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Objectives and Strategies - Creating a Platform for the Library in the Information Society

Introduction

Libraries meet many of the cultural, leisure, academic and general information needs of European society. In addition to helping preserve Europe's cultural heritage and managing scientific, technical and business information systems, they are one of our most heavily used social institutions. At a time of ever increasing demand for information and its ready availability, libraries must keep ahead of developments in information technology and advanced communications to enable them to provide the services that today's society both needs and expects. The convergence of computing and communication technologies impacts significantly on the way in which information resources are created, managed and used, and libraries need to plan and implement systems which take advantage of these developments.

Libraries can no longer afford to be parochial and isolated. They have to cooperate to share resources efficiently (this has been recognized for several decades) and the networked world of the Information Society imposes per se a new dimension and a new obligation for cooperation.

Libraries can play an important role in the Information Society. At European level, this has been recognized by the European Ministers of Culture in a Resolution of 25 July 1996, and by the European Parliament in a Resolution of 13 March 1997 on the Information Society, Culture and Education (Morgan report) which has called explicitly for the preparation, by the European Commission, of a Green Paper on Libraries. There is also growing recognition of the role of libraries in the new continuous learning and educational processes - viz., the drive to connect not only schools but also libraries to the Internet in many countries.

The Initiatives of the European Commission

The European Commission has been active in the libraries area for a number of years. The principal context of these activities has been the EU's Third and Fourth Framework Programmes for Research and Technological Development and more specifically, the Telematics Programmes of which libraries have been a part.

The European Parliament first drew political attention to the importance of libraries in the Community in 1984. In 1985 the Council of Ministers adopted a Resolution which called for action by the European Commission in this area. A series of exploratory activities were then initiated in order to establish the size and impact of the library sector, to identify areas where libraries experience difficulties in adapting to the new conditions of the Information Society, and areas where cooperative European actions would most contribute to the better use of resources.

The First Programme

The Libraries Programme was launched in 1990, based on the results of these exploratory actions, extensive consultations and early pilot projects. The first work programme placed emphasis on developing innovative library services and tools as well as on the bibliographic resources and library networking infrastructures which underpin such services. The work programme was structured around the following four complementary action lines:

- *Computerized bibliographies*: which aimed to create, enhance and harmonize machine-readable

bibliographies and catalogues in Europe, thus contributing to the efficiency of libraries and improving resource sharing between them;

- *Library networking and interconnection of systems*: which aimed to help set up networked services between libraries by ensuring that technical opportunities available through new telecommunications services and progress in open systems interconnection (OSI) were fully investigated and exploited;
- *Innovative library services*: which aimed to enable libraries to offer more cost-effective library services through the use of advanced information and communication technologies;
- *Technology-based library products and tools:* which aimed to provide a stimulus to the European market by encouraging the private sector to work with libraries to produce commercially viable telematic products, services and tools designed specifically for libraries.

The immediate goals of this first programme were to create a process of change which could acquire a momentum of its own and to stimulate awareness of the benefits and implications of European cooperation among libraries. These goals, which we believe have been achieved, were set in the framework of longer-term objectives of promoting the availability of modern library services throughout the Union, the cost-effective use of technology, standards and the emergence of coherent library policies.

Between 1991 and 1994, three Calls for Proposals were published and over 80 actions were launched - including 51 mainstream cooperative shared-cost projects, a range of key concerted actions or "platforms" and feasibilities as well as many studies (now published). These addressed practically all the areas of concern to libraries at the beginning of the decade with respect to the application of information and communication technologies, including those of the emerging Internet. They have involved over 200 organizations across Europe, and probably as many as 600 to 800 people, perhaps even more! During that same period, national programmes and policies were developed in many EU Member States which, even if independent of the Commission's actions, can generally be said to be moving in the same direction.

The Second Programme

The next Libraries Work Programme covering the period 1995 to 1998, implemented under the Fourth Framework Programme, builds upon the results and on-going activities of the Third Framework Programme whilst at the same time moving into important new areas.

Increasingly, information is being created, distributed, accessed and used entirely in electronic form. Libraries have a central role in managing these information flows and introducing users to new ways of working and information use. The new programme therefore highlights libraries as key participants in the move towards an electronic information infrastructure.

The added value of libraries to society can only be realized by creating a Europe-wide libraries infrastructure, and the programme therefore aims to support the development of interlibrary networks to optimize resource-sharing and as a way to link less advanced libraries to the resources and services of more advanced libraries. The programme aims also to encourage a more market-oriented approach among libraries, and to harmonize practice in the predominantly public sector libraries with that of information providers in the private sector.

The focus is thus more ambitious and more integrated than that of the previous programme. The work programme structure in fact reflects the different interlocking levels at which libraries operate: the library itself; the "traditional" information chain of which the library forms an integrated component; and the emerging world of networked information.

Thus, there are three Action Lines:

Action Line A: Network-oriented internal library systems: focuses on the continued development of tools for effective services such that their local systems are hospitable to networking. Furthermore, work is required for the specific development of systems to manage and provide services in a variety of electronic formats. Libraries need to be able to acquire and handle materials in electronic form and to convert existing resources so that they are available through telematics systems. This Action Line also continues the collaboration with private sector initiatives to develop appropriate applications for libraries in support of cost-effective and modern library services.

Action Line B: Telematic systems for library co-operation and networking: focuses on the move from collection-based to access-oriented libraries. Enhanced cooperation both between European libraries themselves, and with suppliers and publishers, can significantly increase the range, quantity and quality of resources and services available to the individual library user. Interlibrary networks, linking libraries both nationally and across borders, will greatly facilitate resource development and resource sharing between libraries, and provide integrated services to their users. Libraries also need to extend their interconnections to publishers and distributors as user demand for electronic distribution of published information becomes more common-place. The shift towards electronic information leads to changes in the way products and services are marketed, distributed, authenticated and paid for, and libraries have a central role to play in this process.

This Action Line is the keystone of the libraries work programme and aims at the consolidation, integration, and upward scaling of the results of interconnection projects under the previous programme.

Action Line C: Library services for access to networked information resources: focuses on the value-added and mediation role of libraries in the networked information world. The traditional role of the library has been to provide access to resources they themselves collect and store. While to a certain extent this will remain the case, even where electronic documents are concerned, increasingly libraries are required to offer access to networked information resources. These resources include file archives and data sets (documents, software, images, statistical surveys, etc.), as well as interactive services. Libraries are well positioned to play a very important role in the organization and distribution of networked information and to act as the intermediary between the end-user and the resource, providing they mobilize effort to contribute to the developments which are needed.

Two Calls for Proposals have been published. Fifteen cooperative R&D projects and seven concerted actions (or platforms) and other measures have already been launched. Over 20 new projects and horizontal support actions will emerge from the second Call. Together these projects and actions cover all the topics identified in the work programme.

Horizontal or support actions, some of which had already started under the first programme, address broader issues common to clusters of projects (for instance, awareness of the copyright issues in an electronic environment; performance indicators and management of information; implementation of networking protocols such as Z39.50); or create a common platform for key players to define cooperative actions and strategies (for instance, bringing together national libraries; public libraries; players from the music arena); or focus on dissemination, awareness raising and exploitation. These support actions contribute to consolidate what the programme has already achieved and at the same time should optimize the success of future projects.

The programme is also progressively opening to the needs of Central and Eastern European countries and quite a few of the new projects and actions involve Central and Eastern European partners or are focused on these countries.

Achievements and Lessons Learnt

With over seven years experience of R&TD on library automation and networking, and several years of preparatory work, the results - and the lessons learnt - are now beginning to emerge.

- *Technologies*: In an initiative such as this one, aimed at applications and ultimately at users, the primary goal has been the wider and the more effective use of existing (advanced) technologies rather than developing entirely new ones. One of the general achievements has been to improve familiarity with the application of these technologies - which are proving to be key constituents of the evolving library role.
- *European cooperation*: A major achievement has been to sensitize library communities in all the Member States to the European dimension of library networks and services in the evolving Information Society. The establishment, within the programme, of different common interest groups (national libraries, public libraries, etc.) reflects this new dimension which is further reinforced by the practical experiences of co-operation in the projects themselves.
- *Partnerships and alliances*: The work programmes have succeeded in creating a constructive balance of project partnerships, bringing together libraries of all types, software houses, publishers and communications companies.
- *Standards*: Several flagship projects have promoted the implementation and use of high-level networking and format standards (Z39.50, EDIFACT, UNIMARC) in libraries and in the information community at large. The European Forum for Implementors of Library Applications has been instrumental in catalyzing widespread collaboration on networking standards. New issues are being addressed in recent projects such as those related to metadata.
- *Copyright*: A considerable amount of experience in dealing with IPR issues in the electronic environment has been gained from project work. Furthermore, the European Copyright User Platform (ECUP) has provided a forum for exchanges of ideas on strategies and approaches in the library context and a libraries "voice" in other forums where these issues are discussed.
- *Provision of new services*: Prototypes for a range of innovative services in the areas of document delivery, imaging, education and training and access to networked library resources have paved the way for concrete developments of marketable products. Indeed, the key action lines for projects under the libraries component of the Third Framework Programme coincided very closely with the move towards integration in the current Telematics Applications programme. These new services have the potential for a wide user base, including: student users and specialist researchers in both cultural and scientific/technical areas; users with special needs, such as visually disadvantaged people, library users in remote rural areas; and distance learners.
- *Political impact*: The programme has had a marked influence on library automation and networking policy in a number of countries and has fostered European collaboration at all levels of the decision-making process.

The true impact of these achievements will only become apparent as Europe's libraries accelerate the pace of adaptation to the pervasive conditions of the Information Society and begin to exert their influence in

fulfilling Europe's information needs in an open and flexible manner.

Conclusion - The Future

The EU's work does not stop here. The year 1998 will see the start of the 5th Framework Programme for Research and Development which will provide specific support for "Creating a User-Friendly Information Society". One of the key goals is to develop widely accessible services based on multimedia content. Libraries, with other public institutions such as museums, galleries and archives, will have a new role to play, namely that of strengthening the emerging knowledge and culture economy by providing mediated access to these rapidly evolving resources.

This will require integration of print and digital information, allowing users to benefit from a whole new generation of seamlessly integrated services. Not only will there be a long-term goal of ensuring continuity of access for future generations but, over the next few years, new business and economic models will be required for managing access to vastly expanded and widely distributed stores of digital information. Moreover, with the blurring of borderlines between roles, professions and even institutions, there will be a need for new partnerships, new business alliances, new training initiatives, preparing the way forward towards enhanced levels of information services. Indeed, the effects of media convergence will increasingly require traditional players like publishers, libraries, museums, archives and educational institutions to work hand in hand with the software, telecommunications and media industries.

In closing, let me turn to the more general question of how libraries can best contribute to the Information Society. Like many other organizations, libraries are having to respond to the broader changes taking place in society as a whole. Recognizing this requirement, the European Parliament recently invited the Commission to prepare a Green Paper on the Role of Libraries in the Information Society, prompting it to examine carefully those areas where libraries are not necessarily in the driving position but are nonetheless affected by developments and decisions.

I refer here to matters such as cultural identity, lifelong learning, copyright, literacy and cost of service, not forgetting the key issue of how libraries can best help to close the gap between the information rich and the information poor in the years ahead. The Green Paper we are now drafting raises many questions, building as it does on the wealth of new ideas, policies and research strategies emerging at the national level across Europe. The ensuing discussions and consultations should contribute to the metamorphosis of Europe's libraries as they move into the new millennium.

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The Challenge of Openness as European Union Information Goes Electronic

Introduction

Openness and electronic information are both high profile topics within the European Union. They are often linked together whenever the relationship between European institutions and the citizens they serve is discussed and progress towards the realization of the information society is under review.

A major difficulty in writing an article covering these topics is that they are the focus of extraordinarily rapid change as policies develop and technology advances. Between, for example, 1 May and 1 November 1997 there has been a relevant reorganization within the European Commission and the signing of a new European Union Treaty, the Treaty of Amsterdam. The reorganization of the European Commission's Directorate General within which I serve, the Directorate General for Information, Communication, Culture and Audiovisual, DG X, will help to emphasize the priority given to information access and electronic and multimedia tools. The 2 October signing of the Amsterdam Treaty promises renewed interest in the meaning of European citizenship in an enlarging Union and provides the strongest commitment yet to freedom of information. Parallel with such organizational and political changes, a new electronic European information service will be seeking to prove itself in the global market place.

In such a dynamic and evolving situation it is always best to begin from fixed reference points. For me the essential benchmarks are found early in 1994 and 1995. On 8 February 1994 the European Commission adopted a code of conduct covering public access to Commission and Council documents. The WWW server EUROPA was launched by the Commission a year later, in February 1995, on the occasion of the G7 Ministerial Conference on the Information Society held in Brussels. Virtually all subsequent discussion of openness within the Union has been about the intent and effectiveness of the code of conduct. EUROPA has developed into an inter-institutional Website and its success has generated an important internal institutional process of reflection and discussion about the roles of the Internet and electronic information and their impact on information dissemination generally. The core of this article must therefore be a progress report on the implementation and working of the code of conduct and on the availability of electronic information services.

The Code of Conduct Covering Public Access to Documents

The general principle behind the code of conduct is that the public should have the widest possible access to documents held by the European Commission and the Council of the European Union, subject to public or private interests being protected.

In his preface to *Access to Commission Documents: A Citizen's Guide*, published in 1997 (ISBN 92-827-8315-4), the President of the Commission, Jacques Santer, writes: "The policy of giving wider access to Commission documents has now been successfully practiced for two years. The Commission intends to continue this policy and improve its application and to encourage European citizens further to exercise their rights under it."

The fact that the number of requests for documents which have had to be treated formally by the

Commission under the code of conduct procedures is surprisingly small (500 requests in 1996, 180 in 1994) is a tribute to the long-established and routine openness of the Commission. In addition to the volume of Commission material published and put on sale by the Office for Official Publications of the European Communities, notably the *Official Journal*, the Commission produces a wide range of free general information booklets and leaflets describing its objectives and policies. The free publications can usually be obtained by inquirers from Commission Representations in the Member States or Commission Delegations in non-Member States. Within the Union the Commission also supports an extensive network of information relays ready to respond to inquirers on a local or regional basis: Euro Info Points, the Rural Information Carrefours and the Local Urban Initiative Centres, for example.

Formal requests dealt with by the Commission under the code of conduct are therefore usually for internal documents, documents which have not been finalized or are not intended for publication. Anyone may request such a document regardless of his or her personal or professional status, and without having to give reasons for the request. A fee may be charged for documents supplied which run to more than 30 pages. Total charges must never exceed the cost price.

The grounds for refusing access to a document are clearly set out in the code of conduct and are applied on a case by case basis. They cover the following areas:

- protection of the public interest (public security, international relations, monetary stability, legal proceedings, inspections and enquiries);
- protection of the individual and of privacy;
- protection of commercial and industrial secrecy;
- protection of the financial interests of the Community;
- protection of confidentiality if it has been requested by a supplier of information or, if the supplier is a Member State, because that country's legislation requires it;
- protection of the confidentiality of the Commission's internal deliberations.

While the Commission's administration of the code of conduct has attracted little comment, the way in which the Council of the European Union interprets the exceptions to the right of access has been the subject of continous press scrutiny, notably because of a case brought by John Carvel of the *Guardian* newspaper before the Court of First Instance of the European Communities, and the volume of requests and complaints submitted by Tony Bunyan of *Statewatch* magazine. The Information Group and the Committee of Permanent Representatives of the Council have developed procedures to meet all such requests in a way that responds to the different understandings and traditions of openness in the 15 Member States. The Council's General Secretariat is also actively developing a public information programme.

Electronic Information Services

Just as the latest guide to the code of conduct is a useful introduction to the current state of openness in the European Union, so the 1997 edition of the *European Union Database Directory* (ISBN 92-827-8305-7) signals the dramatic progress being made in making more and more EU information available electronically. Now subtitled *A Guide to Electronic Information Services*, the Directory introduces over 50 online and CD-ROM databases, Internet-based services and document delivery services produced by the European Commission, the European Parliament and other Union institutions.

The trend towards using the Internet as a distribution channel has made a very significant impact on the evolution and development of electronic information services. CELEX, the database created in 1971 to provide a comprehensive and authoritative information source on European Community law, is becoming much more user-friendly. RAPID, the database of daily European Union news briefings is constantly extending its coverage and is now available on the EUROPA Website, as are other databases of particular interest to librarians and documentalists. EUR-OP is market-testing its new document delivery service EUDOR which will allow customers to see the title and other basic information relating to any document published in the *Official Journal of the European Communities* and to order the document by post, fax or by electronic file transfer.

The success of the EUROPA Website merits particular note. It is now well established as an inter-institutional site and offers a rapidly growing amount of updated information on all aspects of European integration. Its presentation and content are increasingly multilingual, thanks to its policy of presenting DG X publications and key European documents, such as Green Papers. It is among the world's most frequently visited sites with around 5m. hits per month. A subset specifically on the right to free movement is put under <citizens.eu.int>, and there are currently experiments with online debates, Internet video, and electronic magazines like European Dialogue. The European Commission's library catalogue called ECLAS (European Commission Library Automated System) is being mounted on EUROPA early in 1998. EUROPA complements the CORDIS Web initiative of 1994 launched to cover Community research and development programmes.

Two other well updated and linked Commission sites, I.M. Europe covering the market in electronic information services, and ISPO on information society

projects, help to remind us that access to electronic information is part of a pattern of change which is transforming society and offering new economic opportunities. The major bibliographical database SCAD, which provides references to articles on EU affairs and to current EU legislation, and the new SCADplus listings of EU policies, meetings, etc., should also be noted.

The Challenges Ahead

The reality of the European Union's commitment to openness and the dynamism of its engagement in electronic publishing and document delivery may be a matter of pride for the Commission's information professionals but there is no complacency about what is required to sustain this effort or the challenges posed by the information society.

One of the working definitions of openness which has emerged in the course of an inter-institutional review of editorial and publishing strategy is that the workings of the institutions should be as visible as possible to the people they serve and that European citizens have the right to know what exactly the institutions are doing and how and why they do it. To translate such an institutional attitude and ambition into reality is much easier said than done. New technology will certainly be increasingly helpful but one must also be alert to the fact that change can sometimes have perverse effects and can put at risk levels of access and openness that have long taken for granted.

Let me give some examples. Electronic information is still only accessible to a privileged few. Access requires equipment, there are connection costs, and some training is required. Information on the Internet, which is often currently treated as if it were free, will cost more as the mechanisms of electronic charging become well-established. How public information should be priced is already an important question where print, database and CD-ROM media are concerned. Public libraries, which have long been the information reference points serving the least privileged in society, are finding it increasingly difficult to acquire the publications and equipment they need to maintain established standards of service.

The replacement of a print publication by an electronic one may thus mean less, not more, openness. The volume of information available electronically is also becoming a problem. Many of us feel we may become less informed rather than better informed because we find the screen version of a valued publication much less user-friendly than its print equivalent or we cannot afford the search time spent at a terminal to reach the page that used to arrive automatically in an in-tray. And then there is so much information available online it is often difficult to rate it in terms of relevance and quality. These are the symptoms of what we now call "information overload".

A Personal View

The openness of European Union institutions has to continue to be a political imperative if the ongoing development of the Union is to have the support and understanding of its citizens. This imperative must find expression in the attitudes of institutional leaders and public servants. It also requires the vigilance and sensitivity essential to ensuring that new methods and new technologies enhance rather than detract from current best practice.

Openness and information should never be taken on trust, whatever the goodwill of politicians and public servants. Public libraries and a free press have played key roles in the development of the concept of democracy which is at the heart of the European Union and which draws the countries of Eastern and Central Europe to seek membership of it.

I believe that the mass and complexity of information relating to the Union, which is bound to increase as integration advances and the Union enlarges, will make more and more demands on the professionalism and integrity of librarians and journalists in the years ahead. Much of the value of print has come to us through well managed collections. The effective summarizing and interpretation of complex data by an unnamed journalist often does more to alert and inform citizens that the instant value judgment of a named editorialist. Such library and press skills often pass unnoticed. I consider them to be essential features of openness in any evolving society and believe they are likely to become more rather than less important in the years ahead, no matter how professional the information and communication services provided by institutions may be.

It seems appropriate to conclude by paying tribute to two Commission activities making important contributions to openness. The information Directorate-General has over many years supported training programmes for European journalists. The Libraries Programme of the Directorate General for Telecommunications, Information Market and Exploitation of Research (DG XIII) contributes significantly towards equipping the libraries and librarians of the future to put new technology at the service of readers and researchers.

Julie Carpenter and Ioannis Trohopoulos

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Mobile Libraries and New Information Services in Public Libraries: Issues Arising from the MOBILE Project

Introduction

MOBILE developed in 1992/1993 from separate but closely related ideas for research projects originating in the Netherlands, Belgium and the UK, arising from some serious consideration of how mobile library services in Europe were responding to the opportunities opened up by information and communications technologies, and whether mobile service points could exploit those technologies to deliver a broader range of information services cost-effectively to the communities they serve. While traditional mobile libraries, offering mainly book-based services to urban and rural communities were clearly widespread in Europe, the principal use of information technology applications appeared to be in providing online or offline access to automated library catalogues and issue systems. The concept which lay behind MOBILE was closer to that being pursued in the United States and described by Suyak Alloway from St Louis Public Library in the USA as "the electronic bookmobile"

> A full-service mobile library unit [which] could have many applications depending on community profiles and needs. For example, neighborhood stops, traditionally a mix of adult and juvenile readers, might have increased use with homework-laden students making use of CD-ROM reference sources, or pages faxed from the main library. A bookmobile targeted to the business community with stops scheduled at office complexes could have a number of machine-readable statistical and business databases available, with management and related materials available for checkout. Schools lacking adequate libraries could benefit from a mobile unit set up as an "electronic learning centre" with multi-media equipment, microcomputers, and other resources on board for special research projects.[1]

It also seemed clear to the organizations planning MOBILE in 1992/93 that the next five years would see increased demand among the general public in the Europe for information about European initiatives relating to business, culture, language and travel, and a consequent growth in the number of pan-European electronic information sources, relevant, cheap and accessible.

MOBILE was submitted to the European Commission as a proposal for co-funding under the European Action Plan for Libraries Second Call for Proposals in October 1992 and the project contract was finally signed in December 1993. It was one of only two successful projects dealing with public library issues to emerge from the Second Call The final project Partners were the Nederlands Bibliotheek en Lektuur Centrum (NBLC) and Centrale Bibliotheekdienst voor Friesland (CBD) from the Netherlands; Borders Regional Council Library (now the Scottish Borders Council) and Carpenter Davies

Exterior View of Mobile Library

Associates (CDA) from the UK; and the Public Library of Veria in Western Macedonia, Greece. MOBILE was scheduled to run for three years from January 1994.

The MOBILE Project in Greece

It seems appropriate, since the project had the greatest impact and success in Greece to describe briefly the Greek context. The Public Library in Veria is known as a "central public library", one of 18 established in the regional capital cities and which also provide a mobile library service to the surrounding districts. The Library occupies premises owned by the Municipality of Veria and its operations are financed by the Ministry of Education. The Library has one static school branch library and operates two mobile libraries serving a large area in Northern Greece which is not restricted to its own county. The population served by the mobile libraries can be roughly divided into two types: relatively affluent, accessible agricultural communities surrounding Veria; and remote rural communities in very mountainous countryside, economically disadvantaged and socially isolated. Library service users are predominantly younger than 40 or school children. In 1992/93 all its services were sustained by a total book stock of under 60,000 volumes and its staff included two qualified librarians. Work on automating the catalogue in the Library headquarters had just begun. To set the national context, Trohopoulos in 1994 commented that the lack of a single law governing all categories of public library, the differences of funding, standards of service, etc., make it very difficult to define and identify the precise role or purpose of the public library in Greece today. Until recently, its image was in general rather old-fashioned, at the expense of meeting the library and information needs of the population at large. Now there is more in the way of popular reading matter or information service provision. The concept of service to readers is slowly emerging, whereas information provision is in its infancy and there is no national scheme of interlibrary loans to overcome local collection deficiencies.

Objectives of the MOBILE Project

The MOBILE project had the following broad objectives:

- to identify information needs of target user groups which the public library services are currently unable to meet;
- to investigate the technical feasibility of introducing a range of information services using information and communications technologies in mobile libraries;
- to specify, procure or renovate mobile library vehicles, equipped with the requisite hardware and software, for the three Partner library services;
- to provide a mix of services in each of these three areas, using information and communications technologies to meet identified demands;
- to evaluate the effectiveness and impact of the new mobile library vehicles and services in each area; and
- to disseminate the resulting data and conclusions widely to key institutions and organizations throughout the European Union.

MOBILE was planned in three overlapping stages: the first would identify the target user groups and survey patterns of library and information use, education, work and leisure activities, and try to identify unmet demands for information or gaps in current provision. On the basis of this research, services would be planned, vehicles designed and procured. The second stage would test these new vehicles and services among the target user groups for one year. The third stage would evaluate the field trial services and operation of the

vehicles and technology, analyze data, produce and disseminate final reports and research results.

Issues Arising from the MOBILE Project in Northern and Southern Europe

Target User Groups and User Needs

The intention of the MOBILE project partners was to identify specific target users in each of the three regions; groups of people who are not currently regular users of the mobile library services, such as those undertaking full-time and part-time adult education courses locally, local business people and entrepreneurs; and groups which can be expected to have information needs which traditional mobile library services do not cover. The problem for MOBILE with this approach was that, due to funding constraints and the restriction to only one MOBILE vehicle imposed by the European Commission, the experimental MOBILE services in the UK and the Netherlands had to be grafted onto existing mobile library services paid for by local taxpayers; only in Veria, Greece, could completely new target users be identified to benefit from new services. MOBILE faced a dilemma which may be familiar: how to design and introduce effective new services, using new technologies, which will be of recognized value to a group of mobile library users who have expressed no apparent need for such services. How could library users express a clear need for access to information services and sources when they were completely unaware of their existence? Could MOBILE be successful in introducing library users to a new world of information access and presentation, and a new range of hitherto unsuspected information sources, which would stimulate demand and attract different kinds of library service users?

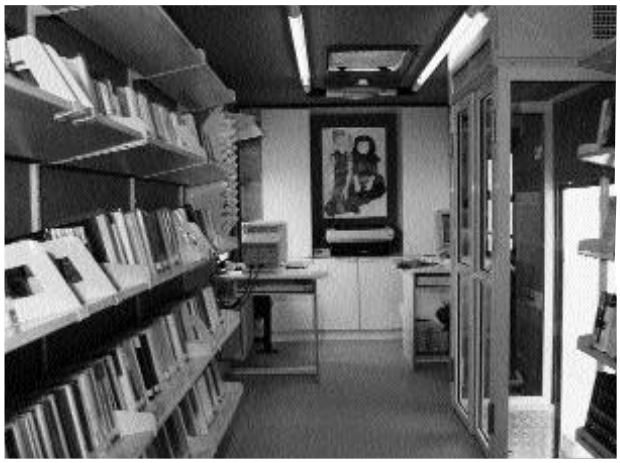
Technological Constraints

MOBILE partners investigated the various technical options available to establish external online connections from the vehicles:

- radio - to be specific, Mobile Data Radio (MDR); such systems are widely use, for instance, in Denmark for communication between mobile and library headquarters. "Patching" into open telephone lines via headquarters would allow access to external on-line services and databases;
- cellular telephones - specifically GSM networks which can effectively carry data as well as voice transmissions;
- satellite or mobile satellite services (MSS) using very small aperture terminals (VSATs) - a remarkably cost-efficient system to run in the USA, even in 1989;
- telephone lines - plugging the mobile library (equipped with a modem) into a telephone outlet in a nearby building.

MOBILE quickly concluded that establishing online access services in the new vehicle in Greece would not be technically feasible: the national telecommunications infrastructure in Macedonia was at that time poorly developed, so that even the latter option of using open telephone lines in, for instance, schools, would be a hit and miss affair, subject to poor quality lines and slow transmission speeds outside Veria. No GSM cellular telephone networks operated in the area, nor were any planned until 1996/97. The MDR and VSAT options were simply too expensive to contemplate.

In Borders and Friesland, MOBILE Partners had higher



Interior View of Mobile Library

expectations which were quickly dashed. MDR was attractive in that it involved high capital costs but insignificant running costs. Friesland seriously considered this option, but Borders lacked the funds to make such an investment. The European Commission contribution to the costs of MDR (and all other) equipment would be no more than 33%.

A further constraint was discovered: while MDR is efficient for mobile vehicles wishing to communicate with their headquarters or with each other, the "patching" method of gaining on-board access to external networks is unreliable and costly, and transmission speeds are unsuitable for the transmission of large amounts of data (such as using the World Wide Web).

Since MOBILE's principal aim is to offer mobile library service users access to a wider world of information sources and services, Borders and CBD opted for the GSM network option, with relatively low start-up costs, but potentially high subscription and running costs. Perhaps the most surprising discovery was that the GSM network infrastructure was established in the Scottish Borders only in 1994/95, and in Friesland in 1995/96. In common, perhaps, with many colleagues, the Partners had assumed that data telecommunications infrastructure, in the age of teleworking and the

Bangemann Report,[2] was more widely and evenly established in Western Europe than in reality.

Sources of Information: What Do Users Want?

The MOBILE project came to the following conclusions about using networked information sources and multimedia materials in a mobile library environment:

- at that time we had restricted choices of materials in CD-ROM and multimedia
- the Internet/WWW was not something you could just plug into and access information with ease: if all technical issues were solved, the WWW needs time and expertise to use information sources productively and effectively
- this takes staff time and staff skills as information intermediaries: the constraints of the mobile library environment do not encourage "browsing" and "end-user access".
- it is too easy to suffer from "information overload"
- the users were almost completely unaware of the potential of networked information sources: we should have built into MOBILE a period of intensive "user education" and persuasion.
- almost all of the quality titles commercially available in CD-ROM/multimedia formats were in English.

Things have changed considerably during the lifetime of the project, for instance, the number of commercially available CD-ROM/multimedia titles increased by 45% just during 1996. Almost every type of information is now available on CD-ROM, not just entertainment and "infotainment". The numbers of general interest, recreation and leisure titles have increased by a similar volume over 1996.

While English remains the language of 50% of the CD-ROMs available, German is a growing second and French a distant third. The two categories of subjects that are clearly growing the fastest are "general interest, recreation and leisure" and "education, training and careers". Since 1993 the proportion of titles originating in North America has been decreasing in the face of faster growth in Europe. With Europe's multiplicity of markets and the growth of localization this should be expected. But the number of new publishers in Europe has grown dramatically, a 90% increase in one year, especially marked in Germany and France.

To help to overcome the time constraints inherent in mobile library-based information services, which caused many problems in the MOBILE project, there are now numerous software products that can be applied: such as software which continuously monitors multiple Web pages chosen by the user, detecting any change (e.g., Internet Fastfind and Tierra Highlights). Some of them can be set up to monitor sites as often as every 15 minutes or only once a month. You can store passwords for sites that need them; pages monitored are stored on the hard drive and can be browsed offline using Microsoft Internet Explorer or Netscape. There is no limit to the number of sites that can be monitored. Also there are a growing number of new software packages enabling the user to cut down on phone bills by allowing them to "surf the WWW" offline: e.g., Webex for Windows 95. The Webex interface allows you to select a WWW page that you want to work with on a regular basis, add it to a list of personal sites, then logs on to the site and downloads a copy of the page with active links to all other pages and sites. This can then be read and browsed through offline.

Other Issues

The more substantive, broad-ranging issues which emerged from MOBILE can be summarized thus:

- The first is whether the nature and likely development of mobile library services in Britain make them inherently unsatisfactory vehicles (pardon the pun) for telematics-based information services. In rural areas, Capital Planning Information[3] asserts that "although there is little direct evidence or available research results, it seems likely that mobility and income levels determine the extent to which the rural population are able to access library and information services in market towns and major urban centres...There will be an increased demand [for library services] in the future from the elderly and housebound reader.....Many of the elderly

Greek Minister of Education, Gerasimos Arsenis Visiting the Mobile Library

make significant demands on services and as the range of materials is extended to include talking books, large print materials, and other non-standard items, these demands are likely to increase significantly'. In this context, will significant investment seem worthwhile to also equip the mobile library for on-line database and network access, fast document delivery and extended use of multimedia materials?

- The second related issue is, if the users of existing mobile library services, at least in Britain, are not the ones most likely to benefit from and demand telematics-based access to remote information services and sources, is the development of new and separate mobile service points the most effective way of delivering such services to targeted users? One might reasonably assume that potential and enthusiastic users of information networks, databases and document delivery services, such as adult learners in full or part-time education, businesses and entrepreneurs, will join the growing number of individual and corporate PC users and Web browsers, at which commercial network and document deliverers are increasingly targeting their services in addition to public sector and academic institutions.

The MOBILE Project, the issues it deals with and mobile library services in general have different implications in Southern Europe. MOBILE has excited a great deal of interest from the European Union's southern members, notably Spain, Portugal and, of course, Greece, where the Ministry of Education responded positively and generously to the request for additional capital funds in the Public Library of Veria, thereby making it possible to build a completely new MOBILE library service vehicle, the first new mobile library of any kind in Greece for over a decade. The Project has been influential in raising a new awareness of the potential of mobile library and information services to overcome the considerable gaps in public and educational information availability. Ironically, it is precisely the possibility of developing telematics and electronic information services in mobile service points which seems to point the way to comprehensive services, which have never been achieved in Greece (and perhaps never will be) using print-based information sources.

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Buying Shares in Libraries: The Economics of Cooperative Collection Development

Cooperation between libraries is something which library staff take for granted and many cooperative schemes have started which underline working together, which is so much a part of our professional ethos. This article considers the economics of cooperative collection development, both in theory and in practice in European and particularly UK academic libraries. In the context of this international meeting the scene was set by Battin in 1980: –the process of scholarship cannot be confined to one building, to one institution, to one region, or even to one political institution ... we must ... assure the continuing, unobstructed flow of information across local, regional, and national boundaries."[1]

This has recently been echoed by the European Community (EC) in a report which looks for cooperation to improve the conditions for citizens' access to information resources - one step towards the theme of the 1997 IFLA Council and General Conference, ":Libraries and Information for Human Development."[2]

The Economic Imperative

Cooperative collection development grows from the idea of resource sharing between libraries. Economists would describe resource sharing as having four different modes of operation.[3] The first way of sharing resources is known as bartering, which we may translate as interlibrary loans, a largely voluntary activity, with some costs attached, which has problems of free-riders and a tendency to help those who help us. The second method is monetary exchange which means paying directly for a service such as document delivery, which reveals the market value of such a transaction. Method three is giving grants whereby one group gives freely to another. We might see this in the library world as providing free access to our collections to outside users. This method is usually limited to discrete groups. The fourth method of sharing or reallocating resources hinges on contributing individual resources to a central body which directs their use - in other words taxation. Library cooperatives make use of this method. Members of a cooperative pay into a central pool which works on the reallocation (or sharing) of joint resources. While this sounds like a stable situation from which to plan, it is by no means certain that libraries can commit themselves indefinitely to such taxation.

Libraries have always worked together to some extent, but it is now the cost of materials which is driving us into cooperative corners. The price of periodicals has gone up remorselessly, and that of books more gradually, but still beyond the bounds of our budgets. As Desmarais has written: "What happens when a library can no longer afford to collect or own materials?"[4] In the UK the Higher Education Funding Councils (HEFCs) look for efficiency gains within existing budgets. The Follett Report on University Libraries said that it was: "neither feasible, nor even desirable, to expect each institution itself to provide for all the research needs of its staff and users".[5] In an era of dwindling resources for libraries we have all been guilty of building duplicate collections and therefore duplicate gaps in those collections.[6] Journal price escalation has led to the cancellation of the most expensive titles by most libraries. We need to decide carefully whether purchase of artefacts or access to them is preferable. Even a decade ago a workshop on cooperation focused on economics rather than on working together.[7] Libraries used to try to be self-sufficient repositories of printed works but now we not only struggle to maintain these collections, but we also want to look beyond the printed word. Perhaps self-sufficiency was always a myth,[8] but it was one we like to cling to, like the Emperor's New Clothes. In any case in many academic libraries we have taken the power to choose to ourselves and away from our users.

As economic pressures force us to think about cooperation so do changes in academic research. The increasingly interdisciplinary nature of research, combined with its short-term nature, mean that we are in danger of building library collections which will soon be redundant. It is also difficult for us to retain the results of short-term research. Exercises to measure the

effectiveness of research only exacerbate the uncertainty, and increase our collection problems in the rush to publish at all costs. This pressure from research ratings provides an atmosphere of competition between institutions which provides sterile ground for library cooperation. The pressure to publish spawns more specialist journals we cannot afford to buy. We cannot afford some of the new forms of information, particularly when bundles of electronic products may overlap with material we already buy. In the UK at least we have also faced a substantial increase in the number of students over the last few years.

Large institutions wish to maintain local autonomy and local access, with the feeling that being rich means that you can afford a few luxuries. They try to maintain a policy of "just in case" while other libraries are forced to opt for "just in time" delivery with charges. There will be some libraries which can afford neither course of collection development. Not only the pricing of materials, but charging for access to them, is controversial for librarians who cling to a belief in free access to information for all.

Holdings versus Access

As already mentioned, there is nothing new in the idea of cooperation between libraries and virtually all librarians at least pay lip-service to the concept. Indeed IFLA itself has set up a twinning database between libraries.[9] A report from the UK Library and Information Cooperation Council points up our current predicament:

"the extent of meaningful and practical cooperative activity fails far short of the widespread and evident enthusiasm for ... cooperation in principle."[10]

The basic goal of any library cooperation is to improve the service to users. Any cooperative arrangements have to be fair to all parties, and cost effectiveness should be combined with the aim of equity of costs to all partners. Too much concentration on the ideal of cooperation will obscure the need to focus on practical solutions.

The idea of hyper-libraries which contain "everything" rears its ugly head from time to time. However local users nearly always want local services. A move to enhance remote access in the UK, following the Follett Report[11] has been provided by substantial funding to conserve, catalogue and provide access to specialist collections.

A related outcome in the UK has been consideration of a regional strategy for higher education provision. A recent report considers: "the development of a national and regional[12] strategy governing library provision for researchers across all subjects... The proposed system should play to the strengths of the different libraries "whose participation is supported by formal and public commitments". Libraries involved must have "clearly articulated library and information plans" which include acquisition and retention policies, and information on existing collaboration with other libraries. Joint acquisition of non-English language material is recommended, since this has undoubtedly been a common area for cancellation, or failure to collect.

Attention is also drawn to the difficulties in the collection of non-book material, an issue which our national and copyright librarians are trying to address by legislation. The laudable aims of this report reflect the tension already noted of librarians' willingness to cooperate and the financial stringency under which they operate. The report says: "The core of a national strategy for research should be access, free at the point of use, for all researchers to collections held in higher education, national and other research libraries. Where enabling this access places significant additional costs on particular libraries, financial recompense should be available for these libraries."[13]

Holdings and Access

Having considered some of the reasons why libraries are moving towards greater cooperation we should now focus on what cooperation in collection development actually means. On a very simple level we are looking at an agreement where one library buys material to be used14 by several libraries. The library making the purchase may be obliged to buy some material that it might not otherwise have purchased. The library takes on extra responsibility and needs extra funds to support this. Pure altruism in library cooperation is no longer economically viable. There are at least three possible means of financial support:

- external funding (from a national or international initiative)
- annual subscriptions from all participants
- diversion of the library's own funds.

The librarian's belief in free access to information will be severely tested. Of course as librarians we already make many charges to users, for example for the use of photocopiers, but cooperative access is potentially much more expensive. Partners in a project have to agree on the imposition of direct or indirect charges to users. A difficult judgment on what the market will stand will have to be made, or library budgets spent on service subsidies. There is a real tension between judging the perceived value of a new delivery system, as against the protection of the public interest at large. Apart from the financial argument, librarians will need to use professional persuasion on potential partners to motivate them to take part and to show the enlightened self-interest required.

Libraries are used to having well-developed collection development documents but in a cooperative environment they will need to add information on

access. As Wessling says: "In order for users to experience a seamless circle of access to information, the definition of collections suddenly incorporates a description of both holdings and access.[14] The traditional acquisitions librarian will have to work cooperatively with their internal colleagues before offering external access. Local ability to weed collections could be seriously affected. It is as difficult to stop an independent library discarding material they no longer want, as to persuade them to buy something for the good of another library's users.

Cooperative collection development is described and assessed in a guide from the American Library Association (ALA).[15] The guide recognizes various models including: distributed responsibility for collection development, shared purchases with agreed locations, and cooperative weeding/retention policies. These may be linked to cooperative automation, cataloguing, inter-library loans and preservation programmes. As noted previously none of this works without agreed access: "bibliographic access without physical access is an empty promise".[16] Hightower and Soete focus particularly on the need to provide incentives, training and information for library staff to make any project successful. Information on the consequences of failure, and regular monitoring of progress, are crucial ingredients so long as librarians are prepared to learn from their mistakes.[17]

Moves towards Cooperative Collection Development in Europe and the UK

In Ireland a joint database searching service based on the Z39.50 protocol provides information on the six major research libraries, and has been combined with a commercial document delivery service since 1994.[18] The project has received funds from the EC Télématique Programme. On first review, recommendations were made on providing a better business base, and acknowledging that cooperative cataloguing has little use without document delivery. Technically the project has been a success but it was noted that: "there is a fundamental difference between cooperation in the management of a technical project and collaboration on the delivery of a sustainable service."

Other cooperative networks utilizing Z39.50 in Europe include Opac Network in Europe (ONE) which has 15 European partners and plans document delivery services. There is no cooperative collection development as such, but the partners all form nationally important library collections in their respective languages.[19] National self-sufficiency is a concern throughout Europe.[20] Dutch academic libraries have made a concerted effort to survey shrinking collections compared to those of Germany. Voorbij suggests that filling gaps can only be achieved by extra funding.[21]

Given the extreme disincentive to cooperation in the UK, in the shape of the efficient inter-library loans service from the British Library, there is nevertheless some achievement in terms of cooperative work. For example the Consortium of University Research Libraries (CURL) has a cooperative cataloguing programme which covers six of the major research libraries in the UK and Ireland.[22] Some central funding has been provided for expansion although the question of equal access and collaboration over collection development is largely unexplored. The most likely area for cooperation is the purchase of non-English language publications.

There are similar schemes in local areas of the UK such as the M25 Consortium which brings together information on 100 libraries in 38 colleges and universities in the London area.[23] It was set up to foster "cooperation between our libraries in order to serve our users better" and it provides access via a Web site to collection information, and tellingly "which M25 libraries will admit you to their collections." Similarly the libraries in the cities of Sheffield and Newcastle have cooperative schemes with limited access arrangements, but embracing public libraries.

However of the cooperative projects so far developed in the UK the furthest advanced, in academic libraries at least, is the Consortium of Academic Libraries in Manchester (CLAIM). This grouping of five academic libraries, serving some 45,000 users, was formally constituted in 1992. It was initially funded entirely by subscription proportional to the size of institution, but grants for development work have been obtained. The mission statement gives the intention as "The coordination of the personnel, physical and electronic resources of the constituent libraries for the purpose of enhancing and developing the range of services offered ..." The main aim is to "encourage resource sharing in a spirit of enlightened self-interest" and to agree policies of collection development preventing unnecessary duplication ..."[24]

In fact developments so far have concentrated on priorities other than collection development, including access arrangements, union serials listing, common catalogue access and a local network. Overlap studies have begun between two of the larger libraries, but are not progressing very fast as document delivery needs to be guaranteed before academic staff are willing to relinquish local holdings. The resource sharing strategy includes the drawing up of collection management policies for books and journals with the further possibilities of a shared storage facility and pooling of withdrawn stock.

Hybrid Cooperation

Two factors are currently delaying the development of library-only cooperative collection development. These

are firstly funding (economics), and secondly the technology to effectively deliver shared resources. Some hybrid schemes are appearing using library and other funding. The Delivery of Copyright Materials to End Users (DECOMATE) project uses developments from the University computer centre at Tilburg to link the London School of Economics and the Universitat Autónoma de Barcelona. Software designed with EC funding enables the libraries' users to search and retrieve full-text journal articles from the publishers Elsevier and Kluwer.[25]

In Scotland the Scottish Collaborative On-Demand Publishing Enterprise (SCOPE) has been funded in the UK Electronic Libraries Programme by the Higher Education Joint Information Systems Committee (JISC).[26] The project aims to develop alternative ways of delivering articles and book chapters to students of 13 Scottish universities. Sociology was chosen as the pilot project and much time has been taken up pursuing copyright permission for electronic storage and delivery. This type of on-demand publishing is not meant to subvert sales to publishers, but they are clearly concerned that it will. Naturally if the pilot project is successful there will be an effect on the collection policies of the 13 institutions. The economics of SCOPE is a crucial issue. Study packs are proving price-sensitive and some critics argue that charging users for packs simply transfers library costs to students. Developments for 1997 included online access and the provision of self-published works.

Site-Licensing

Following the BIDS initiative which licenses large databases nationally in the UK[27] an ambitious three-year project to license periodicals to university libraries began in January 1996.[28] Journal output from Academic Press, Blackwell and the Institute of Physics is available to all university libraries at substantial discounts, with online access where available, on payment of a license fee. Initial funding for the project has come from the four national funding bodies for higher education, which have effectively paid the copyright fees to the publishers. Unrestricted photocopying for research and study purposes is allowed for all the licensed journals.

Behind this project undoubtedly lies the publishers' fear that paper subscriptions are dwindling in libraries, and licensing still affords a steady income. For librarians there is a concern that central control may be exercised over their collection policies and that they may have to take unwanted material because it forms part of a licensed bundle. The fair price for a license is very difficult to calculate for libraries and publishers have not stopped increasing their prices. There may also be deleterious effects on periodical agents.[29]

The Technological Imperative

Most of the cooperative models which I have described have a strong technological component whether it be access to computer catalogues, or document delivery, or licensed journals held electronically. Librarians are often assured that we are moving away from the controversy of holdings versus access to a paradigm of real access.[30] However it is the cost of this access which may cause a new crisis. Money for automation of our technical services was diverted from acquisitions budgets in the past and now we risk seeing it diverted again to access costs. We must solve the paradox that books in the library available for loan appear to be free, while document delivery may attract a charge.[31]

The wisdom of permitting the vision of a virtual library to drive our services is in doubt. There may only be virtual benefits, since a library without its own material to barter will find itself unable to join cooperatives. Technology does not guarantee access for all, and enhanced access may only be available for those who can pay. Political agendas may fix what material is available thus hindering human development.

Technology must not govern our services and collection development librarians must ensure that they have the right material to share with others.[32] Multiple cancellations of the most expensive material leads to cloning of collections. Weeding must be cooperative and unique holdings must be part of cooperative access, remembering that some items will never be available electronically and must be preserved.[33] As someone currently involved in the design of a new library, I wonder how the successive drawings will be preserved. Electronic information being licensed rather than sold outright has to be preserved too.[34]

The Professional Imperative

Cooperative collection development can spring from various roots. There may be an economic incentive to cooperate as budgetary resources dwindle. There may be a feeling on the part of library directors that cooperation would improve the status of the library service and they should harness the power of the computer to deliver services. There may be pressure from publishers to cooperate via licensing. Whatever the motivation, collection managers should approach cooperation professionally as a way to enhance their service.

Cooperation is not cost free and it is not easy. Time (money) has to be given to planning and communication and time (money) must be allocated to staff training.35 The work often has to be accomplished on top of normal tasks and effective negotiation skills are needed to get partners to compromise. Collection managers need to be motivated to get involved and

should ignore the driving hype behind the virtual library concept. Cooperative collection development is only worth pursuing if it actively benefits those people who are our first responsibility - the library users.

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The Digital Library: Myths and Challenges

Introduction

The purpose of this article is simple: it is a provocation. It aims to rebut the technolust and rhetorical excess that has characterized much of the reporting on "digital libraries." The polemic here aspires to provide a corrective to the reporting that is whipped up by the technology companies, politicians, and *Wired* magazine - the same forces that gave us the "paperless office" and predict the "demise of the book." But it does not suggest that "digital libraries" are a waste of time and money. There is no call for a neo-Luddite uprising against "digital libraries" developments and technology. But the polemic tone is intended, for a call-to-arms is needed in the library community to meet the challenges of "digital libraries" - and we must attempt to recognize these challenges clearly. To further this process, a suggestion for a new focus in the pursuit of "digital libraries" is suggested which present a renewed role for librarians in the digital future.

Technological progress has changed how libraries do their work, not why. But the most profound technological development, a connection of computer to computer in an unbroken chain around the world, may alter the fundamental concept of the library in the 21st century. But we would suggest that technology will not substantially alter the business of librarians - connecting people with information.

If librarians and information professionals are going to progress into the 21st century then a clear and effective "digital library" model for library services and development will be increasingly important. An increasingly complex technological, social, legal, and economic environment defines many boundaries within which "digital library" services will evolve. Librarians may discover that "libraries-without-walls" are actually only libraries with new walls, technologically bounded, legally restricted, and administratively hamstrung. The "digital library" may be equally impenetrable and as profoundly limiting to their patrons as the physical library which techno-pundits would suggest digital collections are intended to replace.

Exposing some myths that permeate the popular press reporting about digital libraries sets the stage for a closer examination of the significant challenges to "digital library" development.

Digital Library: Myths

Myth 1: The Internet is the Digital Library

A commonplace among information technology vendors is to suggest that the vast array of information resources found through the global Internet is a "digital library." Perhaps to the dismay of librarians, a digital library has come to mean many things to many different people. With the many different types of information available - text, pictures, video, audio - and seemingly, on every conceivable subject, the Internet can appear to serve some of the same purposes as a library.

But is this disparate collection of electronic "stuff" a "digital library"? In reality, the Internet and the World Wide Web are to libraries what a fleamarket is to the Library of Congress. For many common library requests, locating information on the Internet remains highly inefficient compared to traditional library sources, especially for unfamiliar users. Finding information is difficult, the quality of the information is quite variable, and reliable, professional assistance for the confused and lost is lacking.

What challenges emerge? The development of an infrastructure for the networked resource discovery and retrieval of highly distributed, autonomously created, and diverse electronic information is required. Above all, this infrastructure will need to be managed by professionals who understand information needs and uses. An often repeated quote among library lists is that the Internet is the place to find an answer in three days for a query that would take three hours in a library. Evaluation and authority are required in order to ensure the "slow horse of meaning" is not overtaken by the

"fast horse of mere information."[1] There remains much work to be done before the Internet will have the coherence and user-friendliness of a library.

Myth 2: The Myth of a Single Digital Library or One-Window View of Digital Library Collections

Nicholas Negroponte, a guru of the digital cognoscenti, has called for the U.S. Congress to pass a "digital deposit" act to change the Library of Congress from a "depository" to a "retrievatory". His vision of the library is one where a "Library of Progress could be in the pockets of tomorrow's kids" and where citizens can get electronic access to a library-without-walls where information is accessible anywhere and anytime.[2]

The challenges to this vision? Despite the utopianism of Negroponte's view, even modest moves towards increasing digital collections and services will be strongly affected by future copyright and licensing regimes, as well as prohibitive costs for digitization and support of technical infrastructure.

But more importantly, the digital future will be an unruly one composed of multiplicity of competing information providers. Libraries will be only one source of information. "Prime" information resources will probably be locked into proprietary collections, essentially "private digital libraries" which are accessible on a subscription or pay-per-use basis. Developing interoperability standards for locating and retrieving information in this highly distributed and heterogeneous environment will be a considerable challenge in their own right.

Myth 3: Digital Libraries Will Provide More Equitable Access, Anywhere, Any Time

A great deal of work must be done to turn this myth into reality. We can assume that a global computer network, the Internet or some descendant, will be the primary delivery mechanism for digital information. Equitable access is currently compromised by the fact that the Internet is not as ubiquitous as the computing press would have us believe. There are relatively few connections outside the more populated centres, the costs of access can remain high, and for the vast majority of the world's population in developing countries, having widespread Internet access may be the equivalent of walking on the moon. Furthermore, the connections that do exist for most people are slow. For a digital library to provide equitable access to information, it is imperative that the same universal availability that is a characteristic of the telephone system is also a characteristic of the network.

In the future, complex multimedia resources and services may have specialized hardware and software requirements such that only a limited number of workstations can actually access the information. Limits of network bandwidth and slow transmission speeds may make the effective access to information problematic for many users.

Given the immense technical and legal hurdles involved, the prospects for equitable access to digital collections and services seems increasingly problematic. Copyright reform will be a slow process and has the potential to derail the very idea of "digital libraries". The technologies on the desktop, between computers, and for storing and processing information are dynamic variables. What is certain is that the management of technology for digital libraries are becoming more complex as is the administration of licenses and user access. The impact upon equitable access could be considerable.

Myth 4: Digital Libraries Will Be Cheaper than Print Libraries

A common assumption among technology reporters about the costs of "digital libraries" is that digital is cheaper than paper. This contention is far from established in fact or in practice. Although many libraries project savings, especially when substitution strategies are used which replace selected serials titles with document delivery services, the cost/benefit analysis of making this switch remains unclear. In some cases, the switch to electronic serials may save the library money by offsetting the cost to users who must pick up the charge for document delivery.

Furthermore, the costs of "being digital" are substantive ones. Many libraries now devote significant resources for hardware and software infrastructure. These expenses will increase - new hardware will be required, more licenses to software, increased infrastructure administration and training. And these costs are borne by libraries who only be acquiring digital materials and have limited electronic services. Those institutions that aspire to the development of digital collections and services can expect all of the above plus extensive design, digitization, and implementation costs. Are digital library budgets evolving at the expense of decreasing acquisitions budgets? At the end of the day, how many libraries can afford the effort? And at what cost to the valuable existing services they perform?

The Digital Library: Setting out the Challenges

Creating "effective" digital libraries poses serious challenges for existing and future technologies. The integration of digital media into traditional collections will not be straightforward, like previous new media (e.g., video audio tapes), because of the unique nature of digital information - it is less fixed, easily copied, and remotely accessible by multiple users simultaneously. Traditional library processes such as collection development and reference, though forming a potential

basis for "digital library" work, will have to be revised and enhanced to accommodate these differences. Taking what we know about libraries as a starting point, we can begin to examine in more detail what the specific challenges might be.

Resource Discovery

Digital information on the Internet is characterized by the fact that digital documents can exist in several formats, possibly in several versions, in locations that are not yet fixed. A document or resource may exist at one network location one day, and disappear the next. Services such as AltaVista, YAHOO, and other WWW services are increasingly popular. These indexing services provide an essential service in assisting users to find information. But users are already noting that these services are becoming overburdened and that obtaining meaningful results can be frustratingly elusive.

The indexing service developers are still trying to establish a cost recovery model that will allow them to match capabilities with the growth of information on the Web. Currently this is through advertising. But there is no guarantee that these services will provide high-quality service to the general public for indefinite return on investment. A reasonable expectation is that there will be levels of service established. At a base level, anyone can access the database without charge but the results will be of limited usefulness and good information will be swamped by a flood of the bad. Searching will not be efficient. But a "higher" level of users who can pay for better service may get benefits such as increased search functionality, better algorithms for ranking information, or higher speed access. Presumably the techno-peasants, to paraphrase the famous saying of Marie Antoinette, are expected to eat "digital cake."

There are also important questions as to whether the existing technologies can scale sufficiently to accommodate growth in the number of users and the volume of information on the Internet. Users are discovering the quality of information retrieved from large heterogeneous databases may be lost in a flood of irrelevant results. Large centralized databases represent single points of failure and bottlenecks.

Librarians organize knowledge through the processes of subject analysis and cataloguing - creating information about information, or what is known as "metadata". A major challenge exists to develop methods of consistently and uniquely identifying and retrieving networked information, no matter what format they are or where they reside. Metadata standards are still in their infancy. Initiatives and research such as the Dublin Core/Warwick Framework for metadata, Government Information Locator Services (GILS), and Uniform Resource Characteristics (URC) are promising ways forward. But discussions by many of the participants in these efforts suggest that given the complexity of metadata issues, a solution to the global resource discovery problem remains distant.

Librarians provide another role in supporting resource discovery, one in which digital technologies play only a small role. This is in providing a "trusted" service. This trust and authority is based upon librarians' making choices, evaluating information as a part of collection development and with a thorough understanding of what users need. Librarians are do not only create pathfinders and guides for their users, they are the pathfinders and guides.

Digital Collection Development

Librarians have considerable experience in digitization, although the profession has tended to call it something else. The "retrospective conversion" of printed library cards into machine-readable catalogue records represents one of the earliest widespread, digitization efforts. What was learned in the process? One lesson is surely that conversion of paper into digital is expensive and time-consuming. The cost/benefit analysis to librarians and users for enhanced bibliographic access established the benefit of the expense, but it was acknowledged that the costs involved were higher than anticipated.

Some types of media reveal themselves to be more suited to digitization than others. Photographic collections, bibliographic resources, statistical collections, and even some kinds of journal literature are amenable to digitization. Other materials such as maps and books may be less amenable to digitization. Considerable study of what users need, how they use information, and whether digital formats serve their needs effectively is still required. Undertaking large digitization initiatives without a fundamental understanding of user needs is putting the cart before the donkey. Being digital is not necessarily commensurate with being useable.

In an era of difficult to obtain resources, questioning the efficacy of undertaking the expensive process of digitizing specialized collections of materials that may support a handful of scholars is not only legitimate but essential. It is possible that some digitization efforts will create collections of what is essentially, dead digital information - information with low market value, of limited interest and utility, and whose circulation is no greater than its paper or microfilm equivalent. It may be that most of the important information that the poor in any country need may not be in databases.

Libraries provide a range of materials in many different formats to serve a particular clientele. As the information explosion continues its expansion, digital materials will be added the collections of books, journals, and audiovisual materials that libraries currently provide access to. But it is also increasingly

apparent to many libraries that libraries will replace older media such as books with new digital media. Rather, digital collections and services, when established, will exist as complements to existing collections and services.

The reasons this substitution will not easily occur are many: user resistance, limitations on use, poor digital product design, or the medium may not be effective to satisfy the user requirements. The challenge here will be to "span both print and digital materials... [and to] ...provide a coherent view of a very large collection of information."[3]

Preservation

If we assume that libraries are able to build and/or acquire some types of digital collections, there remains a significant challenge inherent in preserving these collections. Pre-digital libraries have had to worry about climate control and the deacidification of books, but the preservation of digital information will make these time-consuming and costly problems look easy. For example, digital storage media are "fragile", with a limited shelf life. Worse yet, the digital information on those storage media, even if they do survive will be rendered unreadable by obsolescence of technology - the fact that as information technology evolves, older systems disappear taking with them the ability to read the information they managed.

To preserve digital information, information one digital hardware and software configuration will require regular "refreshing" or migration to more current systems. The Report of the Task Force on Archiving of Digital Information suggests that "rapid changes in the means of recording information, in the formats for storage, and in the technologies for use threaten to render the life of information in the digital age as, to borrow a phrase from Hobbes, 'nasty, brutish and short.'"[4] Cost models for the regular "refreshing" of electronic data have not been established. The digital preservation function must be attended to in all digital collections. Even libraries which do not normally have a significant preservation concern will find that digital collections will require "refreshing" and migration to new systems to maintain their accessibility. Technological obsolescence, migration of digital information, legal and organizational issues all test the "limits of digital technology." There are no preservation standards for digital information.

Libraries have a well-established culture-sharing materials amongst themselves. This has taken the form of consortia or to share catalogue records or journal subscriptions, reciprocal borrowing and interlibrary loan arrangements, preservation programmes, and the creation of union lists. It has been carried out through many associations, consortia, cooperative projects, and other formal and informal resource sharing agreements. No single library can take upon the responsibility of "doing it all".

The same resource-sharing will be necessary in the coming digital era. For example, in the United States, libraries have begun to create strategies for sharing digital information. The U.S. National Digital Library Federation, made up of the largest American research libraries and archives and the Commission on Preservation and Access are working to develop a coordinated funding strategy and formulate selection guidelines to collect electronic information in the US. Without such arrangements, there will be no one to ensure that the terabytes of digital information that will be scattered about the network will be collected, ordered and preserved. In Canada, the Data Liberation Initiative is a cooperative effort by Canadian universities to increase access to Canadian statistical databases through common licensing and access arrangements.

Librarians argue that if we do not emphasize the library in the phrase "digital library" and build collections that can be preserved, then future generations will look back at this time as a digital Dark Ages, a time when, somehow, the record of human knowledge went missing. In the final report of the Task Force on Archiving of Digital Information, the first of the general conclusions was that "the first line of defense against the loss of valuable information rests with the creators, providers and owners of digital information."[5] Are libraries the second line of defense? Can and should we entrust our electronic legacy to creators, providers and owners of digital information whose interest in preserving information may only be as long as it has market value - materials which may disappear when that market value approaches zero?

Digital Library Administration

Peter Graham of the Rutgers University Libraries, suggests that for implementation of a Digital Research Library, long-term organizational, fiscal, and institutional commitments will be necessary. The technical tasks are "the easiest to solve; they will only cost money" - it is the institutional commitments that "will be much more difficult to achieve."[6] The TULIP final report provides supporting evidence of the importance of this commitment:

> *Politics, lack of priority and lack of responsibilities can cause long delays and have all but killed the [TULIP] project in a few of the TULIP universities.*

Management of the technical infrastructure for "digital library" services will be a significant hurdle for most libraries, especially as budgets continue to shrink and the costs of developing and maintaining collections increases. The recently released final report of TULIP (The University Licensing Program), a major project between Elsevier Science and nine leading American universities to test systems for the networked delivery of

electronic publications, concluded that "managing large digital collections locally, is harder and more expensive than managing a comparable print collection."[7]

Copyright and Licensing

If libraries do begin to systematically collect digital information on a larger scale, the provision of effective access could be questionable. In fact, copyright could end up preventing libraries from providing open access to the digital information they collect. Questions of copyright must be managed so that digital information can be created and distributed throughout "digital libraries" in a manner that is equitable for both information producers and information consumers. Copyright could become an insurmountable barrier to the development of digital collections.

There are indications that content providers unhappy with the protections afforded them under copyright law, will turn to contract law and licensing for protection. Libraries are already experiencing the administrative burden of managing site licenses for electronic information such as CD-ROMs and data files. Licensing provides content providers with a stronger mechanism to control the transmission and use of information. This has the effect of moving information from a realm where ideas are allowed to flow in the public domain, to one where this flow is controlled by the provider.

There is an increasing unease among members of the library community that copyright changes will adversely affect the ability of libraries to provide digital collections and services. The discomfort librarians feel is justified. One has only to consider the statement of the International Publishers Copyright Council on digital library collections to sense the challenge that librarians face:

> *Many national and regional libraries contemplate digitizing their print collections to facilitate a virtual library that can provide service to patrons at remote locations and facilitate resource-sharing. Such a concept will destroy not only the incentive to create new copyrighted works, but the revenue from existing works that provides the investment in new works by authors and publishers.*[8]

Information providers such as publishers increasingly see libraries and themselves as sharing the same customer base. Publishers view libraries as threats to their market. What is being established is a sense among publishers that they are in the same business as libraries:

> *No longer will libraries be the sole repository of published matter. No longer will libraries be the only means of obtaining archival information. In some areas, libraries will be able to fulfill their function by merely pointing to other electronic repositories and in others they will seek out more active roles.*[9]

But it remains important to remember that the "public" is not the same as a "customer" and access to "publicly available information" is not a product. Herein lies a fundamental difference between libraries and commercial information providers.

Under restrictive conditions of use, whether imposed by contract or some revised copyright legislation, "digital libraries" will not be able to satisfy many of the imperatives of information anywhere, anytime. Libraries will be required to provide reasonable assurances to content providers that the terms of their licenses can be maintained, and that distribution of copyrighted materials are restricted to particular users or locations. It is even likely that users will have to visit the physical building of the library since the digital collections may only be available on particular workstations or require special equipment to access the materials.

Cost

Information has never really been free. There is always a cost in its creation, its production, and its dissemination. Freely accessible public libraries, subsidized through taxation, largely hide the real cost of information from library patrons and this is appropriate where libraries are considered as a public good. "Digital libraries" introduce new and uncertain economic realities and relationships into libraries. Where the costs of accessing information were once hidden to "patrons", the digital era is likely to require "customers" who will be required to pay fees for access to digital services and collections.

A major assumption of the information age, is that information will be available to all - for a fee. This assumption runs counter to the ethos that underlie libraries. It will be a cruel irony that the very technology that holds so much promise of providing access to digital information en masse will end up restricting it to only the very few that can afford it. What is affordable for some users, isn't for many others. "Digital libraries" may be privately owned corporate services and collections to which subscription, pay-per-use, or licensing fees may apply. Libraries are already having a taste of this future as they wrestle with restrictive licenses for the use of data tapes and CD-ROMs. Users are often required to use digital materials on-site in order to satisfy the contract requirements of the information providers.

The TULIP final report suggested that "building digital libraries will be a costly and lengthy process" and that making additional funds available for this content "will not be a trivial issue." The "harsh economic realities" are that digital collection development entails heavy costs for implementation, licensing, training, promotion, and the development and support of a technical infrastructure. Furthermore, the report suggested the one critical issue which was not resolved was "how to make the transition to digital libraries work economically."[10]

Economic models for making the "digital library" work, in terms of real costs and benefits, have neither been clearly articulated nor established.

Conclusion: Rethinking Digital Libraries, Reinventing Librarians

Digital information is, and will be, treated differently than paper-based information. It is likely that in the near future, the terms of accessibility and the conditions for management and collection of electronic information will not be determined by the library profession within the context of traditional library services, but rather by information professionals working to maximize return on a corporate information resource. Making the distinction between "public digital libraries" and "private digital libraries" will become an increasingly important consideration.

In the view of some librarians, a "digital library" should do all the things that traditional libraries have done for hundreds of years, and play the same essential role in society that libraries have always played. Accordingly, a true "digital library" will build on the central library ethic: it would exist as a sustainable information commons that supports open access to a wide variety of material expressing diverse viewpoints. The only difference is that a "digital library" operates in an electronic medium.

In this view, a "digital library" should include a collection of digital objects, but it would encompass much more than such a collection. A "digital library" would also include all the processes and services - collection development and management, subject analysis, index creation, reference work, and preservation - that are the backbone and nervous system of contemporary libraries. These are the processes and services that are invisible in a well-run library, and thus are taken for granted.

Although this perspective of the "digital library" is predictable because of existing library models, there remains an anachronistic quality to it. As suggested above, the costs, technologies, legal issues and administration of "digital libraries" militate against achieving this old paradigm vision.

One important consequence of the information revolution is that the costs of organizing information are beginning to match the costs of producing the information. A number of technology experts have suggested that the future electronic information environment should be based on an "underlying ethos of abundance rather than scarcity" of information. [ARL 94] In this view, it is the context not the content that will be locus for value. "The future belongs to neither the conduit or content players," posits Paul Saffo of the Institute for the Future, "but to those who control filtering, searching, and sense-making tools we will rely on to navigate through the expanses of cyberspace."[11] Esther Dyson, a well-respected commentator on technological developments concurs. The "value shifts from the transformation of bits rather than bits themselves, to services, to the selection of content, to the presence of other people, and to the assurance of authenticity - reliable information about sources of bits and their future flows."[12]

Librarians should be heartened by this future. Computers only manipulate numbers - it is people that connect them to meaning. Librarians provide context to users. Even as the stuff of library collections begins to change and become collocated in the private digital libraries of publishers and content owners, the value of librarians who can effectively turn mere data into knowledge will be paramount.

A "library" has always been more than a building containing books, or a computer on a network full of documents. In some respects, "digital libraries" are not new: libraries have been using technology to facilitate access to information for years and telephone reference can easily be considered a type of "digital library" service. Following the direction suggested by Esther Dyson, librarians might willing accept the "depreciation of intellectual assets and property", i.e., digital collections, while finding a greater appreciation in the "intellectual processes and services" that a "digital librarian" might provide.

A different view of the future might be one where a "digital library" is more like a "knowledge centre", where a complex system of professionals whose expertise supports access to information and acts as an intermediary to a variety of digital and other sources. These digital librarians/knowledge workers, who imbued with an ethic of equitable access, would function as well-trained intermediaries in an heterogeneous information environment - environment that if not actively hostile to users is certainly confusing - find and make sense of the masses of data for their users. The knowledge that "digital librarians" bring to this information environment would make sense of a multiplicity of digital and paper-based collections and resources, provide access to a network of key contacts, identify cost effective strategies for information retrieval, and assist users in the publication and creation of new information.

Open access to information - it is this principle that lies at the heart of the modern library, digital or otherwise. It is this principle which must be upheld against the many forces which might diminish its enlightening force. But perhaps open access to information in the future does not mean open stacks and digital collections. Is it possible that the principle might be changed slightly to "open access to knowledge", a principle which suggests a right to publicly accessible professional services that can guide users through information flows and mediate information overload? Is it not possible that the value of libraries is not in the collections, but in the librarians? In a turbulent

technological environment, perhaps a change of scenery is required. Redirecting the focus of librarians' attention and resources from the development of "digital libraries" to the development of "digital librarians" will be vital to the future of the profession. The time has come to invest in people and not in technology. Central to the vision of the new digital library is a digital librarian/knowledge worker who cares about people.

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Characteristics of Web Accessible Information

In just five years, the World Wide Web has become an important source worldwide for scholarly literature and a major force in reshaping the way information is distributed and used. The resources available on the Web exceed, at least in number, those of our great libraries. Last year, Inktomi[1] estimated that there were a total of 50 million documents on the Web with an aggregate size of about a half a terabyte. The sheer size of the Web, and its explosive growth which shows no signs of slowing down, leaves little question regarding its importance to libraries and library patrons.

Background

The World Wide Web (Web) is a form of Internet access. Using special browser software (such as Netscape or Internet Explorer), users can access a range of Internet services. Additionally, the Web has its own special protocol, Hypertext Transfer Protocol (HTTP), which permits the transmission of hypertext documents. The flexibility of the Web and its ability to deliver hypertext, graphics-oriented documents has made it the most visible segment of the Internet today.

Although the Web is well understood from a technical standpoint, very little is known about what type of information is available and about the collection of documents that constitute the Web. One thing which is clear is that the Web is a collection of documents *contributed* from any authors and publishers who buy a Web server. The Web does not have a *selection* policy such as libraries where conscious decisions are made about what works will be acquired and maintained in the collections. In contrast to a libraries' clearly defined development policies, the Web looks more like the result of a fantastically successful gifts programme: it includes the good, the bad, and the ugly.

From the content prospective, the Web remains somewhat of a mystery. We know very little about the sources of its materials, the types of documents available, the authoritativeness of the documents, the languages in which information is available, the age or longevity of the documents, the scope of subjects available, and other descriptive characteristics of an information collection. Few studies have been done on content due to the unpredictability of this area and the lack of overall guidance to development of the Web. There is even wide disagreement on the size of the Web. General Magic[2], the source of statistics recently used by Time magazine[3] has estimated the number of Web sites to be 400,000 while Gray[4] estimated this number to be closer to 650,000.

Users can access the Web from their offices, schools, homes, and local libraries with public terminals for Web access. To continue providing patrons with high-quality reference assistance and usage support, libraries need reliable statistics describing the huge, invaluable information resource which the Web represents. As a preliminary step to the study described herein, OCLC searched the Web and print sources for complete, documented and reliable statistics describing the content of Web pages. No statistics were found which provided any useful information for member libraries and their patrons. This study, thus, is being undertaken to rectify this situation _ to characterize the contents of the Web and produce statistics useful to the library community.

Web Pages

The Web uses its own terminology to describe the storage, maintenance, and dissemination of its information documents. Those terms most important to the study described herein are home pages, static and interactive Web pages, and Web sites.

Entry to the Web site usually starts at the *Home page*, which is roughly equivalent to the title page in the print environment. The Home page commonly provides

general information about the site, and may also function as a table of contents.

Following the Home page, the most fundamental bibliographic unit on the Web is the *Web page* (Web document, HTTP file). The Web page is a distinct entity that is identified by a unique universal resource locator (URL). There are two types of Web pages: static and interactive.

A *static Web page* is a document that can be read from top to bottom without leaving the document. Unless explicitly modified, the static Web page presents identical information to all viewers.

An *interactive Web page* is a customized document which uses external programs to perform specified functions. Interactive Web pages allow users to submit forms, query databases, format results, structure displays, and access password-protected areas of a site. A good example of an interactive Web site is the Delta Airlines' Web site[5]. Rather than searching through tables of published airline schedules, users simply enter the relevant information needed to produce their customized information document (i.e., flight schedule).

A *Web site* is a collection of Web pages linked together and which exist on a particular server.

Sampling Web Pages

The vast size of the Web prohibits an exhaustive analysis of its content. The next best approach is to collect a sample of Web pages. This sample must be large enough to represent the diversity of information on the Web, yet small enough to be manageable. The sample must also be unbiased, permitting extrapolations from the Web as a whole.

The Web includes sites on Intranets behind firewalls, Web pages which impose a fee for access, Web pages that require prior authorization, and other instances of restricted access. Only Web pages which are publicly accessible without restrictions or fees will be included in the sample.

The study will use cluster sampling in which the Web site becomes the primary sampling unit, and the Web page is the subunit. Cluster sampling is well suited to sampling Web pages since no list of subunits are available. A random sample of the Web sites will be taken, and data will be taken from each of the Web pages found at the site. The methodology for cluster sampling with clusters of unequal size is well-documented by Cochran[6]. The IP (Internet Protocol) address will be used to identify Web sites. Each site has a unique, 32-bit numeric identifier, its IP (Internet Protocol) address. The address is divided into 4 octets of 8 bits each, usually shown separated by dots (e.g., 132.174.1.5). Since each octet is 8 bits, it can range in value from 8 to 255, creating over 4 billion potential addresses in the total address space.

While every Web site has a unique IP address, not every IP address corresponds to a Web site. Many IP address are associated with other Internet services, such as e-mail or FTP, some sites are not publicly accessible, and some IP addresses have simply not yet been assigned. The small proportion of IP addresses currently associated with Web sites complicates data collection, but does not impact the validity of the sample. Each Web site has an equal chance of being selected for the sample. However, the number of Web sites in the resulting sample will be much smaller than the number of IP addresses selected.

The sampling itself will be done in three phases. First, a random sample of IP addresses will be generated. Second, an automated programme will attempt to connect to port 80 (the standard port for Web servers) at each IP address to determine if the address serves a public Web site. Third, the contents of each sampled Web will be harvested by downloading all HTML files from that site.

Data collection will begin in June 1997 and continue into the summer. The preliminary analysis is expected to be completed during the summer so that detailed results will be available prior to the conference. We anticipate that the analysis will provide accurate statistics on both the magnitude and characteristics of Web-accessible information.

Analysis

Libraries and the Internet community need reliable statistics regarding the size of the Web and the content of the information on Web pages. These statistics must be based on a well-documented, valid methodology. At a minimum, statistics are needed for:

- The number of Web sites.
- The number of static Web pages.
- The average size of static pages.
- The number of interactive Web pages.

The nature of static and interactive Web pages demands that these be treated differently from one another. For example, while estimates of the average size of a static page is meaningful, the average size of an interactive page is meaningless. Generally, the service provided by an interactive page is more important than the text. A small interactive page may be the equivalent of several volumes of tables, or provide services for which there are no print equivalents.

These estimates are more like those maintained by publishers than those collected by libraries in that they reflect what is *published* on the Web. To assess the nature of this published information, a categorization of information types is necessary. For the study, each Web page pulled for the sample will be categorized into one of the following five broad groups:

- *Non-fiction*: reports, scholarly papers, articles, commentaries, essays, editorials, monographs.
- *Fiction/Entertainment*: humor, fiction, games, entertainment-oriented materials.
- *Reference/Index*: home pages, indexes, abstracts, fact sheets, summaries, directories, profiles, bibliographies, guides, biographical/autobiographical information, cross-references to external resources.
- *Institutional*: online sales, advertisements, product information, catalogs, manuals, promotional material, institution descriptions.
- *Personal*: pages devoted to information about an individual or groups.

These categories are mutually exclusive. Initial pretesting showed the categories to be viable, although they have not yet been proven to be comprehensive. Most likely, additional categories or subcategories will need to be added to this list. These will be identified during the analysis.

Several other statistics will also be estimated from the sample data. These include:

- The distribution of languages
- The distribution by place of publication
- The average age of the Web page.

Although the sample is explicitly limited to publicly accessible Web pages, we will still collect a significant amount of information about nonpublic Web pages. Except for the Web sites on the Intranets, many of the nonpublic pages are accessed through a gateway page. These gateway pages are usually public pages and will be included in the sample. The gateway pages will provide sufficient information to estimate the amount of nonpublic material and to identify the common types of restricted pages.

Conclusions

The World Wide Web is an important and rapidly growing information resource. However, relatively little is known about the collection characteristics of the Web pages. Reliable statistics are rare. The sampling procedure described in this paper is based on clustering sampling methodology and can be used to collect a representative sample of publicly accessible Web pages. The resulting analysis of the sample is expected to yield comprehensive and accurate statistics on both the size and characteristics of Web accessible information.

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Robert W. Frase

Robert W. Frase is a personal affiliate of IFLA and Honorary Life Member of the American Library Association. He has been nominally "retired" for some years, but it is still actively engaged in several public interest causes, first among them promoting the use of permanent paper. He became interested in this subject during his years as vice president, economist, and director of governmental relations for the Association of American Publishers and its predecessor organizations. Subsequently, he was executive director of American National Standards Committee Z39 (libraries and publishing) - now the National Information Standards Organization. While at Z39 work began on an American standard on permanent paper, first published in 1984 and subsequently revised and expanded as American National Standard ANSI/NISO 39.48–1992. He has contributed two earlier articles to IFLA Journal in 1991 and 1995. Mr Frase may be contacted at 6718 Montour Drive, Falls Church, Virginia 22043-1746, USA (fax: +(1-703) 5328239).

Permanent Paper: Progress Report III: The UNESCO Resolution

Unlike the two previous articles in this series, I shall not be providing as updated overview of developments relating to the production and use of permanent paper, but will concentrate on the major event of 1997: the UNESCO Resolution adopted by the General Conference in Paris, November 1997. The text of the Resolution appears as an appendix to this article. The bibliography has been revised.

The UNESCO Resolution on Use of Permanent Paper is truly a milestone event, and opens up opportunities to carry the campaign for permanent paper to higher and broader levels. Some of the action points in it are largely self executing, but others set goals that IFLA and its members, as well as other associations, can help to achieve. In the latter part of this article, I shall suggest some specifics.

IFLA has reason to take satisfaction in this action by the UNESCO General Conference, action which was called for in the permanent paper resolutions IFLA adopted in Paris in 1989 and in Moscow in 1991. But special thanks are due to the National Library of Canada and the delegation of Canada to the 1997 General Conference. It was Canada's Draft Resolution on the production and use of permanent paper that the Conference adopted, with strong support from many other delegations and the endorsement of the Director-General.

Implementation of the UNESCO Resolution

The UNESCO Resolution calls for three actions to be taken - three goals to be achieved. IFLA and its members and allies can play a major role in helping to make these goals a reality. Let us consider each of the three in turn.

The Member States of UNESCO are urged "by legislation, regulation, encouragement and example to "promote the use and identification of permanent paper in their respective territories for publications and documents to be retained for historical or information purposes."

Clearly there is an important role here for IFLA and its affiliated national associations and national libraries. National governments can be encouraged to draft laws and regulations providing for the use of permanent paper in official documents and publications, and supplied with examples of such legislation or official decrees already in force in a number of countries.

The Director-General is invited to "ensure that UNESCO documents and publicationS are printed on permanent paper and carry a statement or logo to that effect."

Since the Director-General endorsed the Resolution, we can be confident that he will do what he has been invited to do with respect to UNESCO publications and documents. However, the resolution says nothing about publications and documents of the United Nations and its agencies, and other international organizations such as the World Bank and the International Monetary Fund. Once this policy is in effect in UNESCO, it would be appropriate for IFLA to urge that these other international agencies follow suit, if they have not already done so. If a resolution to this effect is necessary or desirable, it can be put on the agenda for the Amsterdam conference this coming summer (along with a resolution of appreciation to UNESCO and to Canada).

The Director-General is invited to "arrange for the collection of data through the UNESCO statistical surveys on the extent to which permanent paper is used worldwide."

Here again, since the Director-General endorsed the Resolution, we can assume that he will direct his staff to carry out this provision. But since IFLA and its members are knowledgeable in these matters, it would be in order for IFLA to offer to provide technical help in posing the right questions in the survey forms. Fortunately for the early implementation of this aspect of the Resolution, the two regular UNESCO surveys to which this new but related subject matter can logically

be attached are scheduled to go out very soon: the survey of *libraries* in March 1998, and the survey of *book production* (publishing) in June or July 1998. But this also means that if technical advice is to be offered, it needs to be done without delay. Then by the time of the IFLA Conference in Bangkok in August 1999, UNESCO may be able to report on the preliminary results of these first two surveys and any problems that may have arisen in collecting data on permanent paper use.

Appendix: Text of the Resolution on the Use of Permanent Paper

The General Conference,

Recalling that the preservation of and access to the cultural heritage is one of UNESCO's major concerns,

Considering that, with respect to the preservation of the tangible cultural heritage, UNESCO has initiated several international conventions and recommendations, including the Convention for the Protection of the World Cultural and Natural Heritage, and has initiated or participated in several programmes such as the "Memory of the World" programme and the "Blue Shield" initiative,

Considering that many of the world's cultural, educational and scientific resources in written form on paper are endangered because the acidic paper which has been in common use for the last 150 years deteriorates in a matter of decades,

Considering that permanent paper with a life of hundreds of years is increasingly available at comparable prices,

Considering that major and costly efforts are required to salvage the most important existing publications and documents, and that these efforts could be avoided by the use of permanent paper,

Considering that the International Council on Archives at its 12th International Congress held in Montreal in 1992 recommended that its members encourage their governments to adopt policies promoting the use of permanent paper,

Considering that this was discussed by the PGI Intergovernmental Council and its Bureau in 1993 and 1994,

Considering that in 1989 the International Publishers Association (IPA) recommended the use of permanent paper by publishers in its affiliated national publishing associations,

Considering that the International Organization for Standardization (ISO) through its Technical Committee 46 (Information and Documentation) had adopted International Standard ISO 9706:1994 *(Information and documentation - Paper for documents - Requirements for permanence*),

Considering that, in a number of countries, laws or regulations have been adopted requiring the use of permanent paper in some or all official publications and documents,

1. *Commends* the International Federation of Library Associations and Institutions, the International Council on Archives, the International Publishers Association and the International Organization for Standardization for their efforts to promote the use of permanent paper;

2. *Recommends* that the Member States of UNESCO, by legislation, regulation, encouragement and example, promote the use and identification of permanent paper in their respective territories for publications and documents to be retained for historical or information purposes;

3. *Invites* the Director-General to ensure that UNESCO documents and publications are printed on permanent paper and carry a statement or logo to that effect, and arrange for the collection of data through the UNESCO statistical surveys on the extent to which permanent paper is being used worldwide.

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