Design Choices for Libraries in the Digital-Plus Era

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Abstract: Libraries are more important, not less so, in a digitally networked era. Despite the fact that today's mobile devices feature Google's search box and Apple's Siri to help us find a quick answer to just about any question, we ought to be investing more capital than ever in our public libraries. We need libraries in the digital era to provide a public option to ensure sustained, free, equitable access to knowledge and preservation of our cultural and scientific heritage. In a period when both the analog and digital are useful, the design choices for those building, and reimagining, libraries are many and complex. We ought to design our libraries to meet the near-term possibilities of a networked environment, as well as the long-term requirements of democratic societies and the practice of scholarship. These design choices involve trade-offs and new commitments that may pit future activities against entrenched present-day interests. The essential design choice is between reliance on ever-more efficient interfaces, often developed by commercial outfits, and interfaces that are developed by the library community, engaging the public in coproduction and extending outward via the networked public sphere. The fate of libraries as vibrant institutions with broad public support could turn on the outcome of these design decisions. The challenges facing libraries also inform conversations about the future of other public-facing institutions, such as schools and newspapers, which are important contributors to an informed citizenry and a vital republic.

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The main building of the Chicago Public Library (CPL) occupies a full city block downtown. From the outside, the building is massive and imposing, yet also appealing in an institutional way. Once inside, however, the building is far from intuitive. You are not met by a warm and welcoming reading room. There's not an obvious pathway to the popular books and DVDs, which are floors away. You find yourself instead in a warren of long hallways, occasionally punctuated by guards and metal detectors: unmistakable signs of the time we live in and the realities of running a public institution in a big city.

The essential concern that animates this essay is this: what if people turn away from imposing buildings like the massive Chicago Public Library and turn instead to their mobile devices, serviced by commercial firms, to meet their needs for knowledge and information in an increasingly digital future? If that

comes to pass, what will democratic societies lose? And can librarians, or any of us, do something to head off this outcome?

Brian Bannon, the commissioner of the Chicago Public Library system, is responsible for keeping his library essential and relevant to his city. Bannon and his team know they have to make the main library building, as well as its dozens of branch libraries, accessible and inviting to today's diverse population of Chicagoans. More broadly, Bannon has the job of ensuring that his library is a relevant public institution in a digital age. Libraries cannot afford simply to continue doing things as they have done in the past, assuming that the public will find them useful and that public officials will, in turn, continue to fund them. Bannon – not alone among big-city library leaders, but among the most inventive and forward-looking – has acknowledged this challenge and is meeting it head on, with a modern design sensibility and a highly networked approach.

The challenge facing all library leaders as we transition from an analog era (of atoms) to a predominantly digital one (of bits) is multifaceted. Materials today are typically created using digital platforms, though they are often later rendered in other formats. Think of this journal, or the newspaper you read in the morning. Each was initially produced as a digital file, on a computer (this essay, using Microsoft Word and Google Docs), and then rendered in a variety of formats. In the case of this issue of *Dædalus*, it will exist as both a printed journal and as a digital file, perhaps even in a range of digital formats. In the future, materials will be mostly accessed in their digital forms; the trends in use clearly point in that direction. It is for this reason that I argue we are in a "digital-plus" era of libraries: not everything must be digital, but materials tend to be born digital and, thereafter, take a variety of forms through which people access them.

The need for libraries to provide information in a heterogeneity of formats stems from a heterogeneity of preferences among those who interact with these materials. The challenge for libraries is to find a way to keep up with the rapid changes in the desires and expectations of citizens regarding the type and nature of information that libraries provide. The formats of materials are shifting rapidly: from vinyl to cassettes to compact discs to MP3 files to streaming services in audio; from enormous film reels to VHS and Betamax to DVDs and Blueray to myriad other digital formats in video and film; from the traditional printed codex (our familiar book format) to all manner of digital files for monographs, journals, and other text-based works. What's more, in each medium there is wide disagreement on which format is superior. And within any community, a librarian finds a split in preferences. While the growth in eBooks is sharp and unmistakable, many readers – of all ages, it turns out – still prefer the feel of a real book in their hands. (Though I work to build digital libraries, I share this same preference.) A librarian needs to be able to meet all these varied desires in order to keep patrons coming back, whether their interests are traditional or new-fangled.

Expectations about the services that librarians ought to provide are also changing quickly. From the libraries of antiquity until well into the twentieth century, a library could succeed by serving as a well-indexed, well-organized storehouse for printed materials. Patrons had no choice but to come to a physical space – often a glorious one – to consult the materials and to seek help in finding knowledge that they had previously not encountered. Today, so much knowledge – as well as misinformation – can be found instantaneously by anyone literate and wealthy enough to own a smartphone, tablet, or computer. Consider what has happened to the market for printed copies of the *Encylopædia Britannica*: is there a single

encyclopedia salesperson going door to door today, as they once did in large numbers? The worlds of reference, of book provision, of news and information – they have all undergone radical change in a few short decades. That change shows no sign of slowing down.

Mr. Bannon faces, as do all library leaders, these many issues at once, without major budget increases to foot the bills. Bannon's answer has been to be both excellent at traditional librarianship and creative about offering new services. He has ensured that his library is a part of broader networks of people working toward common ends. In adjusting the way the Chicago Public Library operates, Bannon has managed to get in front of the changes and align building, staff, and services to the needs and interests of the communities they serve. For instance, one way the Chicago Public Library has attracted more visitors has been to observe what they do in the library and what they do not; to ask them what they want and what they could do without; and to make adjustments accordingly.

One way to preserve libraries as public access points and repositories for culture and knowledge is to ensure that people of all ages keep coming in to use them. That previously uninviting first floor of the main Chicago Public Library building today hosts a large number of adolescents every afternoon in a space called the YouMedia teen learning space.[1] YouMedia is instructive and important on multiple levels. One is that the young people using the space are involved both in the enjoyment of cultural materials and in the creation of new materials. The space includes printed books, attractively set forth on well-positioned shelves, alongside other age-appropriate physical materials. But the space also features a range of digital devices, used both for interacting with and creating digital images, sounds, and text. The staff who work in the You-

Media space are expert at engaging young people in the hybrid world of the digital and the analog. And the YouMedia space is an oasis in the hectic city; whether hot or cold outside, the center is a safe, attractive, warm environment for teens to congregate in, not far off the street, in the city center.

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The YouMedia learning space demonstrates the design sensibility that helps keep libraries vibrant, as well as the importance of libraries operating as nodes in a network, rather than as standalone facilities. YouMedia came about as a partnership, not just a library-only activity. The core funding has come from the John D. and Catherine T. MacArthur Foundation; the intellectual capital has come from academics and activists; the staffing has been drawn from multiple networks of people interested in kids, technology, and education, as well as libraries. And in turn, YouMedia facilities have cropped up in other cities (including, for instance, Miami); other foundations have stepped up to fund these related efforts; and a new network, spanning communities around the country, has emerged to support teen learning. One space and one team will always be the first, and surely there is pride of place; but more important, the network effect ensures that the whole is greater than the sum of the parts. Librarians who can create and nurture such partnerships stand to benefit enormously.

To draw in new patrons and build strong networks, the Chicago Public Library has done more than just incubate the YouMedia learning space. Entrepreneurs and tinkers are drawn into a new "maker" space devoted to innovation and creativity in that same massive building, just upstairs from YouMedia. The Library has also helped to host and support national and international networks of librarians who are involved in the reinvention of libraries, including through the Digital Public Library of America (DPLA) and the international NEXT Library network.

As one of the great urban public library systems in the world, the Chicago Public Library ought to continue to circulate books, operate its eighty appealing branch locations, and manage an important physical collection. In 2014, the roughly thousand-person staff made services available to ten million visitors and circulated another ten million materials.[2] But the CPL takes none of this activity and popularity for granted in what are uncertain times to work in any aspect of the information business. Rather, the CPL is showing how a focus on design sensibility and building networks can ensure that libraries secure both visitor and financial support and thrive into the future.

The design choices for libraries during this period of transition come fast and furious. Each type of library – whether a university academic library, a public elementary school library, a special library, or an archive – must question its priorities and vision for the future. Choices are prompted, in part, by the aging of buildings. More acutely, the changes are brought about by the question of whether to invest more in on-site physical objects, or in digital works. These digital works are not owned and stored in the traditional way – they are not "bought," "shipped," and "shelved" – but are shared and made available to patrons near and far. Librarians who serve patrons directly must decide how to spend their time: by making themselves available at a reference or circulation desk, or by focusing on instant messaging and responding to online queries. Libraries who manage collections must decide whether to emphasize aggregation of shared materials or curation of unique collections.

These library-level design choices roll up to a society-wide decision about access to knowledge. One option is to continue the present trajectory toward access to knowledge increasingly through commercial interfaces. These interfaces are improving in efficiency, beauty, and accessibility at a fast pace. Some of these interfaces are supported through advertising; others are pay-per-use; but uniformly, the leaders are commercial. Libraries, in this model, would accept their reliance on these commercial services and would instead focus their attention inwardly and locally, serving communities through the space the library can provide and by setting these materials in helpful contexts. Another option is for libraries to compete with these commercial firms, developing systems at networked scale that would serve the public through networked interfaces as well as through the local, physical interfaces of their buildings. In this second response, librarians would function as networked actors, their physical presence being nodes in that larger network of public-facing cultural heritage institutions. Either way, librarians must change the way they conceive of their role.

The existing architecture of a wonderful, historic library and shifting formats are not the only constraints facing libraries during the transition from the analog to the digital. The other major challenge involves personnel; put more precisely, the way in which librarians have been trained. Many active librarians learned through countless hours of disciplined practice in a very different environment than now exists, predominantly based in analog materials and associated services. This challenge is not lost on librarians; the topic is addressed, one way or another, at nearly every library conference. A growing cohort of librarians has made the transition from an analog-era outlook to a digital-era approach. Others have not.

Instead of thinking of them as standalone institutions, we ought to reconceptualize libraries as nodes in a network and librarians as networked actors. Each library, or node, serves both people immediately proximate to the library in physical terms and those who are interested in the library's contents but are remote from it. Each librarian,

in turn, is a networked actor, involved in so-cial production of knowledge on a scale much larger than the library in which she or he physically works. For example, in addi-tion to serving patrons standing in front of them, librarians undertake the act of work-ing with a highly distributed group of peers, all devoted to the task of building a digital knowledge commons.[3] The notion of librar-ianship takes on a yet higher profile: librar-ians have a role to play, as collaborative ac-tors, in developing, curating, and making ac-cessible the world's knowledge on a grand stage.

Librarians who operate as networked ac-tors are already rethinking their roles and redesigning libraries as institutions, from the inside out. Librarians who learn to hack systems, in collaboration with other public-spirited actors, are positioning themselves for success in their profession as it continues to morph toward the digital. These librari-ans will focus on serving the public good be-yond the immediate needs of the patrons in their community. This shared work will thus serve all communities better.

New platforms can assist networks in functioning well. For libraries and librari-ans, a common, open, distributed technol-ogy platform can bring together the tech-nology, people, code, materials, and spaces in ways that will serve the public during this hybrid era of print and the digital. In the United States, the Digital Public Library of America is designed to serve the role of shared platform. The DPLA is an open dis-tributed system for sharing the cultural, his-torical, and scientific heritage of the Unit-ed States. As a platform, it also functions as a test environment or, at the risk of mixing the metaphor, a "sandbox" in which this reinvention process can happen.

On one level, the DPLA is an open-source repository of code, tools, and metadata. As a repository of code, the DPLA makes avail-able the computing know-how of a subset of a community to everyone else in that

community. Just as many aspects of the In-ternet have come to run on open-source code, the library world can share the core systems that make knowledge available broadly. As for tools, the DPLA encourages people to come up with mechanisms for sharing information and knowledge in new, graphic, enticing ways. Examples of these tools include means to integrate library ma-terials with Wikipedia, the peer-produced online encyclopedia; ways to display books and other materials on an online "book-shelf" that can extend forever; and ways to sort materials based on what types of knowl-edge people have accessed in the past (pro-tecting the identity and privacy of individ-uals in the process).

As for metadata, the DPLA pulls together the digital materials that librarians from across the globe have digitized and made available online. Large institutions – such as Harvard University, New York Public Library, and the National Archives – con-tribute millions of records, making them easily accessible to the public. When Har-vard digitized its Emily Dickinson papers, for instance, these materials could be ac-cessed directly through the university's websites, or through the DPLA. Likewise, a local library could take the metadata – the data that describe the Dickinson papers – and point directly to the sources for their local users.

Smaller institutions, too, can contribute their materials to this shared repository. Through a series of state hubs, or "on-ramps," to the national database, local his-torical societies, libraries, and archives can digitize materials and then share them with the world. For instance, a postcard collec-tion held at the Boston Public Library, scanned and shared through this national platform, has made available historical im-ages that show the Little Missouri River in the Badlands of North Dakota and the Ring-ling Museum in Sarasota, Florida.[4] Maps of the Atlantic continents, showing the change

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in perception of land and sea over hundreds of years, held in trust by a New England boarding school, have been digitized and shared such that the maps can be used in classes and by scholars anywhere in the world.[5] These materials would not become accessible to the public without the hard work of librarians, trained in the art of digitization, metadata creation, and online storage.

By operating as nodes in a network, librarians can make their materials more broadly accessible to others, and in turn make accessible to their own users materials held elsewhere, all in an instant. Kept locally, materials are of limited utility; shared globally, via a well-designed network, these materials have far greater value. The DPLA includes large stores of open-access metadata and content, intended for curation and reuse in specific communities.

The DPLA is fundamentally a network of people who want to serve the public as well as possible, by and through digital technologies. The DPLA is designed to be a mechanism to support librarians in crafting and honing their role as nodes in this new, highly networked environment. As a platform, the DPLA can also help support the professional development of librarians (in the service of their patrons). These librarians might still be students; they might be seasoned veterans; they might be retirees with active minds and the will to continue to give back to society; they might work in public or private libraries. While one size never truly fits all in libraries, a common platform and commitment to retraining can be broadly effective across environments.

The network of library professionals, library schools, and cultural heritage organizations that are coming together around the DPLA are also, together, creating a training and retraining system on the national scale. A system such as the DPLA builds upon its network of service hubs – currently up and running in more than one-third of states –

to create both a curriculum and training programs to develop skills and capacity within public libraries. Through a series of workshops and online webinars, librarians come together to train one another in the latest new technologies and design techniques. Together, they are building the required skill set in the community while also adding to the availability of materials and code.

This collaborative, distributed approach both to social production and to professional development can work. The idea is to build upon existing relationships and organizations, such as state librarians and their counterparts, wherever possible, avoiding the need to create redundant networks. The outcomes of this networked activity are twofold. First, library students, current librarians, and library volunteers around the country would be trained with new skills, using DPLA-related open materials. Second, these librarians would constantly be creating, through their training, curated exhibits and materials that will be immediately useful to their patrons and to all those who use the DPLA, whether in the United States or elsewhere.

The specific activities in this professional development curriculum include the use of DPLA materials to establish curated exhibits. These locally relevant projects support schools and their libraries in meeting the needs of young patrons. For example, through a DPLA-supported training, a public librarian might establish a customized web environment for the fifth graders in his or her town to understand a scientific phenomenon (such as kinetic energy or the phases of the moon) or a local historical event (such as the California Gold Rush for San Franciscans). The exhibit could be co-developed with local school librarians and teachers to ensure its relevance. If the librarian's work is effective, the resulting metadata could be harvested for broad reuse.

This experiential learning approach can bring librarians in direct contact with some

of the most promising new open-source technologies. For instance, the open-source platform Omeka provides a toolkit for librarians to use as part of the library reinvention process. Omeka is a simple-to-use, inexpensive way to publish digital collections online. The tools that the Omeka team has developed are designed for librarians, archivists, and museum staff who want to curate digital materials into online collections that will entice their patrons. These online collections are networked to one another, as well, such that they can be shared broadly outside the library, archive, or museum where they are created. The work that one librarian does can make the job of the next librarian (seeking to curate a similar or even distantly related exhibit) much easier.[6] The existence of open and free systems such as Omeka is a major reason why this process of reinvention could work today.

The primary advantage of a networked model, supported by a networked community and organized around a common platform, is that it can scale itself sustainably. Think of the extraordinarily quick growth of the Internet and, more recently, the World Wide Web, which is just twenty-five years old. Wikipedia, today one of the world's most frequently visited websites, likewise grew rapidly as a result of this distributed, networked model. The growth of shared resources through a shared platform and social production can sustain libraries and their users for this generation and beyond. New partners – for instance, library and information schools, or related cultural institutions such as museums – could join the network at any time and enable it to expand and grow further.

The constraints and possibilities facing libraries today are important for their own sake: libraries matter a great deal to the proper functioning of our democracy and to our scholarly enterprise. The inquiry into the future of libraries also contributes, though, to our understanding of the nature and importance of public-facing institutions in broader terms. Institutions devoted to the common good, and that have information and knowledge at their core, face similar challenges to one another in a digital era. Libraries are joined by schools and newspapers as institutions under threat of disruption from digital-age competitors; and each also plays an essential role in modern democracies. Profit-seeking competitors to these essential public-facing institutions pose a threat to the extent to which our citizens can inform themselves and participate in effective ways in civic life.

Our risk is that public-spirited services, today provided by libraries, schools, and newspapers and motivated principally by shared interest in the common good, will become the province of profit-driven entities that provide these services less effectively and, perhaps, less ethically. In the field of libraries, there is reason to fear that the runaway success of Google in information retrieval and Amazon in the sale of digital books, music, and movies will draw people away from reliance upon libraries. Even if nominal, this change would cost society in the long run. Libraries and the librarians who work in them serve an essential purpose in a democracy: to provide information and knowledge, free of charge, to people who rely on it as life learners and civic actors. Librarians have no incentive to promote one work over another or one product or service over another; they serve the patrons and their interests solely, and they do so with a fierce commitment to user privacy. These commitments, which are not shared by librarians' commercial counterparts, support the proper functioning of our democracy.

The spheres of education and journalism are closely related to libraries in this respect. Schools and newspapers, like libraries, are under threat from the widespread adoption of digital technologies. Newspapers

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already suffer from declining advertising sales and decreased subscription revenues, siphoned off to the web and to search-related advertising. Schools have been less plainly affected to date, but threats from online courses, offered at massive scale, have sent shockwaves through higher education in particular.

The best design choice for leaders in libraries, education, and journalism is the same: resist a world in which the role of public-spirited institutions is dramatically reduced in favor of commercially oriented firms offering slick interfaces. In each field, digital media and networked modes of collaboration can support the core mission of public-facing institutions. In each field, the practice of professionals must change to meet the evolving expectations of those whom we serve and those who pay the bills. In this, the leaders of these institutions must continue to hew to the traditional princi-

ples and activities that make their work so effective and important to society: independence, trustworthiness, dependability, and a public-spirited orientation to providing access to knowledge.

The philosophy and methods that have enabled the online world to grow and thrive so quickly can serve librarians, educators, and journalists, too. A commitment to a design sensibility that is oriented toward the needs of users, whether online or in physical spaces, is a crucial starting point. A re-orientation toward working not alone, but as networked actors, wherever possible, and using digital platforms in a mode of social production, much as technologists have, is equally important. The nature of the practice in these fields, and of the firm itself, is changing and needs to change, in order for libraries, educators, and journalists to thrive in a digital-plus era.

ENDNOTES

[1] Chicago Public Library, "YouMedia," http://www.chipublib.org/youmedia/.

[2] Chicago Public Library, "Facts and Figures," http://www.chipublib.org/facts-and-figures/.

[3] Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom* (New Haven, Conn.: Yale University Press, 2006).

[4] Digital Commonwealth (Massachusetts Collections Online), "Little Missouri River in N. Roosevelt Park, North Dakota Badlands," Boston Public Library Tichnor Brothers Postcard Collection, https://www.digitalcommonwealth.org/search/commonwealth:xw42n8060; and Digital Commonwealth (Massachusetts Collections Online), "Ringling Museum, between Sarasota and Bradenton, Florida," Boston Public Library Tichnor Brothers Postcard Collection, https://www.digitalcommonwealth.org/search/commonwealth:41687m16r.

[5] Caroline Nolan, "Connected Learning in Practice: The Sidney R. Knafel Map Collection," Tang Institute at Andover, Phillips Academy Andover, http://tanginstitute.andover.edu/2014/04/connected-learning-in-practice-the-sidney-r-knafel-map-collection/.

[6] Omeka, http://omeka.org/.