

A DEER FOR EUROPE: A DISTRIBUTED EUROPEAN ELECTRONIC RESOURCE

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The DEER is the concept of a Distributed European Electronic Resource for the digital cultural memory of Europe. Major components would be a distributed repository accessed through a Virtual Reference Room, and a Virtual Agora for collaboration and research. It would be visionary, multilingual and permanent. A suitable organisational structure could be a matrix of national and thematic committees with a small executive. It would require initial central funding followed by more diverse income sources. With a DEER to provide a framework for permanent benefits from investment, Europe would achieve the impact that European culture deserves in the knowledge society.

INTRODUCTION

The DEER is the concept of a Distributed European Electronic Resource for the whole digital cultural memory of Europe. It is a vision of an integrated online information environment offering an increasing range of methods and tools for delivering information and learning resources, to a European audience with diverse characteristics and needs. Such a vision requires widespread support at a high level, targeted investment of effort and resources, and ruthless prioritisation in implementing it.

The concept of the DEER arose in the establishment of E-Culture Net, a project initially funded by the EC's Information Society Technology programme in the final stage of the 5th Framework Programme[1]. E-Culture Net's purpose was to work towards the evolution of European culture in the digital age, by bringing together organisations involved in research, cultural institutions, education and industry. E-Culture Net participants were 35 universities, museums, libraries, archive institutions and networks from numerous European countries. E-Culture Net has also submitted a proposal for funding as a Network of Excellence under the 6th Framework, with an even larger and more diverse group of participants.

The major deliverable of the first E-Culture Net was a report on how a DEER could be set up[2]. The DEER is a grand vision, and if it is to become a reality it will require organisational politicking and commitment at the highest level, together with a dauntingly complex comprehensive set of organisational and practical measures.

This paper will provide a brief overview of the DEER and of the means by which a sophisticated theoretical model could be transformed into an operational service for seamless access to distributed resources.

WHY A DEER?

Culture is one of Europe's core assets and expressions, a key to diversity and identity within a European Union, and a vital source for future employment. Information and communication technologies using digital media will shape European culture in the future, and must also convey its past. ICT is now the EU's second most important economic sector[3]. These developments are significant for the cultural sector since cultural materials play a major role in the expression and manipulation of social and political identities, which are now increasingly influenced by the new technologies as well.

Furthermore, the growth of the knowledge society is paralleled by public interest in learning and discovery, and new information technologies present the opportunity to make historical knowledge accessible to all. The large number of EC funded IST projects demonstrates the value placed on the use of information and communications technology to enhance, represent and communicate history and culture[4]. The wealth of digital cultural resources already available argues not only that there is sufficient content to make a project such as the DEER a viable one, but that such a service is increasingly necessary and desirable to facilitate users in their research, and to make best use of all the available resources. The DEER would serve an important purpose in communicating and stimulating in an inspirational and accessible way humanities research into European history and culture.

A DEER would support and advance the realisation of European IST policies, by providing an integrated and user-friendly system to create, maintain and disseminate historical and cultural information. Hence there is both the need and the opportunity for a service that would present the wide range of cultural resources to users in a coherent and meaningful way.

DEFINING THE DEER

The DEER would have three major components: a *distributed repository* of European digital culture resources for research, learning and enjoyment, with a *Virtual Reference Room*, a portal, to make the resources accessible to all people of Europe; and a '*virtual Agora*' for European Culture: a Forum for communication between researchers, content creators, memory institutions, the commercial sector, and users.

Fig. 1. The three main components of the DEER. (Diagram: F. Monti)

DEER principles

A number of principles would form the foundation for the DEER:

- *Overarching*: The ultimate aim of the DEER would be to provide a gateway to all the digital culture of Europe, to be Europe Digital memory repository
- *Unity and Diversity*: The DEER would illustrate and promote through its content resources the diversity of European culture, as well as providing a unifying means of enjoying this inherent diversity
- *Visionary and Forward Looking*: The DEER would groundbreaking innovative technologies developed through research in Europe.
- *Multilingual*: All efforts would be made to make the DEER content translated or translatable into diverse European languages, to allow people in all countries of Europe to use the distributed resources.
- *Empower users*: The DEER would focus on users, by promoting market and user surveys and research.
- *Communication, creativity and collaboration*: The DEER would provide an Agora', a forum, a meeting point for joint working and collaboration with technologies companies.
- *Permanence*: The DEER would ensure the permanence of the resources it integrates, develop and distribute by stimulating the development of distributed information repositories throughout Europe.
- *Multinational*: The DEER would solicit collaboration with countries worldwide to promote our shared culture.
- *Interoperable*: As an environment for a distributed electronic resource, the DEER would pay great attention to secure interoperability and compatibility of databases and all other resources.
- *Education and Learning*: The DEER would provide resources for learning, collaboration and communication.

DEER objectives

The following objectives are at the core of the DEER:

- *To actively engage and involve users* in the development and fruition of a *collaborative research space*
- *To add value to quality-assured content* by providing services which allow users to integrate online resources into their research activities
- *To commit to the development of innovative technological tools* to support new research methodologies based on the existence of on-line resources
- *To promote and facilitate collaborative research* around Europe, enabling innovation and excellence
- *To develop partnership between researchers, industry and service providers* in order to promote the development of innovative tools for research and learning To enable users from different backgrounds, with different needs and involved in different activities to access the widest possible digital content from different ways

DEER components

The DEER system would require the following major components:

- *Communication Infrastructure*: fast high bandwidth connections to all European countries.
- *Content*: distributed through participant organisations and member states. E-Culture Net content would be united and harmonised by means of terminology and

- discovery tools, interfaces and gateways, and adherence to interoperability standards.
- *Interfaces, navigation and delivery mechanisms:* with reference to metadata, interoperability standards, gateways, translating facilities, ability to use different languages and scripts.
 - *System management:* providing user authentication and identification, payment mechanisms, rights managements, data protection and accessibility of resources to all.
 - *Support services:* Advice in the use of data sets, training. Guidance on creation and preservation of digital assets. Guidance of use and application of E-Culture Net standards.
 - *Research integration:* support for content creators in linking to and using novel methods developed in research by the Centres of Excellence.
 - *The Agora:* an interactive platform offering new technologies for researchers, and tools for collaborative working.

The DEER would also require an *organisation to manage and operate it, a means of achieving consensus* among its stakeholders, content providers and users, and a *financial model or models* for its initial establishment and its sustenance in the long term.

Fortunately a pathfinder for the DEER exists, in the shape of the UK higher and further education JISC (Joint Information Systems Committee) Distributed National Electronic Resource (DNER – hence DEER), now known as its Information Environment[5].

DEER users

In the long-term the DEER audience would serve the following sectors within the EU:

- Higher education
- Further education
- Cultural and memory organisations
- Public sector organisations
- Other networks and portals
- Tourism
- Industry and R&D organisations

Initially it would be necessary to focus on a more specific group of users, and E-Culture Net participants identified the priority as higher and further education users together with informal researchers.

DEER RESOURCES

The DEER aims to embrace and represent with its content resources European culture in its widest possible sense. Its content would include the arts, humanities and history.

DEER resources would consist of a wide array of digitised resources. In addition, there would be the components of the Virtual Reference Room: a range of advanced technologies employed in the discovery, brokering and delivery of content, as well as the people and expertise involved in the widely distributed DEER. Also there would be the DEER Agora, a digital workspace for researchers, and a range of support services: training, information and guidance documents, and so forth.

Since the DEER's initial objective is to add value to existing content, the general categories for collecting areas would be those where a significant body of resources already exists, mainly within higher education research establishments, libraries, archives and museums. To some extent these would already meet standards for permanent preservation and interoperability. Initial priority collecting areas would include:

- **Primary sources:** digital surrogates of material such as manuscripts and rare books, maps, paintings and works of art, still and moving photographic images, audio material, and original 'born digital' works of art.
- **Research data sets** such as archaeological records, data from tax records, commercial transactions, birth, death and marriage registers and many others; geospatial data on the development of cities and settlements.
- **Digitised realisations:** digitised primary sources augmented by means of digital technologies, such as geospatial reconstructions, virtual reality reconstructions, augmented maps
- **Meta resources:** the DEER's Virtual Reference Room: cultural ontologies, subject gateways, discovery tools, multilingual tools, web service software for combining resources from different sources
- **Software tools for learning and teaching:** tools for creating and using its materials in learning and teaching.

Already within E-Culture Net a demonstrator for a Virtual Reference Room DEER service has been developed: the DACO, Digital Autonomous Cultural Objects, which will provide an individual unique reference plus catalogue metadata for any individual digitised object, whether a museum item, a page from a rare book, or a manuscript leaf[6].

Expert resources: The resources of the DEER will include an ever-expanding multi-skilled number of individuals and teams from around Europe are already working in areas that could form components of the DEER. Their capabilities cover a vast range of skills, which would be of great benefit both to the DEER and to its users.

The DEER Agora: A further DEER resource would be its *Agora*: virtual and physical workspaces that would enable users from all corners of Europe (and beyond) to avail themselves of the cultural resources in innovative and personalized ways. Where these tools and services were exclusively provided by the DEER (as opposed to those already existing ones supplied by other networks) they would build on the partnerships which the DEER would create with industry and researchers.

THE TECHNOLOGY REQUIREMENTS

The technology requirements for the DEER would be:

- an excellent quality, high bandwidth generic communications infrastructure to all parts of Europe.
- technologies to span the entire chain of the process of cultural content management, from content acquisition and archiving down to its delivery to the end users.
- technologies for interactive working and communication for the DEER Agora.

It is anticipated that the DEER's communications infrastructure would be provided via the GÉANT and GRIDS programmes. GÉANT is providing very high bandwidth capacity between European supercomputing centres, primarily for use in scientific research but also available for cultural applications. The GRIDS programme is developing the technologies of distributed information storage and processing[7].

Among the technologies for cultural content management the DEER will require a very large scale *distributed knowledge management system*; *distributed data repositories* for data organisation and preservation; *web services technologies* for information access, distribution and delivery; technologies such as *text encoding* that make the content of documents accessible to automated searches; and its *Virtual Reference Room*, using metadata and web services to enable user access via sophisticated interactive portals.

Naturally the technologies the DEER employs would be open source and non-proprietary, conforming and contributing to European and international standards.

ORGANISATION AND MANAGEMENT

If major European stakeholders such as the European Commission, governments of member states, the European Science Foundation and the joint European Research Council body that is being formed wish the DEER to happen, then the DEER will come to pass. Success in establishing it will depend on aligning plans for it with the interests of bodies such as these. A sound and credible organisational structure would be essential. It must allow for efficient and effective management of a large, complex distributed system, engagement with stakeholders, content providers and expert individuals and development through consensus.

As well as establishing and maintaining the DEER system components described above, the DEER would require the usual management functions such as decision making and consensus brokering; executive and resource management; communication channels; expertise and technical capability; dissemination activities and user integration.

Three possible organisational models have been examined: a centralised committee structure, as in the JISC[8]; a distributed nodal structure such as that employed by CULTIVATE[9]; and a combined geographic/thematic matrix as in ICOM, the International Council of Museums[10]. The advantages and disadvantages of each were explored, and it was concluded that the ICOM model was the best basis for the organisation of the DEER.

ICOM has been working since 1946. It has benefited museums internationally by engaging professionals in their development. It has created fora that encourage communication and research by specialists in an area where research is not a priority and receives little funding. One of its prime functions is to influence museum and cultural policy with governments around the world.

ICOM functions through National Committees, whose members are elected, one for each country having ICOM members, and 17 thematic International Committees. Any member may join three thematic committees. A triennial General Assembly and Congress elects an Executive Council. The Chairs of each National Committee and thematic International Committee are members of the Advisory Committee, which advises the Executive Council. The organisation is supported by a small central Secretariat with a Director General. Thus, it combines national representation with the

full engagement of expertise. The thematic International Committees play a major role; some of them have specialist subsections and major conferences of their own.

ICOM membership is primarily its 17,000 individual members. While the DEER organisation would not be primarily for individuals, a matrix of highly distributed national and specialist committees with considerable autonomy and a small central secretariat seems an appropriate configuration which has stood the test of time.

FINANCIAL STRUCTURE AND BUSINESS MODELS

The economics of digital culture are reviewed in the DigiCULT report. A business model will be required to show how the DEER's operations and activities can be launched and sustained. Four possible models for financing the DEER were investigated.

Cost headings

It is assumed that the costs of the DEER would partly be met through institutions in each country providing the information repositories that would be the basis of the DEER system. As well as financing the management operations described above, the DEER would fund the added value operations that it offered. These would include:

- The development of new technologies and infrastructure
- In time, the development of particularly innovative content and collections
- Development of generic specifications, software and services to assure integrated operation of the information repositories, such as user authentication
- Interface, navigation, metadata and delivery technologies: ie, a central Virtual Reference Room
- System management
- Support services such as training
- The DEER *Agorá*

Possible funding models

The four funding models that were analysed are:

- A designated central government funding programme, as for the GEANT and GRIDS programmes[7], where the objective is to develop a specified facility
- 'Serendipitous' project funding as in the IST Framework Programmes, where bids are invited against broadly defined objectives
- a membership subscription model, such as employed by SCRAN, the Scottish Cultural Resource Network[12]
- a commercial not-for-profit model such as found in AMICO, the Art Museum Image Consortium[13] and Fathom, the cultural education website (which has now, however, wound up).

Each of these models has advantages and disadvantages. It is likely that the best model would allow for a combination of them, and that the proportion of funding from each would vary over time. Initially, the DEER would require assured central funding comparable to the GEANT and GRIDS programmes to develop a soundly constructed system, technically, in terms of content and also organisationally. 'Serendipitous' project funding could be provided to build on this foundation, to encourage the creativity from the European digital cultural community that the DEER would need. The DEER might be able increasingly to supplement central funding from membership subscriptions perhaps mainly from organisations that benefited from it. Finally, it might

be possible to institute license fees for access to content, and to engage in partnerships with commercial companies that wished to exploit attractive DEER cultural material such as images.

Cost-benefit analysis

The risk with the current 'Serendipitous' FP6 mechanism is that unless there is some coherent and persistent outcome, EC funding will continue to be put into making a thousand electronic cultural flowers bloom which, while they develop useful new capabilities, lack the organisational framework to enable them to coalesce into a critical and permanent facility: a field of wildflowers rather than a productive fruit tree.

If the DEER delivered the benefits and the services that it should be capable of, it would be in the interest of its stakeholders and major content providers to sustain and collaborate in it. Benefits to different stakeholders range from the enhancement of Europe's position in the global marketplace and knowledge economy; enhanced cultural identity for Europe and its countries; a larger market for the providers of DEER content and the use of DEER facilities such as multilingual technologies; the facilitation of historic and cultural research and access for users to its results.

LEGAL FRAMEWORK AND GUIDELINES

The DEER would face a range of issues that would require a legal framework and authoritative guidelines for its distributed members. Primary issues for any organisation dealing with technological innovation and content are those of IPR (intellectual property rights) and copyright. In addition, the DEER organisation would need to be established with a constitution that would deal with responsibilities and relationships with stakeholders, funders, content providers, technologists, and users. An EEIG, European Economic Interest Group, may be the best legal model, but this would depend on decisions at the time it was established, and other options may be available.

A number of issues would need to be regulated through comprehensive guidelines. Guidelines would inform content providers and participants in the DEER system of best practice, and promote interoperability and the implementation of DEER standards. These would include such issues as:

- Accessibility and design guidelines
- Content development strategy
- Legal information, especially on copyright
- Systems and web service technologies
- Networking
- Use of DEER materials for learning and research

IMPLEMENTING THE DEER

Finally, in practice how might the DEER be established? The point was made above that major potential stakeholders would need to commit to the DEER if it were to come about. A credible series of events might occur during the timescale of the 6th Framework.

First, a number of projects will be funded by the 6th Framework. Some of them will develop potential components of the DEER. Examples are E-Culture Net itself[1], DEER-cities[14], ORION[15], SEMKOS[16], ARTNOUVEAU[17], and other proposals. Concertation mechanisms are already proposed for the 6th Framework to assist in achieving the Commission's primary objective of research integration. These

mechanisms would allow the participants in the successful projects to explore ways in which they complement each other both in the present and within a possible future DEER framework.

A small core start-up Steering Committee would need to be established, which would need to include representatives of the major stakeholders identified. This Steering Committee would identify a permanent host organisation and location for the DEER Secretariat. With a stable executive core, the chairmanship or presidency of the DEER could move between National Committees. Finally, a specific funding programme, persisting over more than one Framework Programme, would need to be established.

CONCLUSIONS

This paper has set out the stall for a DEER, a Distributed European Electronic Resource, and shown how it could be created and sustained. Europe needs a permanent framework for digital culture such as the DEER would offer. Without it, a multitude of technologies and cultural materials will continue to be funded that never form a permanent critical mass. A DEER is not only desirable but necessary, in order to pursue and realise European policies to promote a knowledge economy and to enhance the economic and political advantage of our rich and varied culture. A DEER can realise the full benefits of past and present European investment in this field and achieve a lasting impact.

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