

Memory of the World Programme

International Advisory Committee

**Report of Third Meeting of the
Sub-Committee on Technology**

National Library of the Czech Republic

Prague

March 1st to 4th, 1996

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Report of Meeting

1. Introduction

Adolf Knoll, Deputy Director of the National Library of the Czech Republic, welcomed the participants to Prague and to the National Library. He reported that Michael Alexander, of the British Library and a member of the original group, had been taken ill and was unable to attend the meeting. He then introduced Vojtěch Balík, Director General of the National Library, Michal Benes of the Ministry of Culture, Abdelaziz Abid, Programme Officer for the UNESCO Memory of the World Programme, Ariane Iljon, Head of Unit, Directorate General XIII, European Commission and Dietrich Schüller, Director of the Phonogrammarchiv of the Österreichische Akademie der Wissenschaften and Co-Chair of the meeting.

Mr Knoll thanked UNESCO and, particularly, the European Commission for their support, without which the meeting would have been impossible to arrange. He said that the meeting was not a conference but a group of colleagues who have come together to discuss and decide how they can assist with the development of the Memory of the World Programme.

Vojtěch Balík welcomed the participants to the Klementinum. The present building was constructed as a college by Jesuit priests and currently houses the National Library. A new repository has been built and the task of moving the collection was about to begin. The meeting had brought together people with knowledge of old information technologies and of new to explore how the new technologies could help preserve the old. The National Library of the Czech Republic was pleased to be part of the Memory of the World Programme and, in fact, had been responsible for the first project to be undertaken within the Programme.

Michal Benes said that the Czech Republic had many cultural items that were worthy of preservation. The task facing the Ministry of Culture was very large but the parameters set by the Memory of the World Programme would be a very helpful guide for the work. The main priority of the Ministry was to ensure the survival of the Czech patrimony.

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Abdelaziz Abid said that he was pleased to attend this meeting of the Sub-Committee on Technology held at the site of the first project within the Memory of the World Programme. He welcomed the newcomers to the Sub-Committee and said that they were joining a "task-force" working to preserve the documentary elements of the cultural heritage of the world. The aim of the Programme was to combine old and new technologies to preserve and improve access to the documents that collectively form the Memory of the World. The increasing co-operation between UNESCO and the European Commission was a sign of the growing awareness of the importance of this work. It was hoped that the meeting will provide new perspectives and show new ways to progress the work of preservation. It was also hoped that the work will stimulate more co-operation between countries and institutions to help ease the burden of what is a task of enormous magnitude.

Ariane Iljon said that the objectives of the European Commission in general and of Directorate General XIII in particular had a great deal of congruence with the aims of the Memory of the World Programme. The Third Framework had supported a number of projects of great relevance to the Memory of the World Programme. In addition, the concept of the Electronic Library that is being explored by the G7 group of nations was also very relevant. For the Programme to be successful, the technical standards applied must be in harmony with those applying to other initiatives with a similar aim. The EU were very pleased to co-operate with UNESCO to achieve a common, fundamental aim. Ideally a common set of minimal technical standards were required that do not block the development and application of new technologies. The first blocks of funding would, if used correctly, help to stimulate further development work.

Dietrich Schüller gave a short summary of the history of the Memory of the World Programme for the benefit of the newcomers to the group. It was launched in 1993 by Federico Mayor, Director General of UNESCO, and was the first large scale initiative to recognise and address the lack of appreciation of the non-monumental heritage of the world. Much of it is at risk and the great majority of the world's population are unaware of the importance of keeping it in good condition and accessible. The Memory of the World was acting as a trail-blazer to help others preserve the thoughts and ideas of earlier generations.

After an exploratory meeting in Paris in 1992, the first meeting of the International Advisory Committee was held in Pultusk in Poland in 1993. The Sub-Committee on Technology was established in 1994 and its first task was to investigate the applicability of digitisation of documents to the Programme. The Report was published in 1995 and accepted by the International Advisory Committee at its meeting in Paris in May that year. For its second task, the Sub-Committee was requested to investigate the existing standards for preservation of documents and access to them. The meeting in Prague was the first stage in this work.

The Agenda for the meeting had three major topics:

1. Review of Existing Preservation Standards for Documents of All Types.
2. Review of Digitisation Standards (The First Report of the Sub-Committee for Technology).
3. The Harmonisation of Access to Electronic Documents.

Dietrich Schüller would be the Chair for Items 1. and 2. and Adolf Knoll the Chair for Item 3.

The co-operation between UNESCO and the European Union has permitted the widening of the scope and the participation in the discussions. The wider membership of the Sub-Committee will result in more opportunities for cross-fertilisation of ideas between the various groups of archivists and librarians. It will also lead to a better understanding of the problems facing the custodians of the various types of carriers. This will, in turn, help with the development of the desired harmonisation of access.

The opening session concluded with each participant giving a short summary of their work etc.

2. Review of Existing Preservation Standards for Documents of All Types.

Dietrich Schüller introduced this agenda item and said that the aim was to explore and agree the basic structure of a compendium of standards relevant to various groups of documents but not to decide all the details. The compendium is intended to assist custodians of documents by easing the task of finding the relevant information about preservation. The preservation of the original documents is central to the Memory of the World Programme. The previous work of the Sub-Committee on Technology on digitisation had led some to believe that the Memory of the World Programme was only about digitisation and access. The preservation of the original document is to be pursued for as long as it is practical.

Access is, however, equally important. Billions of dollars of public and private money were being spent on the development of communications systems with faster speeds and greater capacity. Satellites were being launched and cables installed. The area that is being neglected in all this activity, however, is the traffic to be carried on these new "Super Highways". Much of the traffic would be real time - telephone conversations, E-Mail messages etc. - but much more would come from storage devices. The contents of libraries and archives would increasingly be sought by entrepreneurs to fill the spaces on the communications networks. Indeed, there were clear signs of this beginning to happen. Carriers of all kinds, and audio-visual carriers in particular, are, however, vulnerable and prone to decay. If the holdings of libraries and archives are allowed to decay, they could not be used to help fill the information networks. The information required by the networks will spread far beyond the obvious entertainment based material to include science, art, politics, economics etc.

Ariane Iljon gave a summary of the current EU initiatives relevant to this debate. She also referred to the work of the US Commission on Preservation and Access and the many documents that they had published covering a wide range of information carriers. The European Commission on Preservation and Access had recently been established and is to hold a conference about traditional preservation methods in Leipzig at the end of March 1996. A conference held in Vienna in 1986 had considered the problems of preserving newspapers and books. IFLA had organised a survey about national policies in this area which had been published by UNESCO. There is also to be an EU study into the ways that new technologies can be employed to assist with the preservation of older information carriers.

The past heritage was usually created with the intention that it would survive forever. Today, much information was ephemeral. This raised questions about the capture and selection of such information for the benefit of future generations of researchers.

A general debate followed during which the following points were made:

A. The information contained by many documents went beyond the basic information that the creator wished to communicate. There were hand-written notes and alterations, stains, water marks etc. that should also be preserved.

B. When cleaning works of art, it is now common practice to make a high quality digitised copy of the work before commencing the cleaning process. The digitised version allows much investigation into what is beneath the dirt and grime without physically touching the original. It also provides a method of making a record of the changes made at all stages of the work. The Canadian Heritage Information Network (CHIN) has a major data base listing possible cleaning and restoration methods.

C. Digitisation in itself is an aid to preservation. The use of a digitised access copy and the restriction of access to the original reduces the stress on the original document.

D. Many historic recordings are being re-issued and are earning money for the publishers. The commercial attitude to archives and libraries is changing. The archive is no longer seen as a "money pit" but, increasingly, as a source of revenue. The economics of preservation are changing and this must not be overlooked.

E. A good archivist does not only preserve documents - he also selectively destroys them. Much of the information is worthless. In addition, the world does not have the resources to keep every piece of paper or tape that is produced.

F. Technical standards are important. The archive and library world must, however, work harder to influence the International Standards Organisation (ISO) and the other standards bodies. The standards that do exist have not been disseminated widely enough. More needs to be done to make people aware of what exists already. The proposed compendium will be a very helpful tool.

G. The application of technical standards requires some training and experience of the appropriate technologies. Possessing a copy of a standard is merely the first step.

H. The various groups within the archive and library world do not have a common language. To achieve harmonisation, a common understanding of terms etc. must be reached.

J. The UNESCO RAMP Studies are a good source of information. The series currently contains 108 publications and copies can be obtained from PGI at UNESCO in Paris. IFLA have established a project to translate selected RAMP Studies into a number of Eastern European languages.

K. A joint ICA/IFLA Project Group is compiling a collection of articles relevant to archives and libraries in Africa. The completed publication will be available in English and French.

L. Most information carriers are designed for use in the First World which, in general, has a more temperate climate. More research is required into carriers suitable for use in other climatic conditions.

M. Initiatives to assist less developed nations should not rely solely on despatching an expert for a short duration mission but should allow time for the in depth exploration of local problems and the full involvement of the local staff.

N. Many Third World countries have problems with adverse climatic conditions. Heat, humidity, dust are common problems. In addition, the local energy supply is often erratic and unreliable. The cost of maintaining a suitable climatic conditions in the storage vaults is often too great a burden for the institution.

P. The investigation of traditional methods that may offer cheaper, less energy dependant methods of preservation is necessary. Constructing buildings in Third World countries to plans and with materials designed for use in the First World is frequently inappropriate. Many tropical countries have traditional building methods that provide a cool, airy interior which may be adapted for storage purposes. For example, the use of corrugated steel for roofs frequently leads to the building overheating during the day and a rapid drop in temperature at night. A secondary roof above the existing roof, with a space for air to circulate between them, will help to avoid these extremes of temperature.

Q. The possible application of traditional building methods in Third World countries should not be used as an excuse to reduce standards in the First World. The primary aim must still be the maintenance of a stable environment with the humidity and temperature kept at the optimum for the carriers in the repository. Any relaxation of this policy where it was not necessary would be wrong.

Dietrich Schüller suggested that the debate took the following path:

1. Group the information carriers into families.
2. Agree the parameters of preservation for each family.
3. Identifying agreed preservation standards and where they can be located.
4. Identify and try to fill gaps in the existing standards.
5. Specify measures for countries facing unfavourable climatic or economic conditions.

This was agreed.

Several suggestions about the methodology for the grouping of information carriers into families were made and debated. A proposal from Astrid Brandt was accepted (ANNEX B) and co-ordinators appointed for each group. The co-ordinators will be responsible for acting as the point of contact for each work-group which may include people from outside the Sub-Committee. The co-ordinator will also act as the spokes-person for the work-group. The six family groupings chosen are:

Group 1: Traditional Materials - paper, parchment, leather, bindings and associated materials.

Co-ordinator: Helen Forde (with the ICA Preservation Commission).

Group 2: Photographic Materials - still images on paper, glass, cellulose and other polymeric materials.

Co-ordinator: Jonas Palm.

Group 3: Micrography - microfilms of all types.

Co-ordinator: Wolf Buchmann (with the ICA group working with the ISO standards committee for micrographics).

Group 4: Audiovisual Records - sounds and moving images in all forms.

Co-ordinator: Dietrich Schüller (with the Technical Committees of FIAF, FIAT and IASA).

Group 5: Electronic Publications - CD-ROMs etc.

Co-ordinator: Trudi Noordermeer.

Group 6: Virtual Information - E-Mail, computer data etc.

Co-ordinator: Wolf Buchmann.

A date of June 30th 1996 has been set for the first draft documents to be sent to George Boston for collation and distribution to the members of the Sub-Committee and other interested parties.

The final output of each work-group will be in the form of a booklet or brochure. This will contain three main sections:

Section 1: A listing of existing relevant preservation standards. To include standards agreed by ISO and national and regional standards bodies, professional standards issued by societies such as the Audio Engineering Society and the Society of Archivists and de-facto standards accepted by experts in a particular field.

Section 2: Annotations of the standards to provide additional background information.

Section 3: Information about the application of the standards. This may be in the form of a commentary plus a check-list of steps to be taken.

The introduction to the brochures will emphasise that preservation and conservation of documents is much more than the simple application of standards. Preservation and conservation are the foundations upon which an archive or library is built and these concepts must pervade the workings of the institution at all levels.

Some carriers may be covered by more than one group. Such sections of the reports will be checked against each other for consistency of information but the duplicate entries will remain. Carriers not specifically listed in any of the Groups will be covered by the most appropriate work-group.

The modern electronic communications systems were discussed. It was agreed that the danger of losing important documents because of the ephemeral nature of information carriers such as telephones, E-Mail and many radio and television broadcasts is very high. As with paper records, not every document is worth keeping but archivists have to, at least, be given the chance to consider the value of the information before it is lost. In some countries, radio and television are subject to a form of legal deposit but these are the exception rather than the rule. Guide-lines for the archiving of such documents are needed. This is beyond the scope of the Sub-Committee but should be considered by the appropriate committees within ICA and other organisations.

The question of whether draft versions of such electronic documents are to fall under the remit of any such guide-lines was debated. If the guide-lines required that the electronic equivalent of every scrap of paper with rough notes on it generated within an office be kept, the archives will be overwhelmed. It will be equally bad to keep no working drafts of electronic documents at all because this will make it impossible to see how an idea has developed. Again, this question needs further examination by people outside the Sub-Committee on Technology.

A possible seventh brochure was discussed. This will cover general archive topics such as disaster preparedness and building construction standards. Some material has already been produced by the NGOs and could be collated into one short guide with the same format as the standards brochures. The International Standards Organisation (ISO) had recently circulated a draft standard about the storage requirements for library and archive material for comment (See Annex C).

The work-groups may need some financial assistance, for example for the purchase of copies of standards. Abdelaziz Abid said that the Co-ordinators should approach him for help if required.

3. Review of Digitisation Standards (The First Report of the Sub-Committee for Technology).

Dietrich Schüller opened the discussion by saying that the agenda Item fell into two parts. Firstly, a review of the text of the report and, secondly, a review of the suggested standards.

a. Review of the Text of the Report

The title of the first report had given rise to a number of comments. When the Sub-Committee on Technology was set up, it was created to complete only one task viz. the study of the practicality of using digital technology within the Memory of the World Programme. Subsequently, the life of the Sub-Committee had been extended and additional tasks allocated to it. The first report should, therefore, be re-titled to reflect these changes. "The Digitisation of Documents" would be more appropriate.

Such re-titling would also help remove some of the misunderstandings generated by the first report. A number of comments had been received to the effect that the report was advocating the digitisation of all documents and the destruction of the originals. The report had not said this. It had recommended that the use of digitisation be carefully considered as a means of improving access to documents and, where appropriate, as a means of creating a preservation copy. It stated positively that, whenever practical, the original must be preserved.

A number of comments were made during the discussion.

Comment: In Section 2.a, the Report flagged the possible need for documentalists to examine cataloguing rules.

Reply: It was stated that the appropriate ICA committee would be asked to consider whether the cataloguing rules should be revised to take account of any special requirements of a digitised collection, including the possibility of creating a web of links or pointers between entries. The G7 Group of Nations working group on the electronic library are also examining the possibility of linking existing catalogues to effectively form a unified catalogue.

Comment: In Section 3.c.iii. - Paragraph 5 of the reply to the disadvantages of digitisation - the Report quoted as an example the damage of some early commercial audio CDs by corrosive inks. Why had no explanation of the method used to cure the problem been given?

Reply: In fact, there had been no cure for the faulty discs. When the problem was discovered, the disc manufacturers used different inks for later pressings. The example quoted was the only relatively large-scale problem that had occurred with commercially issued audio CDs. It is an example of corrosion caused by a secondary factor and not inherent to the information storage system itself. It is quoted to give re-assurance about the relative safety of information stored on pressed CDs of all types.

Comment: A digitised copy could be made accessible to several people independently and simultaneously.

Comment: Concerns were expressed about the suitability of digitisation for some types of documents. Digitisation would only be appropriate for some specialised purposes in the textual document areas. There is a danger that Third World countries would move too swiftly to digitise their holdings.

Reply: The principles behind these points were accepted but the Sub-Committee was reminded that the Report recommended that a collection should only be digitised after a careful examination of the potential benefits, and problems, that digitisation might generate for the collection.

Comment: There was a lack of comment about alternatives to digitisation such as micrographics. Many documents would still require an intermediate carrier. Over-expectations of the benefits of digitisation were being generated.

Reply: The Sub-Committee's brief was to examine digitisation not micrographics or other possible technologies. It had tried to give both sides of the story and not hide possible disadvantages with the use of digitisation. Replacement of existing documents by digitised copies is not the aim of the Memory of the World Programme unless the document is so decayed that the information that it holds is in danger of complete loss. The report also tries to clarify the differences between using digitisation as an access tool and using the technology for preservation purposes.

Comment: It was unclear who the Report was written for. There was also a lack of information about copyright and security questions.

Reply: At the time the report was drafted, pressure was being brought to bear on UNESCO and others to use Brand X or System Y for the Memory of the World Programme. The Report was primarily prepared for the International Advisory Committee to help them with their deliberations. Much pressure had been brought to make the Memory of the World Programme a programme for the creation of CD-ROMs. The Memory of the World Programme is more than just a programme for making CD-ROMs. One major task of the Programme is to raise the public awareness of the value of the non-monumental heritage of the world and the dangers that face it. Non-technical questions such as copyright are the responsibility of other working groups.

b. Review of Technical Parameters (Annex A of Report)

Dietrich Schüller said that the Report quoted three usage standards for digitised documents:

- a. Access - suitable for 95% of users.
- b. Intermediate Access - a higher quality access copy suitable for 99% of users.
- c. Facsimile - a very high quality copy that could be used to replace the original document and acceptable to 100% of users.

The resolution figures quoted within the Report are set at what the then members of the Sub-Committee thought were the minimum necessary to achieve an Intermediate Access Usage Standard. The actual resolution standards to be used can only be determined after the document has been examined.

It is intended that the figures quoted will be widely debated and a greater consensus established. The US Commission on Preservation and Access have quoted higher resolution figures in a recent document but it should be noted that these are set at a replacement standard (the equivalent of the Facsimile Usage Standard).

The discussion was taken section by section.

Introduction - test captures should be made before each main run of work to ensure that the equipment is in good condition and correctly aligned. The equipment used and the settings of any variables should be noted and stored as supplementary information with the image.

Section 1.a.i. - a discussion was held about the method to be employed for texts that could not be held flat, eg. bound books. These will have to be captured by a digital or photographic camera with the relevant page kept flat and the remainder of the book supported. In the latter case, the resulting photographic image will then have to be digitised. The use of TIFF files in preference to other formats was discussed. It was agreed that the use of TIFF files is the most flexible method as TIFF can be translated easily into the other formats when required.

Section 1.a.ii. - it was agreed that lossy compression may be used for non-critical images.

Section 1.b.i. - concern was expressed at the use of a resolution of 100 dpi. Because the major cost in digitisation is likely to be that of capturing the images, it was agreed that the use of a higher resolution standard is to be encouraged. The phrase "Use the highest affordable standard" is to be added to the introduction in any revision of the Report.

There was also a debate about the merits of using a lossy compressed eight bit grey-scale as opposed to the recommended loss-less four bit grey-scale. No clear conclusion was reached.

Section 1.c.ii - the use of the photo-CD format was questioned. The format is a two step system with two opportunities to adjust the information parameters. This is not acceptable as an archival format.

The relationship between the size of the original document and the resolution needed to capture it should be quoted in some form. Transparencies, with their smaller dynamic colour range, should be captured using a higher bit rate and then be compressed before final storage.

Section 2.a. - in general, the process of digitisation of sounds and moving images is very time-consuming. Even without difficulties, a time-ratio of 3:1 is typical for audio. This means that many documents would have only one chance of digitisation. To repeat the work will be too costly. Also, many of the carriers are decaying and may not be available for a second attempt later. The digitisation should, therefore, be carried out at the highest practical standard. It was agreed that a longer explanation of the difference between the digitisation needs of texts and still images and the digitisation needs of sounds and moving images should be included in any revision of the Report on Digitisation.

Some surprise was expressed at the resolution standards quoted. It was pointed out that the CD audio standard is already exceeded by formats such as R-DAT and the standards used in production are also in excess of the levels quoted. The speed of development means that the standards used for long-term storage should reflect these realities.

Developments in communications networks and replay systems may make the use of compression systems unnecessary. There are also questions about the effect of multiple compressions and de-compressions on digitised data. This underlines the need for loss-less data compression systems that restore the information to its original state after de-compression.

Section 2.b. - the storage of video on digital tapes recorded on specialist machines will continue to give concern about the Life-Expectancy of the information. Specialist machines are more subject to the commercial pressures of manufacturers wishing to bring new formats to market - formats that are not compatible with earlier systems. A computer based storage system that is format-transparent will overcome many of these difficulties.

Video compression systems are still being developed but they are unlikely to make optical discs a suitable mass storage replacement for a linear storage systems such as magnetic and optical tape.

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Section 2.d. - it is now technically possible to digitise film to a standard that exceeds the requirements of the most demanding film specialist. There are several such systems available and they are being used as production tools. What is still not available is a sufficiently large storage system that will offer significant space advantages over standard photographic film. The Fox programme to digitise its newsreel collection had been criticised for not using a preservation standard but a standard suitable only for access or for television.

Some general points were made in the closing part of the discussions.

Collections should begin now to budget for digitisation. Money should be put aside now for future work.

The priorities for the Memory of the World Programme are the preservation of the original documents and access to the information. It is clear that, in the main, any digitisation in the text world will be primarily for access purposes while in the sound and moving image world it is more likely to be for preservation reasons.

Any revised text of the Report should be cross-referenced to the Preservation Standards brochures.

Many new "written" documents are now created in the digital domain and are often of a higher quality than the standards quoted in the Report. This should be taken into account in any future revision of the Report on Digitisation.

4. The Harmonisation of Access to Electronic Documents.

Adolf Knoll introduced the debate on this topic by summarising the reasons for its inclusion on the agenda. Scanning a document to produce a digitised image requires standards - a common platform. The proliferation of operating software for CD-ROMs means that special software has to be purchased with every disc to ensure that the information can be accessed.

Even within the Memory of the World there are several operating systems because each pilot project has been carried out in isolation. The emphasis has been on exploring the problems of digitisation. Consideration also has to be given to the use of distribution methods other than the CD-ROM, for example, the use of Internet distribution. A simple, universal set of rules, that can be applied to digitised copies of documents made as part of the Memory of the World Programme, are needed. The choice is between having a harmonised architectural structure, accessible by generally accepted and widely available software, or continuing as we have been with new software for almost every product.

Adolf Knoll then invited some of the participants to give a short presentation of current work in the field.

Trudi Noordermeer spoke about the INCIPIT Project - a project involving six European libraries, a commercial publisher and DG XIII of the European Commission - which is producing a series of CD-ROMs that contain information from the British Libraries Incunabula Short-Title Catalogue. More information is contained in ANNEX D.

Jan van der Starre spoke about the Van Eyck Project which is also being funded by DG XIII of the European Commission. This project is creating a database containing information about reproductions of works of art (see ANNEX E). The images included in the current work are non-copyright to avoid difficulties of clearance. The searching for an image can be done using traditional catalogue methods or by using an outline or part of an image as the search key. The work being performed at the Institut de Recherche en Informatique de Toulouse (IRIT) in the field of image recognition was mentioned.

Ariane Iljon reported briefly on two other Projects being supported by DG XIII that are of relevance. The first is ELISE which is working with the Victoria and Albert Museum collection of photographs. Partners in the project include de Montfort University in Leicester and IBM. The second project is HISTORIA. This is scanning a codex of heraldic devices to produce a preservation copy and access/browse images of the plates.

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Man-Sze Li gave a brief report of the Open Information Interchange (OII) which forms part of the IMPACT Programme of the European Commission. It is an on-line listing of standards in the electronic information field and covered standards for texts, images, sounds etc. Many standards cover more than one area and many repeat work performed elsewhere. The OII data base is accessible on the World Wide Web and its home page is at "<http://www.echo.lu/impact/oii/oiistand.html>".

The IMPACT Programme is coming to an end and is to be replaced by INFO 2000. Information about the new Programme is obtainable from the World Wide Web and the INFO 2000 home page is at "<http://www.echo.lu/info2000/info2000index.html>".

It was pointed out that the INFO 2000 Programme is targeting information not archives and libraries. It is intended to stimulate the development of the information industry. This will, in turn, increase the demand for information to fill the systems and the archive and library community should be prepared to help meet this challenge.

Three CD-ROMs produced as part of the Memory of the World Programme were demonstrated. The first was the disc of the Koranic fragments from Sana'a. Abdelaziz Abid gave a short explanation of the making and structure of the disc (see ANNEX F). Similar presentations followed from Jacque Klossa of the St. Sofia CD-ROM (ANNEX G) and Adolf Knoll of the disc of the Chronicon Concilii Constantiniensis (ANNEX H).

Adolf Knoll then tabled a discussion paper containing draft recommendations for digital copies of old printed books and manuscripts. He also tabled a document giving further information about the application of the draft recommendations (ANNEX J).

After much debate, the Recommendations were accepted with some minor changes. The revised text of the Recommendations can be found in ANNEX K.

It was emphasised that the Recommendations could only apply to Projects within the Memory of the World Programme. If, however, the harmonisation idea worked well, it will be taken up by other publishers and become a *de facto* standard.

More work has still to be done in order to create a standard list of field names and to define the presentation of information within the fields. It was decided to form a working group to devise a field list for old books and manuscripts in libraries. The National Library of the Czech Republic offered to produce a CD-ROM to test the ideas. The CD-ROM may also be offered funding as an EC Project.

The work will then be examined by archivists working with the same carriers. The archivists will add fields and comment on areas of conflict before passing the work to other groups. After all groups have examined and commented on the work, it will be reviewed by the full Sub-Committee to decide what further work needs to be undertaken.

The results of this work will mean:

1. That the information is made available in a variety of ways including:
 - a. Local access via a CD-ROM.
 - b. Via networks including the Internet and Local Area Networks.
2. The document will contain information about:
 - a. The original document.
 - b. The digital copy - how it was captured etc.
3. The use of HyperText Markup Language (HTML) levels will be enabled.
4. The use of markers to facilitate searches.

A Working Group was formed charged with the task of:

1. Preparing a detailed specification of field labels.
2. Specifying the appropriate description rules, their formal application and any additional data necessary for the identification of the original document.

The Working Group contains six members:

Michael Alexander
Julian Bescos
Adolf Knoll
Man-Sze Li
Trudi Noordermeer
Jan van der Starre

Adolf Knoll is to be Convener for the Group and he will oversee the production of a sample CD-ROM based on the Recommendations of Working Group which may become an EC Project.

Ariane Iljon said that the work of the Working Group may be considered for funding as a Project by DG XIII within the next call for Projects. The likely dates for the call for applications are June 15th or September 15th 1996. Abdelaziz Abid said that UNESCO will consider helping to fund the costs of preparing a submission.

Dietrich Schüller said that the demonstrations had shown the need for harmonisation of access to the products of the Memory of the World. They had also demonstrated a need to discuss the harmonisation of the presentation of the product. Should the documents be presented as raw information or should they be embellished with music and other ancillary material? How much supplementary explanation should be provided to explain the basic information? These points are at the heart of a fundamental question that has been missed so far in the debates about the Programme. What is the prime audience for the output from the Memory of the World Programme. Is it the academic or is it the public? Is it to inform the seeker after knowledge or is it a form of entertainment, albeit educational?

After a short debate, it was agreed that material issued under the Memory of the World label should include raw information with the minimum of supplementary information immediately available. Additional information may be supplied but accessed only if required by the user.

5. Closing

On behalf of the participants, Dietrich Schüller thanked Vojtěch Balík, Director General of the National Library of the Czech Republic, and Michal Benes of the Ministry of Culture and their colleagues for their kind invitation to hold the meeting at the historic Klementinum building in Prague; Ariane Iljon and her colleagues in Directorate General XIII of the European Commission and Abdelaziz Abid of UNESCO for providing the necessary support for the meeting; and Adolf Knoll and his staff for all the work that they had put into organising such a successful meeting.

Dr. Schüller closed the meeting by thanking the participants for their patience and hard work during the four days of the meeting. He was certain that the goodwill and enthusiasm shown would ensure positive results and he looked forward to the output of the various Working Groups.

List of Participants

Experts Nominated by UNESCO and EC

Dietrich Schüller
Co-Chair of Meeting
Österreichische Akademie der Wissenschaften
Phonogrammarchiv
Liebiggasse 5
A-1010 WIEN
Austria

FAX: +43 (1) 403 0465

Tel: +43 (1) 4010 32734

E-Mail: pharchiv@kfs.oeaw.ac.at

Note: Brochure Co-ordinator - Audiovisual Materials

Adolf Knoll
Co-Chair of Meeting
National Library of the Czech Republic
Klementinum 190
110 01 PRAHA 1
Czech Republic

FAX: +42 (2) 2422 7796

Tel: +42 (2) 266160

E-Mail: adolf.knoll@nkp.cz

Note: Member of Working Group

Michael Alexander
The British Library
Computing and Telecomms
Boston Spa
WETHERBY
West Yorkshire
LS23 7BQ
United Kingdom

FAX: +44 (1937) 546872

Tel: +44 (1937) 546883

E-Mail: michael.alexander@bl.uk

Note: Member of Working Group

Julian Bescós
C-Director Archivo de Indias Project
Co-Director Society Archivos y Bibliotecas
Sector Oficinas 2
28760 TRES CANTOS (MADRID)
Spain

FAX: +34 (1) 804 0567

Tel: +34 (1) 804 4622

Note: Member of Working Group

George Boston
Rapporteur
14 Dulverton Drive
Furzton
MILTON KEYNES
MK4 1DE
United Kingdom

FAX: +44 (1908) 502520

Tel: +44 (1908) 502610

E-Mail: gboston@gn.apc.org

Note: Point of Contact

ANNEX A

Astrid Brandt
Bibliothèque Nationale de France
Direction des Services de Conservation
quai François Mauriac
75706 PARIS CEDEX 19
France

FAX: +33 (1) 5379 4161

Tel: +33 (1) 5379 4158

Wolf Buchmann
Bundesarchiv
Potsdammer Straße 1
56075 KOBLENZ
Germany

FAX: +49 (261) 505226

Tel: +49 (261) 505300

Note: Brochure Co-ordinator - Electronic Records and Micrography - Contacting ICA

Helen Forde
Public Record Office
Ruskin Avenue, Kew
RICHMOND
Surrey
TW9 4DU

United Kingdom

FAX: +44 (181) 878 8905

Tel: +44 (181) 876 3444

Ext 5257

E-Mail: hforde@cix.compulink.co.uk

Note: Brochure Co-ordinator - Traditional Materials - Contacting ICA

Man-Sze Li
IC Focus Ltd
42 Clifton Road
LONDON
N8 8JA
United Kingdom

FAX: +44 (181) 347 7356

Tel: +44 (181) 347 7355

E-Mail: mali@icfocus.co.uk

Note: Member of Working Group

Trudi Noordermeer
Koninklijke Bibliotheek
PO Box 90407
2509 LK THE HAGUE
Netherlands

FAX: +31 (70) 314 0424

Tel: +31 (70) 314 0597

E-Mail: trudi.noordermeer@konbib.nl

Note: Brochure Co-ordinator - Electronic Publishing
Member of Working Group

Jonas Palm
Det Kongelige Bibliotek
Levgravsvej 59
2300 KØBENHAVN S.
Denmark

FAX: +45 3297 1810

Tel: +45 3297 6652

ANNEX A

Jan van der Starre
Netherlands Institute of Art History
PO Box 90418
2509 LK THE HAGUE
Netherlands
FAX: +31 (70) 347 5005
E-Mail: jvdstarre@artnet.xs4all.nl
Note: Member of Working Group

Tel: +31 (70) 347 1514

Observers

Vojtěch Balík
Director-General
National Library of the Czech Republic
Klementinum 190
110 01 PRAHA 1
Czech Republic
FAX: +42 (2) 2422 7796
E-Mail: votech.balik@nkp.cz

Tel: +42 (2) 2166 3262

Michal Durovič
Preservation and Restoration Department
State Central Archives
Karmelitská 2
118 01 PRAHA 1
Czech Republic
FAX: +42 (2) 2451 0359

Tel: +42 (2) 2451 0210

Miroslava Hejnová
Head of Manuscript and Old Printed Books Department
Klementinum 190
110 01 PRAHA 1
Czech Republic
FAX: +42 (2) 2422 7796

Tel: +42 (2) 2166 3282

Vladimír Opěla
National Film Archive
PO Box 1001
Národní 40
110 00 PRAHA 1
Czech Republic
FAX: +42 (2) 894501

Tel: +42 (2) 2422 7137

Hana Paulusová
Preservation and Restoration Department
State Central Archives
Karmelitská 2
118 01 PRAHA 1
Czech Republic
FAX: +42 (2) 2451 0359

Tel: +42 (2) 2451 0210

Jiří Růžička
Preservation and Restoration Department
State Central Archives
Karmelitská 2
118 01 PRAHA 1
Czech Republic
FAX: +42 (2) 2451 0359

Tel: +42 (2) 2451 0210

ANNEX A

Zdeněk Uhlíř
Manuscript and Old Printed Books Department
Klementinum 190
110 01 PRAHA 1
Czech Republic
FAX: +42 (2) 2422 7796

Tel: +42 (2) 2166 3281

Marie-Thérèse Varlamoff
Director
IFLA PAC Programme
Bibliothèque Nationale de France
2 rue Vivienne
75084 PARIS
France

FAX: +33 (1) 4703 7725

Tel: +33 (1) 4703 8726

E-Mail: marie-therese.varlamoff@bnf.fr

Jiří Vnouček
Head of Restoration Department
National Library of the Czech Republic
Klementinum 190
110 01 PRAHA 1
Czech Republic
FAX: +42 (2) 702655
232

Tel: +42 (2) 702600 Ext

UNESCO

Abdelaziz Abid
General Information Programme
UNESCO
1 rue Miollis
75015 PARIS
France

FAX: +33 (1) 4449 0058

Tel: +33 (1) 4568 4496

E-Mail: a.abid@unesco.org

European Commission

Ariane Iljon
European Commission
DG XIII
Library Networks and Services
Bâtiment Jean Monnet
Plateau du Kirchberg
2920 LUXEMBOURG
Luxembourg
FAX: +352 4301 33530

Tel: +353 4301 132923

ANNEX A

Manufacturers Representatives

Vladimír Karen
Albertina icome Praha
Revoluční 13
110 00 PRAHA 1
Czech Republic

E-Mail: aip@login.cz

Tel: +42 (2) 2480 3254

Jacques Klossa
ICG Mémoire Directe
12 rue Blaise Pascal
922 00 NEUILLY
France

FAX: +33 (1) 4192 0060

Tel: +33 (1) 4192 0050

Tomáš Mayer
Albertina icome Praha
Software Development
Na dražkách 328
266 01 BEROUN
Czech Republic

E-Mail: aipdev@login.cz

Tel: +42 (311) 21053

Stanislav Psohlavec
Albertina icome Praha
Software Development
Na dražkách 328
266 01 BEROUN
Czech Republic

E-Mail: aipdev@login.cz

Tel: +42 (311) 21053

ANNEX B

Grouping of Carriers							
Type of Carrier	Paper, Parchment, Leather, Bindings	Photographic	Mimographic Film	Audiovisual Records	Electronic Publications	Virtual Information - E-Mail etc.	
Processing	Manual	Light Sensitive	Light Sensitive	Analogic Digital	Digital	Digital	
Access	Direct	Direct	Direct Machine Readable	Machine Readable	Machine Readable	Machine Readable	
Original/Substitute/Facsimile	Original Facsimile	Original Substitute Facsimile	Substitute Master Copy	Original Master Copy	Original Substitute Master Copy	Original	
Nature of Support	Cellulose Protein	Cellulose Cellulose Derivatives Synthetic Material Metal Glass	Cellulose Derivatives Synthetic Material	Cellulose Derivatives Synthetic Material	Synthetic Material Glass		
Nature of Information Layer	Protein	Collagen					
Nature of Pigments, Dyes and Additives	Carbon						
Type of Degradation	Hydrolysis, Mould, Insects						
General Recommendations							
Standards	National International for Manufacturing for Transfer for Storage						
Standards Under Development	ISO9706:1994						ISO/TC46/SC10

ISO / TC 46 / SC 10

Information and Documentation / Physical keeping of Documents*Secretary:*

Ivar A. L. Hoel
The Royal School of Librarianship
Birketinget 6
DK-2300 Copenhagen S
Denmark
Tel: +45 31 58 60 66
Fax: +45 32 84 02 01
e-mail: ih@db.dk

**CD 11799
STORAGE REQUIREMENTS FOR LIBRARY AND ARCHIVE
MATERIALS****Contents**

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ANNEX C

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing international Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75% of the member bodies casting a vote.

International Standard ISO 11799 was prepared by Technical Committee 46, Information and Documentation.

The two annexes A and B are for information only, and do not form integral part of the standard.

Introduction

Libraries and archives are institutions established by society in order to collect, make available and preserve carriers of information intended for consultation, either by viewing directly or via a screen, or, in the case of sound recordings, by ear.

Library and archive collections normally contain documents in a wide variety of formats. These will be mainly paper based volumes and files, but may also include vellum, parchment, photographic material, sound recordings, magnetic media, and machine readable formats. All these materials ideally require different storage conditions, but they may have to be housed in the same space.

Data carriers for current use and those requiring long term or indefinite preservation may require different storage conditions.

This standard applies to the long term storage of archive and library materials, but takes into account that, as the materials are stored to allow present use as well, the ideal conditions for long term storage may not be achieved. The storage of documents in open access has been excluded, since self service from the shelves by the public is not compatible with long term storage.

While it is relatively simple from a scientific point of view to define the right conditions for long term storage of archive and library materials, it is, however, difficult and expensive to realize them. This realisation depends on many circumstances pertaining to the different climatic zones of the world and on the economic situation of a given country.

This standard therefore avoids giving absolute figures, as they are to be found in national standards where such exist, and in that genre of technical literature that may be called "Principles of Conservation". Instead it presents some facts and general rules which should be considered when a building for the purpose of archival storage is newly constructed, when an old building originally designed for other use is converted, or when a building already in use for this purpose is renovated.

ANNEX C

1. Scope

1.1 This standard covers all materials commonly stored in libraries and archives, ie. mainly paper (and parchment, papyrus) based documents and binding materials, books, files, manuscripts, graphic collections. etc.

1.2 Requirements for the storage of other media, such as photographic materials and machine readable data carriers, are the subject of specific standards and are covered by the present standard only insofar as they form an integral part of the wider holdings of general purpose archives and libraries, where mixed media are commonly stored together.

1.3 This standard applies to requirements for long term storage; to the sites used for this purpose; to buildings and their structure, to installations and equipment, and to how these are to be used.

1.4 General repository management procedures are excluded.

1.5 This standard identifies the overall storage conditions that will best meet the needs of a general-purpose repository, holding library and archive materials of several kinds. It does not preclude the establishment in individual repositories of separate areas or compartments in which the tolerances of environmental control can be more finely adjusted to create conditions suiting the needs of specific archival materials.

1.6 In a number of fields, national or local building regulations may cover in detail such matters as construction, safety and security for public buildings and buildings in which valuable objects are stored (fire precautions, emergency exits, security against earthquake, theft, burglary, terrorist acts etc.), services and equipment in professional use. This standard therefore avoids detailed rules and regulations in these fields except when recommending departures from general requirements.

2. Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of ISO maintain registers of currently valid International Standards.

ISO 9706: 1994, *Information and documentation - Paper for documents - Requirements for permanence.*

ISO 10214:1991, *Photography - Processed photographic materials - Filing enclosures for storage.*

CD xxx:xxx, *Information and documentation - Archival boards - Requirements for use. At present being developed by TC46/SC10/WG1.*

ANNEX C

3. Definitions

For the purposes of this International Standard the following definitions apply.

3.1 archive and library materials: All types of information carriers kept in archives and libraries, mainly books, files, records, maps and other documents consisting of paper, but also parchment, papyrus, film, photographic materials, magnetic and optical media, as well as binding and protective materials.

3.2 document: Any item stored in a library or an archives.

3.3 long term storage: Storage for an indefinite period, without any time limit.

3.4 repository: A building or room designed, installed and used specifically and exclusively for long term storage of archive and library materials.

4. Site of building

When choosing a site for an archive and/or library repository building the following shall be taken into account:

The site

- should not be liable to subsidence or flooding
- should not be especially at risk from earthquakes, tsunami or landslides
- should not be at risk from fire or explosions in adjacent sites
- should not be near a place or a building which attracts rodents, insects and other pest
- should not be near a plant or installation emitting harmful gases, smoke, dust etc.
- should not be in a especially polluted area

5. Construction of building

5.1. Self-Containment and Security

The repository shall be secure against theft, burglary, vandalism and terrorism. It should be in a purpose-built detached building, or, if it forms part of a larger building, in a self-contained unit. There should be only one entrance for visitors. Precautions should be taken against any other entrances being used by unauthorized people.

Emergency exits shall be constructed in such a way that they can easily be opened from the inside and that they cannot be opened from the outside.

The storage area should have no windows.

5.2. Climatic inertia

The external walls, roof and floor of the building shall be constructed from materials that as far as possible insulate the interior from external climatic changes. Walls, floors and ceilings inside the repository should be made of, or be lined with, materials that have a high thermal and hygroscopic capacity.

5.3. Inner structure and load

For reasons of fire safety and efficient climate control the area used as repository should be divided into compartments, not exceeding 200 m² or 600 m³ each.

The walls (including doors), floors and ceilings between single rooms and compartments, and between storage and other areas of the building shall be constructed so as to prevent fire (and water) from spreading into a neighbouring unit. The doors should be self-closing, but capable of being kept open. There shall be no door sills.

The materials used for all inside surfaces shall not be combustible nor emit, attract or retain dust. Nor shall they be liable, through decomposition in the event of fire or for other reasons, to emit substances harmful to the documents stored, e.g. acidic gases. They shall not, in the case of fire, generate excessive soot.

When constructing the floors, it shall be taken into account that densely stored library and archive materials can have a considerable weight. Under normal conditions a floor-loading capacity of 10-11 kN/m² is sufficient. It should be noted that this may be insufficient for mobile shelving.

6. Installation and Equipment

6.1. Services

Supply systems for electricity, gas and especially for water shall not be located in or near a room in the repository, unless needed for a specific service in that room.

Installations providing temperature/humidity control, air filtration and ventilation systems shall be in a separate room not adjacent to the storage area and preferably outside the building.

6.2. Fire Detection System

All parts of the building shall be provided with a fire detection system connected to a central monitoring panel. Such a system should respond automatically to the presence of fire by detecting smoke or other products of combustion. Heat detection devices should only be installed in areas such as plant rooms where other types of detectors are inappropriate or unsuitable. All parts of the building shall, in addition, be provided with manually-operated fire alarm call points which can be used by occupants to indicate the presence of a fire.

ANNEX C

The operation of the detection system shall result in the following actions:

- A local warning at the control panel and/or repeater panels.
- Operation of plant shut down such as air handling or heating systems.
- Automatic transmission of a warning to the local fire brigade or central alarm station.
- General fire alarm warning throughout the repository building.

The central fire alarm control panel should provide a facility to monitor all components of the system and should visually display the status of the system. Panels should be located in a convenient, central location which is either continuously manned or is at least manned while the repository is occupied or open. Where the panel is not located at or near the probable fire brigade entry point, a supplementary or repeater panel should be provided for the use of the fire brigade.

6.3. Fire Extinguishing System

Consideration should be given to the benefits offered by an automatic fire fighting system.

Gas systems are only suitable for smaller compartments, ie. discrete spaces which can be made airtight. As Halon gases are excluded for environmental reasons, the only proven agent is carbon dioxide, CO₂. Carbon dioxide should not be used for rooms normally occupied by people.

NOTE 1: New fire extinguishing gases are being developed, but have as yet not been proven suitable for the protection of library and archive materials.

It may be necessary to use gas or water-based fire fighting systems in repositories, but such systems, if ill-designed or faulty, may themselves cause unnecessary damage to documents.

If water-based fire protection systems are to be installed, provision shall be made for rapid drainage from all protected spaces. Shafts, staircases and drains shall be so configured that water leaving one space does not enter an other.

NOTE 2: Water mist systems currently being researched for library and archive use apply small amounts of water at very high pressure and may offer a substantial advantage over conventional sprinkler systems. A principle advantage of water mist is that when correctly designed and installed all the water discharged should turn to steam and leave virtually no residual water.

Where an automatic fire extinguishing system is not to be provided, the following shall be installed:

- Hose reels or racks so as to ensure that all parts of the building are within 6 m of the nozzle of a fully extended hose.
- Hydrant systems or rising mains on all buildings more than 30 m in height or where a single floor exceeds 1000 m². The hydrant or rising mains should be located so as to permit the fire brigade to pressurise the pipework from outside the building.

Portable fire extinguishers should always be available, even if an automatic fire suppression system has been installed. There should be a suitable number of hand-held extinguishers strategically placed. Gas and water extinguishers are suitable.

A smoke extraction system is recommended.

6.4. Intruder alarm

The provision of a monitored intruder alarm system is recommended.

6.5. Illumination

The damage caused by light is cumulative. Intensity, duration and spectral distribution of any illumination in a repository should be controlled to minimize damage.

A repository room shall not be illuminated more than is necessary for retrieval and replacement of documents. Direct daylight should be excluded. In a building not primarily designed as a repository, windows shall be screened by curtains or blinds. Care shall be taken to ensure that such measures are permanently deployed.

Fluorescent lamps fitted with diffusers are recommended. Each lamp should be fitted with an effective ultra-violet filter. The wavelength range of the light should be 400-760 nm.

If incandescent light is used the minimum distance between the light and an item on a shelf should be 0.5 m. Heat absorbing filters should be used.

There shall be separate switches for the illumination of each section.

At an easily accessible place outside the repository, there should be a central switch indicating whether all lights and other electrical equipment in the repository are turned off.

6.6. Ventilation and Air Quality

Shelves shall be adequately ventilated to allow the free circulation of air and prevent a build-up of pockets of high relative humidity.

To ensure good ventilation there shall be a distance of at least 15 cm both between the floor and the lowest shelf and between the average line of upper edges of objects stored on the top shelf and the ceiling. Gangways and aisles also contribute to the ventilation (see also 6.8, second last paragraph).

If adequate ventilation does not occur naturally, a ventilation system should be provided. Such a system shall be able to provide a minimum of 5 air changes per hour in the repository, with a fresh air intake of at least 20%.

The air in a repository should be kept free of air pollution, acidic and oxidizing gases and of dust. Acceptable maximum limits of the most common air pollutants are listed in the informative annex B. It shall be taken into account that some materials such as plastics for wrapping, paints and coatings for walls and shelves, etc. may emit noxious gases not only when burning (cf. 5.3. and 6.8.), but also when slowly decomposing. Slow decomposition is also inevitable with all organic materials.

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The air quality should be monitored regularly and in different seasons for acidic and oxidising gases and dust.

If necessary a filter system shall be used. Materials used for filtration shall in themselves not be damaging to the documents. Filter systems shall be regularly maintained.

Photographic materials, sound recordings, and magnetic media are particularly sensitive to oxidizing pollutants, dusty air and/or other active compounds. Optical disks are also sensitive to oxidizing agents. Separate storage for these materials is preferable.

6.7. Room Climate

Repositories for library and archive materials shall be kept at a cool temperature. If the room is heated, this will be not for the sake of the documents, but for people working there. Sharp fluctuations in temperature and relative humidity put stress on library and archive materials and should therefore be avoided. The aim shall be to achieve as stable a temperature and relative humidity as is practicable, within the acceptable levels stated below.

For storage of materials in normal use a temperature within the range 14°-20°C is recommended. Within this range a fluctuation of $\pm 2^\circ\text{C}$ is acceptable. Maximum temperature is not to exceed 20°C.

The optimum relative humidity depends on the nature of the materials in the collection. Materials which are sensitive to humidity fluctuations or low humidity, e.g., parchment, some binding materials (and paintings), should be held within the range of 45%-55%.

For materials which are subject to accelerated acid hydrolysis, e.g., 19th and 20th century paper, storage at a lower relative humidity will extend its life. Consideration should be given to the increased brittleness of some materials at low relative humidity and the effect this may have on frequently used items. Reconditioning to a higher humidity before use is beneficial.

For cold storage of infrequently accessed mixed-media collections a temperature down to 4° C and a relative humidity below 65% are recommended. It must be taken into account that at such a low temperature even a small drop in temperature may result in a large increase in relative humidity. The dew point must never be reached.

Photographic materials need a lower temperature than paper-based data carriers. For long term storage of colour film and photographs a temperature near 0°C is recommended. Nitrate film shall be stored separately because of its volatile and hazardous base material.

NOTE: More information on storage of photographic material can be found in the following standards:
ISO 3897:1992. Photography - Processed photographic plates - Storage practices.
ISO 5466:1992. Photography - Processed safety photographic films - Storage practices.
ISO 6051:1992. Photography - Processed photographic paper prints - Storage practices.

There shall be monitoring devices for temperature and humidity. Sensors should be sited to provide readings that represent the storage areas, but account should also be taken of any extreme or abnormal conditions which may be present, e.g. near outside walls or close to a source of heating or ventilation.

The monitoring instruments shall be calibrated correctly and recalibrated at appropriate intervals.

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If material is taken out of cold storage acclimatization is likely to be necessary. Measures shall be taken to ensure that the material neither adsorbs nor exudes moisture in order to avoid expansion and contraction. Special attention shall be paid to the danger of approaching the dew point (where condensation occurs) at the surface of an item if it is moved to a warmer room. Satisfactory acclimatization can be achieved by having the material placed in an airtight enclosure with a minimum air volume until the temperature has risen to the ambient temperature.

6.8. Furniture

No furniture other than that used for storage and handling shall be allowed in the repository. Furniture used shall have no sharp edges or corners, no protrusions on the sides adjacent to the stored items, or in other ways be able to damage items with which they intentionally or unintentionally may come into contact.

The materials used for furniture shall not emit, attract or retain dust. Nor shall they be liable, through decomposition, to emit substances harmful to the materials stored, e.g. acidic gases. The choice of material shall minimize, in the case of fire, the emission of harmful substance, smoke and soot.

The load bearing capacity of shelving shall be sufficient to carry their load. The shelves shall be large enough to ensure that documents will not protrude beyond the edges.

Shelves for normal storage, e.g. of books, shall be fitted in such a way that the material will stand upright when required. The items shall be able to be stored close together, but not so close that they cannot be easily removed. Equipment for this purpose shall be easily adjustable. For books and paper documents the lateral or vertical pressure on an individual item should not exceed 350 Pa for normal objects and 150 Pa for electrostatic copies.

NOTE: A pressure of 350 Pa roughly corresponds to that received by a book lying horizontally, on which a book of similar size and 45 mm thick has been placed.

In order to allow easy access for normal and emergency use, and to allow air circulation, ample space shall be left between the shelves (or blocks of shelving) and between shelves (or blocks of shelving) and walls (see also 6.6.)

For the correct functioning of the principle of climatic inertia (cf. 5.2.) no furniture nor any other item shall be placed in close proximity to an outside wall. There shall be a distance of at least 30 cm between items and wall.

7. Use

7.1. General

In a repository for archive and library materials smoking, eating and drinking shall be strictly forbidden. Activities not related to storage shall not take place. Only library and archive materials shall be stored there.

ANNEX C

For security reasons, and also for managerial purposes, telephone extensions should be present in the repository, installed at a distance of not more than 50 m from each other.

7.2. Cleaning and disinfection

The repository, its air-handling systems and the items stored shall be cleaned regularly. Cleaning agents must not be harmful to the materials stored.

The items in the repository must be free from biological infestation. Documents received for the first time from outside shall be examined before being placed in the repository. Any item suspected of being infested should receive appropriate treatment. Careful cleaning using vacuum methods is essential in any case of infestation, and in most cases it is sufficient, provided the cleaners used are fitted with microbial filters.

NOTE: All methods of disinfection using chemicals or radiation are likely to be damaging to the materials.

For checking, cleaning and interim storage of items which may be infected a special room, isolated from the normal repositories, is necessary.

7.3. Protection

All documents shall receive protection. The degree of protection required depends on the state of the documents and the amount of use they are likely to receive.

Bindings, custom-built boxes, folders or containers provide effective means of protecting the document. Any protective covering shall enclose and support the items without exerting undue pressure.

The protective device shall not carry original information.

Paper for protective material in direct contact with data carrying sheets shall fulfil the conditions of ISO 9706. Board for protective material in direct contact with data carrying sheets shall fulfil the conditions of ISO xxx. Protective material made of plastics must not contain plasticizers, nor emit acidic or otherwise noxious gases.

NOTE: Plasticizers can migrate into the data carriers and damage or at least disfigure them. At the present time plasticizer-free polyethylene, polypropylene, polyester and polymethyl methacrylate seem to fulfil the condition of being plasticizer free.

Photographic materials shall be stored in enclosures made according to ISO 10214.

No uncoated metal surface shall be in direct contact with stored items. The coating shall not be combustible nor emit, attract or retain dust. Nor shall it be liable, through decomposition in the event of fire or for other reasons, to emit substances harmful to the documents stored, e.g. acidic gases. They shall not, in the case of fire, generate excessive soot.

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7.4. Storage position

The normal storage position for books is upright, on the tail edge. Volumes with a height over 40 cm should be stored flat. If they are placed on top of one another, their weight shall be taken into account. There shall be no excessive pressure on the volume at the bottom (see Note to 6.8.) and it shall be possible to remove and replace it easily.

Single sheets (maps, posters, graphic art, drawings), shall always be well protected. Large formats shall be stored flat in drawers. Outsized items, too large to be accommodated in drawers, may be rolled.

8. Disaster Preparedness Plan

For a proper system of indefinite storage a disaster preparedness plan pertinent to the specific building and collections shall be established. For elements of such a plan, see informative annex B.

9. Exhibitions

Generally for exhibitions the same requirements regarding room climate, security etc. as for documents repositories apply. Exhibitions put documents at increased risk and shall therefore be restricted to a minimum. Items should not be permanently on exhibition.

Because being on exhibition means that the surface of a document is exposed to extensive periods of light, the intensity and duration of light shall be reduced to a minimum. This is especially necessary for the most sensitive items such as modern writing inks, acidic groundwood paper, colour photographs, coloured prints and drawings etc. A light level of 50 lux on the displayed document is sufficient to view it if ambient light levels are lower and sufficient time is allowed for the viewer's eyes to adjust to the lower light level.

Curtains on the showcases, which are opened only when a visitor is inspecting the items may reduce the time of exposure to light. Light switches outside a showcase or an exhibition cabinet which can be turned on by the viewer and are turned off automatically after a suitable time fulfil the same purpose.

For documents required repeatedly for exhibition a facsimile substitute shall be provided.

ANNEX C

Annex A (informative)

Maximum limits for air pollutants*

	micrograms per cubic meter (mg/m ³)
Sulphur dioxide (SO ₂)	< 1
Nitrogen oxides (NO _x)	< 5
Ozone (O ₃)	< 2
Chlorine (Cl ₂)	< 0,2
Dust particles	< 50

* The first three figures are taken from: Wilson, William K.: Environmental guidelines for the storage of paper records. Bethesda, MD: National Information Standards Organization. 1995.

Annex B (informative)

Disaster preparedness plan

It is recommended that contingency plans to meet the disaster threat should include the following:

- Liaison with the emergency fire services so that they understand the special concern libraries and archives have for water damage to their collections.
- A plan or an outline of the building.
- Location details of the rare and most important items in the collections, and where any concentration of such material may be.
- Contact telephone numbers for the Disaster Coordination Officer.
- Contact telephone numbers for conservation expertise, a conservator working with, or for, the institution.
- Contact telephone numbers for a person qualified to advise on the salvage of damaged library or archive materials.
- Names and telephone numbers of staff who can be contacted outside normal working hours.
- Telephone numbers of institutions who may be sympathetic and able to provide additional manpower in an emergency, e.g. neighbouring institutions, militia.
- Telephone numbers of companies and institutions able to provide containers suitable for carrying and freezing damaged materials.
- Telephone numbers of companies and institutions able to provide deep freezing facilities.
- Telephone numbers of companies and institutions able to supply dehumidifying equipment.
- Telephone numbers of companies offering wrapping materials.

Incipit

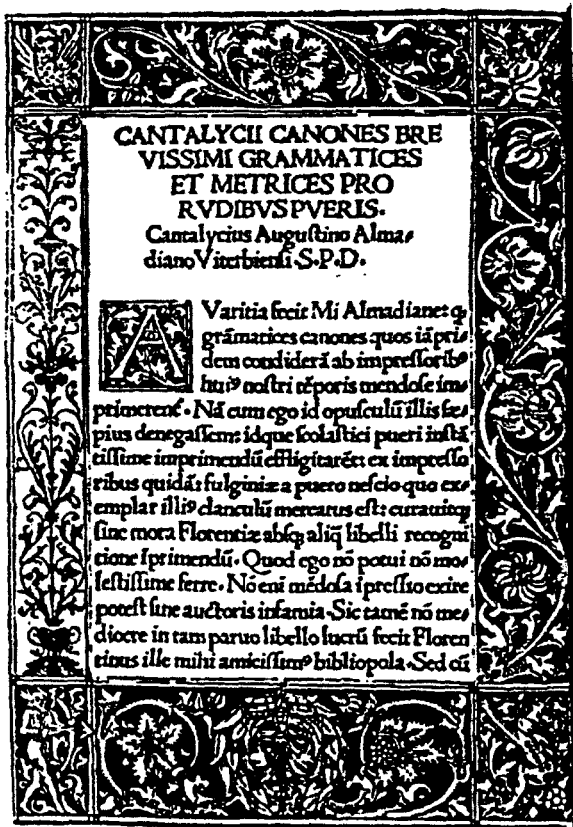
A CD-ROM of Incunabula

The Incunabula Short-Title Catalogue, a database file in development at the British Library since 1980, represents the largest and most exhaustive record of printing before 1501 yet compiled. ISTC contains short-title information on some 27,000 incunabular editions, together with references to fuller descriptions in printed catalogues, and the most comprehensive listing in existence of known copies and their current locations around the world.

Since 1994, a partnership of the British Library, five other European libraries and the commercial publisher Primary Source Media has received funding from the DG XIII Libraries Programme of the European Commission to publish the ISTC on CD-ROM, with the added enhancement of digital images of bibliographical key pages.

Project Incipit (as the partnership is known) has released a series of trial disks in 1995 and aims to produce a first commercial version, with approximately 15% of bibliographical records enhanced with digital images, by July 1996.

Using existing as well as specially-produced microfilm, colour slides and transparencies, Project Incipit scans images of incunabula and converts them into digital form. Advances in CD-ROM technology mean that these image files can be linked with their corresponding ISTC records, searched and viewed, using a single, portable disk.



Incipit is not a full-text database: it provides only images of pages from each edition key for bibliographical identification.

Reproductions of key pages (the title page, the colophon page, or the first page of the second quire, for instance) will replace the textual transcriptions traditionally used in incunabula bibliographies and catalogues, and thus change entirely the process of identification and description of early printed books.

And, while performing the technical task of a transcription in a far more direct and visual way, Incipit will make the study and comparison of fifteenth-century typefaces, as well as of non-typographical elements, page layout and design, a real possibility for the first time.

ANNEX D

POLIPHILI HYPNEROTOMACHIA, VBI
HVMANA OMNIA NON NISI SO-
MNIVM ESSE OSTENDIT, AT
QVE OBITER PLVRIMA
SCITV SANEQVAM
DIGNA COM-
MEMO-
R AT.

*

Incipit's incunabula images represent a wide range of fifteenth-century printers, printing areas, languages, authors and texts. In the early stages, selection by the partner libraries is based on loosely thematic lines: groups of editions produced by the same printer, or of the same text, or in the same language (Greek and Hebrew are especially sought), in order to test the disk as fully as possible as a tool for comparative research.

Incipit pays particular attention to recording typographical variations or imperfections in the editions described, so that each is documented as a printing artefact as well as an early text. Images of all known variant settings are included. Also, examples of red- and gold-ink printing are captured and reproduced in colour.

Online Help provides user support, a list of secondary catalogues and bibliographies, and a census of libraries and other incunabula collections. Incipit's long-term goal is to gather images representing every edition listed in the ISTC. Supported by the constantly growing ISTC database, Incipit will be the first and only complete short-title catalogue *and* visual repertory of 15th-century printed material and printing types, the most advanced tool available for bibliographical identification and research.

utriusq; iuris poete laureati

Incipit Partners

The British Library
Biblioteca Nazionale Centrale, Rome
Bibliothèque Royale/Koninklijke
Bibliotheek, Brussels
Consiglio Nazionale delle Ricerche, Rome
Instituto da Biblioteca Nacional e do Livro,
Lisbon
Koninklijke Bibliotheek, the Hague
with contributions from
Bayerische Staatsbibliothek, Munich
published by
Primary Source Media

Project Coordinator

Dr Lotte Hellinga
The British Library
Great Russell Street
London WC1B 3DG
tel (0171) 412 7581
fax (0171) 412 7762



VISUAL ARTS NETWORK FOR THE EXCHANGE OF CULTURAL KNOWLEDGE (VAN EYCK)

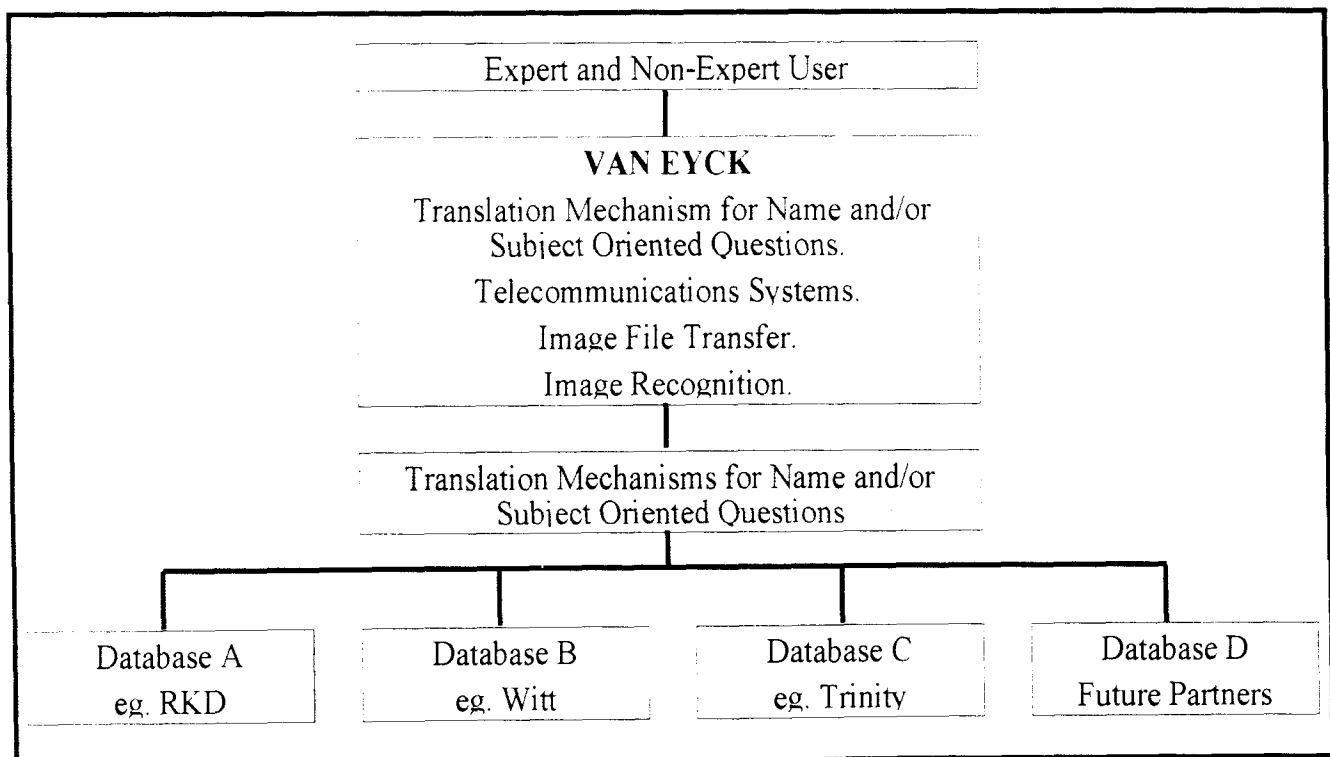
The Van Eyck project is a research project with the goal to define and construct an integrated workstation for art historians and related professions in the arts field for the consultation of art historical databases and the retrieval of basic art historical information, irrespective of the location of the databases and the user. In practice this will lead to the construction of a virtual database, leaving the underlying databases of the partners untouched.

The partners in the project are:

- * VASARI (UK) (Commercial managing partner)
- * Witt library (UK) (photo archive)
- * RKD (NL) (photo archive)
- * Trinity College Dublin (IRELAND) (photo archive)
- * University of Utrecht (NL) (technical partner)
- * Birkbeck College (UK) (technical partner)
- * BSL (NL) (Commercial/technical partner)
- * SSL (UK) (Commercial/technical partner)

The European Commission, DGXIII (Libraries Programme) is providing 50% of the funds for the Project.

The structure of the Van Eyck system can be represented as follows:



The project has successfully completed the first phase: the feasibility study (January '93 - March '94), and is now in its second phase: construction and implementation (January '95 - January 1997). By the end of 1996 a working system will be completed and made available to the market.

The system will be based on existing standards (client/server architecture (Oracle + Powerbuilder or similar, TCP/IP, Z39.50, DOS/WINDOWS, ISDN, INTERNET)).

For the structure of the virtual database a so-called core record structure has been defined, consisting of artist information, object and image information.

Artist Information		
Fields for Retrieval (R) and Fields for Display (D)		
Name	R	D
Birth Place	R	D
Start Date Begin	R	D In combination with Start Date End
Start Date End	R	D In combination with Start Date Begin
Death Place	R	D
Last Date Start	R	D In combination with Last Date End
Last Date End	R	D In combination with Last Date Begin
Nationality	R	D
Artistic School	R	D
Place of Activity	R	D
Start Date	R	D
End Date	R	D
Variant Name	R	D
Gender		D
Religious Affiliation		D
Related Person		D
Standard Reference		D
Literature		D

Object Information		
Fields for Retrieval (R) and Fields for Display (D)		
Title	R	D
Title Word	R	
Earliest Date	R	D
Latest Date	R	D
Owner Name	R	D
Owner Location	R	D
ICONCLASS	R	D
Umbrella Keywords	R	D
Type of Object	R	D
Materials	R	D
Support	R	D
Name Artist		D
Variant Title(s)		D
Date Ownership		D
Measures	R	D
Shape		D

Image Information
Fields for Display Only
Name
Title
Image I.D.
Image Type
Location of Image
Source of Image
Date of Image
Date of Accession
Photographer

Part of Van Eyck will be the Morelli system, a software programme which allows the user to compare images (whole image or parts of image). In this way Morelli will be yet another search argument for the consultation of the databases.

As regards image information, the minimum standard is:

- 72 dpi
- 640 x 480
- 8-bit colour
- file format: bmp
- suggested compression: JPEG 30:1 colour or JPEG 12:1 grey scale

However the current best practice is:

- 300 dpi
- 800 x 600
- 24-bit colour
- file format: bmp
- suggested compression: JPEG 30:1 colour or JPEG 12:1 grey scale

The final system specifications will allow for a variety of file formats and qualities.

It is planned to have a working prototype ready in September/October 1996.

Van Eyck Contact:

Jan H.E. van der Starre
c/o RKD
PO Box 90418
2509 LK Den Haag
Netherlands
tel.: +31(70)3471514
fax.: +31(70)3475005
e-mail: jvdstarre@artnet.xs4all.nl

The Sana'a Manuscripts

Presentation of CD-ROM by Abdelaziz Abid

In 1972, after heavy rain, a section of the wall of the Great Mosque of Sana'a collapsed. Work on the roof brought to light manuscripts which had been concealed in the ceiling in ancient times. They are parchment and paper fragments representing approximately one thousand different volumes, the oldest of which date back to the first century of the Hegira. Most are extracts from the Koran and are of considerable interest for the linguistic, religious and paleographic study of the literature of the early centuries of the Hegira and of the Arabic language. The fortuitous and extraordinary discovery of these documents and their unique character make this find a remarkable event which will mobilise efforts and expertise on an international scale. Thanks to the active participation of Germany, a plan of work on the fragments was begun, which led to the construction of a House of Manuscripts, the restoration of some 12,000 fragments of parchment (out of 15,000), their storage, identification and classification and the training of Yemeni restorers and photographers.

Research work on illuminated fragments and on bindings was carried out with a grant from the Getty Institute. This work, together with papers read at congresses and articles in academic journals, shows just how remarkable the collection is. The Yemeni authorities concur in the view that the collection is the equivalent of a historic building of exceptional heritage quality. A UNESCO mission visited Sana'a at their request to consider including a pilot project on the Yemeni collections in the "Memory of the World" Programme.

The collection of manuscripts that it has been possible to examine have been outstandingly rich, justifying their status as a "Memory of the World" project. Their historical, archeological, scientific and documentary quality is such that they have all the features of collections worthy of heritage status.

A National Committee for the project has been set up to identify the most suitable documents. A demonstration disc based on a selection of manuscripts, including some of the Koranic fragments, has been published in co-operation with the Regional Information, Technology and Software Engineering Centre (RITSEC), Cairo, Egypt. This CD-ROM offers an introduction to the Arabic calligraphy illustrated by Yemenite manuscripts, especially the Koranic fragments. Descriptions are provided in Arabic, English and French.

Saint Sophie

Presentation of a CD-ROM by Jacques Klossa

This CD-ROM was designed to explore the different aspects of a multimedia database. In fact, the CD-ROM consists of five different databases:

- Database 1 - Sophie 1 - an iconographic base.
- Database 2 - Sophie 2 - an iconographic base.
- Database 3 - Sophie 3 - a text base accessed through full text in Old Bulgar (a Cyrillic language).
- Database 4 - Sophie 4 - a text base accessed through full text in Middle Bulgar (a Cyrillic language).
- Database 5 - Images from the manuscript.

1. Production of the Iconic Base

The goal was to use an efficient and low cost system suitable for on-site production of the CD-ROM.

a. Image Capture Method

The pages of paintings and text were photographed using 35mm Ektachrome film with a scale recorded with each image. The photographs were then digitised with a resolution of 2000 by 3000 lines using 16 million colour levels for the paintings and 256 levels for the texts. The images were then reduced to a resolution of 800 by 800 lines for the CD-ROM.

b. Organisation

Before the photographs were taken, a database was made containing details of every image to be shot. The information included the name of the manuscript, the folio, the position on the page and the zoom magnitude. The slides were taken using an on-screen list to give the order of shots which permitted the grouping of images by size. This method of working speeded the process and allowed one operator to photograph 500 images a day.

The images were then digitised and the images viewed on screen to allow the data sheet for each image to be produced. Special attention was paid to the keywords used to describe each image. A dictionary was produced to help with this aspect of the project.

2. Browsing the Iconic Base

The first step is to use the data for each image to produce an image database. A generic browser designed for iconographic databases is used to consult the images:

In response to multicriteria search requirements, the browser provides a collection of small, thumbnail sized images that are enlarged to full screen if selected.

The text data sheets can be opened to provide information about an active image.

A selection of images can be stored on the computer disc and sent to other users of the browser via networks for discussion by telephone or for distance teaching.

It is possible to open different databases during the same session and to mix images from several databases to form one selection for comparison purposes.

Chronicon Concilii Constantiniensis

Presentation of CD-ROM by Adolf Knoll

This demonstration is of a CD-ROM containing the manuscript VII A 18 entitled "Chronicon Concilii Constantiniensis". This manuscript was digitized directly by a camera. It contains 72 pages and the images on the CD use about 2 MB in the Windows BMP format. We published it after the "Antiphonarium Sedlecense" as the second of our "Memoriae Mundi Series Bohemica" in 1995.

It has the same software environment as "Antiphonarium Sedlecense" and there is a transliteration of the Latin text with the comments in English and in Czech. The Czech version also contains the translation of the Latin original (the texts are very short).

The author of the original chronicle was Ulrich Riechental (b. c1360; d. 1436/1437) who was the scribe of the City of Constance. The Chronicle was not written before 1430 (the Council of Constance was held in 1414-1418). The Chronicle does not describe theological disputations or diplomatic activities but the outer history of the Council - all the showy festivities and ceremonies as well as traffic in the city. The original has not been preserved. This is the Petersburg manuscript, called the "Small Riechental". Our library also possesses the so-called "Big Riechental" (it has also been digitized but has not been published). The "Small Riechental" does not contain the text of the Chronicle (many of the texts are in the "Big Riechental") but only pictural decorations with short accounts in Latin. This manuscript originates from the 1470's and it assumes the composition of the Constance manuscript. It is important, however, because it contains the best creative accompaniment to the Riechental Chronicle that still exists (there are seven Riechental Chronicles in the world, all very different - all are later copies or even new creations on the basis of the lost original).

ILLUSTRATING WORKING MATERIALS

FOR DISCUSSING

THE THEME

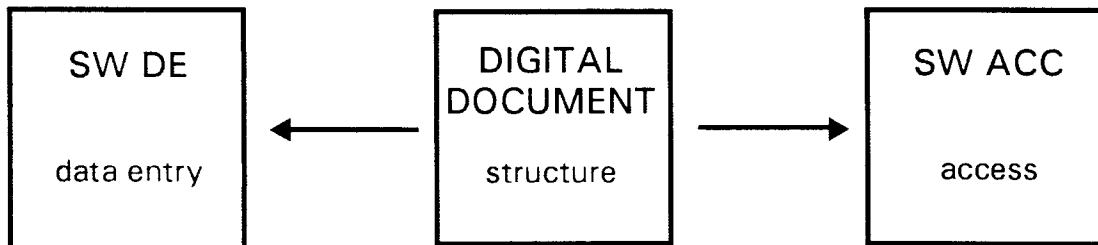
HARMONIZATION OF ACCESS TO
ELECTRONIC DOCUMENTS

A PROPOSAL TO RECOMMEND A STRUCTURE FOR DIGITIZED
MANUSCRIPTS AND OLD BOOKS

**National Library of the Czech Republic
Albertina icome Praha**

THE STRUCTURE OF DIGITIZED DOCUMENTS

The Problem



The Basic Tree Structure

< LEVEL 1 >
Book

< LEVEL 2 >
Chapter 1

< LEVEL 3 >
Paragraph 1

< LEVEL 3 >
Paragraph 2

< LEVEL 2 >
Chapter 2

etc.

Manuscripts and Old Printed Books

For the manuscripts and old printed books, where the results of digitization are images of the pages, the following structure can be applied:

1. BIBLIOGRAPHIC DESCRIPTION UNIT
2. BOOK LEVEL (DOCUMENT LEVEL) - LEVEL 1
3. PAGE LEVEL (MAIN FORMAL UNIT LEVEL) - LEVEL 2
4. FULL GRAPHIC REPRESENTATION OF THE PAGES

ANNEX J

GRAPHIC FORMAT LEVELS

The digital document can contain links to images. Each link to an image must be marked with the tags specifying to which graphic format level the image belongs.

The digital images of the original pages of the document are stored in files in the GIF (Graphic Interchange Format) or PNG (Portable Network Graphics) for smaller bitmaps (low resolution) and in the JPEG (Joint Photographic Expert Group) format (higher resolution).

The bitmaps can be classified in the groups as follows:

Gallery Level

<GALLERY>

This level is proposed for page icons on the book level: GIF or PNG format max. 10KB, 256 colours, resolution 72 dpi.

Preview Level

<PREVIEW>

It is proposed for previews on the Page Level: GIF or PNG format max 50KB, 256 colours.

Low Quality Level

<LOW>

It is proposed for the Internet Full Graphic Representation of Pages. The size of the compressed JPEG file should be under 150 KB.

High Quality Level

<HIGH>

It is proposed for daily use on site for the Full Graphic Representation of Pages. The size of the compressed JPEG file should be about 1 MB, 180 dpi resolution.

Excellent Quality Level

<EXCELLENT>

Maximal resolution enabled by the scanning device, JPEG format.

Details Level

<DETAIL>

No special requirements. It is proposed for details cut from the pages of the document and stored as such.

<LOW><ahref="001001.jpg"></LOW>

<PREVIEW></PREVIEW>

ANNEX J

MOW SUPPLEMENTARY HTML TAGS

The Bibliographic Description is a part of the MoW digital document structure. It concerns the original document which has been digitally reformatted. It is based on the First Level Description as specified by the Anglo-American Cataloguing Rules AACR2. It is stored in the DESCR.HTM file. To organize this description the following HTML tags are added:

<BIBLDESCR>	bibliographic description; this tag is obligatory
<MAINTTL>	main title
<FSTOFRESP>	first statement of responsibility
<EDITST>	edition statement
<GMD>	general material designation
<FPBLSDER>	first publisher group
<PLACEPBL>	place of publication
<PBLSDER>	publisher
<PRT>	printer group
<PLACEPRT>	place of printing
<PRINTER>	printer
<DATEPUBL>	date of publication
<PHYSDESCR>	physical description
<NOTES>	notes group
<CARRIER>	carrier of information
<OTHNOTES>	other notes
<STDNO>	standard number

The tags indicated below are added to the bibliographic description tags to complete the necessary information:

<ANNOTATION>	annotation
<SHELF>	shelf number
<LIBRARY>	library or the place where the original is preserved
<OWNER>	owner of the original if other than tagged with <LIBRARY>

The DESCR.HTM file will serve for the creation of an information system about available digitized documents. It will be used also for cataloguing digital documents.

MOW BIBLIOGRAPHIC DESCRIPTION UNIT

```
<html>
<head>
<title></title>
</head>
<body>
<hr>

<SHELFNO><SHELFNO><br>
<LIBRARY></LIBRARY><br>
<OWNER></OWNER>
<hr>

<BIBLDESCR>

<MAINTTL><h3></h3></MAINTTL>
<p>

<FSTOFRESP></FSTOFRESP><hr>

<EDITST></EDITST><br>

<GMD></GMD><br>

<FPBLSHER>
<PLACEPBL></PLACEPBL><br>
<PBLSHER></PBLSHER><br>
</FPBLSHER>

<PRT>
<PLACEPRT></PLACEPRT><br>
<PRINTER></PRINTER><br>
</PRT>

<DATOFPUBL></DATOFPUBL><br>

<PHYSDESCR></PHYSDESCR><br>

<NOTES>
<CARRIER></CARRIER><br>
<OTHNOTES></OTHNOTES><br>
</NOTES>

<STDNO></STDNO>

</BIBLDESCR><hr>

<ANNOTATION></ANNOTATION>

</body>

</html>
```

LEVEL 1 - BOOK LEVEL

```
<html><head><title></title></head>
<body>
```

```
<LEVEL 1>
```

The Gallery Inline Images can be here:

```
<a href="001.htm"><GALLERY></GALLERY></a>
or the Page Description
```

```
<a href="001.htm">001</a><hr><a href="002.htm">002</a><hr> . . .
```

```
<a href="005.htm">005</a><hr> . . . . .
```

```
</LEVEL 1>      Other data can be here.
```

```
</body></html>
```

LEVEL 2 - PAGE LEVEL

```
<html><title></title>
<body>
```

```
<LEVEL2> . . . (indexable data and the inline Preview Images can be here) . . .
. . . . .</LEVEL 2>
```

Here the links to the previous and next page can be written:

```
<a href="002.htm">Previous Page</a><hr><a href="004.htm">Next Page</a><hr>
```

```
</body>
</html>
```

Note: Links from within the <LEVEL X> tag must refer only to the documents which are lower in the tree hierarchy of the document. Links to higher or the same levels must be placed outside of the <LEVEL X> tag (for ex. the links to the previous and next page).

Indexable Data

The Page Level can contain data which is important and could be followed by a special access software. The tag marking such data is <DX>, it can have the following parameters:

NAME, TYPE

The NAME parameter has the implicit value TEXT, while the TYPE parameter can have as values TEXT, DATE or NUMBER.

For example:

```
<LEVEL 2>
```

```
<b>Motif of Illumination:</b><DX NAME="Motif of Illumination"TYPE="TEXT">Flowers
</DX NAME+"Motif of Illumination" TYPE="TEXT"><hr>
```

```
<b>Incipit: </b><DX NAME="Incipit" TYPE="TEXT">Ecce veniet rex</DX NAME="Incipit"
TYPE="TEXT">
```

```
</LEVEL 2>
```

14 J 169
National Library of the Czech Republic

ANNEX J

AD VITELLIONEM PARALIPOMENA, quibus Astronomiae pars OPTICA traditur ...

Johannes KEPLER

printed book
Frankfurt am Main
Claude de Marne, Johan Aubry
1604
16, 449, 18 pag., 2 encl., 4°
paper
in Latin, Kepler's autograph

Optics is the first of Kepler's works dealing with this subject. It is on geometric optics and makes use of the anatomical knowledge of the sense of sight, which was researched by Kepler's Prague friend, Jan Jesenius. Optics is applied to astronomy. The end-paper carries Kepler's dedication to the Charles University written in his own hand.

Antiphonarium Sedlecense

BOOK LEVEL <LEVEL 1>

XIII A 6

manuscript, cca 1240, parchment and paper, 266 folios, 44 x 32 cm, in Latin, notations, illuminated

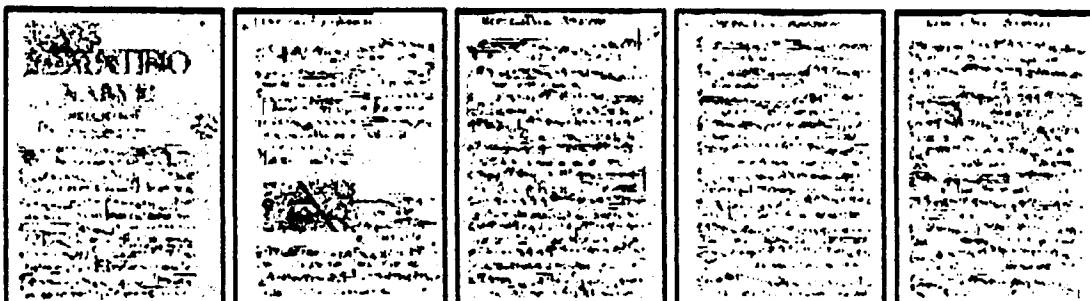
The codex was made for either a Cistercian or a Benedictine monastery probably in the Saxon-Thuringian area, where only a part of the illuminations was carried out leaving in some places the drawn outlines only. The illuminations were finished in Bohemia in the 2nd half of the 13th century. In the 17th century, the codex was owned by the Monastery in Sedlec where the missing folios were completed with paper sheets and the book was rebound.

Pages of the manuscript are listed below. If willing to view them in a catalogue gallery, [click here](#):

[001001 - 001r / 1, orig.1](#)
[002002 - 001v / 2, orig.2](#)
[003003 - 002r / 4, orig.4](#)
[004004 - 002v / 4, orig.4](#)
[005005 - 003r / 5, orig.5](#)

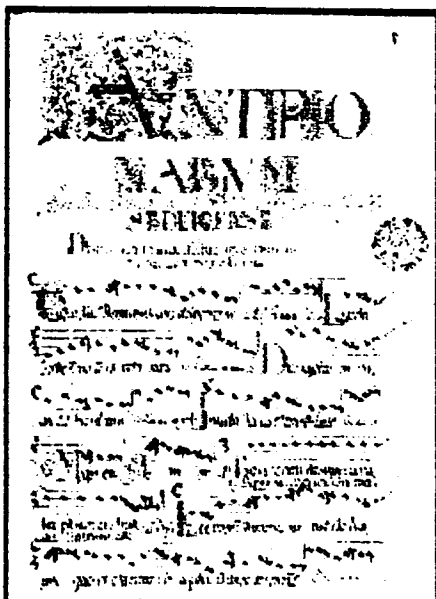
clickable texts (paper)

Pages:



*clickable gallery
images
<GALLERY>*

Preview



Clickable preview image <PREVIEW>;
 When clicking the FULL GRAPHIC
 REPRESENTATION OF THE PAGE
 will appear
 in <LOW>
 <HIGH>
 <EXCELLENT> quality

Writing Material:paper

Description of Area:heading in capital letters, alternatively in red and blue with calligraphic decoration; initial A, ornamental, painted, vegetative motif; notation with text, double frame, majuscules red, rubrics, ownership and cataloguing inscription from the 17th century, running-title, pagination, stamp of the University Library in the right upper corner

State of Preservation: paper partly torn in the right low corner

Scriber:C (17th century)

Motif of Illumination:vegetative ornament with flowers and fruits /grapes/

Authors of Illumination:painter, 17th century

Liturgical Section:Proprium de Tempore

Liturgical Day:Dominica I. Adventus

Hora:Ad I. Vesperas

Function:Antiphona super Psalmum primum

Incipit:Custodit Dominus omnes

Comment:

Important data is tagged <DX-
 and can be indexed and used
 in a database (for ex. Uni.FRET MW)

[Return to TITLE PAGE](#) [Go to FIRST PAGE](#) [Go to LAST PAGE](#)

[Previous Page](#) [Next Page](#)

Recommendations

In order to enable the standardized access to the products of the digital reformatting of the world documentary heritage, it is recommended to follow the below listed principles which are designed to maintain a standardized structure of the MoW products especially in the domain of books and manuscripts:

1. to maintain the same document structure for both remote (Internet) and local (LAN, CD-ROM) access;
2. to use the HyperText Markup Language (HTML) as the basic presentation tool for reformatted documents;
3. to enable the viewing of such documents by standard HTML browsers and viewers as well as by specialized access software;
4. to split the structure of the document into:
 - a. - Bibliographic Description Unit (DESCR.HTM)
 - b. - max. ten levels tagged as <LEVEL 1>, <LEVEL 2>, ..., <LEVEL 10>

(for the digitized manuscript Level 1 = Book Level, Level 2 = Page Level)
5. to respect the minimal structure of each level as described in enclosures including the additional HTML tags/identifiers introduced to enable the minimal function of each level for the Memory of the World programme;
6. to respect the structure of the tags/identifiers which enable the indexing of the textual data (identification of the indexed statement and its indexation with occurring values) necessary for working of database oriented access software;
7. to respect the recommended raster graphic formats as specified for graphic representations of digitized manuscripts and old printed books including the tags marking their quality as described in enclosures;
8. to consider the analogue application of the proposed structure to other types of documents (incl. sound and moving images) and to prepare additions where necessary;
9. to produce, under the UNESCO Memory of the World programme, a pilot CD-ROM concerning a digitized manuscript which would demonstrate the viability of these recommendations.

RECOMMENDATIONS

It is recommended for digital copies of old printed books and manuscripts:

I.

1. to maintain the same structure for both remote and local access;
2. to use the Hypertext Markup Language (HTML 2.0) as the basic presentation tool;
3. to include:
 - the bibliographic description in the HTML format, based on the appropriate cataloguing rules, and describing the original document;
 - a separate file containing the UNIMARC record of the digital document itself;
 - a technical record concerning the capturing process of the digital image;
4. to markup the data which can be indexed;

II.

1. to prepare a detailed specification of formal tags there, where these tools are missing (applicable for I. 3, I. 4) in the HTML standard;
2. to specify the appropriate description rules, their formal application, and additional data necessary for the basic identification of the original;
3. to prepare a digitized manuscript demonstrating the viability of the above mentioned recommendations;

It is recommended for other types of documents:

1. to consider the applicability of the principles mentioned in I. 1 - 4;
2. to prepare there, where these principles are applicable, a detailed specification of formal rules where missing;