The Impact of the Web and a Reconfigured Social Dynamic on LIS digital libraries

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Abstract: **Knowledge and perspective are both conceived within, and given birth to, within particular cultures, and so these two things usually take the form, and indeed the very likeness, of the culture in which they are held. That's why, when the world's culture was made of small, self-contained modules, access to information, and thus the processes of libraries, was structured to reflect that social configuration. But the introduction of the Web, and the emergence of Internet-oriented models of information flow, are challenging the way libraries manage and dispense information. In particular, owners of cultural heritage content must reach new demographic groups, using new channels, since the configuration of culture delivery and acquisition has changed so radically. The Internet and the accompanying Information Revolution have converted the whole structure of communication and knowledge distribution into a permanent dynamic flux from the knowledge creators to the end users and vice-versa in a multidirectional channel. This paper will examine some aspects of the impact of IT on LIS and in particular will consider digital libraries and digital archives as sub-disciplines.**

Keywords: Library and Information Science (LIS); Digital Library, i2010, Wikipedia, Intellectual Property Right (IPR), Web 2.0, Semantic Web.

Historical Background

Knowledge and perspective are both conceived within, and given birth to, within particular cultures, and so these two things usually take the form, and indeed the very likeness, of the culture in which they are held. When the world's culture was made of small, self-contained modules, access to information was structured to reflect that social configuration. The foremost construct of a culture's mode of information-dispensation was the library. It was an enclosed area—a cache or point of deposit that held the ideas and recollections and rhetoric of the leaders, authors, artists, philosophers and educators of a particular culture. Members of that culture, if they conformed to certain pre-established procedures and requirements, were granted access to that information, and went on to some extent to internalize the values of the culture which dispensed such data. Each library was thus also a social force that reinforced a sense of community within a pouch of reality—defined by geographical demarcations. Libraries were extensions of the policy and ideology of a nation and its educational constructs.

Current Scenario

The configuration of cultures has changed radically. The library structures are now facing not only the enormous increase of content volume but also the demand for increased accessibility to these contents in a secure and protected environment. The complexity of the new information society challenges library professionals, who must re-structure their operational models in order to remain relevant in a changing context.

To understand what a library today, is to understand the changes in the culture in which it operate. The information model today

- is global
- is increasingly adopting open solutions (such as 'Wikipedia' and similar)
- is increasingly taking place, not in enclosed, physical spaces, but in the new landscape of Cyber-reality
- approximates infinity by linking information networks in ways that make online information almost inexhaustible
- reduces costs of information sharing (after initial outlay) almost to nil
- adapts to user preference, and is thus individual-based and customized
- is shaped by the forces of Corporations and Cyberspace—both of which override/transcend national policy and boundaries
- is increasingly oriented by brands and corporate strategy. Even non-profit organizations adopt business models for efficiency

For libraries in this new scheme of things, to be competitive with new information sources requires change. Locality no longer guarantees a clientele from surrounding areas when the geography of the world is compressed into a tiny point under an Internet user's mouse. One's foremost competitor may be a library on a small isle across the Pacific—which becomes, through the global web, an icon lying just a few pixels away.

But the context in which the role and perspective of librarians are transforming is much more complex than that. Protocol and channels for information flow are being drastically reconfigured by the new information paradigm. The very form in which information exists, and the way people use and access such information, has been radically reconstructed. High-speed communications, open access protocol such as used on the Web, a variety of digitization devices and scanners that produce professional copies at minimal costs, and the mushrooming of various forms of multimedia, have all opened up new information routes to diverse, and widespread populations. These new routes often bypass established library channels. It is due to the fact that the previous rules of engagement for libraries is to such a great extent invalidated that the modus operandi of library professionals is being so intensely re-evaluated. The radically shifting environment is literally forcing changes in librarians' approach and practice.

Today's global framework

A key feature of the Information Revolution dynamic is that the volume of content increases exponentially every year. In the case of European content, the total number of books and bound periodicals (volumes) contained in European libraries (EU 25) was calculated to be 2,533,893,879 in 2001. Moreover, a survey by the European IST[1] Presto project, which ended in October 2002[2], found that ten European major broadcasting archives "*contained 1 million hours of film, 1.6 million hours of video recordings and 2 million hours of audio recordings. Total European holdings of broadcast material are probably 50 times larger. Most of the material is original and analogue. 70% of the*

[1] http://cordis.europa.eu/ist/
[2] http://presto.joanneum.ac.at/index.asp

material is at risk, because it is decaying, fragile or on obsolete media. Every year Europe's audiovisual archives lose 10,000s of hours of the oldest part of their collections."

Open archives (interoperable, way of storing and searching content, not necessarily free to end-user) and open accesses (free content for the end-user, alternative publishing models, organized author self-publishing and peer review) are more requested than in the past and IPR issues are of high priority, since the end users expect to use the available content in a secure framework. Today open archives are early adopter institutions that organise access to their intellectual assets for internal and external user communities.
Barriers to progress for open archives include:

- Management of vast publishing programmes
- Content tagging, editorial, updating, version control, author control
- Federated search technologies enabling cross-searching
- User / author behaviour changes
- Orphan works issues and privacy

Web 2.0 enables developers and users to push intelligence and active browsers used as agents (client-server applications). Development of active client-side applications use data that are on the Web somewhere, or data that is embedded in the web contents.

Through the Semantic Web--an evolving extension of the current Web and not its replacement--web content can be expressed, not only in natural language, but also in a form that can be understood, interpreted and used by software agents, thus permitting them to find, share and integrate information more easily[3]. The Semantic Web[4] provides a common framework that allows data to be shared and reused across applications and communities. It is based on the Resource Description Framework (RDF), which integrates a variety of applications using XML for syntax and URIs for naming.

The Semantic Web also allows data to be surfaced in the form of real data (avoiding the formatting and other coded information). Moreover, it allows people to generate files which are enabled to "communicate" to a machine intelligence. Concepts are supposed to be retrieved through higher level of structures (usually ontologies) which have inter-concept ruling and hierarchies or simple logical patterns and relations among the elementary concepts.
In Web 2.0 applications are based on combining various types of data (that are distributed on the Web) in an extension known as Semantic Web.
The Semantic Web provides a more consistent model (and tools) for the definition and the usage of qualified relationships among data on the Web. But more significantly, it constitutes one of the ways in which the tools and mechanisms that underlie the information management practices of libraries are being updated, in fact, transformed. These transformative tools require updated methodologies in the area of library

[3] http://www.wikipedia.org
[4] http://www.w3.org/2001/sw/SW-FAQ

management, and so librarians are acquiring the necessary skills to meet new information-management challenges that accompany innovation.

Librarians in archives

The effort of librarians to update their skills includes the study of LIS-oriented archives, such as photography-based collections (for example F.lli Alinari IDEA[5]) as well as other archives (documentary archives, etc.). Archive personnel are trained in areas which include:

- Managing the thesaurus
- Cataloguing
- Indexing
- Information-gathering
- Data monitoring and validation
- Architecture management

Other special areas of skill include the preservation of the originals (which also involves restoration processes), data storage methodology, copyright and IPR managing, orphan works attribution and management, etc.

Due to the growth of the Web, the work of the archive librarians has changed a lot in respect to these past profiles. New services and tools allow them to find information through many sources (but they need authoritative resources -- generic search engines do not fit their needs). Also, due to the fact that more differentiated users access the archival contents, the archive specialists are asked to generate more differentiated information and at different granularity than in the past. For example, a picture representing La Madonna, by Leonardo da Vinci, has many concepts which must be added as metadata (from the colour of dressing, to the background objects, etc.).
The level of granularity is no more economically convenient, since a high level of knowledge is needed to produce a massive volume of even low-level content.
Some automated technology is requested to cluster contents, to migrate the annotations to all similar contents, to annotate contents by means of other information such as content semantics analysis (such as person detection, face recognition, knowledge-assisted analysis[6], etc.). In this area, the Semantic Web is very promising but it is also limited by the fact that the ontologies suffer undetermined domains definition.

Social and business factors influencing the librarian's profile

In addition to updating their technical skills in order to capitalize on new tools and processes, librarians are also re-conceptualizing their role in other areas. Educational processes, for instance (which is one of the key forces shaping library practice) have been increasingly oriented toward lifelong and individualized learning, non-traditional students and decentralized learning. This has shifted the focus of librarians and library services

[5] http://www.alinari.com
[6] http://www.acemedia.org

toward research library instruction and bibliographic control and automation. According to the article "Careers in Research Libraries and Information Science: The Dynamic Role of the Research Librarian," bibliographic instruction, also called library use instruction, or user education, started as a "simple area of interest" but is fast becoming a complex area of study that is a centralized area of attention for librarians. "Instruction librarians", says the article, "have begun to examine the complexities of search strategies, the differing information needs of novices and experts, and the organization of knowledge in various fields in order to better serve their constituencies. All of this has contributed to an important role for the librarian—that of teacher."

As librarians start taking on new roles, they begin to see themselves, not as librarians anymore, but as information specialists or facilitators. "Breaking the Barriers: How Libraries Contribute to Socially Inclusive Communities," comments that projects being launched by library professionals "have incorporated elements that would otherwise appear to be unrelated to mainstream delivery of library services." Librarians are thus increasingly open to new methods and models—not conceiving the role they play and the functions of library and information science in a limited way, but as part of an inclusive, adaptable model which is no longer defined by particular procedures and policies (means), but by the ends—the information delivery to a user. This user-orientation that library professionals are leaning toward, as opposed to the more institution-oriented approach of the past, again simply reflects a culture that has been reconfigured by the Web, which is directed and defined by user searches.

Users are the clients of libraries, but in a culture that is increasingly fusing social and commercial models, they are also, for all intents and purposes, the libraries' market. And that underscores another of the transitions in the mentality of library professionals. They are increasingly market-aware, and are taking on the strategies and perspectives of corporations in their approach to the challenges facing them. The traditional methods of a non-profit institution may be proving themselves not fully appropriate for the challenges being presented by an information culture which demands the highest operational efficiency and strong marketing for survival. For example, in the face of a need to reduce information costs, increase staff productivity, and access more literature within the constraints of static, or diminishing budgets, library professionals must focus increasingly on finding new ways of generating revenue and accessing markets in order to achieve the strongest bottom line. They are seeking ways to alleviate the tight constraints of library budgets, which are being strained by an increasing number of titles—both digital and print: a circumstance that has resulted in an inability to achieve complete, diversified collections. In an effort to reduce costs in other areas in order to be able to finance acquisitions, some library professionals are resorting to outsourcing certain tasks. "Outsourcing of technical services' functions such as cataloguing and processing is becoming more commonplace in libraries across Australia, with dozens of libraries taking advantage of these services from library suppliers," says the abstract of one article to be delivered at a national conference in that country. But, indeed, outsourcing is just one reflection of the increased focus on the part of librarians on supply chain management—administrating the flow of information in ways that keep them afloat.

This need for business acumen on the part of librarians in the areas of supply chain management and marketing is just tiny reflection of how the very nature of the set of competences, skills, qualifications that constitute a library professional are changing. To

some extent, SLIS courses are reflecting that. But present library professionals are also taking it on themselves to acquire the necessary skills to survive in a global information culture that is increasingly regulated by open access. In composite, all these new perspectives and initiatives of library professionals to confront the challenges of a new information system form a new library professional profile: In summary, today's library professionals are:

- less focused on specific cultures or communities and more on the global community of users
- less esoteric and self-contained and more open to partnerships and innovation and unorthodox models
- starting to equip themselves with new LIS methodologies and bear the new role of information specialist
- focused on survival, and are thus to a certain extent adopting a corporate outlook rather than the typical mentality of a non-profit organization.
- and so librarians seem to be, in this context of an unfolding global information network, with the walls being dismantled around them, adapting rapidly to suit their environment.

But the adopting of new approaches and modes of behaviour may still not fully equip libraries to reach the levels of competitive efficiency being demanded by the Web, which is regulated by very little policy, other than the law of action that the user is supreme. Interface, web link sequence, search engines all yield to a great extent to the clicks of the user. Even when libraries adopt an online presence to reach out to the portions of their clientele who may be accessing information from other sources, their offering is just one more site lying among layers and layers of other information and ads and prospective sites, waiting for a click.

The librarian's potential and present users (what a non-Internet model could have, but it's not using, and what it has but is losing, respectively) are part of an international demographic—especially in a world where people are increasingly mobile. Thus the economic/market challenges faced by library professionals, as well as many of the challenges previously described as forcing a change in librarians' mentality, require international solutions because most of the challenges presented by an information system governed by an international paradigm (the Web) are international in scope. International public relations has thus become paramount. Internationalism is redefining the culture/modus operandi of buying, socializing and research, and so making links that renders an information entity an international force is a key strategy to organizational survival for libraries. In the global culture, libraries in particular need international public relations in order to:

- connect with partners that enable them to access the necessary expertise that equips them to operate at a globally competitive scale, and diversify/ expand their offering
- access consumer attention and approval through a favourably viewed, internationally recognized image/ identity

- keep the model up to date by learning of latest trends and accessing the insights and training that takes place at conferences etc.

Key partnerships give access to resources and economies of scale and expertise that allow the library to approximate a large, globally competitive product it would not have been able to assemble (as a response to a global market) otherwise. As Irene Munster of Universidad de San Andres Library, Argentina said on the OCLC (the world's largest library consortium) website, "Before we began using OCLC ILL we were isolated in the south of the southern cone; now we are proud to be at the heart of the international community…."

Specifically, there is the need to form international links in order to be competitive with general search engines, which are international in scope—oftentimes users bypass libraries and other collective structures and just search the web for individual postings. Only by pooling resources together can libraries compete. The OCLC (which is a regional cataloguing cooperative that has about 108 participating libraries in the Americas and is the foremost of its type), for instance, spent $100 million in the last ten years to come up with a solid collection spanning 4,000 years and 400 languages.

The very nature and scope of such a repository suggests another reason why international PR is so critical: there is an expansion in the orientation of academic enquiry and the structure of curricula—key forces in determining the information needs which shape the market for libraries as well as their product. Specifically, as the culture changes, expands and embraces a plethora of alternative systems and views, the needs of researchers and the scope of their projects reflect that. Academic enquiry and coursework are no longer culture-centric, but increasingly placed in international, multi-perspective contexts. In the context of the global village, researchers increasingly want alternate perspectives and approaches that sprout in tiny niches in isolated cultures. Libraries have been the primary suppliers of their research needs and would like to retain their position. But only international PR can permit the access to new information sources necessary to satisfy these greater research demands. Only economies of scale can permit the level of acquisition and storage and dispensation that would be required.

i2010 European Digital Libraries and other initiatives

In a letter of 28 April 2005 to the Presidency of the European Council and to the Commission, it was suggested that a virtual European library be created, which would be aimed at making Europe's cultural and scientific record accessible for all. The European Commission has welcomed this plan and will contribute to it through the i2010 flagship initiative on digital libraries [2].

> *The **digital libraries initiative** aims at making European information resources easier and more interesting to use in an online environment. It builds on Europe's rich heritage combining multicultural and multilingual environments with technological advances and new business models.*
> *Digital libraries are organised collections of digital content made available to the public. They can consist of material that has been digitised, such as digital copies of books and other'physical' material*

from libraries and archives. Alternatively, they can be based on information originally produced in digital format. This is increasingly the case in the area of scientific information, where digital publications and enormous quantities of information are stored in digital repositories. Both aspects – digitised and born digital material – are covered by this initiative.

Targets of the i210 are the online accessibility, the digitisation of analog contents and the preservation and storage. Recommendations will address not only digitisation and preservation but also the copyright framework (at present, only a small part of European collections has been digitised).

Other relevant initiatives have been set up to provide more digital contents to the Web users in particular. Google started to digitise 15 million books from four major libraries in the US and one in Europe. If realised as planned, the Google initiative by far exceeds the efforts at national level in any of the European member states.
Also in India and China there are ambitious digitisation agendas in place covering material in different languages.

The European Commission already set up funds to support content enrichment through the *e*Content*plus*[7] programmes (60 MEUR scheduled and made available for the period 2005-2008 for projects improving the accessibility and usability of European cultural and scientific content).
During the year 2005 the e-content market has effectively showed a significant increase putting the basis to the development of an industry of digital contents which is continuing to grow. Among the factors that constitute the fundamental components for an even stronger growth are

- Technological convergence
- Distribution on the platforms (internet, 3G mobile technology, digital TV and sat)
- Media penetration in user life
- Diffusion of media players
- Increased compatibility among devices

Collaborative factors

Collaboration, especially across boundaries, enables libraries to come up with better solutions to most of the unique challenges facing libraries in an information society, including meeting the demand for research "unhampered by geographic or linguistic limitations and cross-cultural networks." But there is a more mundane purpose for international PR than the expansion of academic enquiry and exchange of expertise: finances. Collaboration among libraries of varying levels of resource availability and expertise creates a balancing system in which the surpluses of some institutions are

[7] The list of funded projects:
http://ec.europa.eu/information_society/activities/econtentplus/projects/funded_projects/index_en.htm

transferred to offset the deficiencies of others. It enables disadvantaged libraries to access the necessary international insights to sculpt an offering that's internationally marketable and ready for the international users, as well as enable staff members of libraries with administrative challenges to access the shared expertise and training of participating libraries with administrative strengths.

Mainly, this international PR as a response to challenges is being rendered a component of large regional library consortia in which the aim is to become international information sources, while addressing a variety of administrative problems. The consortia and in particular online repositories will be the chief context in which the challenges to international collaboration will be subsequently considered (though offline, non-consortia collaborations will also be discussed). And perhaps the first thing to be considered when LIS groups from a variety of nations initiate a collaboration which will involve resource sharing (particularly digitized resource sharing) is interoperability among systems. OCLC advocates, for instance, for the development of standards such as the Dublin Core Metadata Initiative (a set of elements for building universally usable resource descriptions) and the Resource Description Framework (an emerging web consortium standard for interoperability on the Web). By ensuring interoperability, collaborative efforts will create a seamless administrative model and facilitate, rather than complicate, the administrative processes of individual libraries—making them more efficient and thus giving them an incentive for continued collaboration.

Managing Issues

Another incentive for individual libraries to remain participants in an international collaboration is the fostering of administrative processes that reduce the workload of individual libraries and enhances their economic efficiency:

- In the case of international resource-sharing and file-pooling, cataloguing services should be economically efficient, thus increasing library staff productivity and reducing costs.
- Additionally, initiatives should enable libraries to improve services for users while reducing information costs (especially critical research journals—the titles they cannot afford to keep up with) while reducing rate of rise of per unit costs in libraries.
- It should also, as in the case of the OCLC model, provide a means of generating revenue for individual libraries. (WorldCat credits libraries financially for original cataloguing and resource-sharing activities on OCLC systems.)
- And libraries should be getting the kind of information like statistical reports of overall activity and the transfers related to their own library to equip them for strategic decision-making.
- There would also have to be low administrative effort on the part of libraries. [In the OCLC model, fast-record creation is possible through CORC's automated toolkit, which reduces typing and cut-and-paste work.](The OCLC provides online archiving, journal level usage statistics and title-level acquisition—all while ensuring a cost-

effective alternative to high-priced commercially published journals.)

The administration of collaborative efforts is a key issue both in terms of its implications for the financial bottom line of individual libraries and its construction of the smoothest, simplest possible administrative processes to ensure the feasibility of the project in the long-term. While ensuring the reduction of administrative efforts of individual libraries, however, the central administration of the consortia must ensure the overall efficiency of the system and its long term viability. To do this, it must:

- take the necessary measures against duplication of resources
- keep up with user's needs and patterns: The University of Washington, in its article "Collaboration as a Key to Digital Library Development", quoted Don Water, Director of the Digital Library Federation, who said that an effort must be made to understand the ways in which users interact with systems, their needs in relation to new information types, and the functionality of those types in the emerging digital environment. This, said the University of Washington, will involve building test beds to enable a continuous system of testing feedback, analysis and improvement… "It is not enough," it says, "to have interesting collections, flexible, standards-based tools for management and access. We also need current knowledge of user communities' changing needs and information-seeking behaviours and access to emerging technologies."

Financial Aspects

As mentioned before, all these processes to ensure effectiveness of the system require finances. Funding is a key issue—how to access it, and also how to be self-sustaining after the sponsorship period ends. "The First stage of any project is securing the funding", says I.M. Johnson, SLIS coordinator and writer of "In the Middle of Difficulty Lies Opportunity", "*but the budgets of the international development agencies have now, in many cases, been reduced in real terms, and political and diplomatic interests are always subject to change. SLIS wishing to participate in international collaborative activities are now more likely to have to initiate a request for funding themselves and to have to submit a proposal in more obvious (although not necessarily more transparent) competition with other disciplines and institutions*." Of course, when funds do not come from sponsoring organizations, but from participants, richer nations will be able to input more financial resources. This underscores another priority issue for international collaboration that must be considered—should the amount of influence and decision-making clout of a participating library be proportionate to funds contributed? In other words, should the ratio of financial contribution among parties determine the distribution of administrative say? Kigongo-Bukenya (2005) commented that cooperative projects involving institutions from developed and developing countries are not always seen as a partnership of equals. Oftentimes, it is seen as patronization, and library cultures from economies with limited resources tend to fade into the background in such collaborative models.

And yet it's critical that cultures of marginalized groups/nations get their fair share of representation. In general, there is a need to allow individual libraries and cultures their own identity, and not to efface them in the process of absorption into a general consortia. Kigongo Bukenya reviewed partnership initiatives in LIS education in developed and developing nations. "It was deduced from the case studies that success is due to several factors, including conviction and willingness of partners to cooperate; partners' full participation right from the conception of the ventures; the partners' voluntary spirit to offer services and management of the partnership; the apparent benefits for the institutions, staff and students [in addition to available and sustainable funding]." What is needed, then, is to conceptualize and create a cohesive library culture and commitment of partners through shared vision and goals-- a meta-culture. Of course, the issue again arises—who establishes this culture? Who determines its features? Who must passively accept? The decisions made here must be dictated by policies that mirror the dynamic which created the need for such international repositories in the first place: Cyberspace. And in Cyberspace the culture of Wiki reigns. Wiki-emerging as one of the more flexible, dynamic, simple but powerful tools for knowledge-sharing and collaboration in which all users are granted access—has come to be a metaphor for the kind of egalitarianism which is an emerging value in a global information society, and which must be reflected in collaborative policy. It is an egalitarianism which overrides traditional boundaries.

Challenges and Barriers

The European Commission, in its program to develop the information society, recognizes that one of the key actions to create a user-friendly society is the need for its projects to "improve the functionality, usability and acceptability of future information products and services, and to enable linguistic and cultural diversity". In terms of linguistic and cultural diversity, challenges will include, as stated by Johnson in his analytical paper:

- the industry—determined by the characteristics of the information sector in the country that it serves
- environmental factors—obvious environmental sources are
- government policy, fluctuations in the economy etc.

Payment systems present another challenge. In the case of digital library systems, credit card payments are not used enough, in particular by young people which are the main target group for digital content. Another challenge is the varying methods of accounting the VAT and payment systems; this particularly affects the transactions executed on the Internet. In fact, there is not a homogeneous policy in Europe for the calculation of the VAT and it is particularly inefficient for the micro-payment processes.

These affect logistics among countries of varying systems. But the underlying cause may be more complex legal, political and attitudinal issues. Analyses of international cooperation in the library field have revealed other barriers in inter-lending (Johnson 2005):

- inadequate human resources
- insufficient funding to sustain it
- poor telecommunications
- copyright issues
- insufficient knowledge of foreign regulations, policies etc.

- negative attitudes or reluctance to participate

In regards to the fifth barrier—copyright-- the legal landscape of particular countries is a crucial issue. The trend, says one presenter at an Australian symposium on library challenges, has been "the focus on ownership rather than on the relationship between knowledge and innovation and possible benefits from advances in digital technology. The response of many governments in the digital era has been to increase the level of protection for copyright owners—setting up barriers to access." In Australia, for instance, there was a state-wide approach to auditing collections and developing a 2020 blueprint for public libraries in Victoria—with a strong focus on ACCESS and CONTENT issues.

Government's impact on copyright policy is just one area in which politics and leadership of particular countries affects the dynamic of international collaboration in library sciences. In general, government agencies tend to be the major sources of support for libraries and thus impact their operations and modus operandi. Challenges to the international collaboration will brew in the politics of individual nations. Libraries are polarized, for instance, by the potential risk to privacy brought about by the introduction of radio frequency identification system (RFID). Particularly in the US, lobby groups are attempting to stop libraries from migrating to this new policy—and a working group in Australia was set up to establish standards. But the NCIS model best exemplifies the interrelatedness of libraries and government policy. The committee was created in the U.S. by the passing of a 1970 law which states that library and information services are part of achieving U.S. national goals. The NCIS (National Committee for Information Science) was thus charged with identifying needs and translating into policy. One aspect of the NCIS's focus is very telling of the kinds of hurdles to international resource-sharing that may result because of the role of national policy in the administration of individual libraries: The NCIS has been considering the following issues in an effort to regulate access to content: "*What policies in regard to libraries and information services will enable the US to maintain its role as world leader in scientific research? Who organizes, maintains and gets access to large scientific databases? What is the government's role? How should national information security be balanced against scientists' access to information? What open access policy best serves both the scientific and economic interests of the nation? How will mass digitization of scientific documentation affect stakeholders?*" (NCIS Appropriation Justification 2007). This poignantly illustrates that national policy and global competition in areas in which information exclusivity is a determinant of success may affect the potential for international linkages of information.

Inter-nation understanding, though, will be more easily achieved if common social goals are established that fulfill the social function of individual libraries. When considering the inherent social functions of libraries in their respective communities, it's important to ask: How can the library continue to be a social force when it is an international repository that spans various social agendas?

Individual libraries' preoccupation with their roles as social forces could actually cement international groups if the consortia sets as priority the social agendas that are common to all groups. For example, enabling information access to disadvantaged or minority groups could also be a socially binding goal. In "Closing the 95% Gap: Library Resource Sharing for People with Print Disabilities", Mary Ann Epp says: "Experts estimate that only 5% of the world's publishing output is made accessible in alternate

formats for people who cannot use print." She goes on to say that "people who cannot use print due to a visual, physical, neurological or perceptual disability need libraries to provide the equitable access. Libraries need strategic partnerships, improved public policy and international agreements to fulfil the promise." Historians have expressed the view that the very form in which scholarly material is produced has been shaped by the way libraries give order to their collections, and so in the long-term libraries shape information. And so the right kind of collaboration and international social agendas could help ensure that information takes on a socially beneficial global form. Indeed, in the effort to set up international social agendas and a library system with a meta-culture, libraries will help shape cultures as much as the Web reshaped their agendas. It is an ongoing dialectic that goes on in the timeless process of transforming our world.

Conclusions

The introduction of the Web, and the emergence of Internet-oriented models of information flow, are challenging the way libraries manage and dispense information. Owners of cultural heritage content are compelled to reach new demographic groups by using new channels, since the configuration of culture delivery and acquisition has changed so radically. Not only the services but also the approach to the knowledge usage and access has changed radically. Some aspects of the impact of IT on LIS have been explored by this paper focusing on social evolution and impact.

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Acknowledgements

This material is partially based upon work supported by the European Community in the MultiMatch project (http://www.multimatch.eu) CITER project (http://citer.cti.rg); aceMedia project (http://www.acemedia.org); MILE project (http://mile.ssl.co.uk);

TRIPOD project (http://tripod.shef.ac.uk/). This paper is the view of the authors but not necessarily the view of the community.