(In)accessibility and the technocratic library: Addressing institutional failures in library adoption of emerging technologies
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Abstract
Since 2015, there has been a rapid increase in academic libraries focusing their services on artificial intelligence (AI), immersive technologies (XR), big data, and other technologies that align their interests with corporations in the tech industry. However, there are broad ethical failures within this industry that libraries are not equipped to manage and instead risk importing those failures and discriminatory thinking into library services and technologies. This paper draws on the authors’ research on XR accessibility in academic libraries to illustrate how broader trends in technocratic thinking in academia are producing socio-technical configurations that often exclude disabled library users. It argues that critical failures in designing and implementing accessibility programs for emerging technologies in academic libraries point to the broader technocratic imperatives of contemporary universities operating under the logics of neoliberalism. Accessibility is an afterthought in this context, forcing users to adjust their bodies and senses to conform to the master plans of technology designers and evangelists.

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Introduction
Since 2015, there has been a rapid increase in academic libraries focusing their services on artificial intelligence (AI), immersive technologies (XR), big data, and other technologies that align their interests with corporations in the tech industry. However, there are broad ethical failures within this industry that libraries are not equipped to manage and instead risk importing those failures and discriminatory thinking into library services and technologies. In particular, broader trends in technocratic thinking in academia often exclude disabled users from the provision of new technologies in libraries. Accessibility is an afterthought in this particularly fraught context. Increased adoption of technology is typically supported using the rhetoric of increased access for users while silently excluding disability. These innovations for non-disabled users can become a justification for the exclusion of others (e.g., UX designers claiming accessibility comes at the expense of aesthetically pleasing Web design for sighted users) forcing disabled users to adjust their bodies and senses to conform to the master plans of technology designers and evangelists.

This paper examines how library adoption of business frameworks, the lean startup framework in particular, contributes to current failures in adequately supporting accessibility of library technologies for disabled users. Importing business frameworks results in the same technological solutionism that Silicon Valley uses to drive technocratic innovation (Mirza and Seal, 2016; Morozov, 2013) which assumes that new digital technologies are the best and only path forward for solving society’s big challenges. Libraries, by buying into these ideas, then adopt the ethical and structural gaps that are fundamental to these companies and their business models. Aside from accessibility, these gaps are illustrated by evident ethical failures in a number of areas including fair and equitable labor practices, including discrimination and sexual harassment lawsuits filed against major
tech companies such as Uber (Hawkins, 2019), Ubisoft (Gach, 2021), Activision Blizzard (Fenlon, 2021), and Google (Sonnemaker, 2021), not to mention the aggressive suppression of employee organizing by Amazon (Green, 2021; Streitfeld, 2021) and other corporations. There are also broader ethical failures across a range of corporate sectors, including the notorious exploitation of user data by Facebook (U.S. Senate Committee on Commerce, Science, & Transportation. Subcommittee on Consumer Protection, Product Safety, and Data Security, 2021), the overall reliance of the tech industry on the exploitation of workers and natural resources in economically exploited countries (Toh, 2019), and the increasingly exponential demand for server space, which negatively affects the environment (Siddik, et al., 2021). These problematic corporate positions against labor rights, diversity, and privacy, and support for neo-colonial exploitation, are all supposed to be antithetical to the values of higher education, even more so to those of libraries. Domino’s Pizza’s pushback against making its Web site accessible, despite access to developers and technical support (Vu, 2021), was particularly illustrative of the general disregard corporations can show towards disabled customers. As library budgets decrease, technocratic and neoliberalist discourses are increasingly used to push libraries away from functioning as public services, and more towards emulating the profit maximizing practices of the corporate sector. This is particularly evident in higher education. Like Domino’s, many institutions have access to in-house, or vendor support to make the bare minimum changes to their Web site. However, the 132 open investigations, listed by the Office of Civil Rights at the time of drafting, against post-secondary educational institutions related to the accessibility of Web sites and online courses demonstrates the prevalence of persistent accessibility issues (U.S. Department of Education. Office for Civil Rights, 2022).

These contradictions are reflective of the current economic pressures placed on higher education, and academic libraries by extension, in general. Academic budgets are stressed by increasingly inflated operating costs due to continued expansion in new facilities and middle management positions and increasing reliance on tuition due to decades of decreasing public funding for higher education, along with demographic shifts that are leading to shrinking student applicant pools. This has resulted in schools competing with each other to be more “innovative,” offer more student perks, build new facilities, and prioritize more profitable academic programs (and cutting less profitable ones) in order to maintain and increase enrollment. Many universities have adopted neo-liberal budgeting models that force university units and academic departments to compete with each other for resources, with funding reduced for any university programs that are not contributing enough to student enrollments and generating tuition revenue. This has resulted in academic libraries participating in the competition between university units (departments, schools, colleges, etc.) for resources. In response to these pressures over the last two decades, library and information science (LIS) literature and discourses have encouraged the adoption of a business ethos and set of strategies focused on efficiency and customer satisfaction, with an emphasis on the lean startup framework arising in the early 2010s. This article will examine the impact of startup values in LIS on the ways academic libraries adopt and manage new technologies and how this technological solutionism poses particular threats to accessibility for disabled users. The first half will provide a background on the privatization of higher education, introduce the lean startup framework, and explain how these concepts are directly excluding disabled people. The second half will use findings from a study on XR accessibility initiatives in libraries as a case study on the dangers posed by adopting a lean startup model and discuss technocratic innovation and the fundamental ethical tenets of libraries and librarianship.

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**Historical background: The privatization of higher education**

How did academic libraries become ruled by the logics of technocratic innovation? The process begins with historical changes in the funding models of higher education. The social function of universities and colleges is to educate students and prepare them for careers or further study, as well as to support research and the creation of new knowledge and creative works. Historically, higher education and research have been treated as public goods that should be subsidized by the state through the allocation of tax revenues. Beyond the generally positive impact of a well-educated public on social mobility and supporting democratic ideals, corporations benefit directly from a highly skilled workforce and new research, inventions, discoveries, literature, and artistic outputs. However, higher education is increasingly decoupled from public support and driven towards corporate models of operations. According to a 2019 Pew report, as of 2017, federal and state revenue only accounted for 33 percent of U.S. public college and university budgets. The remaining 67 percent is met by tuition and fees, independent operations, fundraising, grants and monetizing research outputs (e.g., patents), and other funding sources, many directly dependent on student enrollment rates. While the 2008 recession influenced the amounts and forms of federal funding, with direct funding decreasing to be replaced by tax breaks that then shifted again over the years (Pew Charitable Trusts, 2019), it had other far-reaching impacts that are expected to have disastrous consequences for long term budgets. Americans are having fewer children and these decreasing birth rates have resulted in student enrollment numbers steadily decreasing since 2011 (Marcus, 2021). Over the coming decades, there will be ever fewer high school graduates available for enrollment and university administrators are increasingly aware of this. These changes in funding and student applicant pools coupled with increasing costs force schools to compete with each other. While not new, the increased adoption of responsibility center management (RCM) as a management model by many universities and colleges has steadily increased since the late 1980s and early 1990s as a solution to these realities (Collini, 2010). Under this model of management, different departments, schools, and colleges are divided into responsibility centers:

“A responsibility center is an organizational unit with a manager responsible
for the relationship between input (resources/costs) and outcome. The combination of the outcome of each unit results in the outcome of the organization as a whole. The assumption is that if each manager achieves his or her own target, the organization as a whole achieves its financial goals.” (Collini, 2010)

Under the RCM model, if each unit bears the responsibility for their spending decisions, they will be incentivized to be more profitable by decreasing input costs and maximizing output benefits. To calculate their costs and benefits for this analysis, units must establish and meet key performance indicators (KPIs), which are numerical values that allow a unit to measure their performance. Temple explains how KPIs function as relative, rather than absolute indicators:

“KPIs differ from ordinary management statistics in that they are relative rather than absolute, and so allow comparisons to be made in, it is hoped, useful ways. Knowing universities’ total spending on their libraries (a set of absolute numbers), for example, is of limited use, as the spending of a large university will almost always be more than that of a small one. Library spending per full-time equivalent student (a relative number), on the other hand, brings together library spending and student number statistics so as to allow reasonably meaningful comparisons between universities of different sizes.” (Temple, 2020)

Under the RCM model, many academic libraries have had to find ways to demonstrate their value by defining their own KPIs. One obvious impact of these trends in higher education on libraries can be seen in the increase of LIS publications and community discussions about integrating a business ethos focused on efficiency and customer satisfaction into library services. This took on new dimensions with the rise of the dot-com bubble and tech startup culture in the 1990s, followed by the development of the lean startup model in the early 2010s (Bieraugel, 2015). These innovation-centered approaches to business would come to shape library responses to their loss of resources and competition between units in the new budgeting models of higher education. The lean startup model, in particular, sets the stage for the current approach to library innovation.

The lean startup framework and library “customer” demands

A startup is a corporate business built on an entrepreneurial endeavor with an emphasis on innovation. While not necessarily explicitly tied to technology, this emphasis on innovation is often synonymous with developments in technologies that offer new approaches to extracting value from consumer markets. Osterwalder and Pigneur articulate this underlying emphasis on innovation in their seminal 2010 work, Business model generation: A handbook for visionaries, game changers, and challengers. As suggested by the title, they place a strong emphasis on “visionaries, game changers, and challengers striving to defy outdated business models and design tomorrow’s enterprises” (Osterwalder and Pigneur, 2010). In the introduction of his foundational and influential 2011 book, Eric Ries explicitly makes the connection between innovation and technology by describing the common trope of young college students “inventing the future. Needless of boundaries, possessed of new technology …” [1]. Ries (2011) connects the dot-com bubble of the late-1990s/early 2000s and his experiences learning computer programming growing up to his own failures and eventual success in the startup industry. In the early 2010s, a new framework would arise to dominate the entrepreneurial startup sphere: the lean startup. Shepherd and Gruber (2021) identify Blank (2013), Ries (2011), and Osterwalder and Pigneur (2010) as the key contributors to the development of the lean startup framework, and their consistent citation in the literature on lean startups supports this assertion. Ries (2011) defines lean startup as “the application of lean thinking to the process of innovation” [2]. Blank (2013) describes it as a methodology that “favors experimentation over elaborate planning, customer feedback over intuition, and iterative design over traditional ‘big design up front’ development”. Whereas the startup component indicates innovation and the implicit experimentation required to do so, the lean component emphasizes reducing waste and allocating resources more efficiently throughout the production design process. This model involves shifting the firm’s focus to responding quickly to consumer needs in an active and responsive fashion via the Build-Measure-Learn feedback loop as defined by Ries (2011). While the Build-Measure-Learn feedback loop is not always referred to using these terms, Ries’ concept is used in this paper as a short-hand way to label this general, prevalent approach that is common within the lean startup literature. This approach seeks to avoid waste by limiting the number of resources allocated to an initiative upfront, implementing iterative feedback mechanisms (e.g., the feedback surveys that have become ubiquitous in consumer e-mail inboxes and as pop-up windows on company sites), assessing that feedback, and adjusting course by modifying the design and implementation of services and products. The aim is to create a flexible, responsive organization that avoids unnecessarily expending resources to build things based upon uninformed, internal assumptions about user needs, what Blank (2013) refers to as agile development, echoing iterative approaches to software development starting in the early 2000s.

The infiltration of these corporate concepts into library literature is hardly new. Concerns about the social relevance of libraries with the increasing availability of digital resources at the dawn of the new millennium inspired librarians and library futurists to
search for new approaches and business models for libraries based on ideas of “disruptive technologies” (Lafferty and Edwards, 2004) and focused on building digital libraries and adopting digital resources in libraries, such as ebooks (Jantz, 2001). Ongoing trends in transforming library spaces to create “learning commons” (Loertscher, 2008) can also be traced to the first decade of the twenty-first century.

In his 2000 article, “The McDonaldization of academic libraries?,” Brian Quinn describes the integration of business ethos into academic libraries by using Ritzer’s 1993 book, The McDonaldization of society, as a framework. Quinn outlines four traits that would come to define technocratic innovation (defined further in the following section) over the next two decades: efficiency, predictability, calculability, and control. Citing Ritzer (1993), Quinn (2000) describes how the increase in competition for students among academic institutions has resulted in “a new emphasis in academia on marketing, quality service, and treating students as consumers or even ‘customers’” [3]. The resulting changes in student expectations for library services include the demand that librarians find things for students, as opposed to teaching them how to find things for themselves, as well as a demand for convenience over quality of information. These demands result in changes in library management style and service priorities, all of which are defined within the four traits of McDonaldization. Efficiency, in this case, is the demand that all tasks and services be done with as little waste of time and effort as possible (e.g., students demanding an increase in readily available online sources and expectations of reduced service time). This type of efficiency is achieved by standardizing and measuring all work practices, inputs, and outputs. Calculability serves these demands for efficiency. All services, spaces, tasks, and other metrics must be measured in order to justify their value. This concern for calculability has clear ties to the Build-Measure-Learn feedback loop and the RCM model’s concept of KPIs. Predictability reflects the prioritization of “customer” demands and the library’s ability to anticipate constantly changing demands. Meeting user expectations of standardized access to the same types of resources across universities, the framing of libraries as campus cultural centers (e.g., filling themselves with art, lounging space, cafes, and other amenities), and adopting standardized responses to patron inquiries are all examples of how academic libraries have adapted to meet student demands for efficiency, predictability, and responsiveness to the expressed needs and tastes of library “customers.” The demand for consistently formatted and displayed, easy-to-access resources has shaped the world of libraries by creating a market dominated by technology and electronic resource vendors and their expensive, standardized database packages and other resources and services. In order to accomplish all of this, the variability in library work must be reduced or removed. This introduces the final trait: control. Increasing bureaucratic red tape, finding ways to replace humans with technology, and constant performance reviews illustrate ways libraries look to establish and meet metrics, ensure predictability, and provide evidence for customer satisfaction. All four of these traits are directly reflected in the lean startup framework and show how the rapid rise of technology blurs the line between public service and the private sector value systems and economic models.

These traits become explicit in the library literature of the 2010s. Articles by Brian Mathews (2012) and Mark Bieraugel (2015) as well as books by Jeremy Nelson (2015) offered examples of how modeling libraries on tech startups was seen as a solution to the challenges libraries were facing. This trend was examined through a critical lens in Nicholson (2015). Nicholson explicitly tied some of the ethical challenges outlined in the introduction of this article to the adoption of neoliberal practices in higher education. The reliance on underpaid, overworked adjuncts and the forced entrepreneurialism of faculty, where they must compete for their jobs by pleasing students who have been rebranded as customers, were given as examples for the way ethical failures in the corporate world were adopted in higher education. This broader discussion of neoliberalism and libraries is very frequently discussed in library literature. John Buschman (2020) explained this by examining the topical history of the journal Library Quarterly over the last nine decades. He argued that conservative backlash to the rise of justice movements during the mid-twentieth century resulted in a reexamination of the relationship between the state and the economy. That reexamination directly confronted the roles of civil society institutions, like schools and libraries, and became the origins of neoliberalism. Buschman asserted that this rise of neoliberalism was cemented in the 1980s, reflected in the articles published in Library Quarterly. Competition for resources was often the justification for the adoption of neoliberal solutions, with the lean startup approach being one of many. Mathews (2012) opened his work with the question “Is higher education too big to fail?” before discussing the ways academic libraries were vulnerable; Bieraugel opened his article by citing Mathews and stating that he was writing in agreement. Both proposed library innovation as a solution to the competition for resources fostered by a privatization of post-secondary institutions and both suggested the lean startup method as a solution. A consistently cited benefit of this lean-startup approach was a promotion of innovation. While Quinn (2000) took a more critical approach to integrating business practices into academic librarianship, by addressing the effects this had on the staff and students and noting the resulting administrative complications, he still emphasized the value of innovation by examining successful examples from corporate America. Similarly, Mathews (2012), Bieraugel (2015), and others who shared their perspective outside of the library literature also emphasized the benefits of innovation. It is this valorization of innovation that steered library discourse towards an implicit emphasis on technology that mirrored technological solutionism seen in Silicon Valley (further discussed later in this article). These approaches to innovation are now prevalent in higher education and have posed very real costs to diverse and equitable access to higher education and increasing student indebtedness. Furthermore, they contribute to the exclusion of disabled users from new library technologies.

Academic libraries are innovating at the expense of their disabled “customers”
According to the National Center for Education Statistics (2018), during the 2015–2016 school year, students without disabilities composed 80.6 percent of the undergraduate population and 88.1 percent of the graduate population, with disabled students composing the respective remaining 19.4 percent and 11.9 percent. Disabled students face well known barriers to access, whether that be inaccessible educational materials, as exemplified by the lawsuit against the Los Angeles Community College District (Jones, 2021), or new construction that is completely inaccessible to anyone unable to use stairs as in the case of Hunters Point Library in Queens, N.Y. (Spivak, 2020). In the court documents for Roy Payan; Portia Mason; National Federation of the Blind; National Federation of the Blind of California v. Los Angeles Community College District (U.S. Court of Appeals for the Ninth Circuit, 2021) the plaintiffs specifically state that “despite being granted individual accommodations, Payan and Mason each encountered accessibility problems while taking classes at Los Angeles Community College (LACC). While some of these accessibility barriers affected Payan and Mason individually, others affected blind LACC students generally. Plaintiffs categorized these accessibility barriers into the following five general inaccessibility claim categories: (1) in-class materials; (2) textbooks; (3) educational technology; (4) Web sites and computer applications; and (5) research databases in the LACC library” [4]. In both of these provided examples, the library is directly implicated in the discriminatory treatment of disabled patrons.

This brings up an important question: which customers are libraries serving and how does the need to maximize returns come at the expense of those who cannot be assigned value under capitalist standards? Many schools are building new libraries in an attempt to increase enrollment by appealing to potential students who are being shown that libraries are cultural spaces of the future, something Quinn (2000) specifically referenced as a way academic libraries pursue predictability. However, architecture is a reflection of the types of people whom architects and their clients envision using the space. When that space is designed to appeal to able-bodied students at the expense of disabled students, that sends a clear message. The same can be said of inaccessible databases. The increased “customer” demands for quick, low-effort digital sources means that database vendors have been able to turn over an immense profit. There is demand for rapid mass digitization and born digital research materials. The open-source community and other cooperative groups, aside from offering potential solutions and alternatives, have long been vocal about how companies like Elsevier, EBSCO, and other large e-resource vendors have a disproportionate amount of control that leads to ethical issues (Murphy and LaCombe, 2022). Some libraries, such as the members of the Library Accessibility Alliance which aims to “engage with library vendors in initiatives to improve usability for all users” (Big Ten Academic Alliance, n.d.), have been able to gain traction with vendors on issues around accessibility. However, as illustrated by the inaccessibility of databases mentioned in the LACC case, this is not true for all vendors and certainly not for all of the technological solutions that academic libraries are adopting. Access to resources is a multi-stakeholder, multi-level process. First the books, media, and other resources need to be accessible, but that will not help users if the database hosting them does not support basic accessible features, including transcripts for video or alt text. Additionally, if the database’s user interface is poorly designed and inaccessible, users will not be able to access any of the resources, even if they are accessibly designed. Beyond that, databases are then accessed via a library’s integrated library system (ILS) and, at times, a library-provided device. Both of these need to be accessible as well. In order to ensure this, library staff must have sufficient expertise in auditing these layers of access and managing the remediation process (whereby inaccessible technology is made accessible). Since libraries are responsible for the services they provide, library expertise in auditing and remediation is, in many ways, the most important skill for supporting library accessibility. Having someone who can audit services and technology, as well as work with vendors and patrons to figure out solutions is crucial to a library’s mission. However, there is an increasing digital skill gap between librarians and the technology that libraries demand they work with (further discussed later in this article).

Technocratic innovation also has had concrete impacts on the types of services libraries provide. Academic libraries increasingly provide access to emerging technologies with the intention of keeping students and faculty competitive in their respective fields. Many libraries host spaces that center technologies including artificial intelligence (AI), gaming, 3D printing, and immersive experiences (such as XR). For illustration, in their 2019 review, Greene and Groenendyk (2021) identified 49 ARL-member academic libraries adopting VR/XR (roughly 42.2 percent of ARL-member libraries). In doing so, these academic service spaces come to mimic, not only the tech industry, but also the ethical challenges it faces.

**Case study: XR accessibility initiatives in academic libraries**

A lean startup ethos based on the values of efficiency, predictability, calculability, and control is clearly at odds with the ethics of librarianship and promotes unsustainable library initiatives. According to the American Library Association (ALA) code of ethics, librarians and their institutions are committed to “equitable service policies; equitable access” and should “work to recognize and dismantle systemic and individual biases; to confront inequity and oppression; to enhance diversity and inclusion; and to advance racial and social justice” (American Library Association, 2021). The case of supporting disabled library users offers a good example of how library initiatives have veered away from their core values. Libraries have long been leaders in making new information technologies accessible to disabled library users (Jaeger, et al., 2015), so it is surprising that emerging technology development in libraries has been proceeding quickly without much concern for accessibility. This paper argues that this “oversight” can be linked back to the library adoption of the corporate ethos discussed earlier. The case of XR accessibility in libraries illustrates how lean startup thinking works against the imperatives of library ethics and leads to technological solutionism and unsustainable library initiatives that exclude disabled library users.
Even as they have moved quickly in the last six years to adopt XR technologies, libraries have not been early adopters of accessibility thinking for emerging technologies in their organizations. Lischer-Katz and Clark (2021) surveyed academic libraries that implemented or were considering implementing XR programs to gauge the expertise of staff, the existing infrastructure, and plans for the future as it pertains to XR accessibility. A 33-question survey was sent out to library-related listservs and to library staff at Association of Research Libraries (ARL)-member libraries. A total of 34 surveys were completed by participants from 30 different institutions (four of the institutions had two participants each). Participants identified as librarians (n=12, 35.29 percent), technologists (n=10, 29.41 percent), administrators (n=1, 2.94 percent), “other,” which included educators, researchers, and students (n=6, 17.65 percent), or as various combinations of these professional identities (n=5, 14.71 percent) (Lischer-Katz and Clark, 2021). Most institutions surveyed did not have policies or dedicated staff to support accessibility for XR technologies, with only one library (3.33 percent) indicating that it had both accessibility staff and policies currently in place. Library staff and administrators surveyed had high levels of formal education, and while nearly all participants were aware of accessibility challenges, few had intermediate or expert knowledge in XR accessibility. Furthermore, many participants were unfamiliar with specific accessibility guidelines or legal frameworks, with over half of the participants having no familiarity with game accessibility guidelines. It is surprising that library staff in charge of XR initiatives are unfamiliar with accessibility guidelines, since a number of international guidelines already exist for implementing XR technologies: “Web content accessibility guidelines” (World Wide Web Consortium (W3C). Web Accessibility Initiative (WAI), 2021), “Game accessibility guidelines” (n.d.), the “Digital library accessibility and usability guidelines (DLAUG) to support blind and visually impaired users” (Xie, n.d.), and the World Wide Web Consortium’s (W3C) (2020) “XR accessibility user requirements,” which is establishing principles for XR accessibility.

The top three barriers libraries face to developing accessibility policies and processes identified by participants were: lack of staff knowledge (21.74 percent, n=20); lack of funding (17.39 percent, n=16); and lack of time (16.30 percent, n=15); and the top three barriers to implementing accessibility policies and processes identified by participants followed a similar pattern: lack of staff knowledge (20.21 percent, n=19); lack of time (20.21 percent, n=19); lack of funding (15.96 percent, n=15) (Lischer-Katz and Clark, 2021). When asked “Does your department have staff specifically dedicated to accessibility?”, nearly two-thirds of libraries (63.33 percent, n=19) reported “No”; while 23.33 percent (n=7) reported “Yes”; and 13.33 percent (n=4) indicated “Not sure.” Of the five libraries that reported already having XR accessibility guidelines in place, 60 percent (n=3) indicated that they were planning on implementing them in the next 1–2 years. Of the nine libraries that were interested in developing and implementing policies/guidelines, 44.44 percent (n=4) said they planned on developing and implementing them within 1–2 years. Only one library (3.33 percent) indicated that it had both accessibility staff and policies currently in place. These findings indicate that the gaps in XR accessibility are less a product of the technology’s perceived “newness” or its recent emergence as a library technology in the years 2015–2016, and more a result of structural gaps in supporting accessible technology more broadly, in particular, a perceived lack of resources, knowledge, and time by library staff (Lischer-Katz and Clark, 2021). While a lack of resources is often blamed on barriers to library success, the adoption of a technocratic mindset exacerbates the problem and produces “innovations” that involve investments in library spaces and equipment but are designed without accessibility in mind and without the provision of accessibility training, policies, and staff. By implicitly following corporate approaches to innovation, elements of the lean startup model, resources are allocated to short-term buildup of new technologies without efforts made to develop policies and procedures or allocate the necessary resources for XR initiatives to be sustainable over time or support the wide range of users that academic libraries are meant to serve. This does not support the institution’s commitments to library ethics that would require that emerging library technologies are implemented in equitable ways that do not leave groups of users behind. While an iterative design approach could be beneficial to XR implementation through user-provided feedback, by disregarding communities of users from their defined user groups that provide the feedback, no amount of user feedback will combat inequality and exclusion.

Lean startup-style innovation and technology in academic libraries

This case study illustrates the inherent dissonance between library ethics and the lean startup model, as well as the insurmountable logistical conflict between the two. Rafia Mirza and Maura Seale (2017) directly address how the dot-com bubble, rise of Silicon Valley, and adoption of the resulting startup ethos by libraries has resulted in Internet-centrism, where all social and political problems are greatly affected by the Internet, and technological solutionism, where technology is seen as the solution to all complex social problems, a central tenet of technocratic ideology [5]. These ideals, while ludicrous to anyone with knowledge of systemic realities, are more readily acceptable to those less familiar with the limitations of technology because technocratic ideology “is also characterized by its stance of impartial, apolitical rationality; technocrats are interested in efficiency, not politics, and believe technological fixes can be applied universally” [6]. The emphasis on rationality and efficiency, which often mask hidden bias and exclusionary practices, are at the center of propagating structural inequality by framing harm as a natural, rational, and unavoidable phenomena, not one caused by active decisions made by those with control over decision-making and the allocation of resources. These trends have deep roots in twentieth century neoliberal discourse, which have adopted ideas such as “creative destruction” (Schumpeter, 1950) and “disruptive innovation” (Christensen, 1997) as key drivers of economic prosperity, as evidenced in the mottos of twenty-first century tech-startups turned megacorporations.
Mirza and Seale (2017) take a human-centered approach and discuss the human-costs that technocratic ideologies conceal, such as the inherent exploitation present in the production of many technologies, as well as how technocratic values are used to devalue “traditional” library work and enact harm on women and people of color. These human-costs are reflected in the various lawsuits and scandals associated with technology companies that are mentioned in the introduction of this article.

Even if it can be argued that these costs are not necessarily an indicator that innovation or agile approaches to management are inherently bad, the results seen in libraries are an indicator that libraries are ineffective at implementing them. All of the business frameworks, management models, and metrics introduced thus far are only successful in companies with direct revenue streams from the sale of services or products, and millions if not billions of dollars in venture capital funding invested to further develop them in pursuit of even more revenue and profit. Additionally, this ignores the fact that 90 percent of startups fail (Camberato, 2020). Those who do succeed expend massive amounts of resources to acquire the talent required for management, accounting, assessment, and change; resources that are simply not present in libraries, nor made available through the funding models of non-profit, academic institutions. The XR case study illustrates some of the gaps in hiring and departmental structure for supporting new technologies, but in order to address these gaps and ensure that librarians have the necessary skills, graduate programs of library and information science (MLIS) would also have to further update their curricula to provide sufficient technical education to their students. Joseph Koivisto’s (2018) examination of system librarian training and the impacts of ongoing consolidation of the integrated library system (ILS) vendor environment is a perfect illustration of how this technical skills gap is playing out. Libraries are not building their own systems and, as a result of the forces previously discussed, increasingly rely on third-party technology vendors. These vendors, which have grown in size and price-setting power as the field of competitors shrinks due to mergers and acquisitions, are increasingly centralizing a number of library services into their own software and moving towards cloud-hosted, black-boxed service provision. As Koivisto points out, this rapid change in technological service is not being matched by the skills that MLIS programs are offering their students. The amount of control and lack of oversight that these vendors maintain has resulted in serious questions and risks for users, particularly disabled users, for which libraries will be held liable and morally responsible in the future. Ironically, the increased demand for technologically skilled library staff is not matched by the salaries that libraries are able or willing to offer, making it difficult for technocratic library administrators to retain the staff needed for innovative projects. Even those that manage to successfully hire for these skills, often are not hiring enough people with the blend of technical knowledge and managerial skills required to properly manage the ever-increasing amount of technical work in libraries. Of course, addressing the shortfalls of the technocratic library through hiring more technicians and providing librarians with more technical knowledge does not address the ethical challenges discussed earlier. The fact that libraries lack the necessary resources for the longer-term staffing of short-term innovation projects modeled on tech start-ups helps to explain why the types of medium to long-term thinking needed for accessibility planning are often lacking in current library innovation efforts. Even beyond hiring and retention, libraries also lack the resources to implement the same measures taken by the private sector in order to maintain technocratic innovation. Google allows employees to dedicate 20 percent of their time to projects that interest them, builds employee cafes, employs specific meeting moderation approaches, and mandates ongoing management training based on employee feedback about their supervisors (although this, like student course feedback, most likely promotes bias and discrimination) (He, 2013; Google, n.d.). These types of interventions are not unique to Google. Quinn (2000) actually referenced Hewlett Packard, Texas Instruments, and 3M’s practice of allowing employees to dedicate a portion of their time to creative thinking for upcoming projects and other companies have also adopted similar measures to Google. With all of this in mind, it is no wonder these proposed adoptions from the private sector have come to cause such ire amongst librarians. Many libraries have attempted to partially adopt methods and approaches that fail 90 percent of the organizations that implement them without much attention to the human-cost, both ethical and financial. Beyond the clear ethical failures, the economics of a lean startup model make it unlikely to succeed when applied in libraries, which have no expectations of future investments by venture capitalists, mergers and acquisitions, or profits to reinvest. Libraries are not start-ups and were never intended to be profit-generating ventures. Adopting the discourse of technocratic innovation and implementing it through a lean start-up model is likely to lead to both ethical and economic failures, most clearly seen in the current lack of support for accessibility in emerging library technologies.

Discussion: Organizational change and thinking beyond technocratic innovation

Innovation should not be the only lens through which library success is examined. Looking to organizational theory can help us understand what is happening across the academic library field and help us start to identify ways of addressing some of the tensions identified in this article. The fact that academic libraries are following similar trends indicates processes of institutional isomorphism.

Examining the tendency for organizations in the same field to become similar over time, DiMaggio and Powell (1983) describe three mechanisms of institutional isomorphism: coercive, mimetic, and normative. Coercive isomorphism develops out of organizations facing a similar regulatory or legal environment (DiMaggio and Powell, 1983). In the case of academic libraries, this can be related to the legal and regulatory forces that they commonly encounter in their field of operations, including legal
requirements that emanate from outside of the university (e.g., Title IX, ADA guidelines, copyright guidelines, etc.). Academic libraries collectively confront a common regulatory landscape, which according to DiMaggio and Powell’s (1983) theory would encourage the adoption of similar strategies and tactics to act effectively and avoid censure or legal entanglements within this landscape.

DiMaggio and Powell (1983) describe processes of mimetic isomorphism as occurring during times of uncertainty when organizations look to other organizations in their field and mimic what they appear to be doing: “When organizational technologies are poorly understood (March and Olsen, 1976), when goals are ambiguous, or when the environment creates symbolic uncertainty, organizations may model themselves on other organizations” [2]. The process of organizations copying each other in times of uncertainty, such as the adoption of a potentially disruptive new technology or innovative organizational structure, can be mapped to the field of academic libraries.

Whereas coercive isomorphism operates at the level of the organizations and the legal and regulatory landscapes they occupy, and mimetic isomorphism relates to processes between institutions, processes of normative isomorphism operate at the level of the professionals who work at the organizations and shape their day-to-day policies, procedures, and practices. DiMaggio and Powell (1983) point to the role played by professionalization and communication through professional networks in creating similar types of workers who make similar types of decisions in their organizations, contributing to processes of isomorphism. That is, organizations become similar because the professionals who run them are similar, particularly in their specialized knowledge base and internalization of behavior perceived to be normative in their fields. A common base of knowledge and normative, professional behaviors is established and maintained through formal educational training, as well as professional networks that are often supported by membership-based organizations, publications, and conferences (DiMaggio and Powell, 1983). In the context of academic libraries, normative isomorphism can be linked to the professionalization of libraries, technologists, and administrators, and the normative practices that each group brings to the organization. When librarians and managers are all drawn from library science programs, we might expect a considerable degree of homogeneity in the normative processes shaping the organization. However, we might expect tensions to develop if library staff and managers begin to be hired from other fields and with different education and training. This could appear as competition between different professional groups and struggles over the construction of normative practice.

Through the lens of DiMaggio and Powell’s (1983) framework, we can see that the problematic trends that we have identified in the academic library field are due to increasing levels of uncertainty in the field (due to the perceived risks associated with a questioning of the value of books and libraries in the rise of digital libraries and Web-based resources in the 1990s and 2000s), and that libraries look to each other for guidance (processes of mimetic isomorphism). Coercive processes seem less at play, as there are legal frameworks in place, but knowledge of these were found to be limited in Lischer-Katz and Clark’s (2021) survey of XR accessibility knowledge in academic libraries. Furthermore, normative processes, by which the professional ethics of librarians or library administrators act to encourage them to follow the normative and ethical pressures of their profession also seem to be less operative, perhaps partially due to the introduction of “technologists” and other non-traditional library workers into library innovation spaces. Thus, if positive change is possible for improving XR accessibility and other innovative technologies in libraries, it will likely need to happen at the institutional level where deans and other high-level administrators make decisions, looking to their peer institutions and their activities for guidance. Thus, while the emphasis in promoting accessibility should be on educating administrators, there will also be a need for training in inclusive design and the ethics of accessibility in MLIS programs and professional community forums (journals, conferences, etc.). Accessibility could be seen as “the canary in the coalmine” for the current state of library innovation with regards to inclusion and equity. Addressing accessibility is inextricably connected to other ethical concerns and should be addressed in conjunction with them.

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**Conclusion**

While many of the trends discussed in this article can be attributed to the external pressures that academic libraries face, to say that library leadership’s only motives for adopting this technology is to increase enrollment would be overly cynical. In many ways, libraries are attempting to meet the technological literacy needs of their patrons. There are real long-term advantages to those who have early access to the newest technologies, and rapid changes in the technical arena are changing the nature of the digital divide. Lai and Widmar (2021) provide a strong example of this fact while examining the impacts of reduced technical access during COVID. Academic libraries are meeting user needs by ensuring that students and community members (in the case of public university libraries) are not left behind in an increasingly digital world. The authors do not argue against the adoption of technology; they advocate for slower, more purposeful adoption that is critical of technological solutionism and inclusive of disabled people.

In closing, while academic libraries do not have the power to change the corporatized, neo-liberal higher education landscape that they are embedded in, their administrators and staff can take steps to better address the needs of their disabled students, faculty, staff, and other campus stakeholders. The first step for improving this situation is acknowledging that adopting corporate models (often in an inconsistent and piecemeal fashion) produces innovative initiatives that have a high likelihood of overlooking

historically marginalized stakeholders and are inherently unsustainable. Adopting corporate models based on startup culture, with the idea of scaling up in the future, makes no sense in an academic library that is already scaled up and is not designed to attract venture capital or make profits for investors. While corporate entities will either go bankrupt if they fail and will reap massive profits if they succeed, success and failure for libraries looks very different. While libraries will need to generate positive impact at the scale of the university to appease presidents and provosts, as measured through quantifiable metrics such as gate counts, circulation, downloads and sessions accessing digital resources, number of appointments with students and faculty, etc., the successes and failures of librarianship happen in the everyday interactions with library users and other library staff members, and the articulation of library ethics in practice and discourse. To move from library innovation models that produce “born-inaccessible” library services and resources requires critically interrogating the myths of technocratic innovation, improving the technical skills that MLIS programs provide their students, advocacy to raise awareness of accessibility in librarian professional communities, and realizing that libraries look to each other for guidance and support. If one library can cast off the blinders of technological solutionism and can make a strong step forward in accessibility support for emerging technologies, then others will follow their lead.

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