

Addressing Digital Memory Preservation Challenges in Europe

Chiara Cirinnà,
Fondazione Rinascimento Digitale
via Bufalini 6, 50125 Florence, Italy
cirinna@rinascimento-digitale.it

Maurizio Lunghi
Fondazione Rinascimento Digitale
via Bufalini 6, 50125 Florence, Italy
lunghi@culturalheritage.it

Summary

Digital preservation is not just a mechanism for assuring bit sequence persistency, but it involves economic, legal and social aspects. Digital preservation is too big an issue for individual institutions or even sectors to address independently. Concerted actions at both national and international level are required.

Apart some isolated initiatives, the first effort carried out jointly by the European Commission and the Member States was the recommendation issued in July 2002 under the auspices of the Council and in cooperation with the National Representatives Group (NRG). After that some projects funded by the European Commission have developed a knowledge background and experience on digital preservation by cultural institutions.

The coordination action DigitalPreservationEurope (DPE), funded under the Sixth Framework Programme, sets out to improve coordination, cooperation and consistency in current activities to secure effective preservation of digital materials. To this end, the project will facilitate pooling of the complementary expertise that exists across the academic research, cultural, public administration, and industry sectors in Europe. Three important projects funded by the European Commission about digital preservation in the cultural sector, namely DPE, CASPAR, PLANETS, are working strongly together, in order to create a unique framework for the users community at a European level.

Future developments are aimed at enlarging the community of users and directed towards the creation of a network of competence centres on digital preservation related issues. In particular, a study about current practices and architectures implemented in competence centres networks worldwide has been produced and a benchmark model open to experts discussion has been proposed as preparation of a network of excellence in Europe.

Keywords: digital preservation of cultural contents, competence centres

Introduction

Electronic resources are a central part of our cultural and intellectual heritage; but this material is at risk. Digital memory needs constant management, using new techniques and processes, to contain such risks as technological obsolescence. Long-term digital resources preservation implicates the use of management procedures since the digital record creation and continues for as long as the digital object needs to be retained. Digital preservation is not just a mechanism for assuring bit sequence persistency, but it involves economic, legal and social aspects.

Digital preservation is too big an issue for individual institutions or even sectors to address independently. Concerted action at both national and international level is required. To this end the Coordination Activity DigitalPreservationEurope DPE¹, works in order to facilitate pooling of the complementary expertise that exists across the academic research, cultural, public administration, and industry sectors in Europe. It aims at fostering collaboration and synergies among many existing national initiatives across the European Research Area.

DPE, lasting three years, has started the 1st of April 2006 and within the ending date it aims at involving all the European Countries in raising awareness, promoting and carrying out research on technical and organisational issues of digital preservation.

DPE's success will help to secure a shared knowledge base of the processes, synergy of activity, systems and techniques needed for the long term management of digital material.

The DPE Vision

DPE objectives aim at the creation of a network of coordination that helps the diffusion of digital preservation issues through coordination, sharing and dissemination of information, experiences and results. In order to accomplish these objectives, the main project activity is directed to the clustering of a wide user community, so as to produce documentations and recommendations, tutorials, training programmes and factual synergies.

DPE has three main objectives, each of which has more sub-goals:

- *To create a coherent platform for proactive co-operation, collaboration, exchange and dissemination of research results and experience in the preservation of digital objects.* In order to reach this objective, several actions have to be implemented. First we consider important to raise awareness on the issues surrounding the curation and preservation of digital objects across the broad spectrum of national and regional cultural and scientific heritage activity in Europe; second it's a priority the elimination of the duplication of effort of research activities by researchers at

¹ DigitalPreservationEurope – DPE, <http://www.digitalpreservationeurope.eu>.

different institutions, enabling identification, collection, and sharing of knowledge and expertise; third a conduit between the research community and practitioner community has to be created, in order to foster the collaborative approaches to preservation needs; finally further research on digital preservation in key areas have to be stimulated, encouraging the development of standards and developing research agendas.

- *To increase prevalence preservation services and their viability and accountability.* In order to reach this goal, we support the development of a European-wide approach to the audit and certification of digital repositories as an essential stage in creating content management and delivery services and to repository federation. This means examining core issues that will deliver essential guidelines, methods, and tools to enable the construction of preservation functionality within European. A basic step in this direction is to stimulate ICT companies and software developers to incorporate some of the curation and preservation thinking into newer generations of software and therefore to relate the digital preservation research agenda more directly to the development of exploitable product opportunities and to develop links with the industrial sectors.
- *To improve awareness, skills and available resources.* This action is accomplished by examining core issues that will deliver essential guidelines, methods, and tools and by implementing a suite of training seminars based on best practice, identifying where and what further practitioner training and staff development initiatives might be undertaken.

Delivering these objectives will help institutions, business and individuals in Europe to respond to the increase in e-commerce, e-government, and eContent initiatives as they continue their pervasive penetration of European society.

The main DPE actions

The foremost goal of the proposal is to create some coordination mechanisms across Europe for the digital preservation on-going initiatives. DPE brings together public sector, academic, research, industrial and commercial organisations into a focused initiative on the preservation of digital objects. The project will achieve its objectives through pursuing six core activities.

Advocacy and outreach

A critical weakness in digital preservation work in member states is a widely perceived lack of recognition of the existence of a serious problem amongst the general public and key stakeholders. Awareness raising has not spread beyond a handful of professionals in archives, data centres and libraries. For a cause which relies almost entirely on the collaboration of data creators, intermediaries, and public funds this is a crucial barrier to future progress. Advocacy and outreach to systematically influence the attitudes of others, is therefore a key component of digital preservation action plans in member states. A number of

key stakeholders are common to all national efforts and may be best informed and influenced by coordinated advocacy and outreach at a European level.

Training and Continuing Professional Development

While levels of awareness of digital preservation issues have certainly increased in recent years, a significant obstacle remains for institutions in translating their awareness into practical digital preservation programmes. Both management and operational staff will need training and continuous professional development to be equipped with both the skills and the confidence to embark on a structured but graduated course of action which allows institutions to develop digital preservation programmes to suit their specific requirements.

Digital preservation training is a resource intensive activity which needs to draw on existing expertise and professional methods of delivery and validation. A range of bodies across Europe have begun to develop training primarily addressing awareness raising or single topics in workshops.

Co-ordination of EU Repository Activities

Digital repositories are a new and high-profile area: their number is growing rapidly as institutions, research teams (and even individuals) invest in digital content and networked access to it. The initial focus of activity inevitably has been on the process of establishing and populating repositories. Given the experimental and project-funded nature of many institutional and individual small repositories, it is not surprising that very few repositories can be considered to be "doing digital preservation" but for all digital preservation is becoming a growing and pressing issue. The objectives of this work activity are to add value to repositories and permanent collections by sharing information on strategies for the development of repositories in Member States, encouraging the adoption of best practice and innovative approaches to the preservation of their content, fostering the collaboration between repositories which could lead to sharing of resources, examining the possibility of a common European infrastructure to provide a last line of service for local and national repositories. DPE has developed an on line registry of repositories to store and share information regarding repositories².

Audit and Certification Services

Data creators, funders and institutions are increasingly recognising that they need access to trusted repositories. Whether they create these themselves or relying on outsourced services, institutions need mechanisms to validate the trusted status of repositories. OCLC and RLG in their Attributes of a Trusted Digital Repository paper have proposed a high level model for the design, de-

² <http://www.digitalpreservationeurope.eu/repositories>

livery, and maintenance of a digital repository. Subsequently RLG and NARA are progressing towards constructing audit and certification requirements for establishing and selecting reliable digital information repositories. Although there is growing awareness of the certifiable characteristics of repositories (e.g. activities, attributes, functions, processes), the mechanisms for audit and the process by which certificates are issued (and revoked) remain to be agreed.

DPE in collaboration with DCC (Digital Curation Centre) has developed the DCC/DPE Digital Repository Audit Method Based on Risk Assessment (DRAMBORA)³, the latest development in an ongoing international effort to conceive criteria, means and methodologies for audit and certification of digital repositories. The intention throughout its development has been to build upon, extend and complement existing efforts. A key requirement has been to establish a toolkit that contributes toward a single process for repository assessment.

Research and Practitioner Integration

Digital preservation is a complex inter-related set of technical, organisational, social, and legal challenges. Successful approaches to resolving them benefit heavily from inter-disciplinary and multi-professional contributions and rely on innovative practice developed in a few leading competence centres and industry teams. The potential contribution of research to successful solutions and interaction between practice and research are currently under-developed. Research in digital preservation in Europe is patchy, fragmented, and disconnected. Different research groups do not communicate well or with practitioners.

The objectives of this activity are to add value to research and encourage innovative practice through coordinating research collaboration, building bridges between practitioners and researchers, and developing a database of research activity.

DPE is co-ordinating a digital preservation challenge to increase awareness of the preservation problems and research opportunities among younger researchers. The DPE Digital Preservation Challenge has the goal to raise awareness amongst researchers of the aspects of digital preservation. The challenge invites participants to overcome the barriers hindering access to (sets of) digital objects⁴.

DPE offers also exchange of researchers to overcome fragmentation and allow experts to visit a host institution of their choice for up to three months. DPE hopes that these DPE Exchanges will propagate knowledge, capacity and innovation as well as foster better cooperation among research institutions and in-

³ <http://www.repositoryaudit.eu>

⁴ <http://www.digitalpreservationeurope.eu/challenge>

dustrial partners working on meeting pressing challenges in digital preservation⁵.

Community building

Fondazione Rinascimento Digitale⁶ is responsible for the task of community building. A detailed community building strategy has been developed in order to create a solid network for spreading the consciousness of digital preservation issues. The first step is the recognition of different level of awareness on the subject:

- some actors are considerably aware of the importance and criticality of digital preservation issues: the DPE network must develop some strategic alliances with these 'competitors' in the digital preservation arena, like other projects, international or professional organisations, cultural institutions;
- some actors are still not aware of the strategic significance of digital preservation: DPE aims at offering to this user community a common, clear, trustable and open point of view and an access to information about digital preservation related-issues through the exploitation of the tools at disposal.

The ultimate purpose of DPE network is focussed at triggering a "virtuous circle", necessary for the exploitation and capitalisation of different expertise and background, deriving both from 'aware' and 'unaware' actors. The strategy of the coordination action in this direction will be realized through the creation of a large consensus.

DPE has identified distinct types of collaboration with its partners:

1. *Cooperation with other projects and international initiatives.* As Coordination Action would like to avoid duplication of effort by individual organisations and different sectors within the Community, in order to ensure that scarce resources, including financial and human, will be used more effectively and efficiently.
 - International organisations and institutional partners have specific tasks and advantages deriving from the collaboration with DPE: some possible terms of cooperation are patronage for events or joint organisation, shared communication channels like newsletters, publications, web-tools and cross-reference;
 - Project partners should contribute through the dissemination of good practices, the promotion of recommendations and guidelines, and establishing expert workgroups. They could assist in the transfer of informa-

⁵ <http://www.digitalpreservationeurope.eu/exchange>

⁶ <http://www.rinascimento-digitale.it>

tion and training materials to small organisations interested in digital memory such as libraries, museums, archives and the commercial sector.

2. *DPE and its Associate Partners*. The problem of preserving and providing of continued access to digital information is faced in varying degrees by government and public administrations, cultural heritage, broadcasting, e-health, e-science, commercial organisations, and even private individuals. However digital preservation is too complex an issue for individual organisations or even sectors to address independently. Efforts to meet these challenges must be coordinated if they are to be successful. To achieve this coordination DPE has developed the opportunity for Institutions to become DPE “Associate Partners” (AP). Institutions with experience in activities related to the DPE objectives, and with visibility at national level can act as national representative for the DPE network. AP benefit from the possibility of sharing experiences with other partners, international visibility, having first access to DPE tools and results, the opportunity to work with DPE to disseminate their expertise to the wider DP community, to join expert working groups to help shape international research and policy agenda and to nominate a representative to attend meetings of the DPE governing board. AP should assist to raise awareness Digital preservation issues and DPE within their own country and disseminate DPE publications and recommendations, where necessary translating them in their mother language.
3. *DPE and its User Community*. The main objective of the DPE project is to raise awareness digital preservation issues to the widest community of users and increase the sharing of experience and expertise. To achieve these objectives DPE has created the network user community. The user community is composed of various types of individual users, both content holders, creators and end users, that need information and tools to cope with the issue of preserving the digital content. Users are encouraged to register by completing the online Registration Form via the DPE website⁷, and have access to the offered benefits.

Preservation Research Roadmap

Over the past five years there has been much discussion of the kinds of research that are needed in the area of digital preservation, but this has not resulted in a concise and well-developed strategy that represents the views of a broad community.

Future research depends upon the availability of such a view. DPE proposes reviewing existing preservation research agendas, and publishing an interim cross-walk and review of them. This review will be accompanied by a question-

⁷ <http://www.digitalpreservationeurope.eu/mou>

naire and opportunity for public comment. The final outcome will be the release of a Research Roadmap in Preservation.

The Roadmap aims at contributing to the planning of our future R&D in Digital Preservation by means of different actions, namely:

- analysing the state of the art in Digital Preservation research and already existing research agendas on a global level;
- analysing the currently available state of computer science, information and communication technology;
- researching and reflecting the needs and demands from the point of view of the Digital Preservation user communities and their leading experts
- researching and reflecting the needs and demands from the point of view of future markets for technology and service providers, to pave the ground for R&D towards such conceptual, technological and application oriented potential building blocks for advanced solutions supporting Digital Preservation applications in a variety of possible scenarios.

The Market and Technology Trends Analysis

This report focuses on market analysis through the systematic consultation of stakeholders on the benefits (access to joint materials and training, licensing of products, etc), and the scale of individual national contribution or individual institutional contribution, to joint collaboration on a European basis. This report has two main objectives:

- Market analysis based on experience and knowledge of all the contributors and the consultation of main stakeholders on their needs and plans so that the outputs of the DPE project meet their present and future demands.
- Technology trends analysis providing main DPE target groups with information on technological solutions available for digital preservation.

The document provides information and knowledge necessary for understanding which are present and future goals and needs of main DPE target groups in the area of digital preservation and how the DPE outputs can meet them in the best way. Moreover the report analyses the technological solutions, both commercial and open source, applicable and already applied for digital preservation in different institutions belonging to the main DPE target group that meet minimal functional requirements⁸.

Competence Centres

The European Commission (EC) is actively working to empower its member states to safeguard their digital knowledge for long-term accessibility and reuse. The EC has set a goal for member states to formalise a strategy for the

⁸ <http://www.digitalpreservationeurope.eu/publications/#reports>

long-term preservation of their digital information by mid-2008. The European Commission is aware that a great deal of support and guidance will be necessary to assist in the creation of these strategies and is eager to ensure that competent facilities are readily available to all member states. As a starting point, the EC organised a workshop to explore organisational models, boundaries and priorities for work, and to explore the potential impact and long-term sustainability of digitisation and digital preservation competence centres. It concluded that ‘competence centres should generate equal access to excellence from anywhere – but not duplicating excellence unnecessarily’. Digital Preservation Europe (DPE), as part of its planned activity, has been reviewing the current international landscape with regard to the availability and provision of digital curation and preservation expertise. In particular DPE produced a study about current practices and architectures implemented in competence centres networks worldwide⁹. We expect that the results of this review as well as being of use to European Commission to help inform the development of existing and new competence centres across the EU, it will also be of value to EU Member States in considering the development of new competence centres and the measurement of performance of existing ones.

As a starting point, DPE has considered some basic questions, like:

- What is competence?
- Why is competence significant in the to content creating and memory institutions?
- What is the right mix of expertise?
- How is credibility established?

DPE considered these questions from a range of viewpoints and examined current examples of competence centres in the cultural heritage sector and beyond. These considerations have helped to define DPE’s ‘7C’s’ benchmarking model. This benchmarking model enables the comparison of competence centres’ overall strengths and weaknesses and illustrates areas where improvements might be made.

Conclusions

DPE is confident that by addressing these areas, the European Commission will help to ensure that sustainable support is made accessible to assist content creators, curators and re-users to effectively manage and care for their digital resources over their entire life-cycle.

⁹ <http://www.digitalpreservationeurope.eu/publications/#reports>

References

- RLG, Trusted Digital Repositories: Attributes and Responsibilities. An RLG-OCLC Report, 2002, <http://www.rlg.org/legacy/longterm/repositories.pdf>.
- Annex: Priority Actions and Indicative Timetable, Council Conclusions on the Digitisation and Online Accessibility of Cultural Material, and Digital Preservation, Official Journal of the European Union, 7 December 2006, http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/c_297/c_29720061207en00010005.pdf
- Report from the Workshop on Centres of Competence for Digitisation and Digital Preservation held in Luxembourg on 14 November 2006, ftp://ftp.cordis.europa.eu/pub/ist/docs/digicult/competence-centres_en.pdf, page 3.