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Item 7 of the provisional agenda

UNESCO CHARTER ON THE PRESERVATION OF THE DIGITAL HERITAGE

Summary

In accordance with 31 C/Resolution 34, the Director-General has submitted to the Executive Board at its 164th sessions a report on the preservation of the digital heritage.

This report is a discussion paper highlighting the principles for the preservation and continued accessibility of the world's ever-growing digital heritage, which constitutes an important part of the "Memory of the World". It also contains elements for a draft charter and strategy for the preservation of this heritage.

Decision required: Paragraph 11

1. The General Conference adopted Resolution 34 at its 31st session, drawing attention to the ever growing digital heritage in the world and the need for an international campaign to safeguard endangered digital memory. The General Conference also invited the Director-General to prepare a discussion paper for the 164th session of the Executive Board containing elements of a draft Charter on the Preservation of the Digital Heritage, to be submitted for adoption to the General Conference at its 32nd session in 2003, as well as to encourage the governmental and non governmental organizations and international, national and private institutions to ensure that preservation of the digital heritage be given high priority at the national policy level.
2. A discussion paper was prepared for UNESCO by the European Commission on Preservation and Access. From this paper, attached as Annex I, and preliminary consultations with the actors involved in the digital preservation, a number of major problem areas and courses of action were identified.
3. A large part of the vast amounts of information produced in the world is digital, and comes in a wide variety of formats: text, database, audio, film, image. For cultural institutions traditionally entrusted with collecting and preserving cultural heritage, the question has become extremely pressing as to which of these materials should be kept for future generations, and how to go about selecting and preserving them. For conventional materials, a certain amount of agreement exists on how to collect information worth preserving.
4. With the advent of digital media, a new and complex environment has come into being. Not only are the media new, but also the contents and the means of distribution have changed dramatically, and new players – among users as well as creators of information – have entered the stage. It has become urgent to establish a clear framework which could facilitate collection, classification and preservation efforts.
5. Legal frameworks defining responsibilities and procedures need to be adapted or extended to be able to deal with the new digital environment. Regional consultations should elaborate options on how to extend deposit legislation to all digital materials regarded as publications. It should also establish whether legal frameworks for archives could cover all documents which constitute a record regardless of its format.
6. A wide array of intellectual property rights may be associated with websites combining mixed materials from various sources. Copyright legislation places such strict limitations on copying that libraries in some countries can not even preserve subscribed electronic journals without infringing the rights of owners and creators. Software copyright is another important issue. Agreement on the principle of the right to copy for preservation will therefore have to be sought to make copyright aspects of preservation more easily manageable.
7. The use of standards and adequate description and documentation facilitate long-term preservation of online resources and help to reduce costs. Creators of digital materials and the ICT industry have to be involved in the process of preservation as their cooperation can reduce the burden for heritage institutions. Creators will have to be encouraged to use open standards and provide adequate documentation of files. The ICT industry should be convinced of the value of open source software and the need to publish detailed and complete documentation to make sure their products can continue to be used in a preservation setting.

8. Cooperation, guidance, leadership and sharing of tasks are all key elements for preservation of the digital heritage. Cultural institutions need the cooperation of creators of information and of software producers. Adequate resources and support at policy level are indispensable to ensure that future generations continue to have access to the wealth of digital resources in whose creation we have invested so much over the past decades.

9. Based on the above findings, UNESCO has developed a strategy for the promotion of digital preservation. This strategy is centred on: (a) a wide consultation process with governments, policymakers, producers of information, heritage institutions and experts, the software industry as well as standard-setting organizations; (b) dissemination of technical guidelines; (c) implementation of pilot projects and; (d) preparation of a draft Charter on the Preservation of the Digital Heritage for adoption by the General Conference at its 32nd session.

10. At its 164th session, the Executive Board invited the Director-General to ask the Member States to provide comments and observations on the discussion paper on the "UNESCO Charter on the Preservation of the Digital Heritage" and to send them to the Director-General and to the Intergovernmental Council of the Information for All Programme before September 2002. The Executive Board also requested the Director-General to prepare a Preliminary Draft Charter on the Preservation of the Digital Heritage to be discussed in appropriate fora and distributed to Member States for broad consultations and to submit a Revised Draft of the Charter to the 166th session of the Executive Board. (164/Decision 3.6.1).

11. In the light of the above report and the attached discussion paper, the Bureau may wish to adopt the following decision:

The Bureau of the Intergovernmental Council for the Information for All Programme,

1. Having examined document IFAP-2002/Bureau.II/7, particularly the discussion paper on "UNESCO Charter on the Preservation of the Digital Heritage";
2. Welcomes the report by the Director-General on the "UNESCO Charter on the Preservation of the Digital Heritage";
3. Requests the Director-General to closely involve the Intergovernmental Council of the Information for All Programme and its Bureau in the preparation of the Charter;
4. Invites the Director-General to submit the comments and observations by Member States on the discussion paper to the Council at its 2nd session;
5. Invites Member States represented in the Council to actively participate in the preparation of the Charter and in the implementation of the proposed strategy.

Preservation of the Digital Heritage

Discussion paper prepared for UNESCO
by the European Commission on Preservation and Access
(Amsterdam, February 2002)

INTRODUCTION

1. A large part of the world's information is now produced digitally. Digital resources range from medical records to movie DVDs, from satellite surveillance data to web sites presenting multimedia art, from data on consumer behaviour collected by supermarket tills to a scientific database documenting the human genome, from news group archives to museum catalogues.
2. The rapid spread of information technology makes preservation of digital heritage a worldwide concern. More and more digital systems for administrative purposes are being introduced everywhere, and a great many countries are digitizing cultural materials for better access.
3. The speed at which the digital world moves has upturned the order of all established preservation practices. Generations of platforms, programmes and machines succeed one another so quickly that it is a matter of years rather than decades before materials become inaccessible as a result of compatibility problems. The timescale for preservation has shrunk: steps to ensure that digital materials remain accessible have to be taken very early on in their lifecycle.
4. Governments and policy makers should be aware that preservation of digital heritage is an urgent issue and that solutions cannot be found overnight. The risk of losing essential materials in which valuable resources have been invested is very real. It is therefore crucial that countries assume responsibility for digital heritage and take steps to prevent such loss.

EXISTING MODELS AND LEGAL FRAMEWORKS

5. Traditionally, preservation of cultural heritage has been supported by legal frameworks and procedures which are largely based on formal criteria. National libraries collect and preserve publications through legal deposit of the national production, and there is extensive archival legislation defining when and how records must be transferred to archives for selection and preservation. Specialized archives and museums have responsibilities for collecting and preserving sound, photographs or film. Legislation may vary considerably between countries (e.g. regarding the categories of material to which legal deposit applies), but there is wide agreement on the basic principles, and all parties involved in the process are well aware of them.
6. In the digital world, new types of materials have come into being that are hard to classify by conventional criteria. Multimedia materials combine different types of content with different functionalities. Web sites may combine files with various types of content –

data, texts, images, sound— and many of them are (partly) dynamic. Web sites may also be distributed sites including materials stored on different servers at different locations in the world. Such mixed or dynamic materials do not fit into traditional categories; on the basis of existing policies it is often not possible to decide where the primary responsibility for collecting and preserving them should lie.

7. Although we speak of ‘*publishing* on the internet’, it is not at all clear what constitutes an internet publication. Place of publication, an essential criterion in deposit legislation, can no longer be used to define the national production or imprint: domain names do not necessarily reflect where the material is produced and in which language, and many sites are mirrored in other locations.

8. That raises the question of which materials should be considered publications as defined by deposit legislation, and how deposit legislation can be adapted to include digital materials that national libraries should preserve. Although some countries have extended legislation to cover offline publications such as CD-ROMs, the case of online materials is as yet still diffuse.

9. In the archival world, electronic records have taken the place of paper. With records being used for years or even decades, they will inevitably have to be moved from outdated environments to new ones, with the risk of changes or loss of content, functionality or original appearance. In the absence of a fixed object that can be preserved as is, it becomes necessary to decide which elements actually make up an authentic electronic record and need to be preserved.

10. Legal frameworks defining responsibilities and procedures need to be adapted or extended to be able to deal with the new digital environment. Adequate legislation in this area is a necessary instrument for institutions to define tasks and select materials for preservation.

THE INTERNET AS A CULTURAL SPACE

11. The internet consists of one billion pages and keeps growing. A number of these pages are devoted to materials of the kind that we traditionally associate with heritage institutions: electronic journals and articles, newspapers, photographs, catalogues and finding aids, and other kinds of records and documents.

12. However, the internet is an extremely democratic medium, and on the other end of the scale there are innumerable web sites created by individuals and informal groups. Virtual communities of people scattered over the globe but united by shared interests discuss just about anything under the sun, including such topics as endangered languages or regional cooking. Artists experiment with multimedia web sites as new art forms, amateur genealogists present data on their family’s history. Taken as a whole the internet in many ways reflects our society, as a huge open space where a variety of cultural activities are pursued.

13. Preservation of digital heritage will somehow have to deal with new manifestations of cultural content on the web, which challenges traditional classifications of materials worth keeping. Unfortunately, it is risky to rely on time to sift what may prove to be of lasting value from the merely ephemeral. Web sites are changed and updated constantly, and superseded materials vanish without leaving a trace. Estimates for the average life expectancy of a web

page vary from 44 days to two years. When organizations go out of business or lose interest, whole web sites disappear from sight.

14. This not only happens with informal or temporary sites, but also with central and official ones. Some heritage institutions, recognizing the risks posed by the instability of the internet, have opted for a proactive approach. From the wide diversity of materials on the web, they aim to safeguard access to what is potentially of lasting cultural value. However, their work is complicated by the fact that there are no established formal criteria to select web sites for preservation. New policies need to be developed to ensure that all kinds of web content that may be of value for later generations are indeed saved for posterity.

APPROACHES TO DIGITAL PRESERVATION

15. A number of initiatives to preserve digital materials have been ongoing for some time. In scientific and scholarly research, computerized data have been created and used for decades. The space and earth observation communities, using massive amounts of data that need to be studied over a long period of time, have been very active in developing a reference model for archiving data that is being widely adapted. Data archives, especially in the social sciences and the humanities, have for years been collecting data sets created in research projects so that they are maintained and can be re-used.

16. National libraries generally approach the digital environment from the angle of deposit legislation. Deposit of offline digital products, such as CD-ROMs, is in several countries already a legal requirement. Online electronic journals are treated as an extension of a long tradition of print publishing, which libraries have always collected and preserved. To ensure continued access to the whole of the scientific electronic journal environment, including live links, data and multimedia presentations, libraries are now trying to come to arrangements with publishers about deposit, as yet often on a voluntary basis.

17. Several libraries have developed strategies for selecting and preserving web sites on the basis of a concept of 'publication', of which the Pandora project of the National Library of Australia is perhaps the best-known example. 'Publication' is defined here in broad terms: anything on the internet is regarded as a publication, only organisational records are explicitly excluded. At the center of the policy is the idea of national production constituting national cultural heritage: sites selected for preservation should be about Australia, or deal with a topic highly relevant for Australia and written by an Australian. Selection is determined by content and 'high priority is given to authoritative publications with long term research value'.

18. Some national archives, as for instance the Public Record Office and the National Archives of Australia, have extended policies for electronic record management to include web sites of government agencies (public sites as well as intranet sites) and developed guidelines describing best practices. The Public Record Office warns that materials on web sites are not always recognized as records. Rigorous records management is required also for web sites. Responsibilities and procedures for identifying records and managing them remain valid in the internet world.

19. Other institutions are focusing on collecting materials in a specific discipline. The International Institute of Social History, as a research institute with the task of collecting and archiving materials relating to social history, decided in 1994 to collect internet documents on politics, social affairs and ecological issues. Their collection policy is exceptional in that it

also includes newsgroups, and they have now collected 900,000 messages from 974 newsgroups which are accessible over the internet.

20. Apart from these selective approaches for preserving web content, there are also examples of comprehensive approaches, which collect enormous numbers of web pages without any selection for content. The Internet Archive, started in 1996 as a private, non-profit enterprise, collects freely available web pages worldwide and now comprises over 10 billion web pages or 100 terabytes of data (5 times the size of all the materials held by the Library of Congress). The Internet Archive launched a 'Wayback Machine' in October 2001 to provide free access to the archive over the web.

21. In Sweden, the Kulturarw3 Heritage Project has been harvesting Swedish web sites since 1996. In the Finnish EVA project all 'the freely available, published, static HTML-documents with their inline material like pictures, video and audio clips, applets etc' in the .fi domain are harvested. This activity of harvesting all materials freely published in the Finnish internet is regarded as complementary to the legal deposit of paid materials by established publishers.

22. At the moment, the main aim of these initiatives is to save web materials that would otherwise in any case have been lost forever. However, rendition of captured sites is as yet incomplete, for capturing online information is extremely complex. Links to external sites will in many cases be broken and interactive navigation cannot always be retained. More and more web pages are dynamic, generated 'on the fly' by databases hidden behind the static front end of the site. It is estimated that the databases behind web sites, together called the 'deep web', contain many more times the amount of information accessible on the surface. The information in those databases cannot be captured by copying the web site, as it is not available in ready-made pages at the surface. Moreover, after only five years of archiving, there is no saying yet how it can be ensured that these materials will still be available after 25 or 50 years.

23. In spite of many uncertainties, the initiatives taken by memory institutions are valuable explorations of the legal, organizational, economic and technical frameworks required for preservation of on- and offline materials. The experience gained by the pioneers in this area will be of huge benefit to the whole cultural sector and will contribute considerably to the development of infrastructure and policies for preservation.

WHAT IS PRESERVATION OF DIGITAL HERITAGE

24. In the world of print, preservation can be achieved by preserving the paper object or, if that is not feasible, creating a durable surrogate for instance on microform. The equivalent in the digital world would be, for example, to preserve a CD-ROM, or transfer its contents to another type of carrier. However, this does not achieve much more than preservation of the actual bits that make up a file. Whereas this is obviously a necessary condition for preservation, it is not sufficient to ensure that the information can be read and interpreted in the long run.

25. As file formats and programmes also become outdated, preservation of digital materials has to deal not only with maintenance of the files themselves but also with ways of keeping them accessible. This means that either the programmes have to be preserved as well and somehow kept running on new platforms, or the files have to be converted to another format that can be interpreted by new programmes. As the digital world moves on all the time, this is a continuous process if materials need to be kept accessible for decades (or even forever). In many cases this will, sooner or later, result in loss of information, functionality and/or appearance, especially with complex, multimedia materials that combine a variety of file formats and applications.

26. This poses risks for integrity of digital materials: how can it be ensured that the digital object, moving from one environment to the next, remains complete and undamaged? A different but related issue is authenticity, which relates to the trustworthiness of materials, in particular of electronic records. As records are used for accountability and as evidence of transactions, it is crucial for future reference that the original exists as it was first created and that the record indeed is what it purports to be. Integrity and authenticity do not only depend on protecting files against intentional changes by unauthorized persons, but also on controlling inadvertent changes resulting from misinterpretation or misrepresentation by computer systems.

27. Preservation of digital materials is first of all a matter of defining the content and properties that need to be represented in future systems. For instance, data in a complicated table may be 'frozen', i.e. only the results of the calculations are kept, not the software to produce them- or they may be kept 'alive', by retaining the software, thus offering future users possibilities for searching, selecting and sorting.

28. If optimal functionality and access is the primary goal, it may even be necessary to upgrade to future requirements and devise systems that can incorporate the improvements of developing technology. Otherwise, future users will have to be satisfied with a level of access and functionality limited to what was possible in days (then) long gone.

29. In contrast, if there are reasons for representing materials in a historical context, one may wish to retain as much as possible of the original, so that future users can experience the material as we experience it now. These issues come up in the preservation of electronic art as for some artists the way the work is displayed (e.g. on a specific type of screen or using a specific browser) is an integral part of the work. To ascertain what the work really is and how it is meant to be shown, museums now often collect information on artists' intentions to guide preservation efforts.

30. As the aim of preservation varies, so will the requirements for future representation and consequently the technology to meet them. In all cases, adequate representation at a later stage depends on the identification of the type of content and file formats as well as the software that makes access possible. Only if one knows what one is dealing with can suitable preservation measures be taken. Documentation starts at the lowest level, by describing the characteristics of the bit stream as well as the hardware/software environment capable of rendering the object in its present form.

31. Additional documentation is needed to understand and evaluate what is presented: information presented as such, without context and background information, will be hard to 'place'. It makes all the difference for understanding a map with red dots on it whether it was used for geological exploration or military actions, and this cannot always easily be seen from the map itself if it is presented in isolation. It therefore needs to be specified how and when the material came into being, who has held it, and how it relates to other information.

32. Documentation of materials is a prerequisite for understanding how they are meant to be preserved, and constitute a considerable additional burden on heritage institutions. To facilitate preservation, efforts will have to concentrate on developing standards for documentation for specific classes of materials and on exploring how processes can be partly automated.

TECHNOLOGICAL ISSUES

33. Most digital materials cannot meaningfully exist outside the digital environment. Printing the information out on paper to preserve it would only work for a small category of straight text files. Generally, in order to use the material at some future moment as it is meant to be used, both content and functionality need to be preserved. Preservation of digital materials is therefore a complex technological task that has to deal with several aspects simultaneously.

34. Basically, there are three ways in which digital materials can become inaccessible: (1) degradation of the media on which they are stored, (2) obsolescence of software making it impossible to read digital files, and (3) introduction of new computer systems and peripherals that cannot handle older materials.

35. Tapes and disks are all subject to physical decay and none of them has a lifespan that is comparable to that of preservation-standard microfilm or acid-free paper. They need to be stored under controlled conditions, but even so materials should be copied onto new media at regular intervals to prevent loss through deterioration of carriers. 'Refreshment' of materials, i.e. transferring them to new media, often becomes necessary because a specific type of disk or tape can no longer be used in current computer systems. The disappearance of the 5 1/4 disk and the accompanying disk drives is a case in point. Refreshment is a recurring activity in any preservation programme.

36. Obsolescence of software and hardware leads to (partial) loss of information or functionality of files in their original format. Successive versions of programmes may be compatible, but software producers do not usually support compatibility over a long period. Programmes disappear from the market or can no longer be used on a

new platform. The combination of dependence on old versions of programmes that used to run on old platforms of outdated computer systems inevitably spells digital death.

37. For the short term, it may be possible to keep the original environment (hardware and software) functioning. There is, however, wide agreement that this will not work in the long run, as it will result in an ever-growing collection of outdated computers and peripherals that is very hard to maintain over time.

38. Different approaches have been suggested to combat obsolescence of software and hardware. One method is to convert files to new platforms or different programmes. This is especially attractive if they can be converted to a standard, non-proprietary format, as this facilitates maintenance over time. However, conversion may lead to unacceptable loss of functionality, especially with complex databases or multimedia materials. Even with relative simple materials it is hard to predict the cumulative effect of successive conversions over time.

39. Other approaches aim to recreate superseded versions of operating systems and programmes in new environments, so that the files can be kept in their original format and read with the software in which they were first created. This is certainly a way to bridge one or two generations of platforms, but over time, as new systems keep being introduced, one may be faced with a Chinese boxes effect that becomes complex to handle. Another disadvantage may be that functionality is kept at the level of outdated systems, which may not be very satisfactory for future users.

40. It is as yet uncertain what will prove to be feasible and successful, and many institutions are doing research, creating test beds and pilots to gain more experience with potential solutions. In the meantime, a better appreciation of the risks and complexities among producers of digital materials could make all the difference for institutions engaged in developing preservation systems.

41. Producers can facilitate preservation efforts by using (official or *de facto*) standards, like XML, TIFF or PDF. The use of proprietary software complicates matters not only because it is protected, but also because it is often inadequately documented, which makes it impossible to predict the outcome of a conversion in every detail.

42. Creators of digital materials and the ICT industry have to be involved in the process of preservation as their cooperation can reduce the burden for heritage institutions. Creators will have to be encouraged to use open standards and provide adequate documentation of files. The ICT industry should be convinced of the value of open source software and of the need to publish detailed and complete documentation, to make sure their products can continue to be used in a preservation setting.

43. The technology for preserving digital materials requires investments in research and development that are substantial. However, such investments are negligible compared to the resources invested in creating the materials in the first place, and the cost to society if no adequate systems are developed and materials are thereby lost.

ORGANIZATIONAL ISSUES AND RESPONSIBILITIES

44. Traditionally, the roles of creators and of keepers of information have been quite distinct. Basically, those who created materials had no interest in their preservation, and those who kept materials had no control over their creation. This division of tasks has to be abandoned in the digital world. Preservation requirements have to be taken into account very early on, even at the point when material is created, and 'the first line of defence against loss of valuable information rests with the creators, providers and owners of digital information'.

45. Creators should be made aware that choices made at the time of creation affect the possibilities for later archiving. The use of standards and open formats, adequate description and documentation, and the use of permanent names for online resources facilitate long-term preservation and help to reduce costs. Creators should realize how good practice in producing digital materials can help to maintain them over time.

46. Many producers of information manage their own materials for some considerable time after they have been created and in doing so will have to deal with preservation-related issues. Record-creating agencies often have to retain records for decades and have to make sure they can be accessed and used: in the past, national archives were expected to take preservation measures for records which they received only after twenty or thirty years.

47. Publishers are motivated to keep digital materials accessible for some time, often storing them in standard formats such as SGML and XML, because it is commercially attractive to be able to re-use them for new products. Also, as libraries do not physically hold the e-journals to which they subscribe, they depend on publishers for such continued access to older materials. At the same time, the publishing industry underwrites the role of libraries and relies on them for long-term preservation. A joint draft statement of IFLA and IPA explicitly distinguishes short-term archiving by publishers (for as long as publications are economically viable) and long-term archiving by libraries.

48. The cooperation of creators and owners of information in developing working models for preservation is crucial. For instance, copyright issues need to be resolved before libraries can take any steps to maintain materials. Copyright legislation places such strict limitations on copying that even transferring files to the library's system may constitute an infringement of the rights of owners and creators. Although publishers recognize that copyright may be a barrier for long-term preservation, they are at the same time wary of any arrangement that would interfere with their commercial interests, by making deposited materials easily accessible on networks.

49. There are some examples of arrangements between libraries and publishers that aim to balance the interests of both parties, allowing copying only for preservation purposes while restricting access. However, rights management is developing into an extremely complex area and not all aspects can be covered by agreements between publishers and libraries. When a digital product relies on proprietary software owned by third parties, the creator of the content does not usually hold these rights. Software vendors have so far hardly been involved in preservation efforts and software is not usually covered by deposit legislation. A

dazzling array of rights may be associated with web sites combining mixed materials from various sources. Agreement on the principle of the right to copy for preservation will therefore have to be sought to make copyright aspects of preservation more easily manageable.

50. Ideally, responsibility for preservation is shared by creators and keepers, each maintaining materials during a certain stage of their life cycle. As creators are not always aware of all the risks, heritage institutions actively seek their cooperation and provide guidance on creation and preservation. Deposit regulations should help to ensure that materials are indeed transferred to an archiving institution. Such regulations should not only be developed for records and publications, but also for instance for research data, by making deposit a condition of research grants.

51. Building a deep infrastructure capable of supporting a distributed system of digital archives would depend on trusted organizations capable of keeping materials alive for the long term. National libraries and archives are at present taking on this role, as are a number of specialized research institutes and data archives. There are, however, a range of other institutions that may have a task in preserving certain types of materials (digital photographs, sound, art, broadcasting materials) or preserving materials for a specific community (institutions with a local or regional task, research institutes in a specific discipline).

52. Digital archives need to be trusted organizations. Those who transfer materials for preservation have to be certain that integrity and authenticity are ensured, that technical measures are taken in time, and that rights and restrictions for access will be observed. At the moment, tasks and responsibilities of such trusted repositories have not been defined. The leadership of national institutions in testing models can help other heritage institutions to understand the requirements for an operational preservation system and to set up systems for their own field.

53. Preservation of digital heritage is as yet an unknown territory for most institutions. When they take on responsibilities in this area, they will have to adapt organizational structures and redefine tasks of staff. Cooperation and exchange of experience will be essential to avoid expensive mistakes, and training programmes for staff are a priority for all institutions facing the digital challenge.

54. Cooperation, guidance, leadership and sharing of tasks are all key elements of programmes for preservation of digital heritage. Cultural institutions need the cooperation of creators of information and of software producers. The creation of a system of distributed archives depends on national guidance as well as international cooperation. However, the terrain is so new and experience as yet so limited, that immense efforts will be needed to build up the necessary infrastructure. Adequate resources and support at policy level are indispensable to ensure that future generations will still have access to the wealth of digital resources in whose creation we have invested so much over the past decades.

Annex II

ELEMENTS FOR A CHARTER

A. Preamble

Reference to the Constitution of UNESCO and to its specific mandate to ensure the preservation and promotion of the world's cultural heritage and its diversity.

Reference the Information for All Programme, providing a platform for discussion and guidelines for action on issues such as preservation of information and universal access to it, and participation of all in the emerging global information society

B. Scope

1. A large part of the world's information is now produced digitally, and most of this exists in digital form only. The web functions as a resource for information and communication as well as a cultural space where a diversity of materials are produced that cannot easily be classified in well-known categories. Much of this digital material is potentially of lasting value, whether cultural, legal, or practical, and new, pro-active strategies need to be developed to ensure it is saved for posterity.

2. The preservation of our digital heritage is a new responsibility that falls on the actors of the information society. It is an ongoing activity that requires commitment and involvement, not only from heritage institutions, but also from governments, policy makers, producers and users of information, the software industry and international professional organisations and associations. Solutions depend on large-scale cooperation and the creation of a lasting infrastructure. Lessons learnt from the preservation of other forms of world heritage, whether intangible or tangible, such as monuments, manuscripts, printed or audiovisual documents, should be kept in mind.

Roles and responsibilities

3. Considering the exponential growth of the digital domain, clear preservation objectives both in qualitative and quantitative terms should be set. Guidelines should be provided to all concerned parties, and particularly national heritage institutions, as to which records should be preserved, and whether they should be preserved in a comprehensive and systematic way or only on a periodic sampling basis.

4. A clear division of tasks and responsibilities, based on existing roles and expertise, needs to be established in order to attain an infrastructure of distributed archives, functioning as trusted digital repositories. It should be established, in particular, how tasks can be shared between national heritage institutions and organizations working for specific discipline-oriented communities, at national, regional and international levels.

C. Awareness raising

5. Awareness of preservation issues should be raised with producers of digital information. They should realize the importance of the use of standards and open source software and of adequate description and documentation. Outreach strategies of heritage institutions are needed to provide guidance and establish strong cooperation with the creators of materials.

6. The ICT industry should be made aware of the need to take preservation requirements into account. The value of standards and open source software should be promoted among software developers. They should be encouraged to make detailed and complete specifications of their products publicly available, especially for (versions of) programmes no longer on the market. Initiatives should be developed to build sustained repositories of specifications, documentation and related software.

Legal aspects

7. Existing legislation should be adapted to support national heritage institutions in the preservation of digital materials. Deposit legislation should extend to all materials regarded as publications, and legal frameworks for archives should include everything that constitutes a record, in whatever format it was produced. Additional procedures will have to be developed for materials that fall outside these categories (such as research data).

8. Copyright legislation should not act as an impediment for preservation of digital heritage. Owners of rights, of content as well as software, should be convinced of the need to allow heritage institutions to take actions necessary for preservation of materials. It should be possible to carry out such actions in the framework of general agreements specifying conditions for access and use.

D. Research and training

9. Further research to develop promising models and technology should be widely supported in order to achieve fully operational systems for preservation of digital heritage as quickly as possible. While the digital world moves ahead at a rapid pace, there is a serious risk that materials will be left behind and irretrievably lost. With so many resources being invested in the creation of digital materials, it is crucial to stimulate efforts aimed at ensuring their accessibility for future generations.

10. The leadership role in digital preservation of heritage institutions worldwide should be acknowledged. Their pioneering work in exploring legal, organizational, technical and economic aspects can provide the basis for defining best practices which should be strongly promoted in the whole community.

11. Extensive training programmes are needed to disseminate the expertise and experience gathered so far widely among management and staff of heritage institutions. Preservation of digital heritage requires new organizational structures, new approaches and new ways of thinking. Programmes will have to focus, not only

on technical aspects, but also on training staff to deal with a changing environment and new directions.

Solidarity and strengthening capacities

12. In the face of the current digital divide, it is necessary to reinforce international cooperation and solidarity aimed at enabling all countries, especially developing countries and countries in transition, to ensure preservation and continued accessibility of their digital heritage, through sharing experience, disseminating results and best practices and concluding twinning arrangements.

13. Market forces alone cannot guarantee the preservation and promotion of the world's digital heritage. From this perspective, the pre-eminence of public policy, in partnership with the private sector and civil society, must be reaffirmed.