DIGITAL LIBRARIES : CHANGING ROLE OF LIBRARIES AND LIBRARIANSHIP IN PRESENT AND FUTURE MODERN WORLD

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Abstract

This article deals with the Digital Libraries Changing role of Libraries and Librarianship in present and future modern world. Digital libraries are more and more actively coming into use within scientific organizations and universities in modern world. Now-a-days, with the growing size of digital libraries and integration of digital libraries, there are various challenges in this field, some of them are Resource discovery, standardization of Interfaces, Digital library administration, Copyright and Licensing, Cost optimization.

Key words : Digital Libraries/ Librarianship/ Information Technology

1. Introduction

Librarianship, today's library-school graduates encounter an economic and technological landscape where information and communication concerns are intertwined with more traditional library-related issues. Consequently, librarians discuss the changing role of the library in the cultural, social, and economic structure of society. They express concern that the essential nature, values, and practice of librarianship are threatened by change. Increasingly, soft distinctions among library services, interactive media, and information communication networks raise concerns about the roles of libraries in the future. The popular old-fashioned image of the librarian is of someone who is behind-the-times and far from business-like. Even today, the general public's view of librarians is that we are more concerned about collections than providing services with new information technology. But many librarians have sensed the ground shifting under their sensible shoes. Articles about reforming, reinventing, revising, and restructuring libraries, librarianship, and information studies are common in the professional literature. Even popular media articles are appearing about "Librarians Surfing the 'Net." Librarianship is caught in a sea of dynamic change; preservation, control, and dissemination of recorded knowledge appear to be at risk in a world where uncertainty, contingency, and the transforming nature of electronic media are increasingly dominant.

To some in the field the dynamic pace of change serves as an energizing motivation. These new-age librarian/information specialists embrace new technologies (often with

little thought for preserving the past) and are more readily associated with Silicon Valley than with the dusty volumes shelved in many of our oldest and richest collections. I believe that libraries are entering into a challenging new stage of development characterized by an extended transition toward an increasingly electronic information future. Over the next decade librarians will encounter the twin challenges of managing buildings and print collections while simultaneously developing policies, tools, and support for digital collections and network information services. Not all libraries will succeed in meeting these challenges.

Are libraries, librarians, books, and reading in danger of being replaced with the digital confusion of cyberspace? Or will libraries successfully integrate new electronic formats and interactive media? The situation for me is captured by a picture hanging on the wall near the desktop computer I use at my office. To rest my eyes from long hours in front of the glaring screen, I look up at a photograph of my father working at the Library of Congress in the early 1940s. In the picture, my father is standing in the Oriental Division book stacks, consulting two volumes for his work compiling a biographical dictionary of eminent Chinese.

The choice of professional work involving daily contact with books and other printed resources was a strong motivation for both my father and me in selecting our careers. However, over the past decade, I have spent less time with books and more time with keyboards and computer workstations, utilizing the information technology tools needed to access and download files from information networks, to communicate electronically with colleagues, to reformat files, and to manipulate digital resources. Despite the absence of books in my work, I am comfortable describing myself as a librarian. I sometimes see myself, however, in stark contrast to the photograph of my father at the Library of Congress, surrounded by printed text, quietly consulting ancient Chinese source material. The differences between my own library experience and his make me wonder about the library of the future. Will librarians of the future also have historic reminders displayed in their offices? Will these be books? Will technological change make the past more or less accessible to them than it is to our generation? Will they even be aware of the concerns of earlier generations of librarians? While these concerns are based on personal experience, similar concerns about the future of libraries in a digital age are reflected in current information policy issues. A few of the doubts and uncertainties that trouble librarians are summarized by the following:

- The impact of recently enacted telecommunications laws on libraries and library users is uncertain, prompting questions about censorship, intellectual freedom, and liability. Will librarians be required to censor patron use of computer networks?
- Librarians and publishers disagree about protecting the copyright of works transmitted digitally and about what constitutes fair use of copyrighted materials. Will library users be charged directly for accessing electronic networked information?

- Congress is planning for the electronic dissemination of government information. Questions about access to print and digital public resources arise: Will printed copies of public documents continue to be available for library patron use?
- Federal grants for the construction of libraries are being redirected for libraries to acquire information technology, and there is concern about future support for library facilities. Will libraries become virtual places, and will librarians be replaced by navigators of cyberspace?

Explorations of the changing role of information in society and the impact of change on the concept of a library are part of an uneven and protracted transition to a future that is increasingly dominated by the fast pace of change set by the electronic information technology industries. Our serious consideration of the future direction and shape of librarianship and of libraries in the postmodern society of the twenty-first century raises fundamental and troubling questions. The following are typical:

- Do libraries have a future? Will they survive the rush to the digital information age? What will libraries look like in the future, and how will they be used?
- How are libraries responding to electronic information technologies? Do recent technological trends threaten libraries?
- How are the changes brought about by electronic information technology restructuring the concept of a library and the role of librarians?

2. The Emergence of A New Information Services

One need not be a librarian to recognize that the emerging electronic frontier presents revolutionary challenges for libraries and librarianship. The traditional relationship between the user and the library involves individuals studying individual works within organized collections. Many of the traditional library tools are designed to guide individual library readers to published works of interest. However, innovative developments in commercial information network services are creating a flood of new information media and service offerings designed to meet the needs of the individual without the assistance or guidance of a librarian. The inherent nature of digital and interactive network technologies makes analogies to the traditional library paradigm difficult. The introduction of each new interactive electronic information service designed to be used easily and intuitively by customers raises questions about the traditional library mission of facilitating information access and delivery of individual works to individual readers. Who needs a library (or a librarian) if one can access vast information resources with a computer, a modem, and a telephone line? But as experienced users of network information services have found, electronic information is not always as constant or reliable as published text in printed editions. Successive generations of retrieval software, browsers, and new operating system releases, as well as a constant flux of new features and functions, mean that a new paradigm of electronic information has evolved in which concerns about the validity and authenticity of information sources become critical.

Numerous recent articles, cartoons, pamphlets, posters, monographs, editorials, and even bumper stickers extol the opportunities created from the confluence of computing and communications technologies. This technological cross-fertilization, it is argued, is responsible for the explosive growth of the global Internet and the World Wide Web, and is fueling a radical social transformation brought on by computer-mediated communications and networked information services. Further, rampant consolidation of media industries and segments by mergers, cross-industry alliances, and complex investment strategies promise to change the nature of the media and information services upon which libraries depend. Even the traditionally minded New York Times now devotes a portion of the business section to covering the information media scene, following the example of Newsweek's "cyberspace" column.

Despite recent popularity and hype about the electronic information media's impending transformation of society into a virtual, interactive, multimedia, digital culture, disturbing questions arise about the implications of rapid technological change on the future of libraries and librarianship. For example: How can responsible librarians and library users address the serious underlying issues affecting their institutions and their futures? What transitional strategies are needed for libraries to chart a course from past missions to an uncertain future?

3. Libraries and Change : The Context

General forces of change confront libraries and society at large in the transition toward global digital information services. Within these general trends, subtle changes are occurring in the nature of information and the expression of knowledge and ideas. These subtle changes provide the subject for sociologists, anthropologists, and ethnographers studying the effects of technology on human behavior, social structures, and institutions.Understanding the cumulative impact that technological tools are having on our intellectual behavior, our rational skills, and our understanding of the relations between events is a subject of increasingly intense study and debate. I find Sven Birkerts particularly cogent in discussing the fate of reading in an electronic age. Writing in The Gutenberg Elegies he notes that:

The advent of the computer and the astonishing sophistication achieved by our electronic communications media have together turned a range of isolated changes into something systemic. The way that people experience the world has altered more in the last fifty years than in the many centuries preceding ours. The eruptions in the early part of our century - the time of world wars and emergent modernity - were premonitions of a sort. Since World War II we have stepped, collectively, out of an ancient and familiar solitude and into an enormous web of imponderable linkages. We have created the technology that not only enables us to change our basic nature, but that is making such changes all but inevitable.(2) Birkerts argues that adoption of information technology evokes inevitable change not only in information-based institutions like libraries, but in our basic nature. If the scope of these changes is as fundamental as Birkerts maintains, the consequences for libraries may well be more revolutionary than the invention of the printing press, although some may see Birkerts exaggerating in his characterization of electronic technologies as a cultural metamorphosis.

It certainly is provocative to view the advent of digital information networks as equivalent to the impact that the discovery of fire had on human existence. If the changes affecting libraries are of this magnitude, then all the future of communication is in an extremely precarious position. Is this all exaggerated hype, or have Barlow and Birkerts identified something of importance for the future of libraries? Certainly, Birkerts shares a perspective on the pervasiveness of the changes we are experiencing in moving toward the electronic frontier:

We have, perhaps without noticing, slipped over a crucial threshold. We have rather abruptly replaced our time-honored and slow-to-evolve modes of communication and interaction with new modes. We have in significant ways surmounted the constraints imposed by nature, in the process altering our relation to time, space, and to each other. We have scarcely begun to assess the impact of these transformations - that will be the work of generations. . . . [S]ome of our fundamental assumptions about identity and subjective meaning need to be examined carefully. For, by moving from the order of print to the electronic, we risk the loss of the sense of obstacle as well as the feel of the particular that have characterized our experience over millennia. We are poised at the brink of what may prove to be a kind of species mutation. We had better consider carefully what this means.(4)

4. Postmodern Trends

Careful consideration of the meaning of the shift from print to electronic media is, indeed, needed to understand the changes that are influencing the future of librarianship. However, instead of turning to technologists, economists, futurists, or librarians for enlightenment about the social and human impact of changes in communications and information media and the possible influence of these trends on information and librarianship, it is instructive to study the work of selected anthropologists and sociologists who are directing attention to the ways that technology is affecting the fabric of our social and cultural lives.

With the advent of artificial intelligence and advances in the field of virtual reality, some are predicting the arrival of a science-fiction age characterized by a post human universe presided over by godlike human-machine hybrids. While this may seem far-fetched, cyber culture-induced scenarios can be seen growing from the increasingly blurred distinctions between human capacities and computers. These shifting boundaries between humans and machines are reflected in Birkerts's concern about "species mutation." Symptoms of an obsessive preoccupation with the insufficiency of the human body are becoming prevalent.

The range of human physical and mental activities seems to require extension through technological means, just as mobility has been extended through ubiquitous motorized transportation. Science fiction predicts that humans of the future will have computer implants giving superhuman capabilities to average people; cyberpunk performance artists proclaim that they seek a human-machine hybrid. Reflections of this are to be found in images included in Wired, a magazine where an unaltered photograph is a rarity. Altered or "morphed" images of humans dominate our media-saturated world.

From television to movies the message seems to be that people need intelligent machines integrated into their internal environments to participate fully in the postmodern society of the future.

The term "postmodern" is increasingly used to describe a mind-reordering shift in the ways that people think about themselves and their world, a change in our concepts of "reality" and "self." This shift has important consequences for communication and information processes. In Life on the Screen, Sherry Turkle, a sociology professor at the Massachusetts Institute of Technology, discusses the psychological impact of the personal computer, especially in our use of the computer as a metaphor for personal identity.The advent of technology on society in the form of the computer and, more specifically, through interactive computer-information networks is having a profound impact on the identity of self, according to Turkle, who has recently observed: In terms of technologies that have really changed people's deepest conceptions of self, we've had a long run with print. . . . Print has been a transparent medium for expression of unitary self. . . . But we're in the beginning of a profound shake-up of that sense of what a self is. . . . When you can embody your ideas in a machine [and] when you can have an instantiation of your body on a computer - this is new.(5)

We are increasingly dependent on digital information technologies to define meaning and provide a contextual framework for our activities and our identities. In this growing dependence, our cultural shifts from the linear, logical, and hierarchical world are noticeable. We seem to be hurtling towards a postmodernism characterized by this decentered, fragmented, fluid, opaque, and nonlinear cultural context. And in the rush towards the future, librarians are among the first to witness the destabilization of the old print order through the wholesale adoption of the electronic media by wide segments of the population. For Turkle, social and cultural structures associated with a modern era are rapidly giving way to a postmodern society. These changes can be characterized as a transition from a modern era to a postmodern age:

Modern	**Postmodern**
linear	interactive
intelligent	intuitive
fixed rules and clearly defined truth	provisional paths
printed text	multimedia
unique identity	relationships
concern for history and preservation	hypertext
permanence	flexibility
independence	contingency
characterization	multiple on-line identities
clear definitions	adaptability and ambiguity
national	global
formal	informal
calculation	simulation

For example, modernist birthday parties have traditional cakes, candles, presents, guests, and games. In contrast, guests at postmodern birthday parties watch and comment on the videos shot and shown during the course of the party; a media abstraction of the event provides the substance for the party itself. The transition from modern culture to the postmodern results from the application of technological information and communication developments to personal and corporate activities. Perhaps the cultural and sociological impact of these shifts to a postmodern era is nowhere more pervasive than in the library and information fields. The postmodern library is as much of a reality for habitual Internet users as card catalogs were for modern library patrons. The chaos and confusion of the networked information world will not, I fear, be tamed by traditional librarian attempts to organize and control information resources. The postmodern information environment is too fluid, volatile, and dynamic for the traditional librarian to control. But the very interactive nature of the digital networked information/communications process requires new approaches in which librarians team with network service providers, software designers, and media specialists to forge a new paradigm for librarianship. I do not intend for this essay to analyze the metaphysical nature of the changes brought about by the introduction of electronic communication technologies into human society - that is beyond the scope of this piece. But it is instructive for those in the library community to appreciate and understand the radical nature of the technological and social transformations that I believe are currently underway. A careful consideration of the meaning of these new modes of communication and interaction from the perspective of the library community indicates the following trend shifts from the modern to the postmodern library:

From:	**To:**
fixed, permanent, formatted text collections multimedia resources	fluid and transient
static library facilities with fixed stacks information spaces	free, flexible, and virtual
uniform sources, citations, references annotations/transient works	customized
services provided to individual readers	tailored services to collaborative teams
standard reference services	personalized consulting and analysis
professionally provided services	integrated service provision
locally owned permanent collections	holistic, integrated networked systems
centralized collections and services	distributed, decentralized global access

the fundamental shift in the crucial threshold that Birkerts claims, nor, perhaps, the trend towards a postmodern culture that Turkle has identified, but the shifts from permanence to transience, from generic to customized services, and from local to global

resource access have important consequences for library planning and for the development of the field of librarianship. An interesting observation in Birkerts's study is that technology is affecting the nature of the human species. These changes, he maintains, are inevitable and unavoidable. The perception of loss of control and regression amidst the current electronic transition reflects the feelings of many within the library community, including myself. Especially within the library field, this perception underscores the importance of understanding the nature of the transition to an information age of the future. It becomes imperative that librarians comprehend the meaning of the species mutation brought on by embracing technological change. If librarians hope to have a future on the electronic frontier, they must develop an understanding of the impact of electronic media and learn to formulate strategies appropriate to the evolution and revision of libraries' institutional structures; this is essential in a future dominated by both digital media and more familiar printed information resources.

The choices librarians are confronting have important consequences for libraries and library users. Birkerts addresses this point in general terms by providing a comparison of gains and losses involved with what he terms the "systemic changes affecting the culture at every level." He writes:

We are at a watershed point. One way of processing information is yielding to another. Bound up with each is a huge array of attitudes, assumptions, and understandings about the world. We can think of the matter in terms of gains and losses. The gains of electronic postmodernity could be said to include, for individuals, (a) an increased awareness of the "big picture," a global perspective that admits the extraordinary complexity of interrelations; (b) an expanded neural capacity, an ability to accommodate a broad range of stimuli simultaneously; (c) a relativistic comprehension of situations that promotes the erosion of old biases and often expresses itself as tolerance; and (d) a matter-of-fact and unencumbered sort of readiness, a willingness to try new situations and arrangements.

In the loss column, meanwhile, are (a) a fragmented sense of time and a loss of the so-called duration experience, that depth phenomenon we associate with reverie; (b) a reduced attention span and a general impatience with sustained inquiry; (c) a shattered faith in institutions and in the explanatory narratives that formerly gave shape to subjective experience; (d) a divorce from the past, from a vital sense of history as a cumulative or organic process; and (e) an absence of any strong vision of a personal or collective future.(6) There is agitation today, as there was fifty years ago, to motivate and mobilize the nation. Indeed, the successful transition to a peacetime economy and a nondefense-oriented national industrial sector depends on redirecting national policies and priorities that are distinctly different from those that have guided the nation since the commencement of hostilities over fifty years ago.

We often feel uneasy when confronted with new situations that do not conform easily to our conceptual models. This is especially true for librarians who find security in consistency and permanence. So it is particularly disturbing for a library community

with traditional concerns related to bibliographic control and carefully defined index and classification schema to address uncertainties related to new electronic media. Problems arise in attempting to apply traditional approaches to more elusive digital media. Librarians are troubled when old solutions do not fit new challenges, such as:

- What information should the catalog record for an electronic journal contain? What information should be included as a standard citation for an e-mail message?
- What about the citation to a comment on a listserv?
- How can one project the building and shelving needs for a university library collection over the next two decades?
- What portion of the library's budget will telecommunications charges assume in the next five years?
- Will universities be held liable for suits filed against student hackers?
- What licensing arrangements will scholarly publishers impose on academic libraries to protect digitally accessible works from use by multiple libraries?
- How much risk should libraries assume by investing in new information technology rather than in the acquisition of collections?

5. Postmodern Librarianship

With the glut of claims and assurances about the opportunities and improvements to come with the advent of the information technology age, there is clear evidence of a backlash responding to oversold claims about the promises of information networking and communications technology to solve problems related to productivity, education', and social inequities. The technological promise for linking large numbers of individuals and institutions to one another and to an unprecedented array of information and services is very real, as is the Internet's potential to be the most significant asset in the knowledge-based economy of the coming century. Information technology has the potential to improve the quality of life and transform the way people work, learn, and live. It can create new opportunities for individuals to communicate, provide, and receive information of all kinds, and to more actively participate in the political process.(8)

However, the truth is that those same social, economic, and cultural issues that librarians confront daily are showing up in the newer electronic media. The hard reality of cyberspace presents librarians with challenges that are just as significant as those faced in the preceding print-based culture. We cannot escape the difficult questions of intellectual freedom, censorship, freedom of speech, security, privacy, crime, useless information, open access, economic discrimination, and cultural bias just because we are hooking libraries up to a postmodern future.

The Internet, that "seamless web of communications networks, computers, databases, and consumer electronics that will put vast amounts of information at users' fingertips,"(9) requires that we address the fundamental issues of librarianship, whether

our concern is with traditional printed textual materials or with the postmodern digital environment. Whether librarians accept the changes or not, the public's perceptions of the "information superhighway" will have a fundamental impact on its relationship with and expectations of libraries. Visions of electronic or virtual libraries do not necessarily depend upon the concept of an information infrastructure within the social context of a public communications architecture. The metaphor of the Internet as an electronic highway is useful for articulating this distinction. The Internet has been compared to "a blisteringly fast, multilane roadway where the vehicles are traveling in at least three dimensions at once, the directional signage changes all the time, and there are no rest stops."(10)

An "information infrastructure" implies a conceptual analogy that incorporates all facets and aspects of transportation systems and the structures supporting these systems, regardless of the specific mode of transportation. Thus the information infrastructure analogy cannot be confined to the national interstate highway system. The US Office of Technology Assessment (OTA) has been explicit in defining the "communications infrastructure" as "the underlying structure of technical facilities and institutional arrangements that supports communication via telecommunication, broadcasting, film, audio and video recording, cable, print, and mail."(11) Similarly, the Clinton administration assigns an expansive meaning to the phrase "information infrastructure," characterizing it to include:

A wide range and ever-expanding range of equipment including cameras, scanners, keyboards, telephones, fax machines, computers, switches, compact discs, video and audio tape, cable, wire, satellites, optical fiber transmission lines, microwave nets, switches, televisions, monitors, printers, and much more.(12)

A national information infrastructure is seen to integrate and interconnect physical components to provide an advanced technological foundation for living in the information age and to make these technological advances useful to the public, libraries, business, and other nongovernmental entities. The value of this information infrastructure to users thus depends on the quality of the information; the ease of the applications and access software; the effective functioning of network standards and transmission codes; and the work of those who create the information and construct the facilities, applications, and services. We are moving away from the information highway towards a broader concentration on communications infrastructure. Similarly, in the terms of the "information superhighway" analogy, our attention is shifting from the lanes of the roadbed to the impact of networking technologies on the nature of social interaction within the global community.

Postmodern librarianship is concerned with the changing nature of information and the evolution of new forms of the information experience. The computer-mediated digital information environment yields altogether distinctly new characteristics - an informal, formless, interactive, subjective experience of multimedia. This is distinct from the private, internal, objective, sequential, solitary, and personal experience that characterizes involvement with printed textual resources. The postmodern librarian

faces distinctions between the world of print and the postmodern digital world. These distinctions involve resources, services, facilities, patrons, and the human resources and skills associated with the profession of librarianship.

6. Resources

Printed resources are primarily textual materials that constitute fixed permanent collections purchased and owned by an institution. Printed works are objective, normalized, and standard. They are organized and arranged to provide centralized services from collections stored locally, based on standardized bibliographic catalogs and indexes that guide readers to desired materials through uniform standard citations, references, and conventions. Print libraries depend on bibliographic control assumptions that identify unique works of authorship and differentiate variant editions by distinguishing features. Printed works are represented in permanently established editions from recognized publishing sources.Digital resources are likely to involve fluid structures and are characterized by multimedia. Their provenance is not easily established, and access may involve opening encrypted files and documents. Digital works depend on customized or subjectively determined assemblages from a variety of digital and print resources. They are not static and permanent but instead are subject to change and variance. Digital systems are distributed and available for access through globally decentralized structures. Digital libraries involve personalized or custom services for accessing, assembling, and analyzing information resources from a variety of diverse sources in many different formats. Digital information resource-based services require integrative skills and often add value to the individual works involved.

7. Services

Print-based library services involve the acquisition of permanent and formal publications through a payment transaction or a subscription arrangement. Libraries providing services based on printed or textual collections offer generic user-services for circulation, reference, and interlibrary loan, which depend on standard resources and references to provide generic links to published works. Print-based libraries offer professional services to patrons within the library service area Digital information services often require the integration of formal and informal publications and resources through flexible services and systems that blend customized interpretive services with standard service offerings. Digital services are offered by integrated technical/professional specialist teams within an informal service staffing structure, often to multiple, simultaneous users. Digital information services require the development of customized pay-per-use consultancies that can interpret multiple digital information resources for specific user-defined needs.

8. Facilities

Print library facilities are static buildings and shelving stacks that are constructed by capital investments and maintained through recurring physical plant budgets. Growing print collections require continual expansion of space facilities in order to maintain

local ownership and control over physical collection resources. Maintenance of facilities and collections are human-intensive and require conservation, protection, and preservation. Hierarchic structures for collections and organizations are static and change slowly over time, if at all. Local, regional, state, and national print resource collections assume universal availability, but researchers often are required to be physically present in order to use unique collections and resources.

Digital library facilities are fluid and flexible, and they may not involve local physical structures or investments. Digital information infrastructures are electronic and dependent upon consistent, dependable, and uniform supports. Communications technology and digital processing storage systems constitute the digital information infrastructure facilities; fragile and complex software links to digital resources and systems underlie a global networked architecture. Multiple simultaneous users are often involved with digital information facilities and services in private linkages to intangible resources. Digital libraries provide facilities to support specific relevant information services that are customized to the needs of an individual user.

9. Patrons

Patrons of print-based libraries are individuals who are physically present at the facility and are usually visiting for a specific purpose within a known discipline or speciality. They come to the library to browse physical printed textual materials, often with little need for staff assistance or service. Patrons of traditional print collection libraries assume that their personal privacy is protected - borrowing records or browsing activities are private matters for patrons. Patrons are known to the library through registration procedures that identify them as being within the service area or as part of the community served by the library.

Patrons or users of digital information services are often participants in a interactive consultant activity involving other patrons, library staff, and various digital and printed resource materials. Digital library patrons may involve inter-, multi-, or cross-disciplinary studies and information requirements using published, unpublished, or informal materials in whole or in part. Digital information users may be physically present or only electronically present. They may be remote and anonymous or they may be local and registered users/borrowers. Digital information patrons may not have assured privacy in their use of library resources.

10. Human Resources and Skills of Librarianship

Libraries involving printed textual materials have professionally trained librarians providing management and services. These libraries have collections, services, and patrons that are divided by type: academic, school, special, and public. Print-based libraries have organizational structures that distinguish between technical and public-service operations. Service subdivisions are typically specialized by function or format: acquisitions, collection development, circulation, cataloging, reference, microform, documents, multimedia, systems, and administration. Distinctions also separate professional from support staff.

Digital information libraries have human resource requirements that are only now beginning to become clear. Although librarians have traditionally engaged in the organization and arrangement of information collections, digital collections and services call for librarians to function as knowledge navigators or, as some have suggested, as cyberspace organizers. The nature of digital information resources also requires digital librarians to be resource integrators and to offer users customized consultation and interpretation services. The new digital information environment requires that librarians add value to the use of information. Librarians working in digital information structures are creators of information through the assembly, organization, and generation of new knowledge. The authentication and validation of knowledge resources presents new opportunities to the postmodern librarian.

11. Conclusion

The volatile and pervasive nature of technological change presents libraries and librarianship with unprecedented challenges. At the same time, some in the field view these changes as opportunities. While ownership of print collections is yielding to access and customized delivery of relevant ideas and information in an increasingly electronic information environment, those librarians who embrace change and chance risk are likely to evolve a new customized information paradigm for librarianship. It is time for the new postmodern information profession.

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