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Part 1

THE ROLE OF LIBRARIANS IN THE AGE OF THE INTERNET.

A LITERATURE REVIEW.

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## INTRODUCTION

### RESEARCH QUESTIONS GUIDING THIS LITERATURE REVIEW:

- What can be said about the attitudes of librarians towards the spread of the Internet in their profession?
- In fact, how have their working lives been affected by the Internet?
- Is it possible to define new roles for them in the networked environment?
- And, if so, what are these roles, and the nature of librarians' profession within the new information landscape?

The development of the Internet during the past four decades has had a profound impact on society in general, and on the field of library and information science in particular: it has been strong, and it has involved the processes, the functions, the services, the media and the information resources: the library as a whole. At the point that this impact (defined "monumental in both scope and practice") has made someone say that a "new librarianship" was growing up (McClure et al., 1994, p366 ss.).

An extensive literature review will be conducted, looking at issues surrounding the research questions. Given the amount of literature written on the main subject during the past 15 years, major issues regarding the attitudes towards the Internet and the role of librarians will be isolated, reviewing journal articles, books, and Internet resources.

The following words can give a hint of what we are talking about:

There is no doubt that the Internet and, in particular, the World Wide Web has transformed university reference departments. Today we take for granted Web-based online catalogs, library-provided portals to quality Web sites, and a plethora of commercial online databases, the most popular of which are Web versions. Hundreds of workstations, complex internal and external network connections, and a mix of in-house and online resources define reference services of the twenty-first century. (Tenopir and Ennis, 2001, p264).

What these authors say about university reference departments, can easily be transferred to library services of any kind, and to librarians' work as well.

Information professionals<sup>1</sup> live today their working life online, connected, "plugged-in".

This literature review, in an age where technology, and especially Internet-related technologies, have become fundamental in every library operation and service, but also in the information habits of users and people in general, is meant to focus on:

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<sup>1</sup> "Information professional" and "librarian" are used in the text without a real distinction, even if who writes is aware of the broader sense commonly attributed to the first idiom. See the definition of "information professional" given by the American Special Libraries Association: " An Information Professional ("IP") strategically uses information in his/her job to advance the mission of the organization. The IP accomplishes this through the development, deployment, and management of information resources and services. The IP harnesses technology as a critical tool to accomplish goals. IPs include, but are not limited to librarians, knowledge managers, chief information officers, web developers, information brokers, and consultants" (Abels et al., 2003).

- the perceptions and expectations of librarians and information professionals toward the Internet;
- how practitioners respond to an online information world which is taken "for granted" (see above);
- the roles librarians can play in the new information landscape.

Before starting to explore our core questions, let's see what do we mean when we talk about the Internet here, and how the Internet is related to the libraries' world.

## 1) THE INTERNET: SOME HISTORY, AND ITS LIBRARIAN PERSPECTIVE.

“The Internet today is a widespread information infrastructure” (Leiner et al., 2001, p4), to which people usually refer as something already established and familiar, without really knowing what they are talking about. Today, when people talk about the “Internet”, they probably want to refer in general to the World Wide Web, which is much younger than it, and only one of the Internet tools, the most successful, and certainly the one which has allowed the integration of many older tools.

In order to be accurate, we must trace the origins of the Net in the work on computer networks and packet switching started at the MIT in 1961, then resulted in the famous ARPANET project, which dates 1967, and “which grew into the Internet [...] based on the idea that there would be multiple independent networks of rather arbitrary design [...] soon to include packet satellite networks, ground-based radio networks and other networks” (id., p6 ss.). This article, written by some scientists “involved in the development and evolution of the Internet” allows to us to realise that the Internet has grown up as a succession of technical projects, the history of which “revolves around four distinct aspects [...] the technological evolution [...] the operations and management aspects of a global and complex operational infrastructure [...] the social aspects [...] [and] the commercialisation aspects” (id.).

For this reason, in 2004, we can state that the Internet is something already mature, with 40 years of history behind, a history of co-ordinate scientific efforts, collaborative research programs, working groups, which worked for decades on protocols, and which made possible the “open publications of ideas and results”, far behind the first steps of the research for military purposes. A history which has seen a revolution inside itself when the World Wide Web was created by Tim Berners-Lee in Geneva in 1989<sup>2</sup>, with its two key inventions which “were the uniform resource locator ([URL](#)) and hypertext markup language ([HTML](#))”(from Wikipedia, 2004).

As for the future of the Internet, Leiner (et al.)(op. cit.) agree that it will “continue to change and evolve” as it has kept on doing since its beginnings, but because of its commercial success and the proliferation of stakeholders, the question is “how the process of change and evolution itself will be managed” (see also Davidson and Chen, 1995).

The importance of the development of the Internet resides in its technical solutions as well as in the fact that, since its beginnings, it created a sense of community in its developers first, and then also among scholars and common people, above all with the creation and deployment of the WWW. It is

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<sup>2</sup> For a history of the WWW see the article “World Wide Web” from the Wikipedia, The free encyclopedia, at URL: <[http://en.wikipedia.org/wiki/World\\_Wide\\_Web](http://en.wikipedia.org/wiki/World_Wide_Web)> (last visited 15/02/2003). See also the website of the WWW Consortium, founded by Berners-Lee at the MIT in 1994. URL: <<http://www.w3.org>> (last visited 15/02/2003), and the history of the Web told by its author: Berners-Lee, 2000.

this very sense of community which has been very soon appreciated by librarians, who, among the first professionals, started to use intensively Internet tools, like electronic mail<sup>3</sup>.

Before seeing how the Internet has affected librarians' world, we consider necessary to state something almost obvious, but noteworthy in this context: libraries/librarians and information technology have had a long history of relationship<sup>4</sup>, thus it is not surprising to find the two associated since the dawn of the Internet. As an example, dating the birth of LITA-Library and Information Technology Association (a division of the American Library Association) in 1966, we get in its mission a statement like the following, expressing care for the developments of networking technologies applied to libraries:

The Library and Information Technology Association shall concern itself with the planning, development, design, application, and integration of technology within the library and information environment, with the impact of emerging technologies on library service, and with the effect of automated technologies on people. Its major focus shall be on interdisciplinary issues and emerging technologies. Within these areas, the Library and Information Technology Association shall foster research, promote the development of appropriate technical standards, monitor new technologies having potential application in library and information science, develop models for library systems and networks, examine the effect of automation on people, disseminate information, and provide a forum for the discussion of these concerns.<sup>5</sup>

Since its origins, thus, librarianship has demonstrated a strong interest in the Internet, increasing as the tools available were growing and the Internet knowledge was spreading. As Zumalt and Smith (2000) remark, "academic librarians were the first to jump on the Internet bandwagon, since the backbones originated in research universities" (p339)<sup>6 7</sup>.

This interest has of course been proved during the years by the professional literature, which is very rich in this field, or better, according to Lewis-Guodo Liu (2001), has exploded since the beginnings

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<sup>3</sup> In 1991 Ladner and Tillman (1993), thinking that the "Internet and what it represents has the potential to make or break the profession of special librarianship"(p1), conducted an extensive and pioneering research in the United States among special librarians "who had access to electronic networks, such as BITNET and the Internet"(p2), in order to assess how they "use the Internet, how they became aware of it, and how they learned to use it" (p1). The results of this work are illustrated in a book, and they clearly demonstrate that special librarians were doing an intensive use of the early Internet most of all to communicate ("work-related communication, e-mail: 93%, electronic forums, bulletin boards, e-journal: 61%", p21), and only in second instance for routine tasks ("searching remote databases: 39%, file transfer, data exchange: 37%, p21).

<sup>4</sup> McClure (et al., 1994) asserts that "the past generation of librarians have been leaders in making new information technologies work in day-to-day operations", with the result they can "more wisely assess new technologies' potential and how to best achieve it" (p377 ss.).

<sup>5</sup> See the LITA bylaws in its website:

[http://www.ala.org/Content/NavigationMenu/LITA/About\\_LITA/Bylaws1/Bylaws.htm](http://www.ala.org/Content/NavigationMenu/LITA/About_LITA/Bylaws1/Bylaws.htm) (last visited: 09/02/2004)

<sup>6</sup> And indeed, in the very early 1990, Caroline Arms, librarian at the Falk Library of the Health Sciences, University of Pittsburgh, was writing an article on the use of networks like BITNET and the Internet, to introduce them to the community of academic users. The history of the Internet also attributes the coining of the expression "surfing the Internet" in 1992 to a librarian, Jane Armour Polly, who after became the "Netmom", "the website review editor and columnist for CommonSenseMedia.org, a family media literacy organization", her history at URL:

<http://www.netmom.com/index.php?module=ContentExpress&func=display&ceid=3&bid=52&btile=About%20Net-mom&meid=30> (last visited 15/02/2004).

<sup>7</sup> Bane and Milheim (1995), reporting a lack of investigations on the profiles of Internet users and their actual use of its functions in the higher education, conducted an international survey (a novelty in that field according to their words) to study the "academic uses of the Internet [...] in order to better understand its utilization by various professionals". The results showed that the "Internet is currently a popular method for academics [...] being extremely fast, easy accessible, global, and truly interactive". And it was only 1995...

of 90s, because the emergence of the Internet “poses tremendous challenges to librarians and library and information science scholars” (pX), and “the most profound changes occurred within the last ten years [as of 2001] and were accelerated by the phenomenal growth of the Internet” (Tenopir and Ennis, op.cit., p264). In 1995, Liu compiled a bibliography which lists over 1000 books and articles published only in the United States between 1994 and 1995, and we can reasonably think that the same work would have been doubled or tripled the following years (and indeed, no one even tried after those years to compile a bibliography of that kind...).

Librarians’ worldwide weren’t just looking at what was happening overseas. In 1992 Peter Brophy, writing a survey report on “The use of information technology by senior staff in UK academic libraries”<sup>8</sup> stated that networking had “become virtually universal thanks to the continuing success of the JANET (Joint Academic Network) and particularly to the enthusiasm with which librarians have made use of its possibilities”(p2)<sup>9</sup>.

In 1989 Klobas and Clyde (1989-1999) began in Australia a research programme meant to study “the ways in which librarians, information professionals, and others use information sources, and the sources of information that they use”, especially networked information systems as they were becoming “more widely accepted and more widely used”. This programme saw different stages of study, and resulted in several reports and publications<sup>10</sup>: Klobas (1994) reports the results of one study among Australian university staff and librarians, who were very early adopters of Internet technologies<sup>11</sup>.

In Italy there were authors who judged “necessary to evaluate and manage library services and the role of the librarian in the light of the development of computer-based communication” (Tammaro, 1994)<sup>12</sup>, and the debate on the networked solutions for libraries started as soon as the Internet was spreading.

No one can deny the huge explosion of the Internet, but it is also true that it has carried with it many contradictions.

Some authors (Shuman, 2001) assert that “the rise of the Internet is one of the most astonishing developments of this or any other century”(pX), singing its praise as a “tremendous boom to society, in general, and to libraries in particular”(pXII). But others fail to be enthusiastic, and more realistically indicate that among librarians in USA “70 percent are carrying on the traditional functions [...], serving those who physically access the library”, without even knowing if “their Internet connections are telnet enabled or not, [...] who don’t write HTML” while the other “30 percent [...] is enamored of the [...] technoglitiz” (Weissman, 2001), fearing the gap created between the net-addicted and the traditional librarians.

Back in 1991 Harold Billings made an interesting observation: while library collections would have continue to grow with paper books and journals, “for some information sources available via remote workstations, the library will soon never sleep, and electronic information will always be, so to speak, ‘on the shelf’” (p38), moving towards new paradigms of access, service, and staff

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<sup>8</sup> The survey compared the results of a similar one “carried out in late 1988” (p1). Mr. Brophy told this author that this kind of survey “wasn’t follow up further” (personal email, 30/10/2003)

<sup>9</sup> “JANET is a private, government funded network for education and research. All further and higher education organisations are connected to JANET as are all the Research Councils”. See URL: [http://www.ja.net/about\\_JANET.html](http://www.ja.net/about_JANET.html) (last visited 21/02/2004).

<sup>10</sup> For a selected list of them see URL: [http://www.hi.is/~anne/clyde\\_klobas\\_reports.html](http://www.hi.is/~anne/clyde_klobas_reports.html) (last visited 17/02/2004).

<sup>11</sup> “Since 1990, staff of Australian universities and research organizations have had access to the primary Australian segment of the Internet, the Australian Academic and Research Network (AARNet). AARNet, and hence Internet, access is available to any member of an Australian university’s staff with a suitable computer, provided the computer is connected to the university’s internal network” (Klobas, 1994, p ).

<sup>12</sup> The translation in English from Italian is in charge of the author, also in the rest of the text.

management. And only a few years later, Tenopir (1997) was making her point in discussing an online interaction staff/users/resources which was already "taken for granted":

- Library users interact daily with a variety of commercial online systems, intranets, local area networks, and the Internet. We almost can take such online interaction for granted. [...]
- EXPECTATIONS: librarians expect to connect to other libraries and to online systems and to send and receive email from all over the world. Library patrons are coming to expect all that as well. [...]
  - HELP: libraries provide access to those who do not have it and assist those who do. [...] Librarians need also to point out sources and networks outside the Internet for those business and school needs that might be better in more formal sources in all media, including print. [...]
  - INSTANT GRATIFICATION: libraries must employ a variety of strategies for document access (in order to meet immediately users' needs). [...]
  - INFORMATION OVERLOAD: we locate too much information. Librarians must offer the "crucial addition of the human judgment". Besides this, library staff face another kind of overload: new technologies, new resources and media are added, so members must learn continually and constantly. [...]
  - HUMANIZATION: humanizing helps people feel comfortable in cyberspace: from this, the importance of the librarian's touch in all aspects of searching success. (p38 ss.).

The Internet, thus, had already permeated the whole library world at the very beginning of the 90s, affecting the job of professionals of course, but also, and most of all, library functions and procedures<sup>13</sup>. The professional literature is rich in titles about the Internet and library services, the Internet and the library profession: titles which range from the various "Librarian's Internet survival guide" to the "Internet companion for librarians" in their several editions since the beginnings of the 90's<sup>14</sup>, to titles describing specific library functions, services or procedures (a quick introduction to current and future applications for libraries are indicated in Moore, 2000).

To stick to the purposes of this literature review, we'll avoid the examination of general titles and introductions to the Internet for libraries and librarians, and the more specific ones on tools, softwares, procedures, and will focus on human perceptions and attitudes towards the "network of networks".

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<sup>13</sup> As McClure (et al., 1994) asserts, "libraries face a range of issues as they confront the networked environment" (p23), and he lists: "electronic publishing and networked information resources; access and ownership of information; costs and funding of electronic resources; copyright and intellectual property; organizing networked information resources; planning for technology change; the library within broader university administrative concerns; the library and the computing center-new partners; a new information delivery paradigm; creating evaluation method for network services; regrowing staff, and research for the future" (id.).

<sup>14</sup> A browse on the title filed in the Library of Congress OPAC shows 38 results with the words "Internet+librarians" and 54 with "Internet+libraries". The same search in the British Library catalogue shows 48 items for the first search, and 50 for the second.

## 2) THE INTERNET: A MENACE TO LIBRARIES AND LIBRARIANS?

There is a share of library professionals who express care, and sometimes fear for the future of the profession after the spreading of the Internet. Not to mention those traditionalists who almost despise the huge presence of Internet-related technologies. Some are critical toward the Internet because of its chaos, its lack of structures, of knowledge organization. The following is a synthesis of major points of trouble.

- Fear of change

It is recognized that change, above all technological change, “often produces fear and anxiety for the future” (Bierman, 1998): in an age where Internet-related technologies push towards the establishments of new information spaces like digital libraries, technology centers, learning resources centers, it is necessary to “involve staff with varying levels of knowledge and expertise” (Lamont, 1995, p395). But there are many difficulties in letting people accept change: more will be optimistic and proactive, others will feel threatened and react with resistance (Bierman, op. cit.). Besides that, “most of the librarians and specialists who are responsible for some aspects of technology often come with no idea of how to manage, work in, and survive in these altered organizations, let alone lead them” (Stover, 1999, pXII<sup>15</sup>).

Michael Gorman, among the main detractors of a digital and fully networked future for libraries and librarians, claims that this we are living in is an “age of uncertainty”, where a group of theorists “publishes incomprehensible papers about digital libraries” when professionals and library users struggle with declining budgets and overcrowded libraries (1999, p. 43). The point to him is to reaffirm some values that should underpin the work in libraries, and don’t demise libraries as a physical space.

In fact, Stover (op. cit.) refers to these “latter-day Luddites” who “believe that information technology unnecessarily complicates our work, and that overflowing e-mail boxes and steep learning curves in software applications conspire to turn our work lives into technological prisons”(p4), but he also tries to explain that this is a sort of negative myth, probably risen from the fact that “librarians face tremendous pressures today [...] encouraged to utilize the latest technological advances to radically restructure conventional library functions” (p9). The point to this author is to offer practical advices in order to make changes in librarians’ worklife easier and more understandable.

- Sense of menace

The Internet has represented for some professionals a sort of attack to the prestige of their career. Mort (2000) reviews that sense of “leadership role for public information and opinion”, which by the end of 90s was wavering: with the technologies readily available to everyone’s desk, some librarians began to feel left on the margins, because patrons really seemed to make it work without their help. It was like “the Internet and the World Wide Web have driven a stake into the heart of that gatekeeper role” librarians had assumed, into that belief they know better than those they serve. Besides that, the changing information environment was creating new roles and job position (see Section 4), which involved above all “a combination of communication and computer skills”

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<sup>15</sup> Stover’s book, *Leading the wired organization*, defines a wired organization as “any business, non profit group, government agency, or educational institution that utilizes networked information technology”, notably “internetworking and intranetworking ... or some combination of the two”(p1 ss.)

(Bierman, op. cit.): at that point traditional librarians could see their positions menaced by the advent of more flexible people, smarter and better trained with technologies.

On the other hand, Keller (et al., 2003) could observe “a propensity for information technologists to predict with complete confidence the imminent demise of libraries, [...] grown thick during the past decade [...] as Internet and digital resources develop”: this couldn’t be that reassuring to professionals who were already struggling with continuous changes in their working life.

- Internet as a revolution?

There were some authors as well who weren’t considering the Internet and networking such a revolution. According to Luigi Crocetti (1998), “a revolution occurs when functions change” (p21): in the recent past, many professionals have felt that something had changed in their profession: of course there had been the technological turning in the working place, with the working tools, the debate on the "ownership vs. possess", but the real problem was the definition of new services, not really the establishment of a “new librarianship”(p25 ss.). As a matter of fact, according to him, the “bibliothecarius technologicus is not yet born” (p27).

- Unsure scenarios

As already mentioned, the professional literature asserts that the future of libraries and librarians has been challenged in by the new information landscape opened by the Internet. Thus, some authors lunches out into drawing some more or less possible scenarios, trend lines. Tom Wilson (1995), looking at “what is happening now and project the possible future” writes an analysis based upon a diagram in four parts where the two dimensions are: individual vs. community, and fragmentation vs. coherence. Four scenarios for information services are drawn<sup>16</sup>, but “from the perspective of the role of the librarian, the situation is much less clear - it all depends upon what you consider the role of the librarian to be”: on these basis, the sensation is that no one can really predict what will happen, creating a sense of uncertainty among the professionals. And indeed, Richard Dougherty (1997), professor at the University of Michigan School of Information, expresses a rather worried opinion about the future of libraries, especially the academic ones:

My personal opinion is that public libraries are in a stronger position than academic libraries to remain relevant and central in the evolving Information Age. [...] Today it can serve as a powerful force in the war against illiteracy and as a free gateway to the world of the Web. The academic library, on the other hand, has always reflected the needs of faculty and students. In universities, the library still serves as the laboratory for graduate students and faculty in the humanities. What happens to this laboratory as more and more scholars use

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<sup>16</sup> The four scenarios are: “Egotopia” (where “work will be decentralised, communication systems (necessary to link the fragmented individuals) will dominate in society, and that the Internet (or whatever replaces the Internet) will become the ‘space’ within which most people carry on their work [...] and where probably “the library will disappear as an institution”); “Consumerland” (where “the stress on the individual will result in the replacement of community structures by privatised services, with individuals living not as citizens, but as consumers” and “the information broker and the cybrarian, selling highly individualised services to organizations and individuals but, perhaps, forming companies to pursue an entrepreneurial role more effectively”); “Ecotopia” (where “Business takes on its civic responsibilities, which directs profits to community ends rather than to uncontrolled growth” and the librarian would flourish”); and “New Civic” (where the society points “to small group cohesion around the family, the tribe, or perhaps the neighbourhood, with shared values creating the cohesion” and “the librarian could flourish, although the settings for his or her activities might be very different from those we know now”).

digital documents, and more students avoid the complexities of using libraries in favor of accessing the Web from their rooms? (The arguments that students can't evaluate the quality of information they retrieve from the Web may have merit, but do students really care? Do instructors vet the quality of information in a report?). The decline of library circulation and use of reference services might soon follow such a turn away from traditional resources. But must this scenario become a reality over the next decade? [...] I'm not predicting the demise of public or academic libraries, but I am suggesting that no library should take its future for granted.

- Technostress

Another tricky issue, related in general to technology, but very important when we speak of the Internet and networking, is that associated to technostress. As Malinconico (1997) underlines, today librarians have “to shift their focus from relatively stable and knowable local collections to a plethora of information sources with diverse characteristics located anywhere a global information network reaches” (p534): a variety of new tasks and skills are required to them, who in general understand “the benefits that applications of modern technologies are meant to achieve”, but “nonetheless , they also perceive threats and difficulties that might accompany them”: the result “of these opposing internal forces manifest themselves as *technostress*” (p536).

A delicate issue seems to be the transition from the “automation stage to the digital” (Lamont, op. cit.), when librarians need to be educated in completely new technologies, and the good results of projects stress on them<sup>17</sup>.

John Kupersmith, reference librarian at the University of California, maintains a website on technostress-related issues<sup>18</sup>, where he states that “technostress affects staff and users as libraries offer more and more information through web sites and other remotely accessible electronic systems”, and he offers the results of an interesting survey on technostress among library staff members conducted in 2003<sup>19</sup>.

The last three issues are more technical ones.

- Lack of standardization

Several authors lament the lack of (classification, cataloguing, retrieval) standards when their working life comes to terms with Internet and electronic resources.

As Michael Gorman (2001b) points out, libraries today are more and more acquiring and giving access to electronic resources of any kind. This results of course in increasing expenditures of money and workload for librarians, without a certainty about the preservation of these resources: this is a major point of discussion to him, who cares about the maintenance of human memory in the age of digital information, claims for Universal Bibliographic Control applied to electronic

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<sup>17</sup> As Roy Tennant (1995) explains, “the creation, management, and support of virtual libraries require at all stages skillful and knowledgeable support of library staff “(p46): the emphasis of digital/virtual libraries issues is thus on information professionals role.

<sup>18</sup> URL: <<http://www.jkup.net/tstress.html>> (last visited: 14/02/2004), where he lists a bibliography on technostress.

<sup>19</sup> The online survey, an informal poll responded by 92 librarians, shows that “59% of survey participants said their level of computer-related stress has increased in the past 5 years”, and as for the “leading causes chosen from a list of possibilities were information overload, networking problems, security issues, computer hardware and ergonomics, and vendor-produced databases”: all problems related in a way or the other to Internet technologies.

resources, and considers unavoidable "a Web and Internet taxonomy [...], a bibliographic control of the Web" to fight the "electronic triumphalism".

The same Gorman (2001a) discussed the effectiveness of using metadata like Dublin Core<sup>20</sup> in order to catalog remote electronic resources, like Web pages: according to him, "the best thing librarians can do, once selected the electronic resources to catalog and/or to apply Dublin Core to, is to print those resources on acid-free paper, make many copies of them, and distribute them to research libraries all over the world", in order to preserve them for the future generations (id., p17 ss.). A similar position is maintained also by Malinconico (1998), when he discusses the analogy that many people do between a library and the Internet, defined an immense virtual library: he argues that the information resources found in the Internet lack the organization, the authoritativeness and the stability of traditional resources held by libraries (p14 ss.), but he gives a more positive contribute to the issue of electronic remote resources when he foretells the implementation of authoritative "virtual reference collections"<sup>21</sup> organized by discipline or to encounter the needs of specific communities" (id., p. 15), maintained by librarians, in cooperation with other subject experts.

- Lack of quality

A major concern among librarians seems to be that of the poor quality of the information delivered by Internet resources which are not controlled or lack of organization. Stover (op. cit. p58) asserts that in many ways "searching the Internet is much like looking through a trash pile for some small slivers of gold", even if he also recognizes that it "can be useful, but the searcher must be aware of the potential pitfalls".

Devlin and Burke (1997) describe their investigation to define the Internet as a reference tool, starting from the fact that the "emergence of the Internet has been greeted with enthusiasm by many reference librarians who perceive it as providing access to huge volumes of previously inaccessible information" (p101). They criticize Valauskas' definition of the Internet as the "ultimate reference tool" (1993)<sup>22</sup>, and their analysis concludes that "there is no overall structure on the Internet that allows reference librarians to navigate to quality information" (p107), claiming for the definition of standards for the description and classification of Internet resources. They also recognize that not even librarians are ready to use the Internet at their best advantage, "as one of many options for identifying quality information" (id.), this because of a lack of appropriate training.

- Competition of search engines and commercial tools

According to Coffman and McGlamery (2000), in the USA statistics assert the falling of reference<sup>23</sup> since 1998, so the question for them is: "where patrons are migrating? [...] Apparently they are frequenting the commercial reference services springing up on the Internet" (p66), which are thus seen as concurrents to reference librarians' work. They discuss the success of some very popular

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<sup>20</sup> "The Dublin Core metadata element set is a standard for cross-domain information resource description", see more at URL: <<http://dublincore.org/index.shtml>> (last visited: 17/02/2004)

<sup>21</sup> Malinconico calls them FCV, "Focused Virtual Collections [...]" which consist primarily in links to external resources".

<sup>22</sup> Edward J. Valauskas is the editor, since the first issue May 1996, of "First Monday", an online monthly journal meant to be a "place where you can find contributions about the Internet from experts and colleagues around the world. A place where the "First Monday" editors work their way through the Internet to find interesting and timely articles for you". URL: <<http://www.firstmonday.org/index.html>> (last visited: 11/02/2004).

<sup>23</sup> See the Website of the American Research Libraries Statistics, URL: <<http://fisher.lib.virginia.edu/arl/>> (last visited 16/02/2004).

services, like AskJeeves and WebHelp<sup>24</sup>, and conclude that "it seems thus crucial that in times where the Internet and its most powerful tool, the WWW, appears to be a major information provider to patrons, librarians try to "offer a viable alternative" adopting the "tools and strategies" of their competitors" (p68).

The same Coffman (1997), discussing the commercial success of Amazon.com, in a provoking spirit invite librarians to adopt that model, noting that "it's a good thing then that Amazon doesn't lend books, as well as sell them, or we librarians might be in really big trouble".

And indeed, the problem of the use of Internet commercial resources among students is recognised by the literature, as Carlson (2001) underlines, the library goes deserted: students connect to the Internet from dormitories or from home, they consider sufficient for their study purposes to use online journal and databases, commercial services and search engines, and as a result the trend is that they frequent less library buildings, circulation statistics fall, reserve loans drop dramatically, reference desks get fewer questions (even if they are more complex and specialised). Similar trends are observed for public libraries, too, but of course with different implications.

Roy Tennant (2000) offers possible answers to the emergence of the problem of commercial competition: he states that things have changed for libraries and librarians because people information habits have been transformed by the Internet, so if they want to stay competitive they have to "redesign their search engines, become better at innovation and building prototypes, foster and encourage individualists and leaders, integrate access to print and digital materials, begin serving users whenever and wherever they want" (p54): libraries and librarians have to give users what they want.

This kind of reflections among information professionals have brought to the development of strategies to place libraries on a preminent position in the networked information market:

- development of libraries web sites (see Cunningham, 1997; Evans, 1999; Falk, 1999; Vander Meer, 2000);
- establishment of new services, which could compete with the information market offered by the private sector (SDI, current awareness, tailored user-centered services...)(see Fourie, 1999; Martin and Metcalf, 2001);
- several projects of online reference services offered by single libraries and consortia<sup>25 26</sup>;
- projects trying to organize the Internet with classification criteria (see Ridi, 1998; Morville and Wickhorst, 1996)<sup>27</sup>.

Strategies that represent the opportunity for library professionals to put their "expertise into a well-designed, well-maintained, "librarian-quality" metasite that adds to the cumulative wisdom of the Web and to the eternal credit of our profession" (Mort, op. cit.)(see also section 3).

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<sup>24</sup> Ask Jeeves at URL: <<http://www.ask.com/>>; WebHelp: <<http://www.webhelp.com/webhelp/>> (last visited 21/02/2004).

<sup>25</sup> "Question Point" (URL: <<http://www.questionpoint.org/index.html>>, last visited 17/02/2004) is an example of collaborative digital reference service 24/24-7/7, "supported by global network of cooperating libraries worldwide", created by the joint venture between OCLC and the Library of Congress, and with the cooperation of more than 300 libraries in 15 countries.

<sup>26</sup> One of the latest number of the Library Review (1/2004) is fully dedicated to digital reference services initiatives (see the table of contents: <http://hermia.emeraldinsight.com/vl=7492284/cl=33/nw=1/rpsv/cw/www/mcb/00242535/v53n1/contp1-1.htm>). (last visited: 17/02/2004).

<sup>27</sup> Among the several projects, see the OCLC "Scorpion project", at URL: <<http://orc.rsch.oclc.org:6109/>> (last visited: 16/02/2004).

### 3) THE INTERNET: A NEW OPPORTUNITY FOR INFORMATION SPECIALISTS.

The Internet, however, has been mostly seen as an opportunity for librarians and information specialists, who have even enthusiastically embraced its tools, technologies and services. Some of them have become sort of “gurus” of Internet applications in libraries:

- Roy Tennant (founder of the California Digital Library, one of the first worldwide)<sup>28</sup>;
- Marylaine Blocks (who defines herself in her website: “librarian without walls”)<sup>29</sup>;
- Jenny Levine (who coined the expression: “shifted librarian”, to mean “someone is working to make libraries more portable” because now “people aren't going out to get information anymore. Instead, it's coming to them”<sup>30</sup>);

to name a few, who have started very soon to preach the Internet *verbo* among their colleagues. The literature shows that something has changed in the library world and in the librarians' professional life with the advent of the Internet, a sort of "before" and "after" which make some speak of "revolution", of "opportunity" for the profession.

LaGuardia (1998), in her foreword to the papers presented at the Conference "Finding common ground" held at Harvard in 1996, tells that the "conference theme<sup>31</sup> was welcome, and overdue, relief from the contrasting omnipresent dire predictions about the death and destruction of libraries" (pXI): as to say that professionals were willing to work with positive accents on the Internet explosion, rather than being overwhelmed by obscure forecasts, "towards an ideal of 'libraries as we -and our users- want them'" (id.).

The following is a synthesis of major points of success of the Internet among librarians.

- New paradigm

June Abbas (1997) discusses the impact that the Internet has had upon the library profession, assuming that it, with networked resources, represents the biggest recent innovation in the field. The scenario is that "the library profession is contemplating a new paradigm, a new set of ideas; one of knowledge/thought/technology integration" and the best solution for the profession is "to embrace these changes and accept a new idea of service as one which integrates the new technology with traditional ideas of service, quality, universal access, and cooperation".

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<sup>28</sup> Tennant is very active in using, promoting and applying digital technologies to create and improve new library services. See his résumé at URL: <<http://escholarship.cdlib.org/rtennant/>> (last visited 19/02/2004).

<sup>29</sup> URL: <<http://marylaine.com/>> (last visited 21/02/2004). Blocks is the author of several books and articles on the Internet in libraries, among them, she edits "Net effects: How Librarians Can Manage the Unintended Consequences of the Internet", where are suggested "practical and creative ways to deal with the range of Internet "side effects," regain control of the library, and avoid being blindsided by technology".

<sup>30</sup> "When the World Wide Web came along, Levine was one of the first librarians out there, finding the good stuff and sharing it with her colleagues in training sessions. In 1995, she created the Librarians' Site du Jour web site, where she reviewed a reference web site in detail every day, to convince librarians that the web was extraordinarily useful for everyday reference and to give them a reason to make visiting the web a daily habit"(staff article in:

<<http://libraryjournal.reviewsnews.com/index.asp?layout=article&display=LJMS&articleid=CA281672&pubdate=3/15/2003&publication=libraryjournal>>, last visited 21/02/2004). "Librarians' Site du Jour" at URL:

<<http://www.jennyscybrary.com/>> (last visited 21/02/2004), which was daily updated until 31 October 1999. Last visited: 18/02/2004).

<sup>31</sup> The Conference was meant to "talking about library realities (as opposed to speculation and fantasy)" (LaGuardia, 1998, pXI).

Rice-Lively and Racine (1997), following Miksa's (1992) two paradigms<sup>32</sup>, acknowledge the establishment of a new one where "information transcends the library building and its collections, and transactions with the user may not be face-to-face" (p34): in this modern library the information professional is "key to the process of sensemaking and value-adding that enables users/clients to create their own information spaces" (id.).

- Revolution

Some authors like to speak of revolution, when they refer to the appearance of the Internet in the library landscape. According to Krystyna Gõrniak-Kocikowska (2001) a revolution "means a truly profound and far-reaching change, [...] it needs to affect all aspects of people's lives all over the world": it is thus legitimate to talk about a "computer revolution" recently occurring in libraries, "with computer networks in place, with long-distance learning, and with rapidly growing possibilities to access library collections all over the world". When she delineates the history and characteristics of this revolution, she notices that, as for all revolutions, it will be naturally embraced "by those individuals who regard these changes as positive, and who feel comfortable in the new situation created by the revolution".

On the issue of October 1997 of the online journal "Pretext"<sup>33</sup>, Hathorn was interviewing some librarians from various institutions, with the provocative title "The librarian is dead, long live the librarian": once recognised the existence of a "digital revolution", librarians daily job was put under the lens of technology, with the conclusion that maybe there were great opportunities for this professional sector to elevate their role, guiding patrons to find the right information, and giving technology the "human face of a librarian".

Wittwer (2001), too, asserts the arrival of the internet as a revolution, which requests information professionals and special librarians (to whom he in particular addresses) not only to "be competent at searching and finding information, but also be fully computer-literate and skilled in the use and application of the main emerging technologies", in order to efficiently manage new information structures.

Rao and Babu (2001) suggest that "the interconnection of world through the use of the Internet and Web has changed the fundamental roles, paradigms and culture of libraries and librarians once for all"(p27), underpinning the idea of revolution in the way people access information ascribed to the Net.

Brendan Rapple (1997) acknowledges dramatic changes in the scholar communication<sup>34</sup>, which affect library culture with the power of a revolution: the primary goal for librarians remain "to providing optimal customer service", but with "the ever-growing electronic availability of information on both national and global networks", the focus has shifted from ownership to the access to collections.

- Great opportunity

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<sup>32</sup> Miksa, professor at the University of Texas School of Information, identifies in Library and Information Science two paradigms, which are "the library as a social institution" and "the process of information movement as a system of human communication" (p229 ss.). For the first paradigm the library's most important function are "its collection of documents and facilities", while the second paradigm considers the information flow which forms human knowledge systems and communication.

<sup>33</sup> The Australian "Pretext" is not more available on the Web as of 18/02/2004, but it was read and printed by the author of this text on 13/01/2003.

<sup>34</sup> The changes he refers to are: "electronic mail; [...] electronic bulletin boards and discussion lists; [...] electronic journals; [...] videoconferencing [...] provide powerful new means of accessing information to support teaching, learning, and research" (Rapple, op.cit., p45).

Using words less important than 'revolution', many authors acknowledge the Internet as an opportunity to improve librarians' roles within the information society and their institutions. Important changes in the scholarly communication and in the distribution of information are recognised, as we saw above. On these bases, information professionals have the opportunity to work closely with their patrons, evaluating, analysing, organizing, packaging and presenting information "in a way that maximizes its usefulness" (Wittwer, op.cit., p221), but also "facilitating the process of information movement in the system of human communication" (Rice-Lively and Racine, op.cit., p34).

Riccardo Ridi (1998) thinks that on the information highway and in the world of digital information, there have been a shift from a *knowledge canon* to a *net of knowledges*, which doesn't lead to a total dis-intermediation, but rather to the need of an iper-intermediation, which can be fulfilled by librarians and information specialists, who will have also the opportunity to guide their patrons through overloaded information resources (Wilson, 2000).

On this subject, Rao and Babu (op. cit., p30 ss.) list "numerous opportunities for the librarian in Internet and Web environment in providing information services easily, timely and appropriately to the users"<sup>35</sup>.

The new roles offered to librarians in the Internet age will be discussed later in the text.

- Challenge for the profession

Zumalt and Smith (2000) claim that "the overwhelming amount of information available to the researcher today" presents librarians an ongoing challenge to offer their patrons the adequate answers to their information needs. And indeed "librarians have not shied away from this great highway; they have created value-added Web sites of use to their customers, and often they have made them available to the entire Web community" (p347).

In a paper where he discussed, in 1995, "the forces impacting on the traditional library environment with particular reference to network developments and the consequent need for intellectual and structural re-adjustment within and between relevant information providers", Colin Steele acknowledged the positive vision librarians have of "the Net as a practical tool which can enrich our institution's mission", without hiding the challenges it poses: evolution of library services, library staff involved in the design and delivery of learning, multidisciplinary character of the profession, new organisational alliances with other departments, empathy with users community, but most important, "ensure that the gap between information rich and information poor does not widen"<sup>36</sup>.

In Rory Chase's opinion (1998), moreover, as we have entered the Knowledge Era and as "libraries and information centers [...] are at the forefront of the digital revolution", the challenge for the profession for librarians is to transform themselves into value-adding knowledge professionals, they have to radically change their roles and jobs within the knowledge-based organization (see also section 4).

- Digital future

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<sup>35</sup> The list includes: universal accessibility of materials, patrons initiated inter-library loans, books and reading lists, online catalogs, local databases, e-newsletters, virtual reference desks, virtual tours, web forms, cooperative cataloguing, distance education support.

<sup>36</sup> The theme of the "digital divide" has been studied since the advent of the personal computer and the Internet diffusion among common people. For a recent discussion on the social exclusion coming from ICT, and the compensatory role libraries can play to fight it, see Hull (2003), who introduces and examines the digital divide both in UK and USA, concluding that librarians can play a positive role in "not making assumptions about their clients' previous experiences in interacting with information resources, [...] but in order to make a real difference they will need to undergo rapid transformation and change" (p142).

As for the issue of the digital libraries, strictly linked to the development and explosion of Internet-related technologies, once worked out that sense of frustration that some authors express "with digital library developers and the shortsighted approaches of computer scientists who ignore librarians in their research and writing about digital libraries" (McMillan, 2000<sup>37</sup>), the feelings we get from authors and practitioners' reflections are in general very positive and confident.

Tammaro (2000) stresses on librarians' expectations relating to the digital library in order to offer better services to their patrons, expectations which rely on an awareness of the need of training and continuing education (p139 ss.).

Campbell (1998), discussing collection development aspects within the digital library, claims for a "holistic approach to digital information" from librarians' part (coining the expression "holistic librarian"), a global way of looking at "not only user need for information, but presentation, bibliographical and physical access, the user's willingness or ability to take advantage of the format, and what instruction or helps may be needed to make effective use of the item possible" (p46).

Roy Tennant, pioneer of the field, lamented in 1999 that digital libraries are lonely places<sup>38</sup>, but that fortunately several professional meetings were beginning to be organised "for reinserting the human touch into the digital mix". The same author the year before asserted that the most important management decision in the digital library was to hire staff with such skills and qualities to "build the library for the new millennium".

According to Malinconico (1998), the implementation of digital libraries will put librarians on a primary role in their use and development, and the building of digital collections will give them the opportunity to highlight their professional competencies at their best (p16).

- A changing user culture

Thus, the Internet was "fast becoming the perceived place to find all the information you want and is frequently used by library clients" (Bell, 1997), who, at the same time, being on the Internet, discover "it is messy" and for this reason provides "librarians great opportunities" (Zumalt and Smith, op.cit., p336)<sup>39</sup>.

Some authors acknowledge an "end-user revolution" (Noble, 1998): "patrons are empowered" (p50), they are able to find information on their own, as well as create it on the Internet, and "as a result [they] believe there is no reason to visit a library or speak with an information professional" (Bell, op. cit., p33).

Scholarly communication has seen dramatic changes, above all with the advent of easy-to-use technologies, like Web publishing, email communication, videoconferencing and so on, not to speak of "journals crisis and the emerging models in scholarly communication" (see Pelizzari, 2002)<sup>40</sup>.

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<sup>37</sup> McMillan (op. cit.) defines the "digital library" as "a series of activities that brings together collections, services, and people in support of the full life cycle, from creation, dissemination, use, and preservation, of data, information, and knowledge. The challenges and opportunities that motivate an advanced digital research initiative should be committed to such a broad view of the digital library environment" (p6), and her point of view stresses on the fact that digital libraries can't be well designed and effective without the human touch and professionalism of librarians.

<sup>38</sup> Tennant (1999): "When we use digital libraries from afar, there are no reference librarians hovering over our shoulder as we flounder around a web search engine, or fail to find the book we seek in the web-based catalog. We lack the most basic library assistance that until now we have been able to take for granted."

<sup>39</sup> Some authors acknowledges also the weaknesses that current search tools exhibit (see Kline, 2002), which seems to be in favour of librarians searching and information handling competencies.

<sup>40</sup> It is worth to mention here the "Open Archives Initiative" (URL: <<http://www.openarchives.org/>>, last visited 18/02/2004), born in 1999 from the Santa Fe convention with the strong belief of the participants that "scholarly authors can make electronic documents available to a global audience by submitting them to e-print archives" (see Van de Sompel, 2000). See also the website of the Los Alamos National Laboratory "Library Without Walls" project at URL: <<http://lib-www.lanl.gov/www/welcome.html>> (last visited 03/03/2004),

There was the feeling that library users' culture was changing as new powerful tools to easily access and create information were imposing: at the same time, the work of professionals in libraries had to adapt and integrate "virtual" services with traditional ones.

The World Wide Web has enabled reference librarians to be creative and dynamic in answering more questions than their traditional collections had previously allowed. However, there are many challenges for Internet reference: licensing for remote access, copyright, making consortial agreements for better subscription prices, keeping paces with emerging technologies, and examining the costs involved (Zumalt and Smith, op. cit., p343).

We must admit here that the major challenges in delivering services to patrons are posed by the Internet explosion to that share of professional represented by reference librarians<sup>41</sup>.

It is the work of reference librarians which seems to be primarily involved in this change of culture: "reference librarians no longer have a franchise as sole providers of information at the reference desk" (Wilson, 2000, p388), and they lament that reference librarianship is in trouble (Lipow, 1999): but nevertheless they have promptly reacted, incorporating the new networked information among their reference tools<sup>42</sup>. Wilson argues, too, that reference librarians should put major emphasis on guiding users with appropriate training to access and evaluate resources, and on that "invisible function" to sort out those information needs users are unaware to have (op. cit., p389 ss.).

- Internet as the "ultimate reference tool"

In the age of the networks, librarians are at the heart of information flow.

Billings (op.cit.) asserts that "librarians should be able to take the hand of the information seeker and step into the knowledge stream to help find, evaluate, and get whatever is needed", acting as the "fundamental and vital participants in this new information environment", (p40).

Another author coined the expression "the ultimate reference tool"<sup>43</sup> to indicate the importance of networked information resources in librarians' worklife, which communicates well the richness of the new information environment (even with all the due caution expressed by others, as we have seen above).

Abbas (op. cit.) acknowledges the changes in the information flow brought by the Internet: the information transfer has augmented, the dissemination become more fluid, creation and production changed, organization, storage and preservation has been both simplified and complicated, and the process of destruction of information began to impose. All these issues see librarians caught in the middle, and their role heavily involved, in the training of patrons to critically evaluate the information available, in the problems of accessibility to resources, in the choice of the library

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whose vision is "To create a network of knowledge systems that facilitate scientific communication and collaboration."

<sup>41</sup> Reference librarians appear to be the most studied in surveys, and the more involved in delivering new information services to patrons: as Welch (1999) acknowledges, "the Internet has been especially time-consuming in its impact, [...] electronic services have become increasingly important in providing reference services, [...] being sometimes] additional responsibilities with no compensating let-up from the traditional functions of reference desk service, bibliographic instruction, and collection development": for this reason, "reference librarians should take the initiative in the implementation of evaluation criteria that recognizes the realities of electronic services within traditional reference functions" (p77).

<sup>42</sup> The literature on the Internet as a reference tool for reference librarians is very rich, almost boundless. Searching INSPEC and ERIC, two abstracting databases, with the combination "reference librarian\*+Internet", gives 289 entries. The same search in LISA gives more 230 results.

<sup>43</sup> This is a Valauskas' (1993) expression, taken in a polemic spirit by Devlin and Burke (1998) as we said above in section 2.

models (traditional, automated, hybrid and digital), in the management of new models, like the open access models.

According to Griffiths (2000),

Librarians add credibility and validation to the collections they build. This validation is increasingly important in cyberspace where anyone can "publish" anything. Search engines can help find things on the web, but they cannot provide the objective validation that librarians can. Librarians are also just about the only people who can link cyber-resources and collections to physical resources and collections. (p47).

#### 4) THE INTERNET: NEW ROLES FOR LIBRARIANS.

The literature examined so far has shown an undoubted interest in the Internet great potential for libraries and their professionals. Positive and negative perceptions and attitudes have been delineated, all recognising a turning point, if not a revolution, for the profession.

Not surprisingly, the new roles created by changing technology have commanded attention and have made up a large part of recent literature about librarians and digital libraries. [...] The struggle of librarians to cope with the dynamic changes brought by technology is real. In the course of this effort, multiple roles for the librarian have been proposed. [...] librarians and technologists are struggling together in the evolution of a new profession. Digital libraries need librarians. [...] Information experts -the librarians - who have the skills, training and knowledge to organize knowledge into systems and structures that facilitate the productive use of information and knowledge resources. (Matson and Bonski, 1997).

The literature, especially in the second part of the 90s, is abounding in authors who speculate, first, if the library profession is going to survive the digital evolution; secondly, if it will, what can be the new roles covered by information professionals (it is interesting at this subject to note the powerful imagination in naming new professional figures).

- Are librarians going to survive as professionals?

Many authors believe that librarians have a strong future in the networked environment (Rapple, op.cit.). Despite many fatal forecasts about the demise of libraries, professionals, we have seen, continue to do their job, adjusting it at the new information environment, facing more complex requests, patrons expectations which keep on growing (Tenopir and Ennis, op.cit.). They all seem to agree that librarians need to be proactive and not passive in delivering new services connected to the networked and digital environment. Some authors also consider that "there is considerable potential for the librarian[s] to become involved with the process of improving access to significant Internet content", because of their experience with the management and classification of information resources (Sturges, 2001, p66).

But, as Malinconico (1992) emphasizes, university library schools and curricula have probably failed in considering a very plausible scenario, "one in which information resources are drawn into the orbits of influence of those who maintain the technological infrastructure" (p227), as to say that the danger was to see information resources managed by computing staff and technicians rather than by information professionals and librarians. The author asserts that if we don't want librarians to be put between the "endangered species", they will have to acknowledge the existence of many others stakeholders within their parent organizations concerned with the management of information, and "because of the new information handling tools available to them, they probably have more to offer than ever before" (p233) if they are adequately prepare to: work in groups, understand the management of library-applied technologies, be critical and problem-solving oriented, and above all strongly end-users oriented.

The latest point appears to be critical to many authors: Lamont considers fundamental the "expectations of the users", and the building of a sense of community with them (op. cit., p390), and indeed Tennant (1998b) lists, among the main skills good staff for digital libraries should possess, "an abiding public service perspective", because "any digital library will benefit from having staffers who understand the needs of its users, and who will strive to meet those needs".

Others recognize that patrons entering the "physical" library need often more help than before, a more specialised assistance (see Kyrillidou, 2000, and Carlson, 2001), because for their basic information needs users are empowered, and access Internet resource often more easily than information specialists. Hence the recognised need for a new partnership with patrons "emerging out of the necessity to take action now, give service now" (Mort, op. cit.).

- New roles for librarians.

In 1997, at a Conference organized by the journal "Computers in libraries", Rebecca Jones put around a table four information specialists with "one common focus: a passion for librarians to recognize and to seize the challenging and critical roles that are evolving as a result of new technologies", to discuss possible new technologies and new roles for librarians. The results of the discussion were:

- resisting the onslaught of the information content and new technologies is futile;
- the constant organizing, classifying, and evaluating role is still most important;
- the development of digital environment, electronic resources and user centered services need the human touch of prepared professionals.

As it is acknowledged that new technology creates new roles, many authors list new possible roles for librarians in the age of the Internet, on the basis that "librarians need to be prepared to take on a new role in the Information Age by educating themselves for the future" (Bierman, op. cit.).

The literature underlines in general a strong relations existing, within the imposing digital technologies, between the role of librarians and individual users: as to say, librarians will continue to exist as professionals only if they will be able to design and taylor services with a strong user-centered perspective<sup>44</sup>. This is Martell's (2000b) position, who speculates on the future of libraries which "will stand on the shoulders of librarians" (p104), in the sense that, as the physical library as we know it is destined to disappear to give place to a (or several) virtual environment, the librarian will deal more and more with virtual users, "with an innovative *value added* approach" (id.). It is noteworthy the fact that this author doesn't see a diminished role for librarians in the future: on the contrary, he thinks that role will be central in the building of new structures. But before coming to an entirely virtual age, he admits there will be a period of gradual changes, where librarians will assume a leading role in handling and enhancing pushing technologies: his "disembodied librarian", at present, is still a future projection.

The literature demonstrates in general two trends in allocating roles to librarians in the Internet age: there are authors who, acknowledging important changes in their professional life, nevertheless see librarians only transferring their competencies to new technologies, a natural evolution of their traditional jobs; and authors who think that library professionals feel their role absolutely altered by the advent of the Internet, enhanced in a completely user-centered perspective, and more collaborative with other sectors of their institutions.

- Redefining roles.

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<sup>44</sup> Tomer, as early as 1994, was already predicting that "networks operating at multigigabit speed will enable librarians to move information from its source to the point of demand almost at will" and this would obviously significantly change "the way libraries and librarians serve readers" (p306 ss.).

In 1998 Fytton Rowland was reviewing the traditional functions of librarians<sup>45</sup>, and their “parallel in the electronic publishing era”: most of them were recognised “just as relevant to the electronic milieu as they were to that of print”, except of course for the circulation function, which was however replaced by a new task: the user education, recognised fundamental by many authors in the electronic age. In fact, the electronic scene is in some way complex and confusing: users will not be able to look after their information needs without assistance, because of the increasing amount of online and electronic resources available, and on the other side, there is the diffuse impression that retrieval of information from the Internet is both easy and cheap, as we’ve already noted.

Hope (et al., 2001) assert this evolution and increased role of teachers librarians play in instructing their patrons “with the explosion of materials available electronically, and with the lack of quality control on the Web”, which makes librarians a valuable resource for patrons in their search of good quality information.

As we have pointed out, users information needs and behaviour are a central aspect in discussing librarians’ roles within new technologies. Mort (op.cit.) acknowledged that sense of leadership held by librarians in the past, which was wavering with the users’ empowerment. But that same author suggested that a new partnership had to be created with patrons, in order to redefine roles, and “taking our services to the client rather than having the client come to us and play by our rules”.

As an early email posted in 1996 by Ginsborg to the DIGLIBNS<sup>46</sup> discussion list stated,

if the library profession is to survive as the primary interface to information \*in any format\* then we must retool, retain, and reinvent. We need to create, foster, beg, borrow and steal digital skills, knowledge, and experience. We need to redefine our roles or risk becoming an anachronism in an increasingly on-line world<sup>47</sup>.

And this is indeed documented by many. Abbas (op. cit.) recognises a need for librarians to weave dense relationship with patrons, in order to help them “sift and sort through the excess information, [...and] critically evaluate information accessed via the Internet”, with an increasing role of teacher and guide. Anderson and Gesin (1997) assess an evolution of librarians’ role as teachers from the bare bibliographic instruction to a “much broader instructional and participatory role in the instructional process”: librarians are now actively involved “in the building of on-line courses by providing assistance in finding current and valid information for instructors delivering instruction on the Internet”.

At the same time, librarians need to remain flexible and open to the potentials the Internet can have for them and their patrons: briefly, they have to improve some core skills applied to a new information environment (Sharp, 2001). These skills must be adaptable to changing technologies, and most of all transferable to users: Tennant (1998b) speaks of some core qualities staff of digital libraries should possess (it is likely to assign them also to librarians in general in the digital age), most of which relate to flexibility, adaptation to change, and good relations with others (users, as well as other staff). And indeed, Marion (2001), exploring 250 online academic librarian employment advertisements posted during 2000, asserts “interpersonal skills, [...] teamwork and collegiality, [...] experience and acceptance of diversity” among the most demanded behavioral characteristics.

St. Lifer and Oder (1996) observe that librarians’ profession does not belong anymore only to the library walls and to “flesh and blood” patrons, and this is probably the most important factor of

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<sup>45</sup> The functions concerned were: collection development and acquisitions, cataloguing and classification, circulation, reference work, preservation, conservation and archiving.

<sup>46</sup> DIGLIBNS “is an electronic discussion list of practical (as opposed to research) digital library issues and the emerging specialty of digital librarianship. Though presently a low-volume list, it is likely to grow as more libraries address digital collections and services” (Tennant, 1998a). The discussion list is not more available as of 01/03/2004.

<sup>47</sup> Cited in: Garrod and Sidegraves (1998).

change<sup>48</sup>. The forecast to them is that all the net jobs created by the recent developments, will soon be standard routine for librarians, who will continue to apply to new technologies the critical skill they've ever had<sup>49</sup>.

Croud (et al., 2001)<sup>50</sup> analyse the role of librarians in the age of the Internet, including the themes just reviewed, stressing four major point of evolution with a strong focus on customer services: "libraries, and librarians, change to best serve their clients". According to them, the user-centered services development allow (and require) librarians to stress their role in the following actions: mediation and assistance (selection, resources evaluation, virtual reference services...); teaching and training (general and on-demand, tailored on new information resources...); partnership (within and outside the insitution); design and production (of web pages and digital libraries<sup>51</sup>). They conclude that "librarians in the digital age are people-oriented, [...] intellectually flexible, embrace change and are constantly updating their knowledge and skills".

- New roles facing new information needs and habits.

There are then many authors considering completely new roles tailored for librarians in the Internet age.

Cheryl Lamb (2001), reflecting on the need of knowledge management in a world of information overload, strongly believe in the role of librarians (and information professionals in general), "the knowledge workers with the capability and expertise to connect people with the information they require" (p22): it is to these "infomediaries" (the words she coins to tell this new professional figures) she entrusts the management of a new environment "so that the sharing of that knowledge can flourish", thinking above all about the "tacit knowledge that resides in another person's mind".

So, despite some forecasts, like Paul Sturges declares (op.cit.), "librarians remain in demand, and they have changed and modernised their practices and attitudes, becoming more like information scientists" (p62). This author revises that process of dis-intermediation brought by networked technologies, began in the 60s, with users searching online databases on their own: today this kind of threat to librarians' job has been enhanced with the "widespread availability of the Internet and, in particular, of the WWW, [...] the technology seems to offer the user complete independence from the librarian" (p63). Once he has recognised the greater independence of the end-user, the librarian can assume the new role of reintermediation, "working closely with the content of information [...], taking a more active role in the buying and selling of electronic information content [...], in the organization's shift towards e-business" (p66). The future for librarians is exciting, he thinks, only if they choose to accept it.

And indeed Corcoran (2000), reporting on a study taken in 1999 on 200 corporate information professionals, urges them to take on a more primary role, because they too often play in support roles which don't adhere to their strong service values.

Thus, authors seem to think that the networked environment has strongly invested librarians, putting them on a "client-centered function as facilitators and intermediaries" (Rapple, op.cit.): if one believes that librarians "must enhance their role as technological gatekeepers, guiding users through overloaded information sources, [...] improve their technological skills, and must learn about new types of users who have taken center stage" (Wilson, 2000), another speaks of librarians as

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<sup>48</sup> For a discussion of the concepts surrounding the emergence of "the hidden user" within the virtual and digital library environment, see Debowski (2000).

<sup>49</sup> Their article is the result of a "most comprehensive and wide-ranging survey to date in an effort to ascertain to what degree librarians' job were evolving and why", conducted by Library journal in 1996.

<sup>50</sup> These authors discuss here their Australian experience of hybrid library, which they call "cybrary", that of University of Queensland, URL: <<http://www.library.uq.edu.au/>> (last visited: 01/03/2004). It is noteworthy in this context the catch-phrase on the home page: "Cybrary. We link people with information".

<sup>51</sup> At that subject, we observe that there are also non-librarian authors who think that librarians would be the best in organizing the Net. See Schneiderman (1997) and Rowbotham (1999).

"knowledge navigators" (Chase, op.cit.), who "understand the differences between information and knowledge, and have the background, technical skills, and abilities to take a leading role in creating the intelligent enterprise"<sup>52</sup>, and someone else speculates on the librarian working beyond library walls, as "educator, facilitator and collaborator, rather than information intermediary" (Newton-Smith, 1998).

Matter of nomenclature apart, all seem to agree that librarians in the Internet age need to come to terms with their patrons' new information habits, first, and then with a working environment always more dematerialised. As Martell (op.cit.) was stressing, "the new value added services customized to the individual users will thrust librarians into a more meaningful and sophisticated role as knowledge advisers and counselors" (p104).

Times appear thus mature for the coming of a new generation, that of the cybrarian, or the "mutant librarian" (Tammaro1995), when users are empowered, their information needs are changing, libraries are on their desktop, and library professionals rethink their services in a renovate perspective.

- Roles for the future

Within the tendencies discussed above, several authors launch out in more or less realistic definitions of new roles and jobs for librarians in the networked environemnt.

We think noteworthy to list them, as a conclusion to this overview of the literature.

June Abbas analyzes librarians as: gateway to the future; teacher/enabler; knowledge manager/worker; organizer of networked resources; advocates for information policy development; community partner; sifter of information resources; collaborators with technology resource providers; technician; individual information consultant.

Matthew Evans (1998), reporting about issues surrounding the public library, adds more net-specific positions: Net navigator; IT gatekeeper; Information consultant; Information manager; Educator.

Jones (1997) speaks about strongly technical roles within the developing networked technologies: Organizers of Internet 1 and Internet 2; Database interface consultants and designers; Metadata specialists; Electronic publishing specialists; Creators and maintainers of electronic or virtual books (i.e., books that can be updated instantaneously, but still maintain their integrity); Monitors of the quality/integrity of Net information/data; Intellectual property and information licenser brokering roles.

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<sup>52</sup> Chase, with a rich imagination, pushes on to say that "a knowledge navigator could be likened to a spider at the center of a gigantic 'knowledge' web".

## CONCLUSIONS.

The developments of the Internet and electronic networked resources have posed tremendous challenges to libraries and their professionals.

The role of librarians has developed to that of educator, facilitator and collaborator, with a very strong customer oriented accent.

New and innovative information resources and tools, developments in networks which empower the end-user, have imposed librarians to be flexible and creative to work out appropriate quality solutions, and deal with a profession which was changing almost every day under their hands.

A native inclination to face changes, an understanding of new technologies and of clients needs, a proactive service attitude, will be the winning traits to drive librarians into the digital future.

Maria Grazia Melchionda  
Padova, 7 March 2004.

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They play an essential role in enabling the delivery of library services to the public and in achieving the copyright system's goals of encouraging creativity and learning. This article explores the enduring importance of libraries and some of the intellectual property-related challenges they face. The Internet has created tremendous opportunities in terms of accessing knowledge. Making the collections of the world's great libraries available to the public through large-scale digitization, however, has yet to be realized. While it is difficult to foresee the full implications of such an undertaking, the benefits promise to be widespread and powerful.