

# What Will Libraries Be When They Grow Up?: Responding to the Innovations of Technology and Imagining the Future

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Cautions and accolades about technology have existed as long as technology has. The change from oral narrative to written prompted Socrates and his contemporaries to discuss, and decry, how society will change.<sup>1</sup> The introduction of the printing press raised concerns about the effect of this new technology even as the positive changes were lauded.<sup>2</sup> In the information age, with the rise of the Internet, much ink has been spilled and electrons scattered in a rush to discuss how new technologies will raise us up or bring us down. Libraries have often been at the forefront of discussions on how technology will change our operations fundamentally, with a predominant thread of fear for our continued existence running through the conversation. We may fondly remember the Tracy/Hepburn movie “Desk Set” where librarian Bunny Watson faced off with the computer set to replace her. Happily, the ‘electronic brain’ malfunctioned and the library was saved through the human touch. Libraries also faced the threats of open stacks, catalog and circulation automation, databases in electronic formats, videos and DVDs, and more. We persist, yet seem to always face existential challenges, most recently in the form of the Internet, ebooks, and mobile devices.

In 2010 two books with competing philosophies were published: *I Live in the Future and Here’s How It Works* by Nick Bilton and *You are Not a Gadget* by Jaron Lanier. Both dealt with the rapid changes tech-

nology has brought about since the turn of the century and how individuals and institutions ought to respond. These two books provide very different calls to action for our profession. Lanier’s book cautioned against too much customization and individualization, and condemned what he saw as a downgrading of content created in the new ‘remix’ culture. Bilton, on the other hand, saw tremendous advantages to technology’s ability to individualize individuals’ experiences with content and envisioned the coming of a new Renaissance in content creation. This paper will set forth these calls to action with regard to libraries as they exist now, discuss how libraries can and should deal with the differing approaches set forth, and offer a plan of action to build upon our strengths as we deal with the monumental changes wrought by technology.

Jaron Lanier is one of the pioneering forces behind virtual reality and hardly a luddite. However, his book, released at the start of 2010, had what Slate.com reviewer Michael Agger called “one of the most sobering prefaces to be found in recent books.”<sup>3</sup> The theme of the preface of Lanier’s book is that actual human eyes meeting the book’s typeface will be a rarity. For the most part the metadata about the book will be aggregated by computers and spit out according to an algorithm in response to a search query. This is also a fairly depressing look at our life’s work. The materials

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we 'handle' in libraries are increasingly not handled by librarians, or by humans at all, during the research process. Most of the time we search via a database to find materials that fulfill our needs, and often view the materials online rather than in print.

Lanier draws attention in his book to the Google Books project as a corollary concern, and wonders how intellectual materials will be accessed and accessible in the future. He writes, "If the books in the cloud are accessed via user interfaces that encourage mashups of fragments that obscure the context and authorship of each fragment, there will be only one book. This is what happens today with a lot of content; often you don't know where a quoted fragment from a news story came from, who wrote a comment, or who shot a video."<sup>4</sup> This is a common concern for academic librarians instructing users to think critically about the content they are accessing. Students have difficulty knowing who authored works, or even where works came from. Thanks to technology, there is a loss of conception regarding the origin of an item of scholarship—books, videos, audio are all reduced to snippets pulled up in a computerized search.

In response to technology, Lanier espouses a philosophy called 'digital humanism.' In short, he calls for consumers of information to do so thoughtfully, in a linear manner, and to take ownership of content they create. The modality of digital communications, content and culture can be at odds with this approach. One point he raises is the concept of 'lock-in:' once a mode of technology is adopted it affects culture and philosophy in fundamental ways that may not have been expected. An example of this is the adoption of the 'file' structure in computing.<sup>5</sup> Perhaps there are better ways to think about information storage in computing, but we are now locked in to this modality. If we approached technological innovation from a perspective of digital humanism we could perhaps break out of the locked-in file structure mode of information storage as we explore alternatives in a critical, thoughtful fashion.

Lanier also raises concerns about the anonymizing nature of technology. In his opinion, the wisdom of crowds often leads to mob-like, dehumanizing behavior.<sup>6</sup> Examples of this can be seen on nearly any anonymous internet message board, where bullying behavior can take place;<sup>7</sup> or on sites devoted to pirating intellectual content,<sup>8</sup> where the concerns Lanier had about mashing up content in the cloud can eas-

ily come to pass. To combat this, he recommends that individuals not anonymize themselves unless safety is a concern, and develop their own individual voice, reflective of internal cognitions rather than external events.<sup>9</sup>

The preface of Lanier's book concludes with the lines, "The words in this book are written for people, not computers. I want to say: You have to be somebody before you share yourself."<sup>10</sup> For us in libraries, the call in his work is complex but clear. We and our users are human, not machines. Our services and materials ought to reflect that mindset. We must provide places and ways for people to interact with information mindfully, with an awareness of how it was created and who created it. We can create spaces for our users to share their own cognitions and take full ownership of them. We need to think about information sharing and storage in ways outside the status quo, to avoid locking in on ineffective means of operation.

Lanier paints a bleak picture, where the masses tear apart content and reassemble it without consideration. But is the openness of digital culture ruinous? The Wall Street Journal's reviewer of his book thinks not. He writes, "Like a remote beach that has been discovered by the masses, the Internet is no longer the pristine preserve of the well-off few. But what it now lacks in exclusivity it has more than made up for in ease of access. And for all the problems that Mr. Lanier rightly worries about, the trend seems to be toward a Web of ever more striving human activity. Indeed, we are not gadgets. I'm scoring that a win."<sup>11</sup> One of librarianship's enduring principles is to provide access to information for all, and it cannot be denied that technology aids the pursuit of this egalitarian goal far more than it prevents it.

Nick Bilton's book came out toward the end of 2010, and emphasizes this more reassuring view of technology as an equalizing force. The introduction of his book relates how he, an employee for the *New York Times*, found himself cancelling his print subscription as it no longer met his needs. He could create his own individual news feed online, focusing only on his interests, and for a lower cost as well. Again, this is a situation we in libraries can relate to, as our users no longer come into the library to read the daily paper or latest issue of their discipline's journal but instead gather their news online in a variety of ways.

Bilton realized that he, as an employee of the *Times*, had a responsibility to discover how his em-

ployer could capitalize on technology to bring back readers like him. He developed a concept of the consumer of the future which he called a consumivore: “collectively rummaging, consuming, distributing, and regurgitating content in byte-size, snack-size, and full-meal packages.”<sup>12</sup> What Bilton ultimately concluded was consumivores are driven by storytelling, and the best way to capture the audience of the future was to ensure you were part of their story. The example of the *New York Times* holds true here. If the newspaper decided to hold firm to their traditional mode of daily print publication and ignored the online realm, they would quickly disappear. But the *Times*’s efforts to create and manage an online presence have kept them relevant, or at least interesting, to today’s consumivores.

Bilton explores the role of online social communities as what he calls anchoring communities, saying, “...these anchors create a boundary in the abyss of the Internet. They help us to manage the information overload that traditionalists have come to fear on the Web.”<sup>13</sup> To live in the future, libraries must continue to explore how to effectively harness people’s dependence on these anchors to minimize information overload. This is a key role we can and should play.

How can we effectively harness these communities? By becoming a trusted resource, presenting high-quality, timely and professional content, suggests Bilton. Anchoring communities consist of peers, authority figures, and other proven entities. The personal (read human) touch is key for providing authenticity.<sup>14</sup> This is something we understand in libraries. If we become a reliable resource for the information gatekeepers, they may drive users to us, and trust us to serve as intermediaries.<sup>15</sup> However, instead of students telling other students in face-to-face study groups how they found help at the library, they may now tweet it or post on Facebook. We are taking good steps toward making our resources sharable on these networks, but more can be done. For example, have you tried sharing an article from a database on Facebook?

Bilton concludes by tying back into storytelling as the key to success, highlighting that users from the future are now searching for an experience rather than a physical good. In his last line of the book, he cautions, “It’s time to reorganize, rethink, and get back to the business of storytelling.”<sup>16</sup> This serves as an excellent call to action for anyone working in a field af-

ected by technological innovations, especially those in libraries. We ought to move away from the mission of physically providing information and rethink what libraries are, in order to go forward.

Technology has cheapened and broadened access to information, both Bilton and Lanier agree. However, Bilton states in his conclusion, “We’re all driving off this cliff together.”<sup>17</sup> We can recognize what Lanier tells us we may be losing: a respect for traditional long form scholarship, and deep linear thinking about important issues. However, we may agree as a profession with Bilton that we will not be returning to the pre-technology modes of thinking, creating, and consuming. How can we reconcile these two visions and best deal with the gains and losses provided by technology?

Articles abound in the literature dealing with new visions of the library as place. The more successful reports find a balance between technology and traditionalism, often using the phrase “learning commons” or “knowledge commons.” One of the best short overviews of the concept appears in *C&RL News* in 2011, discussing the blend of technology and space planning in the University of Central Florida Libraries. Key to their success has been capitalizing on the need for a social learning space on campus, following elements of good space design and form, and providing the traditional library atmosphere of studying, learning, and customer service.<sup>18</sup> This short article and others about UCF’s Commons describe well what a library can do to capitalize on the benefits of technology as described by Bilton, while dealing with Lanier’s concerns about the needs to think deeply and seriously about content and creation. The key seems to be to hold the library as a house of learning and knowledge, but to offer the capacity for users to interact with materials in social and technological ways.

Beyond the library as place, discussion proliferates about new modes of librarianship in relation to technological advances. One of the most enduring has been the concept of “blended librarianship” first developed by John Shank and Steven Bell in 2004. They provided an update to the concept in a recent article, saying in part, “[Blended librarianship] focuses on answering why librarians matter to provide compelling reasons for why academic libraries remain essential and indispensable to the academy.”<sup>19</sup> To provide that value, blended librarianship focuses on the relationships librarians should build across campus to

integrate their services deeply within the educational mission of their home institutions. This is quite similar to Bilton's recommendations on building social community, trust, and story creation. Also, it works to address Lanier's concerns about a lack of respect for content on the parts of users. Librarians can become anchors to help our students, staff and faculty wade through overwhelming information, and foster understanding about where intellectual content comes from and how it integrates with educational goals.

One of the best recent articles dealing philosophically with the changes wrought by technology on our profession, written by T. Scott Plutchak, espouses that we are facing the opportunity to create the "great age of librarians."<sup>20</sup> This article asks us to consider whether we in libraries may be confusing ends and means. If we view collection-building as what librarians do, rather than a means to an end (hopefully a well-defined end), it is unlikely we can survive technological changes that open collections around the world to users from any web-enabled place. If, however, we develop beyond our view of libraries as collection containers, we can regain relevance for our institutions as filtering systems for preventing information overload, capturing and sharing data within and outside our institutions, and engaging with faculty throughout our institutions in support of our joint educational mission.<sup>21</sup>

David Lankes describes the potential goal of librarians succinctly: "The mission of librarians is to improve society through facilitating knowledge creation in their communities."<sup>22</sup> This is a mission that Lanier and Bilton could both support in relation to technology, but it requires a philosophical shift on our parts. Lankes goes on to support Bilton's concept of narrative alongside Plutchak's vision of the role of collections, saying that for librarians, "[t]he story is that moment when you positively changed someone's world... That story never, ever, ever starts with stuff."<sup>23</sup> He further predicts that the attention of library users of the future will be "participatory and distributed"<sup>24</sup>—that is to say that users will want to actively contribute to the creation and dissemination of content in ways predicted by Bilton's concept of the consumavore.

Carlos Cuadra predicted in the ALA Bulletin in 1969 what libraries might be like in the year 2000. Thirty years would see the shift in library holdings from books to a variety of resources, including "digital and analog data bases"<sup>25</sup> and multimedia formats.

He could imagine nothing providing information in a more accessible form than the printed book, however, although he allowed that perhaps video technology would evolve to the point where users could come to the library to view videos on particular subjects.<sup>26</sup> He envisioned a catalog based on ultramicrofiche replacing the card catalog of the time. He also predicted that perhaps users would be able to browse the catalog or even full text items from home, although he allowed that this seemed "pretty far out."<sup>27</sup> In order for libraries to stay relevant, he wrote, library workers would have to become adept at up and coming technologies.<sup>28</sup> Forty-five years later, the advice remains the same as the technology continues developing, but the capabilities have moved far beyond the building and collections at the center of Cuadra's imaginings.

What will libraries be when they grow up? Maybe the answer is that the librarian becomes the library. Our buildings no longer serve as the intellectual center of our campuses. Administrators ask us to justify our existence and explain our relevance in a world of technological innovation. In order to do so, we must first of all know our relevance and adjust our mission accordingly. Libraries can still serve as the house of learning and knowledge on campus, but librarians will have to loosen our attachment to our buildings and collections and develop ourselves as trusted community anchors in a variety of ways external to physical place. We will have to learn to tell our story again, supporting the worthy goals of deep thinking and critical analysis but also providing our users with a valuable experience that supports their educational endeavors in the tech-enabled ways they desire.

## Notes

1. Maryanne Wolfe, *Proust and the Squid: The Story and Science of the Reading Brain* (New York: HarperCollins, 2007), 70.
2. Nick Bilton, *I Live in the Future and Here's How It Works: Why Your World, Work and Brain Are Being Creatively Disrupted* (New York: Crown Business, 2010), 51-53.
3. Michael Agger, "The Geek Freaks: Why Jaron Lanier rants against what the Web has become," *Slate.com* (January 3, 2010). [http://www.slate.com/articles/arts/books/2010/01/the\\_geek\\_freaks.html](http://www.slate.com/articles/arts/books/2010/01/the_geek_freaks.html)
4. Jaron Lanier, *You are Not a Gadget: A Manifesto* (New York: Alfred A. Knopf, 2010), 46.
5. *Ibid.*, 12-13.
6. *Ibid.*, 19.

7. Julie Zhuo, "Where Anonymity Breeds Contempt," *New York Times* (November 29, 2010): A31.
8. Petrus H. Potgeiter, "Availability of Titles on Peer-to-Peer File Sharing Networks." *arXiv preprint arXiv:1209.3644* (2012): 1. <http://arxiv.org/abs/1209.3644>
9. Lanier, *You are Not a Gadget*, 20.
10. *Ibid.*, ix.
11. Glenn Harlan Reynolds, "Caught in the Web, One view of Web 2.0: Opinion becomes lemming-like, culture gets mashed up and hard work goes unrewarded," *Wall Street Journal* (January 12, 2010). <http://online.wsj.com/article/SB10001424052748703652104574652341134015738.html>
12. Bilton, *I Live in the Future*, 10.
13. *Ibid.*, 96.
14. *Ibid.*, 118-119.
15. Paul Sturges, "Gatekeepers and Other Intermediaries," *Aslib Proceedings* 53, no. 2 (2001): 62-67.
16. Bilton, *I Live in the Future*, 266.
17. *Ibid.*, 264.
18. Frank R. Allen, "The Knowledge Commons: Reasserting the Library as the Heart of Campus," *College and Research Libraries* 72, no. 8 (2011): 468-492.
19. John D. Shank, and Steven Bell, "Blended Librarianship," *Reference & User Services Quarterly* 51, no. 2 (2011): 105-110.
20. T. Scott Plutchak, "Breaking the Barriers of Time and Space: The Dawning of the Great Age of Librarians," *Journal of the Medical Library Association* 100, no. 1 (2012): 10.
21. *Ibid.*, 19.
22. R. David Lankes, "The Librarian Militant, The Librarian Triumphant," NEXT: A Library Futures Symposium, The Alberta Library, Edmonton, Alberta, Canada (October 22, 2010). <http://quartz.syr.edu/blog/?p=1050>
23. *Ibid.*
24. *Ibid.*
25. Carlos A. Caudra, "Libraries and Technological Forces Affecting Them," *ALA Bulletin* 63, no. 6 (June 1969): 763.
26. *Ibid.*, 764.
27. *Ibid.*, 766.
28. *Ibid.*, 767.

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Technological innovations result in the improved lifestyles, and hence consumerism increases and thereby results in more employment opportunities. For example, the industrial revolution created more jobs than it eliminated. So, it is inevitable for companies to catch up with the technologies. In this process, low-skilled workers will be the first section to be removed from the jobs. As a consequence of that, income inequalities are further widening. So technology advancement has too its pros and cons. Coming to the point of pros- as technology increases day by day in the market the human being has been able to earn more revenue in less time because due to technology it has been possible to complete more amount of work in less time and with better accuracy. We all imagine a future full of happiness and comfort. Looking at history, this isn't hard to guess that future will surely be more comforting for humans (don't listen to those sci-fi movies), though the possibility of potential disaster will always be there. But let's assume that our future is going to be better, and the innovations we have included in this list could be helpful doing that. So let's get into the list of 10 recent innovations that can make our lives easier and better in near future.

10. Agile Robots. But this piece of technology sure do have bright future, so bright that it may cause problem to your eyes.
3. Manufactured Houses. 2007 was the year when human population living in urban area surpassed that of living in rural areas. Theme: In the future, nobody will buy printed newspapers or books because they will be able to read everything they want online without paying. To what extent do you agree or disagree with this statement? UK newspapers (Yandex picture) For several years now, various electronic books and websites presenting articles as well as worldwide news are increasingly predominating in our so-called. Responding to the Innovations of Technology and Imagining the Future. Samantha Schmehl Hines. Cautions and accolades about technology have existed as long as technology has. scattered in a rush to discuss how new technologies will raise us up or bring us down. Libraries have often been at the forefront of discussions on how technology will change our operations fundamentally, with a predominant thread of fear for our continued existence running through the conversation. We may fondly remember the Tracy/ Hepburn movie "Desk Set" where librarian Bunny Watson faced off with the computer set to replace her. What kind of technology will we have? Watch this video for a glimpse of the homes of tomorrow. Each one has been built as an experiment, designed to test the latest technology and ideas for living. Some of these houses can evolve as people's lives change. Thinking of having more housemates? Just add on another layer like children's building blocks. Peter White is the Marketing Manager of the Innovation Park, where the houses are built. Amandeep: Peter, are these houses really a glimpse of the future? Peter White: They are. In the next few years, we'll be living in houses that look like this. I imagine, there are some robots, which help me to grow my beloved berries and they also look after the house. up. 0 users have voted.

Library is a place where print, audio, and visual materials are collected and arranged to serve people of all ages and interests. Some people say that traditional libraries are not so popular now as they used to be some years ago. But does it mean that libraries are going to disappear? Personally, I think that libraries are very useful. They say that the device for reading e-books is rather expensive and one needs access to the Internet to download them. E-books may cause problems with eyesight because it is rather tiring to read from the screen. Some people say that one of the main disadvantages of e-books is that the battery must be recharged and that e-books can be easily broken. What is more, so far there is only a limited selection of e-books being published.

Overview | What might the future of computing and technology look like? What innovations are on the horizon? In this lesson, students consider predictions about the future of fields including artificial intelligence, communication and computing. They analyze current predictions, consider them in the context of modern-day life and propose predictions of their own.

Materials | Computers with Internet access, projector, copies of the handout The One-Question Interview (PDF), student journals.

Warm-Up | Individually or in pairs, have students use a One-Question Interview (PDF) format to complete a The technological revolution Industry 4.0 is currently one of the major determinants of the economic development of highly developed and developing countries. Therefore, the issue of Industry 4.0 should be introduced as an additional subject in studies in the fields of management, administration, economics, IT, master of business administration, etc. In view of the above, I am asking you: What new professions will be created on the labor market in the future due to the development of the Industry 4.0 technological revolution? Please reply. I invite you to the discussion. In any case, a strategy to prepare for the future labor needs is required and that has to receive the support of public and private institutions and the involvement of government. Cite. 3 Recommendations.