, DLM-Forum Conference, Barcelona, May 2002) to EU and National events (e.g. EU/NSF All Digital Library Concertation Meeting, Rome, 25-26 March 2002, Developing Digital Libraries Workshop, June, 2002, Corfu, Greece).

The first workshop provided another opportunity for disseminating the open archive approach, in particular the OAI-PMH. After the workshop some of the participants decided to adopt this approach within their organisations, others decided to share their efforts and collaborate together. Many participants expressed their requirements and have discussed these among themselves and with the invited experts. An Open Archives Forum Public E-mail List have been set up very recently following a request raised by many of the

participants at the first Workshop. The objectives of this list are to inform about OA-Forum activities and open archives in Europe and to provide a forum for discussion of topics related to the open archives approach.

A liaison activity with the US OAI has been carried out in order to co-ordinate efforts. An exchange of information is on going, both on the technical and on the organisational issues. Mike Nelson represented the OAI at the first OA-Forum workshop, and OAI sent Herbert van de Soempel to participate in the 3rd Workshop in Berlin, and Carl Lagoze was the representative who participated in the fourth workshop (Tim Cole of the University of Urbana-Champaign also attended). The results of the liaison activity have been disseminated as information on the OA-Forum Web site, and the activity is described in more detail in D5.3 *Liaison report* available from the OA-Forum website at: http://www.oaforum.org/documents/.

Publicity material including a flyer and a post-card format leaflet about the 1st workshop were designed and produced. A standard project presentation (D5.4) was prepared in both document and PowerPoint versions. These are available from the OA-Forum website at **http://www.oaforum.org/documents/.** An internal deliverable, D5.2 *Dissemination plan*, was also written.

7.3 Overview of Presentations/Articles

Date	Presentations	Person	Location
11th July 2001	Open Archives Forum: European Support for Open Archive Activity.	Rachel Heery	DNER, CURL, UKOLN: Developing an agenda for institutional e-print archives. Institute of Mechanical Engineers, London.
22 October 2001	Open Archives Forum presentation at the OAI tutorial	Rachel Heery	DC-2001: International Conference on Dublin Core and Metadata Applications. National Institute of Informatics Tokyo, Japan.
8 September 2001	OA-Forum at ECDL 2001	Susanne Dobratz	ECDL 2001 Darmstadt, Germany
26 November 2001	"The OAI Technical Framework and the European OAForum project" internal workshop at DDB	Susanne Dobratz Uwe Müller	German National Library, DDB, Frankfurt/Main, Germany
30 November 2001	"The OAI Technical Framework and the European OAForum project" at the project workshop of "Portal for Neurosciences"	Susanne Dobratz	Intitute for Theoretical Biology, Neurosciences,Humboldt-University Berlin, Germany
31 January 2002	Metadata and protocols for open archives within the presentation of electronic publishing at Humboldt-University	Susanne Dobratz	BONSAI, Berlin, Humboldt-University, Germany
29 January 2002	Open Archives Forum and New Opportunities Fund Digitisation of Learning Materials	Leona Carpenter	Bath, UK
14 February 2002	OAI, metadata, and preservation – with an introduction to OA-Forum	Leona Carpenter	Paris, France (ICSTI Seminar on preservation)
19 March 2002	The Open Archives Forum Project	Jingyuan Wang, Birgit Matthaei,	Colloqium of the Computing Centre of Humboldt-University, Berlin, Germany

		Susanne Dobratz	
26 March 2002	The Open Archives Forum Project	Susanne Dobratz	EU/NSF All Projects Concertation Meeting, IEI-CNR, Rome, Italy

Date	**Publication**	**Author**
October 2001	Open Archives Forum project web page on UKOLN web site <http://www.ukoln.ac.uk/metadata/oa-forum/>	Leona Carpenter
November 2001	"Open Archives Forum" in ERCIM News, n. 48, January 2002.	Donatella Castelli
November 2001	Humboldt-University internal publication RZ-Mitteilungen, "Das Project Open Archives Forum"	Susanne Dobratz
January 2002	The Open Archives Forum Article in Ariadne web magazine (http://www.ariadne.ac.uk)	Susanne Dobratz, Friderike Schimmelpfennig and Peter Schirmbacher
January 2002	The Open Archives Forum Article prepared for d-lib magazine (http://www.dlib.org)	Susanne Dobratz, Birgit Matthaei and Peter Schirmbacher
March 2002	[report on OA-Forum] in UKOLN Newsletter	Leona Carpenter

Date	**Presentations**	**Person**	**Location**
19 March 2002	The Open Archives Forum Project	Jingyuan Wang, Birgit Matthaei, Susanne Dobratz	Colloqium of the Computing Centre of Humboldt-University, Berlin, Germany
26 March 2002	The Open Archives Forum Project	Susanne Dobratz	EU/NSF All Projects Concertation Meeting, IEI-CNR, Rome, Italy
10 April 2002	The Open Archives Forum Project	Susanne Dobratz	DINI-OAI session at the “92. Deutscher Bibliothekartag 2002” in Augsburg, Germany
10 April 2002	The Open Archives Forum Project	Susanne Dobratz	DINI-OAI session at the “92. Deutscher Bibliothekartag 2002” in Augsburg, Germany
6-8 May 2002	“Promoting and Supporting Open Archives in Europe” DLM-Forum 2002 Conference	Donatella Castelli	Barcellona (Spain)
13-14 May 2002	“Overview of European Activity” Open Archives Forum: a “place” for you to meet Open Archives in the UK Summing up, and the way forward	Donatella Castelli Leona Carpenter Suzanne Dobratz	Pisa, Italy (OA-Forum 1st workshop)
7 June 2002	Represented OAF at PULMAN cross-sectoral meeting of European library, archive and museum organisations – discussion-based representation, no formal OA-Forum presentation (www.pulman.org)	Leona Carpenter	The Hague, Netherlands
21 June 2002	“Building Digital Libraries on Open Archives”, Developing Digital Library Workshop	Donatella Castelli	Corfu (Greece)
21 August 2002	Presented OAF at IFLA exhibition on IST stand	Leona Carpenter	Glasgow, UK
20 September 2002	Presented OAF at INETBIB2002	Leona Carpenter	Goettingen, Germany

Date	Publication	Author
June 2002	Bericht vom ersten Open Archives Forum Workshop am 13./14. Mai in Pisa, ZfBB (Zeitschrift für Bibliothekswesen und Bibliographie) 6/2002	Susanne Dobratz

Date	Presentations	Person	Location
17 October 2002	*Open Archives Activities and Experiences in Europe: an Overview by the Open Archives Forum*	Susanne Dobratz	2nd workshop on the Open Archives Initiative (OAI): Gaining independence with e-prints archives and OAI, CERN, Geneva, Switzerland.
21-23 October 2002	*Offene Archive, die Open Archives Initiative und Europäische Aktivitäten*	Susanne Dobratz Uwe Müller	Berliner Herbsttreffen zur Museumdokumentation organised by Deutscher Museumsbund, Berlin, Germany.
19-21 November 2002	*OA-Forum: A European view on the Open Archives Initiative. Museum information on the basis of an open standard.*	Uwe Müller	Les recontres d'Aliénor organiszed by Conseil des Musées de Poitou-Charentes, Poitiers, France
06 December 2002	*Overview of OAI activity in Europe* http://www.oaforum.org/otherfiles/lisb_overview.ppt	Susanne Dobratz	Lisbon, Portugal (OA-Forum Workshop)
07 December 2002	Technical Validation Questionnaire presentation http://www.oaforum.org/otherfiles/lisb_tvq.ppt	Birgit Matthaei	Lisbon, Portugal (OA-Forum Workshop)
03 February 2003	*Digitization and the OAI*	Philip Hunter	DELOS-CEE Meeting of the National Librarians, Torun, Poland
28 March 2003	Technical Validation Questionnaire presentation interim results http://www.oaforum.org/otherfiles/berl_tvq.ppt	Birgit Matthaei	Humboldt University, Berlin, Germany (OA-Forum Workshop)
28 March 2003	Overview - European activities of Open Archives Multimedia Projects.	Philip Hunter	Humboldt University, Berlin, 28 March 2003 (Third Open Archives Forum Workshop, 27-29 March)

Date	Publication	Author
January 2003	Open Archives Activities and Experiences in Europe. An Overview by the Open Archives Forum. Published in D-Lib Magazine, Vol 9 no 1. (http://www.dlib.org/january03/dobratz/01dobratz.html	Susanne Dobratz, Birgit Matthaei

Date	Presentations	Person	Location
25 April 03	*The Open Archives Forum and the international perspective on Organisational and Quality issues.* Presentation at the University of London Library, Senate House, London, 25 April 2003 (Seminar Programme: *Gateways to Research and Lifelong Learning: Portals in Perspective*).	Philip Hunter	University of London Library, Senate House, London
21 May 03	*The Open Archives Forum and its Deliverables.* 21 May 2003. UKOLN seminar programme, University of Bath:	Philip Hunter	University of Bath Library, Bath

	Portals and ePrints		
11-08-2003	Open Archives Initiative in Europe and Germany (http://www.oaforum.org/otherfiles/mueller-postifla-2003-08.ppt)	Uwe Müller	Information Technology and DCMI, Goettingen
04-09-2003	Open Archives Forum – Technical Validation (http://www.oaforum.org/otherfiles/bath_tvq.ppt)	Birgit Matthaei	4th OA-Forum Workshop, Bath

Date	**Publication**	**Author**
April 30, 2003	*Current Trends in Digitisation in Central and Eastern Europe*, in *Ariadne* 35, March/April issue, 2003. An article reporting on a DELOS Meeting of the National Librarians in Torun, Poland, 3-4 February 2003.	Philip Hunter
October 30, 2003	Fourth Open Archives Forum Workshop *In Practice, Good Practice: The Future of Open Archives*: in *Ariadne 37*	Manjula Patel (UKOLN)

7.4 Challenges

There are many communities that can take advantage of the open archive approach; as a consequence there are many dissemination opportunities. As each dissemination activity consumes a considerable amount of resources, both in terms of human resources and travel expenses, these opportunities had to be carefully selected in order to maximise the results. Alternative forms of remote dissemination were clearly a priority. The OA-F Online OAI-PMH Tutorial was a direct outcome of this recognition.

8 MANAGEMENT

8.1 Objectives

The objectives of the management activity were:

- To ensure partners understand their role in achieving project objectives
- To monitor and adapt the project plan in order to meet project objectives
- To ensure project objectives are met with budget
- To report to the EC in a timely way

8.2 Achievements

The *Project Handbook* (D1.1) documenting project procedures and templates for reports and deliverables was produced and agreed with partners. A BSCW archive of project documentation was established on a server at HUB, which provides a secure shared workspace for project partners for work in progress, final versions of deliverables, and related

project documents, reports, plans and so forth, as well a some support for co-operative working. Reporting to, and liaison with the EC were undertaken, including management and progress reporting and submission of deliverables and the first cost claim. This *Interim project report* (D1.2) was produced. Project plans were produced, including task plans for each workpackage and a Gantt chart summarising the plan and relationships among tasks. Regular management meetings were held. Aside from the Kick-off meeting, all meetings were held in conjunction with workshops or other events, or by conference call, in order to save on travel costs. This is necessary as travel budgets are tight within this project in relation to the number of staff who must travel to workshop locations in order to provide the support required for successful workshops.

The project workshops were all successful, held slightly later than originally planned. All workshops were completed before the formal end of the project. The three community specific expert reports suggested on the basis of our early project experience were all commissioned and executed within the agreed time-frame, and to a high standard by the authors. The fourth community specific expert report was replaced with another deliverable (in agreement with the Project Officer and the Commission) - this was the Online OAI PMH self-learning tutorial, suggested by our experience in the early workshops. This was complete by the start of our fourth workshop in Bath, and was announced on the first morning of the event. This may turn out to be our single most important deliverable, and persist as a well-used resource for a considerable period. Already it is being translated into German by volunteers, a Japanese translation already exists, and we are negotiating with a French specialist who has volunteered a French translation. We have also received a number of requests for a Spanish translation, and are looking into the possibility of supplying this.

We were also invited to give a presentation at the OAI3 Conference in Geneva in early February 2004, as well as an introductory and a technical level tutorial at the event, based on Leona Carpenter's online OAI PMH tutorial, developed for the project in her capacity as a freelance consultant (Leona left the project in March 2003).

We received a short project extension to enable us to develop some extra suggestions, such as repackaging the community specific expert reports for publication in various magazines, and to properly digest the large amount of information which the project acquired. Also, to promote the tutorial and to explore the possibility of its translation into other European languages. The project therefore ended officially at the close of November 2003, and our write up period extended to the end of January. Our remaining deliverables, including this Final Project Report, were delivered shortly afterwards.

PART IV - REMAINDER

9 DELIVERABLES

Project number: IST-2001-32015 Project name: Open Archives Forum

Del. no.	**Deliverable name**	**WP no.**	**Lead participant**	**Estimated person-months**	**Del. Type**	**Security**	**Delivery** (project month)
D1.1	Project handbook	1	UBAH	0.5	report	Int.	2
D1.2	Interim project report	1	UBAH	0.5	report	Int.	12
D1.3	Final project report	1	UBAH	1.0	report	Pub.	24
D1.4	Exploitation plan	1	UBAH	2.0	report	Rest.	24
D2.1	Information source for Open Archives	2	HUB	4.0	database on web site	Pub.	4: then ongoing
D2.2	Interim review of technical issues	2	HUB	10.0	report	Pub.	12
D2.3	Final review of technical issues	2	HUB	12.0	report	Pub.	24
D3.1	Interim review of organisational issues	3	UBAH	8.0	report	Pub.	12
D3.2	Final review of organisational issues	3	UBAH	6.0	report	Pub.	24
D4.1	Workshop report 1	4	CNR	5.0	report	Pub.	5
D4.2	Community specific expert reports 1	4	CNR	1.0	report	Pub.	6
D4.3	Workshop report 2	4	CNR	5.0	report	Pub.	11
D4.4	Community specific expert reports 2	4	CNR	1.0	report	Pub.	14
D4.5	Workshop report 3	4	CNR	5.0	report	Pub.	17
D4.6	Workshop report 4	4	CNR	5.0	report	Pub.	21

D4.7	Online OAI-PMH Tutorial		UBAH	1.0	Online Tutorial	Pub.	24
D4.8	Community specific expert report 3		UBAH	1.0	report	Pub.	24
D5.1	Web site, including Introduction to basic concepts	5	CNR	5.0	web site	Pub.	2: then ongoing
D5.2	Dissemination plan	5	CNR	1.5	report	Rest.	3
D5.3	Liaison report	5	CNR	2.5	report	Pub.	6: then ongoing
D5.4	Project Presentation	5		0.5	presentat ion	Pub.	4
D5.5	Initial Open Archives Forum sustainability recommendations	5	CNR	1.5	report	Rest.	19
D5.6	Final Open Archives Forum sustainability recommendations	5	CNR	0.5	report	Rest.	22