

Ownership and the History of American Computing

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Questions about ownership permeate the history of computing. Some of their most common manifestations involve the ownership of individual machines, from mainframe leases to personal computer purchases. Some of their most unusual manifestations involve national debates on the scope of intellectual property (IP) rights. Connecting these questions are stories about the uses and limits of IP that highlight the importance of three forms of protection. First, patents grant a temporary monopoly over an invention in exchange for public disclosure. Second, copyrights protect creative works such as books and sound recordings. Third, trade secrets allow corporations a certain degree of secrecy in the way they treat their knowledge and undeveloped technologies.¹

The study of ownership presents a rich historiographic opportunity to analyze the interplay between IP and technology development. Although historians of computing have acknowledged the importance of this area by writing about topics such as software patents, the broader history of ownership and computing has been generally overlooked.² This Think Piece examines how historians of computing can benefit from works produced by legal scholars and draw methodological guidance from scholarship on the history of ownership.³ I focus on the period between the 1940s and 1980s, during which the legal frameworks for the ownership of machines and programs that we know today began to develop.⁴

The Study of Ownership

The historiography of ownership is an interdisciplinary body of work with a clear methodological agenda: to emphasize the role that innovators, users, judges, legislators, and critics played in the creation and use of frameworks to understand ownership and to explore the symbiotic, yet problematic relationships between the history of technology and American law.

This historiography comprises two important families of work. First, legal history is one of the dominant disciplines in the field. A good example is the work of Pamela Samuelson, which describes what she calls the “strange odyssey” of software as a source of problems in IP law.⁵ Like many other excellent works in her field, Samuelson’s essay favors the development of common law and statutory reform over the broader social and technological contexts within which these changes occurred.

Second, a much smaller group of works examines the historical interplay between technological development and IP law. Writing about inventions that range from punch cards to hormones, a handful of scholars have stressed how specific technologies and their historical contexts are as important as the legal mechanisms that govern their ownership.⁶ In their hands, inventions, works, and knowledge are as illuminating as the patents, copyrights, and trade secrets that protect them.

The historical study of ownership and computing can link these two families of work. IP is central to the problems and solutions that corporations, employees, and inventors faced in order to become and remain competitive in the industry. Business leaders, researchers, and their lawyers have exploited and tested IP rights; strived to protect information in light of employee mobility; and struggled to secure rights over machines, programs, and programmed machines. At the same time, legislators, judges, and bureaucrats have worked to craft and interpret American law in light of the challenges posed by computing technologies.

Regulating a Revolution

The historical roots of the relationships between computing and intellectual property are more than 100 years old. At the beginning of the 20th century, corporations such as Burroughs and Hollerith relied on the American patent system to ensure their growth in light of the federal government’s increasingly strict antitrust enforcement. During the following decades, punch cards, memory drums, and other machine components were the subject of several patents.⁷ Still, the most litigious and enlightening decades of this history coincide with the development of modern computing. For instance, Jay Forrester applied for a patent on his magnetic-core memory in 1951, was awarded the patent in 1956, and soon entered a legal conflict meant to determine the rightful inventor of the technology.

Beginning in the early 1960s, a series of patent applications forced the US Patent and Trademark Office to consider whether inventions that dealt with numerical data processing methods were eligible for patent protection. At the same time, in 1964 the Copyright Office granted protection to computer programs as if they

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were books—as lines of text that had been creatively put together. Presidential and Congressional commissions and hearings soon followed. Much like the nation’s patent and copyright officers, the presidentially appointed commissioners were puzzled by whether computer programs were creative works, applications of formulae, or merely mechanical interfaces between users and machines.

By 1970, computing communities had become especially concerned with ownership. On the one hand, users and scholars announced that perhaps only trade secrets would ultimately protect computer programs. They sometimes complained either that IP lawyers did not know how to cope with algorithms or that the Copyright Office did not know what constituted a book. On the other hand, although several corporations sponsored many of the inventions at stake in conflicts over the patent eligibility of computer programs, their leaders and legal departments were still concerned with machine ownership. This occurred in part because the problem of authorship—of determining who invented specific technologies such as the magnetic storage drum and the electronic computer itself—had become a priority in corporate engagement with IP. Most notably, the well-known 1973 case *Honeywell v. Sperry Rand* raised concerns about whether Sperry Rand owned the patent on the ENIAC, for which J. Presper Eckert and John Mauchly had applied in 1947 and which the Patent Office issued in 1964.

Even after IBM unbundled its software in 1969 and patents for computer programs reached the Supreme Court in 1972, corporations continued to focus on the ownership of machines. This problem had become especially pressing because employees were

moving from one company to another, taking with them knowledge about new and upcoming hardware features. During the 1970s, several courts emphasized that even knowledge about the market, new technologies, or combinations of hardware can merit IP protection. This was especially clear in the 1975 case *Telex v. IBM*, in which IBM successfully countered an antitrust complaint by arguing that Telex unscrupulously obtained IBM’s trade secrets.

Although the question of machine ownership had begun to shift toward the problem of employee mobility, the question of software protection remained unsolved all through the 1970s. By the end of the decade, a presidentially appointed group called the Commission on New Technological Uses of Copyrighted Works (CONTU) recommended that computer programs receive copyright protection. This became part of the law in 1980, and in 1981, the landmark Supreme Court case *Diamond v. Diehr* established that processes run by a programmed computer are patentable if they somehow manipulate physical matter. In addition, an activist group began to develop dedicated to freeing software from the grasp of IP, the Free Software Movement. These events set the stage for the debates on the American patent system that continue to be in the news today.

The study of ownership and computing enables a reconsideration of several themes that are central to our discipline. It demonstrates that authorship is crucial to the historical study of hardware ownership. It also shows that the movement of employees between companies encouraged corporations to protect their proprietary information and that this protection was central to IBM’s engagement with antitrust law during the 1970s. Finally, it demonstrates that software patents are not an isolated problem in the history of intellectual property law. Rather, they are evidence of a series of conflicts as old as computing itself.

References and Notes

1. Trademarks, the fourth major form of intellectual protection, have been less problematic in the history of computing.
2. See M. Campbell-Kelly, “Not All Bad: An Historical Perspective on Software Patents,” *Michigan Telecommunications and Technology Law Rev.*, vol. 11, no. 191, 2004–2005, pp. 191–248.

3. This Think Piece is based on my upcoming doctoral dissertation, "Regulating a Revolution: Ownership and the History of American Computing, 1940–1981," Dept. of History, Program in the History of Science and Medicine, Yale Univ.
4. For legal historians, this is a time during which strict antitrust enforcement and judicial attacks on the validity of patents discouraged businesses from patenting their inventions. For historians of computing, the same period is central to narratives about technologies that predate the widespread establishment of home computing.
5. P. Samuelson, "The Strange Odyssey of Software Interfaces as IP," *Making and Unmaking Intellectual Property: Creative Production in Legal and Cultural Perspective*, M. Biagioli, P. Jaszi, and M. Woodmansee, eds., Univ. of Chicago Press, 2011, pp. 321–338.

6. For example, see M. Biagioli, P. Jaszi, and M. Woodmansee, eds., *Making and Unmaking Intellectual Property: Creative Production in Legal and Cultural Perspective*, Univ. of Chicago Press, 2011.
7. For example, see L. Heide, "Facilitating and Restricting a Challenger: Patents and Standards in the Development of the Bull-Knutsen Punched Card System, 1919–1938," *Business History*, vol. 51, no. 1, 2009, pp. 28–44.

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