

# DIGITAL LIBRARIES AND THEIR IMPACT ON DISTANCE LEARNING: A EUROPEAN PERSPECTIVE\*

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**Abstract:** We discuss distance learning and digital library issues in the context of RTD programmes funded by the European Commission. After explaining the rationale of these programmes we focus on the objectives and other characteristics of individual Commission supported projects that aim to apply digital library techniques to distance learning and teaching on a European scale.

## 1. INTRODUCTION

This paper is not on *technical* details of the role of digital libraries within distance learning arrangements. Rather, as expressed in the title, the emphasis is on the “European perspective” of these concepts. And “European” does mean *European*, not Spanish, British, Greek, Latvian, German, French or Finnish, or any subsets of such nationalities. More specifically, our use of the geographical qualifier refers to activities financially and otherwise supported by the European Commission, the executive branch of the European Union government.

We shall explain briefly the rationale for this support, then look at the place of distance learning and digital libraries within Commission-run research programmes. We shall point out specificities of the European approach that are due to certain idiosyncracies of that part of the world. In the main we shall focus on the objectives and other characteristics of individual Commission supported projects that aim to apply (digital) library techniques to distance learning and teaching on a European scale.

## 2. THE EUROPEAN CONTEXT

### 2.1 A short note on the whys and wherefores of European research funding

Governments spend public money on research for various, but mostly political and economic reasons. This is also true for the governing bodies of the European Union. Funding pre-competitive research and technological development (RTD) on a European scale is perceived *inter alia* as an important contribution to achieving the long-term goal of a single European market, and to strengthening European industry and competitiveness. Article 130 of the European Union Treaty codifies this mandate<sup>1</sup>. It has been the legal basis of multiannual RTD framework programmes since the early eighties.

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\* 5th International Conference on Computers in Education, ICCE 1997, Kuchin, Malaysia (Invited Keynote)

<sup>1</sup> <http://europa.eu.int/abc/obj/treaties/en/entr6d15.htm#141>

The fourth such programme (1994-1998) is currently being executed and the fifth (1998-2002) is in its final preparatory phase. These programmes cover basic and applied research in many different broad areas, such as life sciences, environment, energy and information and communication technologies (ICT). The latter is the one that mainly concerns us here.

Both distance learning and libraries, have been on the Commission's RTD funding agenda for more than ten years now, primarily under the umbrella of the *Telematics Applications Programme*<sup>2</sup>, one of the specific subprogrammes in the ICT area.

## 2.2 Open and distance learning

The DELTA programme, as it was called prior to the current *4th Framework Programme* period, is well known among those interested in the application of ICT to teaching and learning. It has been running since the late eighties and has since changed its name to *Telematics for Education and Training*<sup>3</sup>, to become one of 13 sectors of the (1994-1998) Telematics Application Programme. Its objective is to help improve access to lifelong learning for everyone living and working in Europe. The Sector is currently supporting some forty projects that develop means for people to learn *what they want, when they want, how they want and where they want*. Hence, apart from addressing the (relatively obvious) needs of secondary and tertiary education and those of continuing professional training and education, it also responds - to some extent - to the needs of independent learners.

The *Telematics for Education and Training* programme is part of an effort to modernise European societies by providing more efficient, more comprehensive and more accessible means for people of all ages and occupations to gain and maintain the knowledge and skills that are necessary to keep up with the rapid changes brought about by the ongoing technological revolution. Certainly, each Member State of the European Union has to find its own way of coping with this challenge. However, beyond all cultural differences, there are sufficient commonalities (including common goals) to justify joint European action. This fact has been recognized at the highest political level<sup>4</sup> and led to major Europe-wide awareness campaigns, such as the *European Year of Lifelong Learning* in 1996, preceded by the publication of a *White Paper on Education and Training* (in 1995), setting the political agenda.

Noteworthy among other relevant activities, outside the above mentioned RTD framework, are programmes such as

- LEONARDO, for encouraging the development and use throughout Europe of vocational training systems;

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<sup>2</sup> <http://www2.echo.lu/telematics/home.html>

<sup>3</sup> <http://www2.echo.lu/telematics/education/en/>

<sup>4</sup> Articles 126 and 127 of the Treaty establishing the European Community stipulate respectively that "*the Community shall contribute to the development of quality education by encouraging cooperation between Member States and, if necessary, by supporting and supplementing their action*" and that "*the Community shall implement a vocational training policy which shall support and supplement the action of the Member States*".

- SOCRATES which aims to revive and broaden the European dimension of education and training through a range of measures, including support of the joint development of curricula, teaching materials and other educational products;
- INFO2000, the information market programme, an action line of which is defined to stimulate the production of high-quality multimedia content, including educational and *edutainment* titles, through funding relevant projects.

More recently, a report<sup>5</sup> has been issued that takes stock of all these activities with a view to promoting the use of educational software and multimedia in European schools, universities, businesses, and homes. It defines verifiable qualitative and quantitative objectives and indicates ways of achieving them.

### 2.3 Libraries and digital libraries

The fact that the European Commission has also initiated a programme for helping European libraries to catch up in the technology race is perhaps less widely known outside the library community. The preparatory phases of this programme (in the late eighties) coincided more or less with those of DELTA, and like DELTA it has found its place in the *Telematics Applications Programme*, under the heading *Telematics for Libraries*<sup>6</sup>. Since its formal inception in 1991 (then under the *3rd Framework Programme*) it has provided grants to some 80 projects and accompanying activities, totalling the equivalent of some 66 million US dollars. The programme is designed to cater for the needs of *traditional* libraries of all types (national, academic, public, etc.) and their users, and to take account of the diversity and fragmentation of the European library scene. Unlike the by now famous ARPA/ NASA /NSF initiative<sup>7</sup> in the US, it has not been designed primarily as a *digital library* programme (as a matter of fact, that term had not even been coined when the programme started). Yet it is perhaps not surprising that many issues that are now closely linked to digital libraries have been taken up by projects of the *Telematics for Libraries* sector. These range from structuring and accessing repositories of multimedia materials (image and video banks, sound archives, etc.) via problems of interoperability of library systems to questions of copyright protection in an electronic environment (document delivery, electronic publishing, etc.). The digital library may (and, in this author's opinion, should), after all, be viewed as an extension and enhancement of the traditional library, permitting the improvement of traditional services and the introduction of new ones, often irrespective of the distance between service provider and recipient.

In recognition of the important role of libraries within the field of education and training the *Telematics for Libraries* sector also invites projects that aim to integrate library services with distance learning environments: *Many libraries already provide users of distance learning courses with support in terms of documents, advice and information on sources, and facilities to access multi-media materials. The new information and communications technologies now offer possibilities for access to and delivery of*

<sup>5</sup> Report of the Task Force "Educational Software and Multimedia", July 1996 (<http://www2.echo.lu/mes/en/report796.html>)

<sup>6</sup> <http://www2.echo.lu/libraries/en/libraries.html>

<sup>7</sup> <http://dli.grainger.uiuc.edu/national.htm>

*distance learning materials. Libraries can continue to provide support services to distance learners in this new environment by mediating access to information and to learning resources as well as by providing the facilities to use these networked services*<sup>8</sup>. Clearly, this encourages the adoption of digital library techniques by traditional libraries in order to support education and training at all levels and for all types of learners.

### **3. (DIGITAL) LIBRARIES AND (DISTANCE) LEARNING - AN OVERVIEW OF EUROPEAN PROJECTS**

This invitation has met with considerable response from academic and public libraries alike. Academic libraries, of course, are part of the university infrastructure, and as such have a natural interest in satisfying the particular needs of their respective communities of students, lecturers and researchers, in the best possible ways. Hence they are more than willing to implement new systems that facilitate access (including remote access!) to their collections and services in support of teaching and learning. A similar interest may be less obvious in the case of public libraries. Yet it is heartening to see that throughout Europe public libraries are making headway towards reestablishing themselves as what they were meant to be when they came into existence in the last century (in most northern Member States of the European Union): as centres for lifelong learning, now in the different context of a largely post-industrial society. In southern Europe - as we will see shortly - this implies some real leapfrogging.

We note in passing that all projects we are going to look at in more detail are *collaborative* projects, i.e. they are undertaken by at least two independent partners; and in order for these projects to be *European*, the partners have to be from at least two different EU Member States. Another requirement derived from the general European imperative is for project results to be replicable or transferable into parts of Europe other than those where they have been obtained.

It must also be noted that our use of the terms *digital* and *distance* in relation to libraries and education is quite generous. They include for instance student access from a distance to classical library services, like enquiry and referral as well as reservation and lending, or - more generally - any remote interaction with those parts of the traditional library that have been *digital* for a long time: catalogues and library automation systems.

#### **3.1 Academic library projects related to (distance) learning**

One of the first projects of the *Telematics for Libraries* sector to fit into this category was HYPERLIB<sup>9</sup> (Hypertext interfaces to library information systems, involving a Belgian university library and a university-affiliated research institute in the UK, funded from 1/1993 to 12/1995). Through the development and use of an SGML document type definition (the *HYPERLIB DTD*) covering various *library objects*, and of suitable conversion tools, the project resulted inter alia in one of the first hyperlinked public

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<sup>8</sup> <http://www2.echo.lu/libraries/en/ct96al-c.html>

<sup>9</sup> <http://www2.echo.lu/libraries/en/projects/hyperlib.html>,  
<http://www.ua.ac.be/docstore.html>

access catalogues (OPAC) on the WorldWideWeb in Europe and in remotely accessible *hypertextbooks* for instructing library users on how to use the library.

In January 1994 BIBDEL<sup>10</sup> (Libraries without Walls: the Delivery of Library Services to Distant Users, carried out jointly by three university libraries in the UK, Ireland and Greece respectively, and Commission funded until 9/1995) began to research strategies for remote user access to library catalogues, databases, enquiry services and documents. It is perhaps the one project which the final remark of the previous section is most applicable to.

By developing three different models of provision through the medium of three universities BIBDEL demonstrated how technology and expertise can be transferred between libraries in different countries and adapted to the needs of each. It did not aim to produce a single solution for EU-wide adoption but rather a series of solutions each of which will find application in different geographical areas of different Member States.

Project EDUCATE<sup>11</sup> (End-user courses in information access through communication technology) that started at around the same time as BIBDEL and that was funded for a period of three years, has an entirely different flavour. Its initial target groups have been students of science and engineering who need instruction on how to find and use information sources relevant to their fields. The most visible result of this project is a website<sup>12</sup> that provides precisely this kind of instruction. It includes *net-referenced* textbooks (specially written and/or adapted to meet the requirements of this project) and exercises in information retrieval from e.g. abstracts databases. In a way the EDUCATE product automates a service that is traditionally rendered by many an academic library to its student constituency: teaching them how to find the information they need to pursue their studies. University libraries from five EU member states have been involved in EDUCATE. Work continues and is focussing on including more subject areas (such as chemistry, medicine and also subjects of the humanities) and on enhancing the distance education component, e.g. by providing facilities for discussion, feedback and teacher-student interaction.

A close relative of EDUCATE is project ELVIL<sup>13</sup> (The European Legislative Virtual Library, started in 9/1996 and supposed to run for two years). It is best described by quoting from <http://www.sub.su.se/sam/elvil.htm>, the project's website:

*The project consists of three parts:*

- *the first part aims at assembling a World Wide Web index on law and politics in Europe in order to gather references to all Internet-accessible computer-based information on European law and politics into one coherent World Wide Web-accessible database;*
- *the second part aims at developing a multimedia educational aid for students of European law and politics, and for teachers and librarians;*

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<sup>10</sup> <http://www2.echo.lu/libraries/en/projects/bibdel.html>

<sup>11</sup> <http://www2.echo.lu/libraries/en/projects/educate.html>

<sup>12</sup> <http://educate.lib.chalmers.se/>

<sup>13</sup> <http://www2.echo.lu/libraries/en/projects/elvil.html>

- *the third part aims at constructing a search engine composed of a World Wide Web-interface and software gateways for easy and concurrent access to the national parliamentary databases and to the European parliamentary database.*

ELVIL is based in three universities in Sweden, the United Kingdom and Spain respectively. It receives input from national parliaments and the European Parliament. Although addressing the needs of academia in the first place ELVIL will also be accessible to the *ordinary citizen* via public libraries.

While HYPERLIB, BIBDEL, EDUCATE and ELVIL pick up on very specific library services that are of particular relevance in academic environments (e.g. tutoring and referral) and extend these digitally into the distance education domain, the last project to be mentioned in this section, LIBERATION<sup>14</sup> (Libraries: Electronic Remote Access to Information over Networks, started in 5/1996), is at the interface of digital libraries (in the sense of distributed collections of digital or digitised material), distance education, and electronic publishing. Its partners are university libraries, computer science departments and publishers from Austria, the United Kingdom and Germany. Its approach and ambition are similar to that of projects such as ELINOR<sup>15</sup> in the UK and - to some extent - MEDOC<sup>16</sup> in Germany. Based on *Hyper-G* (now *Hyperwave*<sup>17</sup>) server technology it tests out new models of interaction between libraries, students, teachers and publishers by providing facilities for customizing (multimedia) course material, for annotations, discussion and thus - more generally - *library-supported cooperative teaching and learning*. The project is likely to corroborate some of the views expressed e.g. by Maurer et al. in recent articles<sup>18-19</sup>.

### 3.2 Public library projects related to (distance) learning

A conjecture made in <sup>18</sup>) is perhaps the most appropriate introduction to this section: *The most important changes digital libraries bring may be in advancing informal learning. A study funded by DG XIII/E of the European Commission, on Open Distance Learning in Public Libraries*<sup>20</sup>, seems to confirm exactly this. It investigated the present and potential roles of public libraries in Open and Distance Learning (ODL) throughout the European Union and came to the conclusion *that public libraries could indeed play a major role, in cooperation with other agencies, in the delivery of ODL to Europe's citizens. They are particularly well-placed to address the needs of disadvantaged groups, such as women returning to work, ethnic minorities, those who did not take conventional educational routes and employees of small to medium sized enterprises (SMEs).*

<sup>14</sup> <http://www2.echo.lu/libraries/en/projects/liberati.html>

<sup>15</sup> <http://ford.mk.dmu.ac.uk/Projects/ELINOR/>

<sup>16</sup> <http://medoc.informatik.tu-muenchen.de/english/index.html>

<sup>17</sup> <http://www.hyperwave.de/>

<sup>18</sup> Maurer, H., and Marchioni, G. The roles of digital libraries in teaching and learning. *Communications of the ACM* 38,4 (1995), 67-75

<sup>19</sup> Maurer, H., and Lennon, J. Digital libraries as learning and teaching support. *J.UCS* 1,11 (1995)

<sup>20</sup> <http://www.uclan.ac.uk/research/centre/cerlim/reports/odinrep.htm>

It seems obvious that for public libraries *to go digital* and to assume a major role in supporting informal, independent learning, a substantial effort in training the staff of these libraries is one of the necessary prerequisites. This has also been recognised in the above mentioned study and taken on, as an imperative, by one of the early projects under the *Telematics for Libraries* programme: PLAIL<sup>21</sup> (Public libraries and independent learners, 2/1994 - 2/1996). Five key questions have been underlying this project:

- What are the needs of adult independent learners ?
- What (library) services can meet those needs ?
- To what extent do those services rely on (or could benefit from) information technology ?
- What skills are necessary to provide the services ?
- Can those skills be acquired via information technology ?

PLAIL has not only output a number of significant reports based on desk research, providing (partial) answers to these questions, but also multimedia training materials (CD-ROM, Video) to help public library staff to acquire the appropriate skills. It is worth noting that the very composition of the project consortium itself had the effect of transferring know-how from a group of librarians (in the UK) who were already relatively experienced in these matters<sup>22</sup>, to colleagues in southern Europe, in particular Portugal, where public libraries have been instituted on a larger scale only fairly recently, and Spain whose public library system does not enjoy a very long tradition either<sup>23</sup>. The involvement of Portugal's Open University turned out to be of great benefit especially in this context.

The same partners (and more) are currently cooperating on a project, LISTED<sup>24</sup> (Library Integrated System for Telematics-based Education, started 4/1996), that may be regarded as a logical follow-up to PLAIL. While PLAIL focussed on staff training LISTED aims to deal with a number of issues of direct concern to users, issues that have also been addressed by the *Open Distance Learning in Public Libraries* study, e.g.:

- Bibliographic control of ODL materials is notably weak and must be improved.
- The development of the IT capability of public libraries in respect to ODL support must be a priority.
- The cost-effectiveness of library-based delivery of ODL should be explored and where possible demonstrated.
- The copyright and licensing problems associated with ODL need to be resolved.

Another project which is going to take European public libraries probably even further into the realm of lifelong learning through digital extension of educational services will be DERAL<sup>25</sup> (Distance Education in Rural Areas via Libraries, accepted for funding). Its

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21 <http://www2.echo.lu/libraries/en/projects/plail.html>

22 see for instance: <http://www.ncet.org.uk/info-sheets/flexible.html>

23 see also: <http://www2.echo.lu/libraries/en/plis/homeplis.html>

24 <http://www2.echo.lu/libraries/en/projects/listed.html>

25 <http://www2.echo.lu/libraries/en/newproj.html>

declared goal is to *develop a set of tools based on Internet technology and ISDN-videoconferencing which enables libraries to act as brokers between the providers of distance learning courses and students. It will focus on inhabitants from sparsely populated areas and elderly and disabled people who are unlikely to have access to local learning facilities.* This project is supposed to start in early 1998.

Perhaps the most rewarding target group for educational activities are young children. CHILIAS<sup>26</sup> (Children in Libraries: improving multimedia virtual library access and information skills, started in 4/1996) one of the most promising projects currently supported under the *Telematics for Libraries* sector aims to attract precisely that group to the *children's library of the future.*

*The core of this project is the development of a digital children's library, using varied digitised materials on selected topics to support children in virtual browsing through the library, in discovering learning resources, and in practising and developing information seeking skills. Support applications will cover the development of interactive communications and resource sharing activities, the development of an interactive library service encouraging children in the exploitation and creation of multi-media resources, and the development of an information skills package to support young users in the acquisition of such skills.*

Apart from instigating playful acquisition of knowledge and skills, and apart from promoting competence in dealing with modern media (including *books!*), this project truly *educates* young children to become European citizens. Public libraries from many EU Member States are participating and already at this relatively early stage of the project children in all these countries communicate with each other, exchanging stories over the Internet, experiences in reading and living, and are simply having fun. These children, hopefully, will never fall victim to the prejudices of the past.

VERITY<sup>27</sup>, a project that is supposed to complement CHILIAS by giving similar opportunities to 13 - 19 year olds has been accepted for funding this year and is likely to start in 1998.

#### **4. CONCLUSIONS AND OUTLOOK**

It should not have gone unnoticed that this paper is actually a plea for upgrading the role of libraries in the process of teaching and learning. This may seem surprising in view of the fact that since time immemorial libraries have played a crucial part in the field of education and training as mediators of knowledge. Yet, with the advent of digital techniques for storing and transmitting information traditional libraries are in danger of being left behind. On the other hand, the implementation of *digital libraries* and their application in distance learning environments are likely to fail if they do not take account of the well established practices and services of the traditional library, and of the expertise developed in that domain.

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<sup>26</sup> <http://www2.echo.lu/libraries/en/projects/chilias.html>

<sup>27</sup> see footnote 25



The European *Telematics for Libraries* programme provides a unique opportunity for libraries to develop their services, both old and new, using digital technologies on the appropriate, European or wider scale. By *going digital* (without abandoning their *analogue* legacy!) they may indeed, as the above examples have shown, upgrade their role, increase the efficiency of formal education and training, give enhanced support to independent learners and become a platform for lifelong learning.

There is certainly still a long way to go. A major signpost has been set by the European Commission in its forthcoming *5th Framework Programme: the Information Society*. Libraries as major nodes in networks for learning and studying and as gateways to universal knowledge must and will have a prominent place in it.