Water to the Thirsty Reflections on the Ethical Mission of Libraries and Open Access

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Abstract. The shift to digital information determines a parallel shift in access modes, and digital libraries are called to action by the ethical foundations of their mission. Open Access makes information potentially available not just to researchers, but to everyone, yet there are still barriers to be overcome in terms of technical infrastructures, points of access, digital and cultural divide.

The mission of libraries, as stated by IFLA Manifesto for Digital Libraries and IFLA/FAIFE Code of Ethics for Librarians and other Information Workers, converges with the mission and ethics of the BBB declarations on Open Access: it is about delivering information to everyone, from scholars to the "curious minds", and librarians can be mediators in the wide diffusion, at all levels of society, of scientific, scholarly knowledge, to foster "active" and "scientific" citizenship.

Keywords: Digital libraries · Open access · Ethical mission · Accessibility · IFLA CODE on ethics · BBB declarations

1 Digital Information Landscape: Open to Researchers/Open to Everybody

1.1 Digital Information and Library Mission

Since most of the information and knowledge started circulating in a digital format, life has not been the same for all sorts of libraries, as the growth is exponential: Floridi [1, 2] pointed out that "*Every day, enough data are being generated to fill all US libraries eight times over. […] we shall have 8* ZB *of data by 2015"*. ICT devices are allowing us to navigate this ocean of data "*but at the same time they are the sources of further data, which in turn require, or make possible, more ICTs. It is a self-Reinforcing cycle and it would be unnatural not to feel overwhelmed*". Naturally, Floridi refers to data of all sorts, not necessarily the sort of data libraries organise, yet the scenario raises questions: is it imaginable that libraries – or any other subject – succeed in organizing that data?

Digital libraries, especially research libraries, are probably busy enough with the preservation and dissemination of research in the digital ecosystem; librarians do not only honour their historical commitment to "serving", but accomplish their more recent role – stemmed from the new competencies necessary to manage digital libraries, collections and Open Access– of mediators between science and society. They can

P. Manghi et al. (Eds.): IRCDL 2019, CCIS 988, pp. 61–71, 2019.
https://doi.org/10.1007/978-3-030-11226-4_5

greatly contribute to efficiently disseminating the results of scientific research, as it was the case for the partnership between Charlotte Hess and Elinor Olstrom. Their work was originated by the *Workshop on Scholarly Communication As a Commons*, led by Olstrom at the University of Indiana in 2004, an attempt to define the concept of *commons* from a multidisciplinary point of view. Knowledge as a commons is a shared resource, like natural resources, but, unlike water or fisheries, it is impossible to exclude someone from knowledge once it has been made public- whereas the book it is written in is a piece of private property. At the time they wrote, they were Director of the Digital Library of the Commons at Indiana University and 2009 Nobel Prize in Economic Sciences: the book [3] resulting from the workshop contains papers from those who were to become the most prominent experts and advocates of Open Access.

As librarians develop into researchers, the ethics of science, prime mover of research, gets closer to the basic principles of the library mission, mainly allowing people to find the information they need to advance their knowledge and become active citizens [4]. Commitment to objective quality, to unbiased neutrality, to the rejection of personal gain in the choices, in other words "science for science sake", are common core for librarians choosing resources and for scientists struggling with the citation system [8].

Librarians are not the only new stakeholders on the scene of Open Access: citizens are invited too, as they become gradually more aware of their "worthiness" to be informed of scientific information and research results. The Budapest Open Access Initiative [9] aims at *world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by [...] curious minds*; the "What you can do to Help" section asks citizens to advocate for Open Access demanding that research paid for by taxpayers be made public.

This new "scientific" or "active" citizenship has been acknowledged for some time now in many countries and is expressed in the participation to referenda on scientific issues such as nuclear energy or medically assisted procreation, which imply citizens are informed, and therefore have formed an opinion. In Italy, the patient is asked to sign an "informed" medical release form to authorise therapies. Yet, without being truly informed, it would be a blank check. Pietro Greco [10] underlines the need to raise citizens' awareness on scientific issues, they need to know before they make decision on their health or on their environment; a model for this attitude is Al Gore's engagement both in environmental communication and popularization [11] – for which he was awarded the 2007 Nobel Prize for Peace - and in converting MEDLINE to PubMed under the Clinton Administration in 1997, thus making a precious informational resource available on Open Access to everyone worldwide, not just to the taxpayers. Advancement in science cannot happen without democracy [10], as they share the same basic principles: during Hitler's regime, science moved from Nazi Germany to the USA, where democracy was granted. Science is the prime mover of technology and economics, and no government can hope to succeed if they decide to harness it.

Libraries are ideally poised to mediate science from the specialist to the layman through their reference services. As an example, patients' libraries offer services to help retrieve information on specific conditions, thus allowing the patient to become proficient in his/her own illness. Librarians mediate both researches on databases – be they

proprietary or Open Access as PubMed - and search engines as Google, not forgetting resources in the library. Gaetana Cognetti, director of the Biblioteca Maceratini in Rome and Ivana Truccolo [12], director of the library at the specialized cancer center CRO Aviano (PN) were prominent in establishing an alliance of health libraries in Italy, from which a search engine specific for information on cancer was started.

Probably we are at the point that the distinction between digital and analogic libraries is superfluous, as all libraries, be they digital or not, need to come to terms with digital information.

The sheer mass of information available does not make libraries themselves redundant. The exponential growth of Internet services in the 1990s had raised a debate on the nearing extinction of librarians, who would have become useless: the more user-friendly technology, the less librarians needed, was the perspective. We can appreciate nowadays how this point of view was wrong: as Wiener [13] had already pointed out in the 1950s, machines can carry out better and faster than humans repetitive tasks, but creativity, ethics, empathy and imagination are human, and, as a NESTA report [14] underlines, are core skills to be successful on the job market.

Proceeding from Floridi, recently Bawden [15] argued that in 50 years' time probably computer rooms will be outdated, as everyone will wear their own digital devices, but libraries will still be needed, to help people make sense of the technology. The more information available, the more it needs to be mediated by someone who is interested in filtering it objectively and without judging it, simply discriminating what is reliable and what is not. Researchers are interested in content, librarians are interested in context and reliability, their look is supposed to be objective and unbiased according to their Code of Ethics. The mission of libraries is thus described by IFLA FAIFE's Code of Ethics [16]: *Librarians and other information workers organize and present content in a way that allows an autonomous user to find the information s/he needs. Librarians and other information workers help and support users in their information searching*, and, according to IFLA/UNESCO [4] *The mission of the digital library is to give direct access to information resources, both digital and non-digital, in a structured and authoritative manner and thus to link information technology, education and culture in contemporary library service*.

Thinking in this perspective about the aims of the Open Access movement clarifies immediately why libraries are a stakeholder in this scenario; besides, the Budapest Open Access Initiative [9] invites libraries, among the others who share the same vision, *to join us in the task of removing the barriers to Open Access and building a future in which research and education in every part of the world are that much more free to flourish*. Open Access pioneers set once more an example, as Harnad [17] and his concept that any piece of information shared on the Internet is written in the sky for everyone to see, meaning that it can be shared regardless of borders, obstacles, economic, social and intellectual gaps. Harnad names his blog "Open Access Archivangelism", because everyone can advocate for OA principles according to his/her means and skills, there are no exceptions and no weak or powerful allies. It is a bottom-up process and everyone is invited in.

Marchionini [18] recently remarked that data and information science is a small fish in a big sea, as the ratio is that for 100.000 jobs in data science there are 1 million in the sciences themselves (that is biology, engineering, a.s.o.), but still the field plays the

important role of curating and bridging research data to the people. To be more effective, the action should be carried out in collaboration with other specialists – such as information technology or subject specialists – who may be involved in data production and in the technical aspects of preservation, but who do not need to be involved in the same ethical choices around data curation that directly involve libraries. This convergence would allow library and information professionals to tell the story of what they can do for the organisation, preservation, and consistent construction of metadata to represent data themselves. The benefits of such open attitude, apart from the collaboration between Ostrom and Hess mentioned above, are demonstrated in the case of Luisella Goldschmidt-Clermont (1925–2013), librarian at CERN and sociologist, whose pre-print [19], though never published at the time, was fully acknowledged in the light of the OA movement, as the author's meta-reflection contributes to highlighting the mutual growth that could result for physics, anthropology and library science from the mutual exchange: being married to a scientist, she had the privilege of observing the physicists' community in action. Moreover, the role of libraries is visible in the reasons and benefits that led Ginsparg to transfer arXiv from Los Alamos to the University of Cornell as well as in the contribution of librarians in IRIS, the Italian archive for scholarly publications, where librarians are in charge of the curation, the creation of metadata, the advocacy of the repository among scholars and their training.

The above-mentioned IFLA/UNESCO Manifesto for Digital Libraries mentions the importance to overcome the Digital divide to pursue the Millennium Development Goals, and states that *the dissemination of information enables citizens to participate in life-long learning and education*; in line with other IFLA/FAIFE Code of Ethics and other IFLA documents, user education is one of the missions of every sort of library, and the education to digital content, or media literacy, is carried out by all species of libraries for their different audiences. Academic and research libraries can help researchers use digital collections for their purposes; public libraries help citizens finding and making sense of the information they need for their health, business, or to enforce their rights as citizens.

1.2 Open Access Accessibility: Water to the Thirsty

Telling our story from the perspective of Cultural History [20], a novel by Roth [21] could be used as an example to represent the distribution of knowledge. We are at the beginning of the 20th century; the main character in the novel, David, who had migrated with his family to the USA a few years previously, now is six years old. In his kitchen, he is staring at the water tap which is too high for him to reach:

Standing before the kitchen sink and regarding the bright brass faucets that gleamed so far away, each with a bead of water at its nose, slowly swelling, falling, David again became aware that this world had been created without thought of him. He was thirsty, but the iron hip of the sink rested on legs tall almost as his own body, and by no stretch of arm, no leap, could he ever reach the distant tap. Where did the water come from that lurked so secretly in the curve of the brass? Where did it go, gurgling in the drain? What a strange world must be hidden behind the walls of a house! But he was thirsty.

The water from the tap could be compared to information. Water is distributed freely to everyone in the place where the main character is, though it is not so for other countries at the time – for example the countries of origin of most migrants in the novel, for whom the United States are the golden land. Yet, in the case of David, the tap is too high for him to drink, but he is thirsty. Open Access publications are delivered, as the water is, to everyone, free of charge. The reflection leads the reader to considering that the general public, like David, is unable to take full advantage of that resource. People are not always able to reach out to that knowledge, as there are many obstacles to sharing knowledge worldwide, even after research results, in the form of publications or data are – as the Open Access movement advocates – made freely available. The nature of such obstacles to accessibility regards the digital divide, the cultural (and social) divide, the accessibility issues and the organization and validation of knowledge, *but they must be faced to remove the barriers to Open Access and building a future in which research and education in every part of the world are that much more free to flourish, thus building the basis for scientific and active citizenship extended to all curious minds* [9].

2 Accessibility Issues

2.1 Digital Divide

The IFLA/UNESCO manifesto for digital libraries [4] states that *Bridging the digital divide is a key factor in achieving the Millennium Development Goals of the United Nations. Access to information resources and the means of communication supports health and education as much as cultural and economic development*. The digital divide could merely consist in the lack of a digital device or access to the Internet: back in 2007, when the IFLA delegates visited it, the Mpumalanga Public Library in Kwala-Zulu Natal (South Africa) offered a series of computers to its users. They had been paid for by a nearby factory, which had an interest that young people in the area acquired digital competencies, and the library was the ideal place to do this, as it had space, electricity, Internet connection and staff to help users in their learning needs. This is one of the ways libraries can help overcome that particular sort of divide: access to digital information has a physical dimension.

Even when the connection is present and the device is available, though, there could be a different sort of digital divide: those who are able to use information critically and those who are not, the latter being unable to reach informed judgements. Marchionini [18] stated that democracy is endangered both by too little and by too much information – and science may be damaged by the spread of uncontrolled resources, especially if they are easier to reach than the serious, fact-checked and well-grounded scientific production available through Open Access. Making people information literate is the goal libraries pursue through user education, a topic which will be touched upon in the next paragraph.

2.2 Cultural Divide

There is more hindering the access to open knowledge: cultural (and social) differences matter. Without an adequate background it is probably unlikely that common citizens reach a database such as PubMed, and, even if they do and retrieve the documents they need, they require certain competencies to understand them. The documents contained in PubMed, ArXiv, ERIC are not written for the ordinary public, though it could be argued that there are differences. While the others aim mostly at being understandable for the scholarly community, PubMed must be understandable for a wider audience, if we agree that knowledge about health could be defined as a commons. Actually, the development from Index Medicus – started in 1876 - to its digitization in MEDLARS - available from 1964 at the National Library of Medicine in Bethesda - to MEDLINE, since 1971 the online version of MEDLARS, draw a timeline leading to increased opening and availability of medical information. A dramatic acceleration to the trend was given in 1997 when the government decided to pay for the database, considered a necessary public resource, so the domain changed from .com to .gov and the name updated to PubMed. After this, to increase the findability and overcome cultural barriers, PubMedPlus, multilingual, was started in 1998, with a Spanish interface and a thesaurus mediating between medical specialized terms and common language; in 2000 PubMedCentral added a collection of full-text documents to the bibliographic database. MeSH (Medical Subject Headings) must not be forgotten: started in Index Medicus, it strives to increase accessibility and normalize the vocabulary; the Unified Medical Language System (UMLS), besides, since 1986 strived to mediate among various languages, language registries and communities.

The story of Lorenzo's oil [20], the true story of Augusto and Michaela Odone, constitutes an example of the layman's use of medical information. These two parents were in search for a cure for their son Lorenzo's adrenoleukodystrophy (ALD), and their story, incidentally, was the subject of a 1992 film by George Miller. The Odones were told that the rare illness of their son would have taken him to death in two years' time: they were educated people, they decided to research. The father went to the library in the first place; at the time – the end of the 1960s – there was no Internet available to common citizens. Besides, geography favoured them: the nearest library was the one of the National Institute of Health, in Bethesda, Maryland, the greatest medical library in the world. Though not being medical practitioners themselves, they were people with a higher education background and the husband, Augusto, worked at the World Bank, in an international context. They had acquired the right competencies to look for documentation in their fields of expertise, but now they needed to search in an unknown field. The illness of their son made them transfer those skills into another area, and these skills proved successful: they were able to conduct cross-searches on Medline, other biomedical databases and Index Medicus, which were all, at the time, proprietary tools whose use was dearly paid for. For six months, in line with the code of ethics of the library service, the Bethesda Library enabled the Odones to use those advanced research tools for free, within the library premises – it should be noted, besides, that Bethesda was the place where Medline server was physically located. At the end, the mixture they came up with, the so-called "oil", allowed Lorenzo to live 20 years longer. Their remedy still rises many eyebrows in the professional health field, it

produced no protocol and is strongly criticized, but these facts are of little importance to our present scope: we are more interested in the documentation process, as this story is an example of advanced documentation retrieval. Researchers will just need someone to point them to the right database and will have the competency to understand the results, whereas common citizens who do not have the same skills can ask a specialist for help – or an information specialist, that is a librarian.

This is the same thing happening to David, who needs his mum to help him get to the water and quench his thirst. He is too short, he feels the world around has been *created without thought of him*, his mother is tall enough to get him a glass of water, or, in other words, to act as a mediator and to supply for the lack of accessibility of the resource. This point is developed in the next paragraph.

2.3 Design for All: Web Accessibility

Basically, the world of digital information is still heavily dominated by words and text and therefore subject to some of the same patterns applicable to language. Most of the information offered by libraries at the moment still requires that we sit in front of a computer or use our smartphone and type in text when looking for information, only the space we explore is the infosphere, made of cyberspace, but also including offline and analogue spaces of information.

Text in itself is not clear to everyone, nor are images or the information on the screen. For people with visual impairments, for example, the screen is not that clear, unless it is carefully planned. IFLA has a Libraries Serving Persons with Print Disabilities Section which developed many guides for library services to special communities. Electronic Information for Libraries (EIFL) prepared guidelines for the implementation of the Marrakesh Treaty, a WIPO treaty for persons with print disabilities [22]. The ICT4IAL [23] developed the "Guidelines for Accessible Information, an Open Educational Resource (OER) to support the creation of accessible information in general and for learning in particular.", and the World Wide Web Consortium itself is very attentive to special needs and prepares many Guidelines to accessibility [24]. Without standardized procedures on text writing, XML, description of images, subtitles for the deaf and provisions for special psychological, neurological and physical needs, Open Access resources risk being closed to a meaningful part of the population.

What is more, the concept of accessibility is for all [24], as better-designed resources are an advantage also for people without disabilities – web pages designed for cognitive disorders result clearer for everyone – whether they are using the Internet on mobile devices or with temporary hindrances.

2.4 Knowledge Organization and Validation

The tap David is staring at channels water that comes from different sources (lakes, rivers, basins) but is basically channeled into the same system: it could be correct to say that the same water arrives everywhere in the city of New York.

On the contrary, though there are many databases available on Open Access, there is not only one tap. On the web it is possible to find incredible Open Access resources,

millions of data, articles, papers, videos, images and more. The problem is that, even when they are produced by similar institutions, they are generally based on different platforms. The question is, how is a citizen to know they are all there? This is one of the needs the library community can answer to, differentiating its action according to the population served.

In the case of the scholarly community, the mentoring usually implied in the researchers' career contributes to pass on the discipline-related knowledge on digital and information resources. This system is not flawless: a certain tendency to relying on what is already known overseeing what is not yet known is normal, when one is busy on research: subject librarians can help fill in that particular gap.

As it is the librarians' job to become acquainted with information resources, they can always point library users to those which answer their needs, but this solution works only for the people who actually go to the library or check on the library website. Olijhoek and Tennant [25] advocate users' education, and librarians do precisely that, as it is in their mission and in their code of ethics.

The majority of the Internet users will turn once more to search engines – Google first of all. Search engines can make themselves perfectly understandable, but reliability is not their mission. Google's original mission statement in 1998 was *to organise the world's information and make it universally accessible and useful*. In 2014 Larry Page expressed his doubts that the company probably needed a new statement, but he was not sure which one would actually fit in with what they were doing at the time. Google may be born under the star of that initial mission, but in order to thrive offering free tools it relied on advertisers. Naturally, the mission of every business company is to support itself: Google made and is still making many amazing projects feasible, many of them in and with libraries, yet it would be irresponsible to put a company in charge of organizing, preserving and granting access to world knowledge, this is a task for governments and people's institutions [26–28]. As an aside, the concept of Open Access and free of charge are not overlapping: scholarly publications can be offered free of charge because they have been publicly funded, and therefore belong to the community, they are a commons, unlike resources which are offered free of charge because some company or corporation is trying to get to the consumers through them.

Digital libraries should contribute to raise awareness and increase knowledge, and they definitely strive to do so, also acting as advocates of Open Access, by encouraging authors to deposit in open repositories and making directories of such repositories widely known [29]. They make wonderful collections available, yet these collections are not always visible to the population at large, at least not among the first twenty hits. Admittedly, this search string is quite superficial, yet, this is the way people search - unless they are librarians of professional researchers. This means that many Open Access resources remain invisible to the large public, and all field-specialized databases even more so.

Thinking back of David, so thirsty and waiting for water: what would happen if the water turned out to be polluted? Recently a German magazine [30] published an investigation demonstrating, according to the authors, that Open Access research is not necessarily of scholarly quality. The investigators made up a Mr. R. Funden - "Erfunden" in German means "made up, invented" - gave him life, and he received some invitations

from predatory publishers in the seven months the investigation lasted. The findings might be interesting and made a case in Germany, but they are not news to those into scholarly publishing. According to the authors, the investigation would prove that, provided anyone has the money, they can make themselves a scholarly reputation and be published along with highly-reputed scholars, whose names are sometimes simply used without their knowledge and at other times before they realized who they were publishing with. Other, better informed, sources [25] recall previous similar enquiries and underline the poor data support in the present investigation and state that such examples should not undermine the whole OA movement. Taking the story with the necessary caution, this goes back to what we were saying above: the increase in the information available does not make libraries redundant. Since the main commitment of the librarians is to organize information itself, more than using it to create knowledge in a specific disciplinary field, they are more and more needed on the digital scenario to select sources and train users.

Would David's mother be able to understand that the water is poisoned? Probably not, but she has more chances of becoming aware of that than David himself does: she is in charge of the household after all, whereas he is simply in charge of growing up.

3 Conclusion

The digital revolution is on, as well as the Open Access movement, which, through the three declarations (Budapest, Bethesda, Berlin) made great steps forward.

The huge amount of online free information does not push the libraries out of the game, on the contrary it makes them even more useful, as when everybody is producing open knowledge the mechanisms for distribution that otherwise rely on large private companies cannot be taken for granted.

Great investment is required from the research institutions and the libraries to face the issues related to the accessibility and the usability of the resources – and their preservation too, though this article chose not to did not deal with the latter. Efforts towards grouping of all resources in common large containers is advisable, though simply putting many things in a box does not help with their retrieval: information should be allowed to flow as water does, channeled to the taps in David's and everyone else's homes, and, being a free commons, the costs should be sustained by the institutions with the aim of fostering a larger societal growth. To face all these issues, the long-term competencies of librarians in data organization and curation will be an asset to preserve and maintain open knowledge.

Librarians are bound by their mission to give direct access to information resources, both digital and non-digital, in a structured and authoritative manner and thus to link information technology, education and culture in contemporary library service [4] and in this respect they converge with the aims of the Open Access Initiative, to provide the public with unrestricted, free access to scholarly research—much of which is publicly funded […] free of charge and without most copyright and licensing restrictions—in the belief that such process will accelerate scientific research efforts and allow authors to reach a larger number of readers [9]. In becoming advocates for the process of Open Access, librarians contribute with their competencies in information organization and

dissemination, are involved in the research process and become researchers themselves, thus creating a new vision of science, as the one inaugurated when Paul Ginsparg opened the arXiv repository to the digital humanities.

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