ERPANET Training Seminar

Metadata in Digital Preservation

Archivschule Marburg
September 3-5, 2003
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Getting What You Want, Knowing What You Have, and Keeping What You Need

Wendy Duff, Hans Hofman and Melissa Troemel

Introduction
Preserving the right metadata is key to preserving digital objects. Metadata, or, data about data, provide information about the content, context, structure, appearance and behaviour of records or digital objects as well as the software and hardware environment in which these digital objects are created and reside. They are essential not only to find and retrieve information and to understand/interpret it, but metadata can also increase the reliability, accessibility, and accountability of electronic resources. For example, the metadata component of an electronic resource can yield the information needed to recognize whether that resource can be trusted, or to ensure that intellectual property rights are protected.

Statement of purpose
This seminar will provide an overview of the metadata scene in relation to preservation and focus especially on the following issues:

- Principles and purposes
- Metadata schemes and their structures – An overview of different types of schemes and the various communities involved in metadata identification to assess the commonalities and differences of their mandates and purposes. Identify common elements in metadata sets and their structures. Interoperability of metadata schemes.
- Cost/benefit aspects of metadata (e.g. what are the costs/benefits of creating metadata and what are the risks if you don’t have enough of them?)
- Sources of metadata or from where can we to get metadata?
- How to represent metadata or metadata structures?
- How to find your way through the standards forest? Discussions on the methods for overcoming some of the challenges posed by the creation, implementation and interoperability of metadata schemes, e.g. metadata registries and crosswalks. Choosing a metadata scheme that meets your institutions needs.
- Steps in implementing a metadata program
- Provide a networking opportunity for workshop participants to meet with experts in their field and to interact with other participants.
Type of Metadata and the Purposes they Serve

Metadata can be provided at different levels of specificity, to different types of digital objects and to digital resources at different levels of aggregation, e.g. system, object, data file. As previously stated metadata are needed for preservation, discovery and retrieval, as well as to protect the integrity, reliability and authenticity, of digital objects. Metadata serve a variety of purposes and they enable the performance of different processes. For example, one needs administrative and technical metadata to manage digital objects, search engines use descriptive metadata to improve retrieval, and provenance or contextual metadata help users to understand and use the content of an object. To make a comparison, metadata are like the dashboard meters in a car, that enable you to drive the car, to see what the fuel level is, how fast you are driving, or a navigating device that allows you to orient yourself and help you to find your destination, and so on. As a driver, however, you have to interpret and act upon them. The same goes for maintenance as the garage will rely on the information (metadata) they get from diagnostic devices. In short, they support you in and are critical for doing things, but do not ‘act’ themselves.

Types of metadata can therefore be categorized according to the function that they serve. For example, some have grouped metadata into five categories: descriptive, technical, preservation, administrative, and use metadata. The OAIS metadata reference model identified four different types of metadata needed to adequately preserve the content information in a record. It labels the types of preservation metadata as Provenance, Reference, Fixity, and Context information. The OAIS model also suggests that a digital object would require representation information, packaging information and descriptive information. These categories are not mutually exclusive as descriptive information may contain some of the same elements as Preservation description metadata. The OCLC/RLG Working Group on Preservation Metadata has developed a Metadata Framework that builds on the OAIS model but identifies metadata elements at a much greater level of specificity. However, because they are concerned with preservation they focus solely on metadata related to the long term existence of digital objects and do not deal with metadata for discovery and retrieval or dissemination. Various domains emphasize different uses for metadata, and therefore create, differentiate, and group metadata elements in variant ways. The uses and the interests of the domain affect the content and structure of the metadata scheme.

Regardless of the way we categorize the different types of metadata elements, this data serves many different purposes such as:

- Providing (government) online services and records
- Identifying digital objects
- Rights management
- Digital preservation and archiving digital collections
- Managing multi-media files
- Customer relationship management (CRM) and researching the use of digital collections
- Managing and archiving relational databases
- Preserving the links between and among digital objects.

Roughly two main areas can be distinguished with respect to metadata: the ability to find and understand of information sources throughout an organisation or the World
Wide Web, and the necessity of managing and preserving information objects. The ultimate goal is to be able to use these sources one way or another through time and across domains. At the user end developments such as the semantic web are under way with the objective of adding meaning to these web sources, so that intelligent agents can search more effectively and efficiently. But the question remains of how does this development relate to the attempts of different communities to standardise metadata element sets serving their management needs?

**Different communities, different needs**

The fundamental role that metadata plays in the access and preservation of digital objects has lead various domains and professional communities to develop their own metadata schemes. For example, information technologists have developed metadata requirements for data dictionaries, while the bibliographic community has developed metadata schemes to improve the retrieval of digital documents such as the Dublin Core, and the digital library community has developed the METS standard. METS identifies the metadata needed to discover, retrieve, and render the digital object as well as to ensure that the objects can be migrated over time and includes administrative metadata, structural as well as descriptive metadata. The preservation community has developed metadata schemes for the preservation of digital objects, as previously noted. Archivists have focused more attention on identifying the data needed to preserve the meaning, reliability and trustworthiness of records across time. For example the metadata scheme for the Pittsburgh project, the Victorian Electronic Recordkeeping Model (VERS), the UK Public Records Office’s Metadata Scheme, and the Australian SPIRT project (University of Monash) have all identified different metadata elements required to preserve digital evidence over time. The Pittsburgh Model and the SPIRT model are more conceptual, while the VERS model and the PRO’s metadata scheme are more concrete.

Many but not all of these various groups have built on each other. For example the Australian government locator scheme used and augmented the fifteen elements of the Dublin Core metadata set, and the VERS model incorporated the work of the Pittsburgh metadata scheme. However, not all schemes are compatible with schemes promulgated by different domains often employing different terminology and developing incompatible taxonomies. In these cases, the interoperability of the schemes remains a problem.

This situation raises the question to what extent standardisation is needed, or what role standards should play in the creation of metadata. Will an international ‘standard’ element set be desirable or feasible, and if so what purposes or needs should it fulfil? The growing need of communities to communicate with each other, for instance in e-government and e-commerce, and that of end-users to understand the information sources offered to them by different information providers require some agreement or common basis. It is unlikely, however, to assume that one standard which will serve all needs and (for instance a kind of ‘metadata-esperanto’), but without one standard how can we ensure interoperability across domains?
How to find your way through the standards forest? Interoperability

Interoperability is essential for the sharing of metadata and information, but more importantly it is key to sharing the information in digital objects across domains and through time. Sharing information and research efforts on metadata should make it possible to:

1. avoid duplications of efforts,
2. establish a compatible terminology,
3. enable better understanding and communication, and
4. increase and enable the sharing of digital objects and fruits of research among different communities.

Concern over the interoperability among schemes has arisen because of the plethora of initiatives on metadata and the various schemes that have been developed. Therefore an infrastructure that facilities interoperability is needed. Recently work has started on developing a metadata registry to identify the various schemes and to document their overall structure and purpose. This is a good first step toward metadata interoperability.

Extensible Markup Language (XML) is being heralded as a robust data structure that optimizes metadata sharing and facilitates interoperability. It is a language for expressing information in a structured document according to a schema and therefore it enables sharing of documents and their accompanying metadata that comply with the same schema. Resource Discovery Framework (RDF) provides a meta-language or framework for describing and exchanging metadata from different domains. and thereby provides a metadata framework that facilitates interoperability of variant metadata schemes. RDF is used in a variety of application areas. For example it can enhance search engine capabilities or be used by intelligent software agents to knowledge sharing and exchange. XML and RDF hold great promise to increase interoperability of schemes, but they are not a panacea. Interdisciplinary works and metadata schemes that interoperate require that we overcome (and reconcile) the challenges of different languages, various taxonomies and the variant worldview of metadata developers that impact on the creation of metadata schemes.

Cross-walks between different metadata sets are fraught with problems, because they assume a common understanding and consistency in language across domains. However this commonality does not always exist. OAIS has served as a high-level reference model providing a common understanding and language for digital preservation. Do we need a metadata reference model that can serve the same function? Can the new metadata standard being developed by ISO TC46/SC11 records management committee serve as a reference model for metadata and provide a common language for the records management field? The OCLC/RLG Working Group on Preservation Metadata has developed a reference model for preservation metadata that builds on the OAIS model as previously noted. Will its focus on preservation limits it applicability? What research is needed to ensure metadata interoperability?

Another question is to what extent standardisation contributes to interoperability or should we rely on intelligent agents that search the web for information sources that meet the profile they carry with them? The latter approach is taken in the semantic
web. This approach requires however also a lot of effort in developing and building ontologies that describe the semantics and relationships of the terms and concepts used in a certain domain. Nonetheless this has to be taken into account when talking about metadata initiatives that serve other needs.

**Sources of Metadata. Metadata Creation / inheritance**

Various scenarios are proposed for metadata creation. Some domains envision information professionals supplying metadata, for example, librarians create a bibliographic record for library objects. Other domains envision end users creating metadata, for example the Dublin Core suggests that creators of webpages will add Dublin Core elements to improve retrieval of their webpages. Some systems automatically supply metadata, for example Word-processing software creates document profiles by automatically capturing information about who created a digital object, when it was created and when it was revised. Other systems envision that metadata will be supplied by the software and will be augmented by individuals who create, manage or use the records. For example, email systems automatically provide much of the metadata related to an email message, but the creator of the message must supply the email address of who the message is being sent to and can supply information concerning the subject of the message.

Almost all systems allow people, including information professionals, creators or users of records to add metadata to the records across time. Some suggest that only automatically generated metadata is cost effective for any large-scale digital object repositories. Automatically generated metadata would also avoid having end-users to add metadata, because few creators are willing or able to supply metadata. Research to date suggests that people will supply very little metadata to records, but the circumstances that increase their willingness to do so is unknown. Having information professionals on the other hand augment objects with metadata after their creation is simply too expensive for many organizations to support. More research that investigates the cost/benefits of metadata and implementation issues is needed. Also what sort of infrastructure is needed to ensure metadata capture at appropriate times?

**Implementation**

Although the importance of metadata for long-term preservation has been acknowledged little is known about how these systems should be implemented. As previously stated the OAIS model identifies metadata packets, but it does not provide guidance on how metadata should be captured or from where metadata should come? Groups have tended to focus on developing reference models or identifying metadata schemes without developing best practices for metadata implementation. The new Metadata Guidelines based on the Records Management Standard, being drafted by the ISO TC46/SC11 records management committee goes a long way to filling a void by providing guidance on managing metadata for records. Implementation issues related to who is responsible for metadata or the content of policies and procedures related to metadata and how to enforce compliance with a metadata standard will be addressed in this standard. It also addresses issues of what level of digital objects does one assign metadata, the system, the series, or the item. This is similar in some ways to VERS, which discusses metadata for digital objects and metadata required at the records level. Another concern to the management of metadata over time is the tendency of language or better semantics of words to change. With changes in language there are concomitant changes in the meaning of metadata. A metadata
registry might help track changes in semantics, but the metadata needed to describe metadata schemes still needs to be determined.

On the other hand, metadata can be added to records or digital objects with every migration, and every use and over time appraisal decisions about which metadata to keep will need to be made. Criteria for making appraisal decisions about metadata have never been addressed in any systematic way. Moreover we need a better understanding of how to choose between the various schemes available for use. What makes someone accept one metadata scheme, but not another? What are the factors that they should consider when choosing one scheme over another? How do they decide between the benefits and limitations of each?

What is needed in the area of implementation are for example an implementable data model, e.g. for preservation metadata, tools that can help to automatically extract metadata, and better communication with software suppliers about supporting preservation metadata. The e-commerce community is very active in this area. What can be learned from them? What other developments are under way? What other needs can be identified, who should be involved and responsible, and, last but not least, how can they be initiated and achieved?

**Are metadata costly? Aspects of cost**

An argument heard very often is that (adding) metadata is very costly, in terms of creation, maintenance, and effort in general. To be able to assess costs it is necessary, however, to take into account also what benefits are derived from it. Neither of these two questions has been answered properly and hardly any research has been done on them. Nonetheless they are valid questions and better insight is needed. This also relates, however, to the issue of importing existing metadata from (other) systems, an issue often forgotten. Many metadata may already exist. The e-government and e-business environments produce lots of metadata to enable service delivery and communication for example. How can organisations benefit of sharing metadata?

Another aspect is the role metadata can play in risk assessment. To what extent can they support mechanisms for measurement, quantification or validation of risk in different business contexts? To date, few have examined this role of metadata.

Finally, as previously mentioned, what contribution, i.e. tools, can IT provide to support an easy and automatic extraction, capturing and manipulating metadata?

This seminar will discuss some of the issues and identify ways to address some of these challenges.
Further Reading Material


- The work on metadata of the UK Office for Library and Information Networking (UKOLN, University of Bath, UK), http://www.ukoln.ac.uk/metadata/
Seminar Programme
Wednesday 3rd - Friday 5th September 2003
Marburg, Germany

Wednesday, 3rd September
12:30  Registration
13:30  Welcome – Frank Bischoff (Director Archives School, Marburg)

Introduction
13:45  An Overview of Metadata Initiatives
      Wendy Duff (University of Toronto, Canada)
14:30  Preservation Metadata, OAIS and the bigger picture
      Steve Knight (National Library of New Zealand)
15:15  Break
15:45  Practical Session
17:00  Reporting
17:30  Closing

Thursday, 4th September

Different communities, different needs; interoperability
09:30  Libraries and Digital Preservation: Why and How
      Heike Neuroth (Göttingen State and University Library, Germany)
10:00  Serving several masters
      Malcolm Todd (National Archives, UK)
10:30  Break
11:00  Data exchange and archiving in space data
      Denis Minguillon (CNES, France)
11:30  Metadata and eGovernment
      Palle Aagaard (IT and Telecom Agency, Denmark)
12:00  Discussion Panel
      chaired by Seamus Ross (Director HATII and ERPANET, UK)
12:45  Lunch

Standards, Processes and Schemas
14:00  Preservation metadata initiatives: practicality, sustainability and interoperability
      Michael Day (University of Bath, UK)
14:30  The good thing about standards is that there are so many of them!
      Andrew Wilson (National Archives of Australia)
15:15  Break
15:45  Practical Session
17:00  Reporting
17:30  Closing
Friday, 5th September

Implementation issues

09:30  Climbing up the Information-Mountain
       Thomas Severiens
       (Institute for Science Networking, Germany)

10:00  Working with Metadata in Digital Archives
       Bill Roberts (Tessella)

10:30  Break

11:00  Searching electronic documents
       Lars-Erik Hansen
       (Swedish Social Insurance Administration)

11:30  Practical Session

12:30  Reporting, discussion, and wrap up

13:15  Closing
Palle Aagaard  
*IT and Telecom Agency, Denmark*

**Biography**

Palle Aagaard is a consultant in the National IT and Telecom Agency, Denmark. He is responsible for the Danish eGovernment metadata-standardisation in the field of Information & Documentation as part of the Danish eGovernment XML-initiative. Prior to this Palle had responsibilities with the Danish accessibility guidelines and other web-related recommendations regarding usability. Palle has worked in the field of information science for many years especially with automatic thesaurus construction, simultaneously search in library databases and subject data. Palle is currently a member of the Advisory Board for MIREG (EU-IDA programme’s European metadata model and framework) and the Dublin Core Advisory Committee. He is also co-chair of the DC-Government working group.

**Abstract**

**Metadata and eGovernment - the Danish Approach and Experience**

Interoperability and metadata are today keywords in eGovernment. Interoperability is based on the common use of the same concepts, which often means use of common standards. But what can be done when the existing standards are not sufficient and the decision makers nevertheless want solutions yesterday. Denmark has chosen the hard way, which means “make standards when you implement solutions considering what is happening at the international scene”. This approach means difficulties, but it also means fast implementation of eGovernment in Denmark, and Denmark has invested a lot of work in initiatives regarding documents and collection of documents. The hard way approach also demands co-operation at various government levels and an organization and strategies, which can fulfil the tasks.
Frank Bischoff

Director Archives School Marburg, Germany

Biography

Frank Bischoff studied history, theology, and pedagogy. Subsequently, he spent a year at the "Ecole des Hautes Etudes en Sciences Sociales" in Paris. Parallel to his position at the Marburg Photo Archive of ancient medieval documents (Lichtbildarchiv älterer Originalurkunden) with original charters until 1250, he worked since 1986 at the Philipps University, Marburg, in the department of Auxiliary Sciences of History first as a scientific assistant, then as a lecturer. Another position abroad took him to the German Historic Institute in Rome. From 1996 on he worked as an archivist at the North Rhine-Westphalian State Archives of Münster. He returned to Marburg in 2003 where he is director of the Archivschule Marburg.

Biographie

* 1959 Altenkirchen/Westerwald
1978-1985 Studium Geschichte, Evangelischen Theologie und Erziehungswissenschaften
1986-1991 Wissenschaftlicher Mitarbeiter am Fachgebiet für Historische Hilfswissenschaften und Lichtbildarchiv älterer Originalurkunden bis 1250 der Philipps-Universität Marburg
1991-1993 Lehrbeauftragter am Fachgebiet für Historische Hilfswissenschaften in Marburg
1993-1994 Stipendiat am Deutschen Historischen Institut in Rom
1994-1996 Archivreferendariat NRW Staatsarchiv Detmold und Archivschule Marburg
1996-1999 Dezernent NRW Staatsarchiv Münster, zuständig für Regierungsbezirk Münster und IT
1999-2003 Abteilungsleiter NRW Staatsarchiv Münster, zuständig für Abt. 1 Nördliches Westfalen und IT
seit März 2003 Leiter der Archivschule Marburg
Michael Day

University of Bath, United Kingdom

Biography
Michael Day is a Research Officer at UKOLN, based at the University of Bath (United Kingdom). Since joining UKOLN in 1996, he has worked on a range of metadata-related research projects, which have mostly concerned the development of Internet subject gateways, interoperability, and digital preservation. He led UKOLN's involvement in the Cedars (CURL Exemplars in Digital Archives) project, contributed to the development of its preservation metadata specification, and produced the Cedars Guide to Preservation Metadata (2002). He was also a member of the international working group on preservation metadata commissioned by the Research Libraries Group and OCLC Online Computer Library Center that produced A Metadata Framework to Support the Preservation of Digital Objects (2002). His more recent projects have included a feasibility study of Web-archiving, undertaken on behalf of the Joint Information Systems Committee and the library of the Wellcome Trust.

Abstract

Preservation metadata initiatives: practicality, sustainability and interoperability

In recent years there have been a range of metadata specifications and frameworks developed to support digital preservation activities. These range from formats that are intended to be specific to certain types of resources (e.g., MPEG-7 for multimedia resources, VERS for electronic recordkeeping, etc.) to generic frameworks based on the information model defined by the Reference Model for an Open Archival Information System (OAIS). Those specifications that exist have been developed from the perspective of a variety of different professional domains and world-views. The presentation will outline some of the problems that result from these differing perspectives of preservation metadata initiatives and will highlight selected issues related to their practical implementation and sustainability, and will note the growing importance of interoperability.
Wendy Duff

*University of Toronto, Faculty of Information Studies*

**Biography**
Wendy Duff is an associate professor at the University of Toronto, Faculty of Information Studies. She received her PhD from the University of Pittsburgh. Her primary research interests are user studies, archival description, and electronic records. She has served as a member of the ICA Adhoc Commission on Descriptive Standards, the Encoded Archival Description Working Group, and chair of the Canadian Committee on Descriptive Standards and a member of the Planning Committee on Descriptive Standards. She is presently a member of the Canadian –US Task Force on Archival Description and the Encoded Archival Context Working Group. She was co-investigator for a digitization and access project: Usage analysis funded by the Andrew W. Mellon Foundation. She is presently investigating, how scholars evaluate the authenticity of documents, how archival users find information, and the use of metadata in the scholarly process. These projects are funded by the Social Sciences Humanities and Research Council of Canada.

**Abstract**

**An Overview of Metadata Initiatives**

Metadata and metadata standards are essential to the preservation of digital resources as well as access to these resources. Many governments, and standards bodies are designing and implementing metadata standards and research projects around the world are investigating various aspects of metadata. This presentation will provide an overview of metadata initiatives that are underway and suggestions of how these initiatives could be used.
Lars-Erik Hansen  
*Swedish Social Insurance Administration (SIA)*

**Biography**
Lars-Erik Hansen is an Senior Archivist of the Social Insurance Board in Sweden. He is responsible for the Archiving Project at the Social Insurance Board in Sweden. He has also worked at the National archive of Sweden on the division for inspections and consultation. Added to this Lars-Erik is a doctor in history at the University of Stockholm.

**Abstract**

**Searching electronic documents: The use of metadata within the Swedish Social Insurance Administration (SIA)**
Electronic documents must be marked to make it possible to find one document among many. How documents are marked and what metadata should be included are thus significant to efficient searching and archiving. Several projects are ongoing at the National Social Insurance Board in Sweden that, in one way or another, have to do with managing electronic documents. They are striving to arrive at a common view of electronic formats and metadata. This presentation will describe the results of that effort.

In the discussion of metadata between the two document management projects (one on electronic case management of social insurance cases (CMS) and the other on electronic management of mainly administrative documents) and the Archiving Project, focus was on the following questions: What must SIA preserve? What format should SIA use? Why does SIA need metadata? What metadata are relevant to SIA?
Steve Knight
National Library of New Zealand

Biography

Steve Knight is the Digital Library Transition Co-ordinator, Electronic Services at National Library of New Zealand. The Digital Library Transition Team was established to ensure the long term storage, preservation, and provision of access to New Zealand's digital cultural heritage and to enhance access to New Zealand cultural heritage online through an increased digitisation programme. In conjunction with other business units, the team researches and facilitates the implementation of the operational and technical infrastructure for the integration of digital materials into the collections of the National Library.

From a library background Steve has had experience in a range of information management disciplines, including records management and document management. Much of this work has been in the design and implementation of electronic services.

Abstract

Preservation Metadata, OAIS and the bigger picture

The National Library of New Zealand Te Puna Mātauranga o Aotearoa (NLNZ) has a legislative mandate for 'collecting, preserving, and protecting documents, particularly those relating to New Zealand, and making them accessible for all the people of New Zealand, in a manner consistent with their status as documentary heritage'. This mandate has been given a serious twist in a period of intense change brought about by the quantity of digital resources that must be managed and the knowledge that the rate at which we accumulate this material will dramatically increase year on year. The complexity of digital objects is a concern, as is the rising proportion that are "born digital" rather than as digital copies of analogue items from the Library's collections.

The Library has adopted an holistic approach to the long-term management of its digital assets. This presentation will look at the Library's work on preservation metadata, the need to move on from defining schemas to implementing schemas and attempt to place the work on preservation metadata in the context of the Library's overall response to the requirements of digital material.
Denis Minguillon  
*CNES – Centre National d’Etudes Spatiales, French Centre for Spatial Research*

**Biography**

Denis Minguillon is an engineer supporting software design as well as data description and management. Since several years he is a member of a panel of the Consultative Committee for Space Data Systems (CCSDS) focusing on those topics. In this framework he contributed to the issue of several recommendations and to the development of related support tools.

**Abstract**

Data exchange and archiving in space data: the experience at CCSDS

This presentation views the requirements for scientific data from the background of the long-lasting experience in the space sector. The CCSDS, a world-wide cooperation of numerous space agencies and industrial associates, develops protocols and solutions in space data handling. Their focus is on data packaging to facilitate interoperability, and data description on a syntactical as well as a semantical level. Standards in those fields include the EAST language, which is of major importance in the description of scientific data and is an ISO standard since 2000. Also, actual tools have been developed including the OASIS tool.
Heike Neuroth

Göttingen State and University Library

Biography

Heike Neuroth is head of the Research and Development Department at Göttingen State and University Library (SUB), Germany. In the last years she was involved in the development of several WWW-based services (i.e. Subject Gateway, Virtual Library, Renardus), especially in the field of metadata. She is very active in several working groups of the Dublin Core Metadata Initiative as well as in other national initiatives. Since the previous year she has been responsible for the development of concepts and methods in the field of long-term preservation, also considering metadata profiles. She also participates in a national project for the development of an initiative for long-term preservation in Germany, similar to DPC in the UK. She holds the office of secretary for the German Initiative for Networked Information (DINI). This initiative was modelled on the Coalition of Network Information (CNI) in the US.

Abstract

(Scientific) Libraries and Digital Preservation: Why and How

Increasingly libraries are becoming responsible for indexing and preserving digital objects like books, online resources etc. They create metadata about these objects to provide online access via searching and browsing services. Since the digital world is evolving at a rapid pace libraries have to employ methods and concepts to guarantee long-term access to their holdings and to the relevant information their target group(s), e.g. the scientific community, relies on.

This talk will provide an overview on the very heterogeneous types and formats which preserved documents might feature and will investigate developments and projects in this field. Key issues will be the different types of metadata, especially preservation metadata, to describe the whole life-cycle of a digital object. As no institution is able to preserve the cultural heritage on their own accord agreements on international standards and methods are in pressing need in order to share the knowledge on preservation and to develop redundant repositories.
Bill Roberts  
*Tessella*

**Biography**
Bill Roberts is a software engineer, working for Tessella in Den Haag in the Netherlands, where for the last three years he has been working on the Dutch government Digital Preservation Testbed project. He was responsible for design and development of various software systems to support the work of the Testbed, as well as providing advice on IT related issues. This project involved close co-operation between team members of very different backgrounds, helping Bill greatly in translating his scientific and IT experience to the world of archiving. He is currently collaborating with Tessella colleagues on a number of digital preservation related activities.

**Abstract**
**Working with Metadata in Digital Archives**
This presentation addresses some of the practical issues and design decisions which arise when building IT systems to support storage and long-term preservation of digital records. Drawing examples from archive implementation projects, the talk covers some important points to consider when collecting, storing, searching and editing metadata.
Thomas Severiens  
*Institute for Science Networking, Germany*

**Biography**

09.99 Diplom in Physics at the Carl-von-Ossietzky University Oldenburg  
since 95 developing of PhysNet [www.physnet.net](http://www.physnet.net)  
97-98 "EPRINT" (DFN) [www.eprint.de](http://www.eprint.de)  
99-01 "CARMEN" (BMBF, Global-Info)  
  www.mathematik.uni-osnabrueck.de/projects/carmen/  
since 01 "SINN" (DFN) [www.isn-oldenburg.de/projects/SINN/](http://www.isn-oldenburg.de/projects/SINN/)  
since 01 member of W3C working group XML-Query  
since 01 member of IWI Institut fuer wissenschaftliche Information  
since 02 collaborator and co-proprietor of the Institute for Science Networking:  
  development of several portals e.g.:  
  Fachwelt Physik for the AKI (special-interestgroup information of the German  
  Physical Society),  
  ViFaPhys The Special Subject Library for Physics  
since 02 member of technical working group of VASCODA [www.vascoda.de](http://www.vascoda.de)  
For additional information: [www.severiens.de](http://www.severiens.de)

**Abstract**

**Climbing up the Information-Mountain**

The talk gives an overview onto several projects, trying to produce metadata and to  
link between distributed information sources. Are all the problems solved, describing  
textual objects? What’s about interoperability? What does the user expect? How to  
handle non textual objects? The talk offers a closer view onto some running project,  
as there are vascoda.de, physnet.net, Dublin-Core, XML-activities of W3C, physik-  
multimedial.de, and several document-servers for local and distributed institutions.
Malcolm Todd
UK National Archives

Biography
Malcolm Todd has led the UK National Archives’ work on metadata for the past 2 years. This has produced the first UK government records management metadata standard and draft XML schemae to implement that standard, not least through National Archives software evaluation programme, which he has also run for the same period. He represents the government archival and records management perspectives to the Metadata Working Group of the UK Office of the e-Envoy. This has been the major driver for the revision of the e-Government Metadata Standard (e-GMS2) completed in May 2003.

Abstract
Serving several masters: the UK experience with records management metadata
European National Archives have typically been dealing with metadata for centuries. Discussing the metadata required for credible records management in an electronic environment and implementing it involves engagement with these other communities to ensure that records management standards are met, whilst supporting the needs of e-government including resource description standards for both current and archival material. It is extremely difficult to produce one standard that will encompass everything without compromising what one discipline sees as an important principle. Implementing any standard involves persuasion, negotiation and time. For us, it has also involved a close relationship with other workstreams such as software evaluation.
Andrew Wilson
National Archives of Australia

Biography
Andrew Wilson is an Assistant Director in the Preservation section of the National Archives of Australia. He is responsible for managing an R&D project developing a viable approach to the long-term preservation of digital records. Prior to this Andrew was responsible for development and maintenance of the Dublin Core based Australian Government Locator Service (AGLS) metadata element set, now issued as Australian Standard AS 5044. Andrew is currently a member of the Dublin Core Advisory Committee, and a member of the DCMI Usage Board. He is also co-chair of the DC-Governments working group.

Abstract
The good thing about standards is that there are so many of them! The Australian Experience with Metadata

There are a multitude of metadata standards out in the world, covering everything from data management to discovery and accessibility. How do we find out about the available standards? How do we choose the right one for our needs, and how do we know if we’ve made the right choice? This presentation will address the issue of metadata standards and why they are necessary if we want to implement viable metadata strategies. The presentation will then discuss some of the practical experiences we have had in Australia in choosing and implementing metadata standards for use in the Government sector.