

Part I: Context and Background

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Scholarly communication is the process of producing, evaluating, disseminating, and preserving the research findings of scholars and scientists shared with academic communities and other interested parties. This process helps shape academic disciplines, legitimize lines of inquiry and research methods, and influence public policy; it requires not only the availability of published materials, but also their review, use, and reuse as part of an active and evolving exchange of ideas. Scholarly publishing, the journals and monographs at the core of scholarly communications, has faced a series of challenges over the past few decades: discoverability, collection and preservation, and especially publication and production. Since the mid-20th century, new technologies have been and are being created to meet these challenges, yet many solutions have quickly become obsolete or spawned new problems, such as the attempt to reduce costs by using the Internet to distribute digital publications creating complications involving intellectual property rights, discoverability, and citation. Although the Internet initially appeared to offer a way to reduce the costs of scholarly publishing, particularly in the global north and other portions of the developed world, today, more than 20 years after its advent, its potential to deliver innovative modes of transmission and new communication formats remains largely untapped. Digital publishing has become a form of scholarly communication using PDF and ePub versions of articles and monographs, yet these remain tied to the long-struggling traditional publishing industry, particularly in the West, while more experimental and hybrid forms of scholarship remain on the fringe of student use and faculty acceptance.

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Although scholars have always communicated with one another, the system of scholarly communication began with the formation of learned societies in Europe and quickly spread to colonies and centers of learning throughout the world. Groups of philosophers, observers, and experimenters formed societies to help them work together to increase their knowledge and define common goals by sharing discoveries and experiments. Formal scholarly communication in the English language began in the collection of the notes and letters of the members of the Royal Society of London and their publication in a scholarly journal, *Philosophical Transactions of the Royal Society*, in 1665. In addition to notes and letters, scientific articles quickly became the standard form used within such journals to disseminate observations and findings among society members, patrons, and sponsors. The system continued to evolve and expand as these societies proliferated, diversified, and grew. Journals became serial publications whose increasing number and volume required the development of indexing and cataloging practices in libraries and peer and editorial review processes by the societies to manage their production. However, because the audience for these works was relatively small and specialized, seldom were sales enough to cover production costs and labor. Scholarly publications therefore became the product of a gift or prestige

economy rather than that of a strictly commercial market. Much of the labor surrounding scholarly publications, writing, editing, and peer review, was and is essentially exchanged for reputation and prestige, factors that became and remain important in the assessment, promotion, and tenure process of modern higher education.¹ The system of scholarly communication continued to grow and evolve beyond the journal as the landscape of higher education changed.

The passage of the Morrill Act in 1862 brought about the creation of the land-grant university system and shifted the focus of higher education in the US toward research and improving the economy. More than just increasing the number of students and faculty, the range of scholarly disciplines expanded as did large-scale research projects that necessitated a new long-form of scholarly communication: the scholarly monograph, a specialist work on a single subject by a single author, a format that has since become inextricably linked with the system of assessment, promotion, and tenure for those in the humanities and social sciences. The 1887 Hatch Act placed greater emphasis (and access to funding) on experimentation and the 1914 Smith-Lever Act on sharing knowledge and information with the public, suggesting a greater emphasis on publication by professional scholars.² The monograph was intended to meet this need, rather than provide a source of revenue or even cost recovery, so it fell to universities to augment the efforts of the scholarly societies by also becoming publishers. The economics of the monograph meant that these new university presses also came to depend on the same prestige economy that already supported journal production.

Surprisingly, journals and monographs became profitable in the second-half of the 20th century after the GI Bill and the “space race” fueled a greater expansion of higher education and the rapid conversion of teachers’ colleges into universities. Publishing had to expand to meet the burgeoning needs of a growing faculty and body of scholarship, along with increased interest in new science and technology, leading libraries to purchase more works, and then to physically grow as they required more storage space. This activity was largely funded by government grants and programs in the post-war decades, especially in the STEM disciplines (science, technology, engineering, and mathematics), yet society and university presses could not keep up with the demand, attracting commercial publishers to the now lucrative academic market, creating what some have called the golden age of academic publishing. However, because most of this production was supported by public funds rather than the scholarly market (student use, library holdings, or for use in promotion and tenure review),³ when federal and state budgets were eventually cut in the 1970s, sales faltered and scholarly publishing began to suffer.

The changing roles and mission of libraries and the spreading influence of digital technology began to radically alter scholarly communications in the 1980s. While libraries tried to maintain the strengths of their collections, and preservation efforts and bibliographic control, they also moved to automate processes as computer and information technology developed. Library experts such as Martin Cummings and David Lewis considered the costs of automation and the changing nature of the library, its holdings, and services, with Cummings addressing automation and cataloging, and Lewis forecasting not only the way research might change, but also how scholars and students might use the library differently (if at all).⁴ Cummings added to the voices of others in pointing out that the cost of publications had risen faster than the consumer price index since the late 1970s and libraries had started to develop “resource-sharing

schemes” even as publishers began to look to new online sales of information services for profits.⁵ In 1986 Cummings saw the advantages of preparing and storing information electronically to increase access, availability, and preservation, although this was before consumer-based challenges appeared such as media evolution and the rapid obsolescence of formats (floppy disks, video tapes, CD-ROMs).⁶ By 1988, although Lewis was looking at the library, his comments reflect changes needed in the system of scholarly communication as the “power of new media and the failings of the old system [of print publishing] are driving scholarly institutions toward change.”⁷ Things were beginning to change, slowly, and the advent of the Internet created greater disruption of both scholarly communications (including all forms of publishing) as well as research libraries.

Decades before the Internet was created, librarians and others began to envision networked texts, data, and scholarship that would propel research in the future—the activity that became the conceptual basis for the World Wide Web. Before J. C. R. Licklider of MIT published his report outlining such a vision, *Libraries of the Future*, he described how data, programs, and information might be accessed by people using computers from anywhere in the world; he called this concept a “Galactic Network” in 1962.⁸ The first steps to creating this global network, what would become the Internet, began with DARPA and the ARPANET in 1969. By the mid-1980s it was common for students in the sciences and engineering to dial-in to their institutional mainframes and libraries. By the end of the 1980s, network providers including America Online, CompuServe, UUNet, and PSInet, among others, provided access to the growing free and commercial network of servers. The text-based Internet with its electronic billboards, chat relays, and early use-nets all suggested that the potential Lewis had described as the future digital library was within reach and most university students were now expected to own and use computers in their research and scholarship. 1992 is marked by many as the point at which the World Wide Web became open to the public thanks to the invention of Mosaic, the precursor to Netscape Navigator, a graphical user interface that could present the contents (initially limited to text and images) of these early websites—the first web browser.

1992 also marked the publication of an influential book on the need to transform how the library delivered its services at the dawn of the digital age and of a study commissioned by the Andrew W. Mellon Foundation on the changing and possibly troubled economics of the research library. Michael Buckland’s *Redesigning Library Services: A Manifesto* articulated how library services—providing access to knowledge—needed to be considered in terms of the paper library, automated library (where Cummings and Lewis had placed their focus), and the fast-growing electronic library. Even though Buckland’s vision did not immediately integrate with the emerging World Wide Web, it did suggest how networked data might help libraries take advantage of extended, interconnected catalogs, bibliographies, and digital texts. The report commissioned by the Mellon Foundation, *University Libraries and Scholarly Communication*, emphasizes this moment of flux by suggesting that the entire system of scholarly communication was about to change in part because it was no longer sustainable in its present form. The roots of this study lay in the ARL Serials Prices Project (1989), the findings of which so concerned the Mellon Foundation that it launched its own multi-year study⁹ to better understand major trends in research library spending, including the portion spent on journal subscriptions versus book purchases, the share for new acquisitions versus the cost to preserve and catalog holdings, and to consider how new technology had

recently affected the work of librarians and archivists as well as to envision future changes in not just libraries, but also those needed to sustain scholarly communications more broadly. Scholarly publishing had long coped with a series of issues that one press director characterized as a “chronic illness” going back to at least the 1970s, but also continued into the 1990s as libraries bought fewer books and journal subscriptions.¹⁰

Between the economic instability of the traditional print forms and the need for libraries to use the latest technology to fulfill their core services, both short-form and long-form scholarship had to transform. This transformation started with digitized forms made available online, but quickly began to evolve new features and hybrid forms.

In the early 1990s libraries had already been under tremendous strain because of increasing journal subscription fees, the proliferation of cross-disciplinary journals, the growing demands for ever-more specialized monographs for tenure and review (even though fewer were selling to libraries), and the burgeoning amount of scholarship being produced by faculty under greater demands to publish more and faster. As Buckland’s manifesto suggests, libraries were also under pressure to alter the way they provided services to readers who were quickly being redefined as “users.” The Internet spawned the open source movement for computer code, which provided a model for new initiatives pushing for the free and open access to information—including scholarship and the vast field of gray “unpublished” literature. The Internet also quickly offered novel options to disseminate research and create new forms of scholarship and revolutionary experiments in academic narrative and argument as hybrid or emerging scholarship. Between the economic instability of the traditional print forms and the need for libraries to use the latest technology to fulfill their core services, both short-form and long-form scholarship had to transform. This transformation started with digitized forms made available online, but quickly began to evolve new features and hybrid forms.

Endnotes

- 1 Stanley Chodorow, “Scholarship & Scholarly Communication in the Electronic Age,” *EDUCAUSE Review* 35, no. 1 (January/February 2000): 88–89, <http://www.educause.edu/ero/educause-review-magazine-volume-35-number-1-januaryfebruary-2000>.
- 2 Board on Agriculture, National Research Council, *Colleges of Agriculture at the Land Grant Universities: A Profile* (Washington, DC: National Academy Press, 1995), 9–10.
- 3 Chodorow, “Scholarship & Scholarly Communication in the Electronic Age,” 89.
- 4 David Lewis, “Inventing the Electronic University,” *College & Research Libraries* 49, no. 4 (1988): 298, doi:10.5860/crl.76.3.296.
- 5 Martin M. Cummings, *The Economics of Research Libraries* (Washington, DC: Council on Library Resources, 1986), 26–29.
- 6 Ibid., 58–65.

- 7 Lewis, "Inventing the Electronic University," 296.
- 8 Barry M. Leiner et al., "Brief History of the Internet," The Internet Society, accessed May 4, 2015, <http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet>.
- 9 Mary M. Case, "Scholarly Communication: ARL as a Catalyst for Change," *portal: Libraries and the Academy* 9, no.3 (July 2009): 383. doi: 10.1353/pla.0.0050.
- 10 Sanford G. Thatcher, "Thinking Systematically about the Crisis in Scholarly Communication," in *The Specialized Scholarly Monograph in Crisis or How Can I Get Tenure If You Won't Publish My Book?* edited by Mary M. Case, (Washington, DC: Association of Research Libraries, 1997).

Additional References

- Brown, Laura, Rebecca Griffiths, and Matthew Rascoff. "University Publishing in a Digital Age." Ithaka Report. July 26, 2007. <http://sr.ithaka.org/research-publications/university-publishing-digital-age>.
- Buckland, Michael. *Redesigning Library Services: A Manifesto*. Chicago: American Library Association, 1992. <https://archive.org/details/redesigninglibra00buck>.
- Bush, Vannevar. "As We May Think," *Atlantic Monthly* 176 (July 1945): 101–108. <http://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/>.
- Cummings, Anthony M., Marcia L. Witte, William G. Bowen, Laura O. Lazarus, and Richard H. Ekman. *University Libraries and Scholarly Communication: A Study Prepared for the Andrew W. Mellon Foundation*. Washington, DC: Association of Research Libraries, 1992.
- De Roure, David. "The Future of Scholarly Communications." *Insights* 27, no.3 (November 2014): 233–238. <http://eprints.soton.ac.uk/370703/>.
- Fitzpatrick, Kathleen. *Planned Obsolescence: Publishing, Technology, and the Future of the Academy*. New York: New York University Press, 2011.
- Licklider, J. C. R. *Libraries of the Future*. Cambridge, MA: MIT Press, 1965. <https://archive.org/details/librariesoffutur00lickuoft>.

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