

The McKinsey Study and the Future of Library Work

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“More and more people are clearing out those paperbacks and downloading e-books on their Tablets and Kindles instead. The same goes for borrowing — as books fall out of favor, libraries are not as popular as they once were. That means you’ll have a tough time finding a job if you decide to become a librarian. Many schools and universities are already moving their libraries off the shelves and onto the Internet.”¹ So said Michael Hoon in *USA Today*. It is easy to counter this argument or ignore it. Though Hoon’s argument is flawed, the issue he raises should concern us. A study by the McKinsey Global Institute brings a sound methodology to bear and reaches similar conclusions.

The McKinsey report entitled *A Future That Works: Automation, Employment, and Productivity* was released in January 2017.² The executive summary pointed out the need to understand the impacts of automation on work:

We are living in a new automation age in which robots and computers can not only perform a range of routine physical work activities better and more cheaply than humans, but are also increasingly capable of accomplishing activities that include cognitive capabilities. These include making tacit judgments, sensing emotion, or even driving—activities that used to be considered too difficult to automate successfully... At a microeconomic level, businesses everywhere will have an opportunity to capture benefits and achieve competitive advantage from automation technologies, not just from labor cost reductions, but also from performance benefits such as increased throughput, higher quality, and decreased downtime.³

The McKinsey report was accompanied by the release of data on over 750 occupations. In its simplest form this data is presented on a tableau-public site.⁴ The news for library workers is not good. Library technicians had a 59% automation potential and librarians a 43% automation potential. With museum technicians and conservators and audio-visual and multimedia collections specialists, librarians and library technicians were the four occupations in the education sector with the highest automation potential. The McKinsey study was extensive

with a strong methodology, as such, the results thus need to be taken seriously and considered carefully.

McKinsey's methodology looked at the activities required for each occupation and then looked at the capacities required to successfully do each of these activities. They assessed the activities against 18 capacities that could be automated to some extent using current, leading edge technology. Their core finding was that, "45 percent of work activities could be automated using already demonstrated technology. If the technologies that process and 'understand' natural language were to reach the median level of human performance, an additional 13 percent of work activities in the US economy could be automated."⁵ It is important to understand that activities are the unit of measure, not occupations. The McKinsey analysis indicates that only 5% of occupations can be entirely automated using current technology, but 60% of occupations could have 30% or more of their constituent activities automated.⁶

According to McKinsey's analysis, library workers, both librarians and technicians, fall squarely in this group. Applying automation to activities will inevitably lead to the job redefinition and modifying business processes. Doing so will be disruptive, but the end result could lead to more fulfilling work. As McKinsey puts it, "As roles and processes get redefined, the economic benefits of automation will extend far beyond labor savings. Particularly in the highest-paid occupations, machines can augment human capabilities to a high degree, and amplify the value of expertise by increasing an individual's work capacity and freeing the employee to focus on work of higher value."⁷

The McKinsey analysis identifies seven groups of capacities and their susceptibility to automation. The least susceptible capacities were managing and developing people (a 9% automation potential) and applying expertise to decision making, planning, and creative tasks (a 18% automation potential). Less susceptible capacities were interfacing with stakeholders (a 20% automation potential) and performing unpredictable physical tasks (a 26% automation potential). The most susceptible capacities were data collection (a 64% automation potential), processing data (a 69% automation potential), and performing predictable physical tasks (an 81% automation potential).⁸

Finally, the McKinsey study identifies five factors that determine the extent and pace of the adoption for automation. The first is technical feasibility. You can automate an activity unless the technology to do so has been invented. The second is the cost of developing and deploying the automated solutions. More expensive solutions will not be deployed as quickly or as widely as less expensive solutions. The third factor is labor market dynamics. There will be less incentive to automate if there are large numbers of people willing to do these jobs for low wages. Where high priced labor can be replaced or where the market for perspective employees is tight the incentives to automate will be increased. The fourth factor is the economic benefits, beyond labor cost savings, that can be accrued. For example, automation could increase quality, reliability, or safety. Finally, there may be regulatory or social acceptance issues. For example, there may be legal issues with replacing nurses with automated systems. In addition, many people could be uncomfortable and unaccepting of such a change.⁹ An example of the latter is the recent closure of several locations by Eatsa, a fully automated restaurant chain in response to customers' general reluctance to substitute technology for human interaction.¹⁰

Automation has been altering the nature of library operations and library jobs for nearly 50 years. The advent of shared cataloging in the early 1970s made it possible for lower paid staff to assume responsibility for much of a library's bibliographic work. Automated library systems and the transition to digital from paper, particularly for the journal literature, lead to a decline in the need for many low-level processing activities. The growth of digital systems, especially reliable information that was easily discoverable on the web (for example Wikipedia and Google or Google Scholar), led to a decline in reference work as users could now find documents and reliable answers on their own. So, the impacts of automation are not new to libraries and librarians.

The McKinsey analysis suggests that changes in the future might be larger than in the past. This could happen in several ways:

1. Automation might be applied to activities inside of individual libraries. For example, automatic charging machines might replace circulation clerks. Bookbots will replace shelvers.
2. Libraries might take advantage of automated capacities outside of the library to change strategies. For example, the ability to acquire paper books quickly because of print-on-demand technology could make possible print purchase-on-demand strategies that would replace acquisitions and cataloging staff as well as librarian time devoted to selection.
3. Automation might be applied by organizations external to the library in a way that would make obsolete and/or replace a library function. Wikipedia and Google are examples of this. Another interesting example is Meta, a machine learning system for searching and assessing the biomedical literature. Meta's performance is impressive. "Large-scale trials conducted by Meta in partnership with industry demonstrated that Bibliometric Intelligence out-performed tens of thousands of human editors by a factor 2.5x at predicting article-level impact for new manuscripts, prior to publication."¹¹ This is not quite a library application, but it is easy to image how Meta might play a role in the editorial process replacing peer review.

It is unclear why the McKinsey analysis indicates that such a substantial portion of librarian activities might be subject to automation. One would hope that the classes of activities that McKinsey identifies as least or less susceptible to automation, particularly the application of expertise to decision making, planning, and creative tasks and interfacing with stakeholders are substantial parts of many librarian jobs. One can imagine that these sets of activities would become more important and a larger part of jobs as library liaison roles shift from collection building and are more engaged with instruction and supporting research and scholarly communication. Of course, for some librarians, managing and developing people, a least susceptible activity, will be large part of their jobs.

The McKinsey assessment of library technicians seems more likely to be accurate.

There are a number of important questions that libraries need to address which consider how automation will impact library work:

1. Can we predict what library activities are most likely to be susceptible to automation?
2. Can we imagine how jobs will be redefined, and what business processes will need to be modified and what these modified processes might look like?
3. Given the traditional long tenure of most library workers, how can we develop individual and organizational incentives for the lifelong learning required for the inevitable changes in jobs, especially as these will often involve new skills and expertise?
4. How do libraries create organizational environments that are flexible and where change is embraced?

In commenting on the McKinsey work, Bror Saxberg, vice president of Learning Science, at the Chan Zuckerberg Initiative, says, "As human decision making becomes rarer, and also more complex with higher impact, it becomes increasingly valuable to attract the best talent. You'll do a better job attracting this talent if you have a reputation for taking care of people, even if you let some of them go."¹² Bob Kegan of the Harvard Graduate School of Education says, "The number of employees who are operating in more nonstandard, complex jobs is going to increase, while less complex work is going to be increasingly automated. The time it takes for people's skills to become irrelevant will shrink." He goes on to say "You're never going to be able to hire and fire your way to the competencies you need. So you have to think about how work itself can foster talent."¹³

The core challenge for libraries then is to develop into organizations that allow workers to change and develop over time and that can create work that develops and uses talent.

¹ Michael Hoon, "Careers: 8 Jobs That Won't Exist in 2030," *USA Today*, October 13, 2017, <https://www.usatoday.com/story/money/careers/2017/10/13/8-jobs-that-wont-exist-in-2030/104219994/>.

² James Manyika, Michael Chui, Mehdi Miremadi, Jacques Bughin, Katy George, Paul Willmott, and Martin Dewhurst, *A Future That Works: Automation, Employment, and Productivity* (McKinsey Global Institute, January 2017), <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>

³ Ibid.

⁴ McKinsey Global Institute, “Automation Potential and Wages for US Jobs,” last modified January 14, 2017, <https://public.tableau.com/profile/mckinsey.analytics#!/vizhome/AutomationandUSjobs/Technicalpotentialforautomation>

⁵ Michael Chui, James Manyika, and Mehdi Miremadi, “Four Fundamentals of Workplace Automation,” *McKinsey Quarterly*, November 2015, <http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/four-fundamentals-of-workplace-automation>. See also: James Manyika, et. al., *A Future That Works: Automation, Employment, and Productivity* (McKinsey Global Institute, January 2017), 4, <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>.

⁶ Michael Chui, James Manyika, and Mehdi Miremadi, “Four Fundamentals of Workplace Automation,” *McKinsey Quarterly*, November 2015, <http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/four-fundamentals-of-workplace-automation>.

⁷ Ibid.

⁸ James Manyika, et. al., *A Future That Works: Automation, Employment, and Productivity* (McKinsey Global Institute, January 2017), 6, <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>; and Michael Chui, James Manyika, and Mehdi Miremadi, “Where Machines Could Replace Humans—and Where They Can’t (yet),” *McKinsey Quarterly*, July 2016, <http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet>

⁹ James Manyika, et al., *A Future That Works: Automation, Employment, and Productivity* (McKinsey Global Institute, January 2017), 10-13, <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>; and Michael Chui, James Manyika, and Mehdi Miremadi, “Where Machines Could Replace Humans—and Where They Can’t (yet),” *McKinsey Quarterly*, July 2016, <http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet>.

¹⁰ Makada Henry-Nickie, “AI Should Worry Skilled Knowledge Workers Too,” Brookings Institution, November 8, 2017, <https://www.brookings.edu/blog/techtank/2017/11/08/ai-should-worry-skilled-knowledge-workers-too>

¹¹ Aries Marketing, “Press Release: Artificial Intelligence Integration Allows Publishers a First Look at Meta Bibliometric Intelligence,” October 17, 2016, <https://www.ariessys.com/views-press/press-releases/artificial-intelligence-integration-allows-publishers-first-look-meta-bibliometric-intelligence/>. See also the <http://meta.com>.

¹² “Getting Ready for the Future of Work,” *McKinsey Quarterly* (September 2017), accessed November 14, 2017, <http://www.mckinsey.com/business-functions/organization/our-insights/getting-ready-for-the-future-of-work>.

¹³ Ibid.