The analogue library in the digital world

Professional education and the changing face of librarianship

Af Luke Tredinnick

Abstract

Artiklen undersøger forskningsbibliotekernes aktuelle udfordringer i perspektivet af de senere års udvikling i forskningspublicering og informationssøgning. Artiklen hævder, at biblioteksprofessionen står over for en række alvorlige udfordringer. Traditionelt har biblioteker spillet en central rolle i facilitering og supportering af forskningsprocessen ved at stille information til rådighed og gøre denne tilgængelig. I de seneste to årtier er denne rolle i stigende grad blevet undermineret af udviklingen i forskningspublicering, informationssøgning og -genfinding. I takt med at informationsprocessens "indhold" er flyttet til digitale platforme, er biblioteket ikke længere det tyngdepunkt, hvorom forskningsprocessen bevæger sig. Artiklen argumenterer for, at der er brug for at gentænke, hvordan biblioteksprofessionen kan tilføre informationssamlinger yderligere værdi gennem professionelle aktiviteter, der har betydning for forskningsprocessen og fremtidens institutioner. Artiklen hævder, at der er brug for, at biblioteksprofessionen engagerer sig kritisk i de grundlæggende debatter og tendenser, der informerer forskningsaktiviteter. En måde at tilvejebringe dette kritiske engagement kan være via en ny generation af biblioteks- og informationsfaglige kvalifikationer og kompetencer.

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The impending death of the research library

Only a few years ago it was difficult to imagine that library collections would not continue to have as central a role within the research environments of the future as they had through the twentieth century. If sources of scholarly information were progressively migrating to digital platforms, the library at least would continue to provide access to historical collections, the long tail of scholarly publishing and research. If academic journals and scholarly books were increasingly published online and perhaps, more recently, exploiting open publishing models, the research library would continue to manage access to those resources, and to facilitate resource discovery. The libraries of the future may no longer represent the spiritual home of active researchers, epitomising the romantic ideal of a lonely and dusty pursuit of knowledge, but they would, nevertheless, underpin scholarship by remediating the body of scholarly knowledge for each new generation of student, academic and researcher. However, in the last few years, assumptions of this kind have become less secure. Rapid technological innovation in both the provision of information and of information services has placed even this diminishing role under threat. For perhaps the first time it is possible to speculate realistically about the continuation of scholarly research without the support of traditional library services and professional librarians. Outside of certain heritage contexts, such as for example national libraries of record, it is possible to imagine the impending death of the research library tradition. This

rather bleak possibility is made more plausible by the ways in which structural changes in the production and consumption of scholarly information have begun to reshape the ways in which students, academics and researchers relate to scholarly materials.

This paper explores the challenges that technological innovation presents for the research libraries and the ways in which the information profession might respond to the changing socio-cultural context of information production and consumption in the digital age. There are two sides to that problem. On the one hand, technology is changing how we exploit information, and this has direct consequences for both the professional practices of librarianship, and the theoretical ideas that underpin those practices. It requires perhaps a repositioning of professional practices to deal with increasingly mutable information artefacts. But on the other hand, technological innovation is also transforming how we think about information and knowledge in a broader socio-cultural context, and this, if anything, poses a set of more serious challenges for the information professions, undermining the idea of the research library as a repository of culturally positioned artefacts. The first part of this paper will set out some of the challenges to the values and practices of the profession that arise from increasingly mutable information artefacts. The second will address how these subtle changes to the nature of information seemingly undermine the very idea of the library as a situated repository of information and knowledge.

The changing information landscape

This section presents a brief overview of some of the significant changes in the production and dissemination of information in the digital age. One of the most important of those changes has been the dematerialisation of information. Over recent decades digital technologies have progressively effected the virtual eradication of the material basis of information resources; they have alienated information from the material vehicles in which it was traditionally reified, such as the journal or the book. While digital information is still inscribed in material vehicles of one kind or another, such as networks cables or magnetic discs, that materiality is of no very great consequence for the uses to which it can be put. This marks a significant difference from the information technologies of the nineteenth century. The material

form of the book or journal determined many of the uses to which it could be put, and how it could be located in physical space. It therefore also came to influence the modes of information production, consumption, dissemination and retention; the inescapable requirement to move and manage material artefacts determined how information could be exploited within society, and organised within libraries. But digital information is not subject to the same kinds of constraints. The dematerialised artefact can be transmitted instantaneously and cheaply. It can be reproduced with no practical deterioration in fidelity; every copy has become an almost perfect reproduction, the copy of the copy as unblemished as the original. And the dematerialised information artefact can be endlessly reproduced with no real marginal cost. As a consequence, information is proliferating at an exponential rate (Conway, 1996; Baeyer, 2003), from a gradually expanding range of sites of its production. Information has become a ubiquitous commodity in the information age: cheap, plentiful, widely available, and indispensible. This idea of ubiquitous information describes the embedding of information in the very structural organisation of our economies, societies and cultural practices.

The ubiquity of information in the modern age has transformed the economics of its production, consumption and use in important ways. Feather (2004) has argued that information has no intrinsic scarcity value; a given piece of information does not lose its value to the individual by being passed on. But in the age of print a false scarcity value was created by two factors: the limiting costs associated with producing, reproducing and disseminating information including significant barriers to entry in the publishing and media markets, and the development of intellectual property regulation which essentially imposed on the information artefact a false scarcity value by further restricting copying and use. These limitations imposed on information artefacts a scarcity value that underpinned the modes of its economic exploitation. By contrast, the digital age is witnessing the emergence of a new kind of information economics in which scarcity plays a diminishing role in the production, consumption and control of information resources. Not only do the costs of creating and disseminating information prevent fewer entry barriers, but the economic viability of traditional publishing and broadcasting industries has, as a consequence, come under question as the ability to effectively control reprodu-

ction of information has declined. Free and freemium models are increasingly replacing traditional retail and subscriptions based business models. An age is emerging in which not only is there an expectation that information will be generally widely and freely available, but that also, as a result, the demand for information demonstrates increasing price elasticity as the range of possible substitutions proliferate driving the price of information down further. This general trend is, of course, unaffected by local trends in particular markets such as for example the rising subscription costs of traditional scholarly journals.

The declining cost of producing and distributing information has led to a wholesale disintermediation in its production and transmission. Information is generally now created far closer to the site of its consumption than in the age of print. As a consequence, digital technologies are progressively undermining the mediating infrastructure developed throughout the nineteenth and twentieth centuries, from the publishing house and Media Corporation to the library itself. Computer mediated social networks have become more important to the way in which content is distributed and consumed, as a one-to-many model of content distribution is being incrementally replaced by a many-to-many model exploiting the existing digital network infrastructure. Knowledge artefacts no longer radiate from a single point of origin, but often filter through society from person to person. In the process of their transmission they have a greater tendency to mutate and change, as each hand through which they pass makes their own contribution. Individuals directly intervene in the information artefacts of culture as never before, reshaping, recontextualising, and reconstructing their meaning. Control over discourse has to a degree been disinvested from the apparatus of knowledge creation and transmission and reinvested in the whole social process. This general process of disintermediation has also affected scholarly publishing practices, which are no longer necessarily filtered by the fine channels of academic publishing, but spring up through a myriad of often ephemeral and constantly evolving sources such as web-journals and academic blogs.

The general decentralisation of information creation and dissemination has important consequences for the ways in which we understand the value of information. Much digital information is resistant to the kinds of fixed final form associated with print. Infor-

mation and information artefacts have become more explicitly mutable and more malleable. This mutability is exemplified by the constantly evolving nature of the wiki, which in its collaborative and participatory mode demonstrates the kind of constant drift to which much digital information is subjected. In digital contexts information is often highly participatory; digital artefacts are consequently more explicitly situated as participants in an intertextual space, their meanings generated in the relationship forged between them. Something like this idea is explicit in the epistemology of the Web. Berners-Lee has noted:

> I liked the idea that a piece of information is really defined only by what it's related to and how it is related. There is really little else to meaning. The structure is everything (1999: 14).

As a consequence, digital information finds new meanings in the dialogue created by the ephemeral contexts in which it is constantly resituated, not only through the explicit relationships implied by hypertext and hypermedia, but also from the kinds of *ad hoc* relationships that emerge in search engine results sets, social bookmarking services and the like. Although we tend to think that information is a relatively stable concept, the subtle changes of the information age have revealed its many challenging facets. Not only are information artefacts themselves as cultural objects intrinsically mutable but the meanings and values that are attributed to them are also likewise, equally but independently unstable, drawing more explicitly on the contexts of discovery and use in which those objects are continually resituated.

Challenges to the information profession

Why do these structural changes to the nature of information threaten the tradition of the scholarly research library? In many ways the library can be described as a nineteenth century institution in a twenty-first century world. While histories of librarianship invariably begin with Alexandria, for all intents and purposes the modern library profession was born in the nineteenth century. Libraries emerged in the wake of mass publishing, and in many ways the professional values of librarianship still reflect the influence of assumptions rooted in print reproduction. The expansion of printing through the eighteenth and nineteenth centuries had enormous social and cultural effects. Brewer has written that printing carried

"the stabilising, individualising, internalising effects of writing even further" (1982: 24). Something like this view is widespread (see: Mumford, 1947; Steinberg, 1974; Fischer, 2000; Eisenstein, 2005). Burrow has argued that the press replaced a constant iteration of memorial truths characterizing an 'intermittent culture' with the gradual accretion of knowledge in a 'continuous culture' (1982). It has even been argued that printing underpinned the Enlightenment (McLuhan, 1962; See: Eisenstein, 2005), although it is probably more accurate to say that printing enabled Enlightenment rationalism to make certain assumptions about the ontological status of writing, which in turn helped secure its progressive epistemological ideals. The printed text became a stable vessel for knowledge, separating the *known* from the *knower* in the processes of its production, transmission, and aggregation (see: Tredinnick, 2008). This assumption of stability became integral both to library practices and the cultural resonance of the library.

The library profession was born in the torrent of mass publishing; the research library in the diversification of learning that accompanied the nineteenth century explosion of printed works. Librarianship therefore unsurprisingly reflected in its professional values and practices assumptions that related to the qualities of the printed work, developing a scaffolding of essentially metaphysical notions about the ontological status of writing and its epistemological function. Mechanical reproduction tended to reify the idea of information in the information artefact itself: the book or the journal. It therefore became expedient for the library profession to treat information as if it were, in Buckland's terms, a thing (1991; see also: Buckland, 1997; 1998). Treating information as synonymous with the vessels in which it was inscribed enabled physical processes to be applied to the vehicle that could not necessarily be applied to the information it contained. The thing of information could be located in physical space. It could be tracked through the cycle of its storage, retrieval and use. The thing of information provided a stable object on which could be built standardised classifications, catalogue records, and bibliographic description frameworks. This preoccupation with the vehicle informed some of the early values of the profession, such as for example Dewey's contention that librarians should not concern themselves with what is inside the books (Battles, 2006). Librarianship resisted substantive debates about the value of particular pieces

of information, and contented itself with managing information artefacts only as material artefacts that could be sorted, described, and stored.

Librarianship was able to conflate vehicle and content without introducing any significant contradictions within its professional practice precisely because the uses of information in the age of print reproduction were constrained by the limitations of the material artefact itself. Many of the core profession practices of librarianship depend upon the assumed stability of the information artefact. Items could be classified precisely because their meaning was equated with an essentially stable subject matter that reflects the unchanging text. They could be related in classification schemes precisely because the broad ontology of knowledge and the relationship between branches of knowledge was assumed to be essentially stable and unchanging. They could be catalogued because both the material and conceptual qualities of the work were stable over time. Once placed on the library shelf, the printed artefact would not change significantly, enabling the surrogate to replace the original in the practices of librarianship. But the technologies of the information age not only make possible a more mutable kind of information artefact, but seem to encourage kinds of information artefacts that are subject to constant production and reproduction. They encourage us to participate in the information artefact, to change its meaning, its relationships, and even its very semantic structure and content. The stable information vessels of the past, epitomised by the book and the journal, are rapidly giving way to the more mutable information vessels of digital culture, epitomised by the wiki and the blog. In addition to the mutability of digital artefacts themselves, digital technology also encourages us to see information not as a set of isolated objects, but as an interwoven web of relationships and meanings, constantly shifting over time as new ideas and understandings emerge, and resistant to final description in the surrogate record. This is a very different kind of ontological map than that provided by traditional library classification schemes. The library profession therefore has to learn to adapt tools and practices developed in the light of essentially stable information artefacts to the more mutable objects of the digital age.

If there remain questions about how and whether the rigid classificatory and bibliographic frameworks of the library profession developed for an age of print

can be adapted for a more mutable information artefact, a perhaps more significant challenge emerges in the sheer ubiquity of information in the digital age. All libraries, but research libraries in particular, depend to some degree on the scarcity of information. When the supply of information is constrained by a mode of reproduction dependent on manipulating cumbersome material vehicles, the centralised model of the library collection makes sense. Its social value is secured in its practice of making available a finite stock to a wide audience. And it follows that the scarcer the resources in question, the greater the value of the library service in facilitating its discovery and use. Thus the research library became fundamental to the research process, enabling access to resources that would otherwise be prohibitively difficult or expensive to locate. But information in the digital age no longer demands to be managed as a finite asset. In an age when information is cheap and plentiful, the value added by centralised approaches to managing collections therefore becomes more marginal. Sources of scholarly information, from publisher services to e-content aggregators have gradually proliferated, each one undermining the association of the library with the managed collection. The incremental shift of scholarly publishing to digital platforms is beginning to shape the ways in which students, academics and researchers engage with scholarly materials. The current generation of academics and researchers have grown up with the idea of the library as a central part of their day to day activity, but a new generation who are more familiar with the resource discovery and information retrieval tools of the twenty-first century is gradually taking its place in the scholarly community. Desk research has replaced library research in the vocabulary of scholarly activity; the natural association of the library with secondary research materials is perhaps declining as researchers find new ways of discovering information. The migration of scholarly materials to digital publishing platforms has meant that the physical library is playing an increasingly marginal role in the research process. Therefore the research library faces another challenge: selling itself amid an increasingly diverse and competitive information marketplace. Librarianship must learn how to remediate the new information landscape in a way that adds value to the user experience.

If current trends are challenging enough, the future looks increasingly bleak. Functionally unlimited, universally accessible and virtually cost free data storage is now within our grasp. It is not only now possible, but probable that within the coming decades the majority of scholarly research materials will be published only through digital platforms. And the rapid advancement in digitising the grand tradition of scholarly publishing, exemplified by Google Books but manifest in thousands of individual projects taking place in different institutional settings, means that the historical collection is rapidly being made accessible online. It is perhaps possible now to realistically imagine a distributed universal library containing digital surrogates of every surviving work ever published, of every item held by every research library in the world, freely accessibly to all. When any and every possible source of research information can be downloaded to a mobile phone in a matter of seconds, at no cost, and with the functionality of the printed book, the allure of the library collection may fade. There are still structural and regulatory issues that continue to hold back this ideal (there are no longer any real insurmountable technological issues). Those constraints continue to enable a market based on the scarcity of information, key to the success of the physical library. Key among these is intellectual property legislation. But these limitations on the reproduction of information themselves seem unlikely to withstand the combined forces of the goliaths of the information age and the attitudes of an entire generation of new consumers. It is arguable that the whole social paradigm within which information is produced and consumed is moving to an open-everything model in which attempts to control access are not only actively resisted, but also resented. If and when information is freed, either through a society-wide agreement, or as seems more likely from recent history, simply by information providers with enough economic might choosing to ignore existing regulation and getting away with it, restructuring the idea of intellectual property in a piecemeal fashion based on the contingent demands of the marketplace, there will be nothing to hold back the distributed universal digital library. When almost everything that has ever been published is available online and possibly for free, why bother with the research library any longer? The managed collection may provide an important filter for users, but it is not clear that there is any longer a desire for this kind of pre-filtering of information.

Emerging embodied epistemologies

The structural qualities of information in the digital age pose considerable challenges for librarianship, and require the profession to rethink some of its core values and traditions. In particular librarianship needs to think urgently about the assumptions it brings to information as an object of its professional activity. It cannot content itself with an information-as-thing model in the future, nor rest easily on the assumption that it alone understands information, its structure, management and organisation. But in many ways these challenges reflect technical issues related only to the management of information and the professional practices brought to bear, rather than fundamental challenges to the profession per se. There seems no very good reason to suppose that librarianship cannot adapt to the mutable information artefact, no reason why it cannot develop new professional practice tools to manage mutable sources. There is no reason why it cannot find ways of remediating disintermediated information sources, or channelling the ubiquitous information flow. And while the idea of a decentralised global information resource is attractive – a modern day realisation of Wells' *World Brain* (1937) or Bush's *Memex Machine* (1945) - research librarians have consistently demonstrated themselves active partners in its creation, through collaboration with projects like Google Books, the Open Library, and Open Journal publishing models. The global library is not itself a threat to librarianship, but a long held aspiration of the profession. Who after all will manage these many distributed services if not information professionals? And why might it not be distributed across the existing repositories of information and knowledge, a kind of scholarly web within the web?

The research library is therefore perhaps not as endangered as I have pretended above. But nevertheless, librarianship is facing serious challenges and has generally struggled to keep pace with the rate of change, allowing the drive for innovation in information management and retrieval to pass to a buoyant computing industry. One key problem has perhaps been its tendency to see technology as a tool for managing information, rather than recognising that technology itself is progressively transforming what we mean by information in the first place. Or rather, perhaps the problem has been the tendency to see technology as a means of automating existing professional practices rather than as something that is transforming the wider social context in which information is produced and consumed. The situation librarianship faces is perhaps as McLuhan may have argued, that the medium of digital computing is most profoundly the message. But medium is not here only the material vehicles of information transmission as McLuhan implied (1964). It is also perhaps the whole social context within which information is created, disseminated and used, or what Raymond Williams described nebulously as the dominant *structure of feeling* (1961). Technology has transformed the entire social context of information production and consumption, and has in the process also transformed the ways in which we relate to information as an idea. By treating technology as sets of tools to be applied to library contexts, librarianship has ceded control of both medium and message in the information age, and failed to recognise a set of highly politicised social changes that challenge the idea of the centralised library collection. It is this changing social context, rather than ubiquitous information or the distributed universal digital library, that in many ways poses the most significant challenge to the future of the research library.

Digital technologies are slowly effecting a broad cultural shift in the dominant epistemological paradigm: a shift in the ways in which we relate to the ideas of knowledge and information. That change is deeply rooted in our cultural attitudes and practices, and challenges the very idea of a library as a centralised repository of information, and by extension, knowledge. The fabric of digital culture is geared towards what Henry Jenkins has termed *participatory culture* (Jenkins, 2003), implying a pluralizing of authority in the dematerialised mutable information artefact that runs counter to the 'stabilising, individualising, internalising effects' of mechanical reproduction (Brewer, 1982), on the assumption of which the library tradition was built. Recently this idea has become closely associated with Web 2.0 technologies and approaches to information services. Web 2.0 is often characterised as a technological innovation; the use of new technologies to harness the power of collective intelligence and user generated content. But the real innovation implied by these ideas represents only the latest incarnation of a broader social and technological trend, one that has been politically driven by the key stakeholders of the information age, and one that reflects ideologically situated values

and beliefs. Taylor (2001) has noted that the Wood-stock generation created the computing revolution, and to a degree the echoes of the counter-culture of the nineteen-sixties can be seen in the emergence of a distinctive cyberculture through the closing decades of the twentieth century. Emerging through the open-source movement, and the open protocols of the Internet and World Wide Web, that counter-culture combined individualism with a radical form of collectivism that manifests itself in the participatory nature of Web 2.0. One commentator has noted:

> Both the quantity and content of available information is set by centralized institutions – the press, TV, radio, news service, think-tanks, government agencies, schools and universities – which are controlled by the same interests which control the rest of the economy. By keeping information flowing from the top down, they keep us isolated from each other (cited by Roszak, 1988: 162)

A clearer political statement of the motivations for encouraging participatory culture in all its forms, from citizen journalism to the wiki, would be difficult to find. But this extract was not written to reflect the emergence of the Web, let alone the emergence of Web 2.0. It describes the aspirations of a community computing group based in Berkeley California in the early nineteen-seventies. It is worth dwelling on this example for just a moment to highlight just how closely the political ideas of this movement parallel contemporary trends in the provision of information services. Describing the idea of Community Memory, Michael Rossman argued:

> Convivial and participatory [...] a CM system is an actively open ('free') information system, enabling direct communication among its users, with no centralized editing of or control over the information exchanged. [...] Such a system represents a precise antithesis to the dominant uses both of electronic communications media, which broadcast centrally-determined messages to mass passive audiences, and of cybernetic technology, which involves centralized processing of and control over data drawn or furnished to direct and indirect users. [...] The payoff is efficient, unmediated (or rather self-mediated) interaction, elimination of roles and problems that develop when one party has control over what information passes between two (or many) others. This freedom is comple-

mented by the way the system democratizes information-power, for no group of its users has more access to its main information than the last-user (cited by Roszak, 1988: 163)

Some of the terminology here is clearly dated, but while the project was undermined by the general unavailability and inadequacy of existing network infrastructures, the parallels between the aspirations described here and the Web 2.0 technologies of the past five years are stark. What I hope this reveals is that Web 2.0, and the World Wide Web itself were both driven by political ideals that are deeply rooted in the history of computing culture, and which in some sense remain antithetical to the ideal of the managed library collection with its basis in centralisation both of information and of control over information. Inadvertently, perhaps the library has become the innocuous enemy of the political and social ideals driving innovation in the digital age.

Those ideals are not, of course, uncontested. Perhaps the most vocal critic has been Andrew Keen, whose recent book, *The Cult of the Amateur,* scathingly critiques the consequence of Web 2.0 technologies for knowledge and culture in the digital age. Keen contrasts the value of information and knowledge from traditional sites of authority, such as encyclopaedias, newspapers and publishers, with that which emerges through blogs, mash-ups and wikis. He argues that Web 2.0 technologies replace the expert with an army of amateurs, and insight and imagination with mediocrity and uncritical consensus. The bricolage nature of contemporary digital culture undermines both creativity and talent. He argued that "the ubiquitous remix is [...] destroying the sanctity of authorship", (2007:25). It blurs distinctions between truth and opinion, creating an "undermining of truth" that threatens the quality of public discourse, encourages plagiarism and intellectual property theft, and stifles creativity (2007: 17). This results in an "infinitely fragmented culture in which we are hopelessly lost as to how to focus our attention and our limited time" (2007:60). It also results in an undermining of notions of truth:

> "Blogs have become so dizzying that they've undermined our sense of what is true and what is false, what is real and what is imaginary. These days, kids can't tell the difference between credible news by objective professional journalists and

what they read on joeshmoe.blogspot.com. For these Generation Y utopians, every posting is just another person's version of the truth; every fiction is just another person's version of the facts" (Keen, 2007:3)

Under these conditions, truth becomes just a version of fiction; the particular narratives to which people adhere in furtherance of their own interests or in pursuit of the validation of their own outlook. With this decline in the status of truth comes also the threat of the manipulation of the new mode of knowledge creation, dissemination and authentication by individuals and groups pressing particular political ends. Extremists, fundamentalists and criminals use the blurring of truth and knowledge to perpetuate misinformation and lies. In his acerbic attack on distributed and decentralised processes for managing the creation, dissemination and use of information, Keen can perhaps be superficially counted and the research library's friend.

While *The Cult of the Amateur* has been widely criticised for its theoretical naivety and overconfidence in the impartiality of traditional mediating institutions and infrastructures, what I think is more important is an underlying anxiety that it exposes. (Even the similarity of the title with Roszak's 1988 work *The Cult of Information* points out a set of deeper rooted concerns with which it engages). At stake in the debate over participatory culture are two competing views on the nature of knowledge and the nature of information as they are embodied in social practices. It is a contest that has a profound consequence for the future of the library profession. I have already noted that information has traditionally been equated in the ethos of librarianship with the vehicles that enable its retention and transmission, and this tends to reify information in the material artefact. In a similar way, knowledge has traditionally been treated as something existing semi-independently of cognition and social processes, as if you could open up someone's head and pour the knowledge out. Knowledge becomes information when it is codified in material artefacts of one kind of another, and information becomes knowledge when it is internalised by the cognisant individual; the transformation between the two is perhaps a substantive rather than formal issue. These ways of framing information and knowledge involve their objectification in two senses: they are both turned into objects, and measured by their ob-

jectivity. That objectification exteriorizes truth and knowledge in relation to the subject, and contributes to the investment of authority in institutions, mediating structures, and individuals. Under these conditions, control over the apparatus of knowledge production and dissemination became synonymous with control over knowledge itself, and traditional sites of authority possessed a powerful hold over what comes to be constituted as truth.

The rise of participatory culture - exemplified by the technologies of Web 2.0 but always also an ongoing agenda within the computing subculture - undermines the tendency for objective knowledge to sediment in the vessels of its transmission and dissemination. It does so precisely because it undermines the stability of the cultural artefact in which knowledge is petrified as information. It is this decline of certain mediating and stabilising structures that lies behind anxieties about the fragmentation of truth and objectivity in the digital age; the loss of stable information artefacts seemingly threatens to undo modernist Enlightenment ideas precisely because those ideals were heavily invested in the apparently stable artefacts of a predominant print culture. This reflects perhaps a broader shift in the dominant epistemological paradigm of the late information age; a shift in the way in which we frame the idea of knowledge and knowing in advanced technological societies. It is important here to make a distinction between formal epistemologies and embodied epistemologies (or what Foucault (1980) named *epistemes*). Formal epistemologies are those formalised theories about the nature of knowledge and the nature of knowing that emerge through different discourses and different philosophical traditions. They are, of course, highly important in securing the validity of various theoretical discourses and research traditions, and were as varied in the age of print where schools of thought such as empiricism or pragmatism competed over the status of truth and knowledge. Not entirely unrelated to these formal systems, but nevertheless not formally articulated in any particularly rigorous way, are those epistemological assumptions that become embedded in various social processes and activities, not least of which is the social and culturally situated process of the production and dissemination of information and research. The values that come to be associated with institutions such as the university, the press, or the broadcaster, and with artefacts such as the book, the journal or the database, also embo-

dy epistemological assumptions that remain on the whole unarticulated, quietly exerting their influence on society and culture. It is in the embodied epistemologies of the social practices of information in rich and technologically dependent societies, but also in the culturally situated modes of knowledge creation, dissemination, and validation, that the real challenge digital culture poses to the library is situated.

The idea of the library as a central repository of information and storehouse of codified knowledge finds itself out of kilter with the ways in which we come to regard knowledge and information in the digital age. If the modern age, culminating in the scientific and technological revolutions of the nineteenth century (themselves deeply implicated in the origins, values and practices of academic librarianship), was established on a broadly progressive epistemology assuming the accumulation of information and knowledge over time and the gradually improving understanding, then the social media revolution of the twenty-first century is establishing itself on an embodied epistemology that is a good deal more pragmatic and constructivist. Social media impliy that knowledge is not given, but emerges in the social process through the collaboration of many individual who together create something that is greater than their individual understanding. In addition this process is informed by a certain pragmatism, a reflection on what works rather than on unattainable ideals of objective truth. Thus for example the constantly unfinalised and evolving nature of Wikipedia reflects pragmatic notions not of stable objective truths, but of pragmatic contingent truths. Every where we look, from user-generated content on the television, to the open forums of newspaper websites, the open participatory field, perhaps a modern day *public sphere,* is emerging (see: (Habermas, 1989; 1997; Papachrissi, 2002).

This subtle shift in the episteme is of concern for the future of the research library because the model of the centralised library collection in many ways is directly opposed to ideals of participatory culture. The library collection represents a pre-filtered set in an age where post-filtering of information is becoming the norm. It reflects not the emerging values of a participatory culture in which information of value and interest emerges from the general processes to which it is subjected, but the petrified values of an age of print in which a stability of knowledge was assu-

med. Furthermore the items in the library collection are not open to negotiation, re-situation, or reincorporation within other contexts in the way that the information in a wiki or blog is. The materials in a library collection are overwhelmingly static in an age where static implies the incorporation of somebody else's ideals. It is therefore the managed nature of the library collection itself that sets it at odds with the changing technological landscape of the digital age. The kinds of organising structures that the managed collection epitomises reflect precisely those impositions on information and knowledge that the pioneers of the emerging web enabling participatory culture were trying to overcome. And this basic antipathy suggests something rather concerning: that the library itself has been a part of the apparatus of control through which information and knowledge are regulated, the kinds of apparatus which the open everything movement directly challenges. Anxiety about the influence of the press and media expressed in one of the quotes given above echoes uncannily similar issues raised over half a century ago by Gramsci in his description of coercive hegemonic institutions, but with some interesting variations. Gramsci wrote:

> The press is the most dynamic part of this ideological structure, but not the only one. Everything which influences or is able to influence public opinion, directly or indirectly, belongs to it: libraries, schools, associations, and clubs of various kinds, even architecture and the layout and names of streets. (2006)

Rather than a neutral storehouse of knowledge, the library perhaps perpetuates the interests of the dominant ideologies precisely by legitimising information in its inclusion in the collection. Elsewhere I have made the point that decisions made in collection management are explicitly ideologically situated, even though the information professions in the various guises tend not to see the role in ideological terms (Tredinnick, 2006). What comes to be constituted in the collection has an influence on the parameters of future research and investigation. But the ideological element of librarianship saturates not only collection development, but the entire approach of the profession to managing information. Wiegland for example has argued of something as seemingly innocuous as Dewey Decimal classification, that "it is probably

[…] fair to say that for the past century the scheme itself has quietly – almost invisibly – occupied an influential position as one of the forces sustaining the discursive formations of a Eurocentric patriarchy" (1998). The library has perhaps inadvertently become complicit in the centralization of hegemonic control over information, the very kind of control against which the technologies of participatory culture are amassing.

These broader social and cultural changes represent significant challenges to the future of the research library, and make it possible to envisage a time when scholarly information is accessed through distributed digital services either dependent on commercial interests or collaborative projects by scholars and researchers themselves. The death of the research library will not occur as an incremental series of technological changes leading to an inevitable dwindling and decline. It will occur as a Kuhnean paradigm shift, a revolution in the practices, habits and assumptions of a new generation of researchers raised with a very different set of values about the function of research and the value of research information (See: Kuhn, 1970). While libraries can still generally rely on the good of their will of their patrons, and there is still a strong sense in which the library profession brings something to the collection that cannot be replaced by online databases and information services, these attitudes are slowly changing. A generation of researchers are now emerging whose research habits and attitudes are no longer rooted in the material collection, no longer aspire to the stable information artefact, and perhaps no longer recognise Enlightenment ideals embodied in the very idea of the library and scholarly publishing tradition of progressive knowledge through accumulation of established truths. When the death of the research library finally comes, it may appear rapidly, but it will have been generations in the making.

Future library qualifications

What future then is there for the research library? Something is changing in the nature of authority in the digital age that places the research library in a precarious position. How we interact with sites of authority and truth, how we understand information and knowledge is becoming less secure, less determinate, and more fluid. This change emphasises the importance of understanding the process of knowledge creation, transmission and use, and of critically evaluating the competing truth claims to which we are subjected. As we become deluged by information, and deluged by claims to truth, the mode of authentication becomes reinvested in a critical participation in discourse. The value of first-order knowledge *about* things, including facts, data, theorems and information, declines in importance for the individual. In its place, the value of second-order knowledge about values, assumptions and aspirations increases. In the digital age, where information and data are cheap, proliferating through digital environments and always at the end of a search-engine query, the value of knowledge derives from understanding the process through which truths become authenticated, and the underlying assumptions, values, biases, presuppositions and belief systems that inform that process. Digital culture emphasises not the act of *knowing* per se, but understanding both the uses to which knowledge can be put and the contexts in which it can be situated.

This, of course, has wider educational implications, implying the importance of new skills in understanding the information artefacts and sources of the digital age. And just as with library literacy and information literacy previously, the library profession has an important contribution to make in the provision of this. But it is also important to recognise that this critical engagement with information matters just as much for the library profession as it does for library users. Librarianship cannot escape a broader engagement with the economies of information in the digital age. Those economies are not really a matter of the kinds of information that exist, but rather of the uses to which they are put. Melvil Dewey famously argued that librarians should not concern themselves with what is inside the books they managed, and should focus only on those books as information artefacts with certain material and conceptual qualities (Battles, 2003). In other words, librarianship should not get itself involved in substantive subject-level debates about the value of particular pieces of information, but should only aspire to organise that information which exists and make it available and accessible. In many ways it reflects an enduring attitude within the profession that the ethics of information are outside of its remit. But that is not, I think, an attitude that can prevail in a digital information culture. Librarians cannot hope to understand the emerging mutable information resources of the digital age

without also knowing both the uses to which they are put, and the substantive issues that bear on their drift and change. In my book *Digital Information Contexts*, I suggested that:

> [A]n alternative view may have the information profession accepting its active role in the promotion of certain forms of knowledge as a part of the wider cultural process of knowledge creation and dissemination. This would require the information profession to become explicit about the cultural values that underwrite its practices; or in other words require the information professional, contrary to tradition, to care about what is inside the books. The outcome would be the scholar-librarian, an active participant in the discourses that surround particular collections, a contributor to the generation of new knowledge around subject areas, as well as to the arbitration between competing points of view (Tredinnick, 2006: 225)

This is perhaps a rather naive aspiration, but it does, I think, highlight something quite important: that the information professions need to move away from thinking about information as a series of material things of which they are custodians. They must begin instead thinking about information as a process both complicit in and dependent on the entire social context in which it is used and consumed, and furthermore in which it has itself a vested interest. The library of the future cannot be conceptualised as a politically neutral storehouse, isolated from the social activities that it serves, but only as an active participant in forming the opinions, attitudes, and understanding of the wider research tradition. That is to say, libraries in a very real sense *create* the meaning of the information in their collections through the practices of the profession, and when intervention at the level of the text itself becomes the normal ways of engaging with information, this will only be exacerbated. This places a new ethical responsibility on librarians to consider how the collection itself comes to influence the way in which people experience and understand the world. It means, in other words, that the information profession has to become more critically engaged with those debates which through their professional activities they also help mould. The value of the library is not merely in making available and accessible information that would otherwise be hard to find. If it were, the research library would have no future. The value of the library and

of the managed collection is also in the relationships that it makes between disparate information. These are relationships that are already situated in particular traditions, practices and beliefs. We need to be explicit about that. The added value that librarianship can bring to the collection may come from an explicit critical engagement with sources, not at the level of the artefact, but at the level of the text. Librarians perhaps can become specialist generalists, engaged with the debates that inform the scholarly research process, and able to remediate information through real subject expertise.

This might require a change to the way in which library education is delivered. Like many professional subject areas, library and information education has always had an uncomfortable and unresolved relationship with the idea of professional training. While professional educators would like to believe that they are involved in something a little more pedagogically sophisticated than is implied by the concept of training, nevertheless core professional activities and defined bodies of knowledge continue to apply that professional education is to some significant degree a matter of imparting practical skills and knowledge. The range of those skills and that knowledge have shifted, from cataloguing and classification to web design, database management and information architecture. But library education still remains focussed on real world professional practices. I personally do not have any real problems with this; it is in the nature of professional and vocational education to be focussed on employment needs of the wider professional community. But I do think there is room also for a new generation of information education courses that are specifically targeted to engender critical reflective practices within the library and information profession. These new courses should not replace existing provision, but should supplement it.

This is why at London Metropolitan University we have been working for a number of years to develop doctoral level qualifications aimed at the needs of practicing information professionals. Over the last decade there has been a significant diversification in the kinds of doctoral awards offered in the Higher Education sector in the UK (Powell & Long, 2005). One of the more important factors in this diversification has been the development of professional doctorates. The Professional Doctorate usually consists of a larger taught element than traditional doctorate pro-

grammes, with teaching delivery to larger cohorts, and a greater emphasis on peer support. They have predominantly been linked with professional subject areas, such as Education and Social Work. The UK Council for Graduate Education's report on Professional Doctorates notes:

> In structural terms, it is effectively a form of taught doctorate, but the field of study is that of a professional discipline, rather than academic enquiry and scholarship (2002: 16).

Notwithstanding this, many professional doctorate programmes in the UK combine a greater emphasis on taught components, with the traditional emphasis on independent research capable of making an original contribution to knowledge (UKCGE, 2002; Powell & Long, 2005). Professional doctorates in librarianship and information management would be unlike a traditional doctorate study, which in the UK functions predominantly to prepare students for a life in academic teaching and research. Instead they would combine doctoral level taught components and independent research structured around professional careers. Programmes of this kind have the potential to fill an existing gap in the careers and professional education of librarians and information managers, which like other professions in which professional doctorate models have been a success, follows a pattern in which individuals tend to achieve professional recognition relatively early in their careers.

But the broader advantage of a new generation of doctoral level education targeted specifically at the needs of practising librarians and information professions is the real opportunity of not only providing higher level professional education but also of enhancing the profile of librarianship and information management in the minds of the user base that it serves, a user base that is perhaps coming to regard the custodial role with increasing scepticism and mistrust. It would enable librarians in research libraries to justify their professional activities as equally critically sophisticated and equally engaged as the academic and research community that they serve. More importantly, it would enable librarians, as themselves practicing scholars, to contribute to the research process not merely by providing the tools that make research possible, but also by contributing to the debates and ideas that underpin the research agenda. There is still one real competitive advantage that the library profession has: its understanding of and access to those collections to which it has contributed. The collection, as a collection, encapsulating a social history of particular research centres and institutes, brings its own unique value that is more than just the aggregate of its parts. And librarians are uniquely situated to realise that value through real and substantive critical engagement with what is inside the books.

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