

2014

## The Great Disruption: How Machine Intelligence Will Transform the Role of Lawyers in the Delivery of Legal Services

John O. McGinnis

*Northwestern University School of Law*

Russell G. Pearce

*Fordham University School of Law*

Follow this and additional works at: <https://ir.lawnet.fordham.edu/flr>



Part of the [Law Commons](#)

---

### Recommended Citation

John O. McGinnis and Russell G. Pearce, *The Great Disruption: How Machine Intelligence Will Transform the Role of Lawyers in the Delivery of Legal Services*, 82 Fordham L. Rev. 3041 (2014).

Available at: <https://ir.lawnet.fordham.edu/flr/vol82/iss6/16>

This Colloquium is brought to you for free and open access by FLASH: The Fordham Law Archive of Scholarship and History. It has been accepted for inclusion in Fordham Law Review by an authorized editor of FLASH: The Fordham Law Archive of Scholarship and History. For more information, please contact [tmelnick@law.fordham.edu](mailto:tmelnick@law.fordham.edu).

# THE GREAT DISRUPTION: HOW MACHINE INTELLIGENCE WILL TRANSFORM THE ROLE OF LAWYERS IN THE DELIVERY OF LEGAL SERVICES

*John O. McGinnis\* & Russell G. Pearce\*\**

## INTRODUCTION

Law is an information technology—a code that regulates social life. In our age, the machinery of information technology is growing exponentially in power, not only in hardware, but also in the software capacity of the programs that run on computers. As a result, the legal profession faces a great disruption. Information technology has already had a huge impact on traditional journalism, causing revenues to fall by about a third and employment to decrease by about 17,000 people in the last eight years<sup>1</sup> and very substantially decreasing the market value of newspapers. Because law consists of more specialized and personalized information, the disruption is beginning in law after journalism. But, its effects will be as wide ranging. Indeed they may ultimately be greater, because legal information is generally of higher value, being central to the protection of individuals' lives and property.

The disruption has already begun. In discovery, for instance, computationally based services are already replacing the task of document review that lawyers have performed in the past. But computational services are on the cusp of substituting for other legal tasks—from the generation of legal documents to predicting outcomes in litigation. And when machine intelligence becomes as good as lawyers in developing some service or some factor of production that contributes to a service, it does not stop improving. Intelligent machines will become better and better, both in terms of performance and cost. And unlike humans, they can work ceaselessly around the clock, without sleep or caffeine. Such continuous technological acceleration in computational power is the difference between previous technological improvements in legal services and those driven by machine intelligence. This difference makes it the single most important

---

\* George C. Dixon Professor in Constitutional Law, Northwestern University School of Law.

\*\* Edward & Marilyn Bellet Professor of Legal Ethics, Morality, and Religion, Fordham University School of Law.

1. See Jesse Holcomb, *News Revenue Declines Despite Growth from New Sources*, PEW RES. CENTER (Apr. 3, 2014), <http://www.pewresearch.org/fact-tank/2014/04/03/news-revenue-declines-despite-growth-from-new-sources/>.

phenomenon with which the legal profession will need to grapple in the coming decades.

These developments have enormous implications for every aspect of law—legal practice, jurisprudence, and legal education. Here, we focus on one important consequence: the weakening of lawyers' market power over providing legal services. We argue that these developments will generally increase competition. They will commoditize legal services, permitting clients to make easier price comparisons. They will also bring in new entrants, both as direct suppliers of services and low-cost providers of inputs to services of lawyers.

These new technologies will substantially shake up the legal profession, harming the economic prospects of many lawyers, but providing advantages to some others. Machines may actually aid two kinds of lawyers in particular. First, superstars in the profession will be more identifiable and will use technology to extend their reach. Second, lawyers who can change their practice or organization to take advantage of lower cost inputs made available by machines will be able to serve an expanding market of legal services for middle-class individuals and small businesses, meeting previously unfulfilled legal needs.

Machines may, at least at first, neither greatly help nor substantially harm other classes of lawyers and some of their functions. First, because machines will not speak in court for the foreseeable future, oral advocates will continue to enjoy a lucrative niche, although machines may reduce the number of disputes by creating a convergence of litigants on the value of a case. Second, those lawyers who are in highly specialized areas subject to rapid legal change, like Dodd-Frank regulation, will be relatively unaffected, because machines will work best in more routinized and settled areas. Third, counselors who must persuade unwilling clients to do what is in their self-interest will also continue to have a role, since machines will be unable to create the necessary emotional bonds with clients.

But journeymen lawyers—such as those who write routine wills, vet house closings, write standard contracts, and review documents—face a much bleaker future, because machines will do many such routine legal tasks. Thus, while the arrival of the machines will be generally good for consumers, the picture is much more mixed for lawyers.

The surest way for lawyers to retain the market power of old is to use bar regulation to delay and obstruct the use of machine intelligence. But bar regulation will generally be unavailing. First, lawyers will be able to use many machine-created products to make their own work more cost effective. Thus, using machine inputs can comply with bar regulation, while also creating competitive pressures by lowering costs and reducing the need for the aid of other lawyers. Second, even if unauthorized practice laws in the United States do not change to permit extensive machine intelligence in the production of legal services, those laws will continue to prove ineffective in stemming the emergence of widespread machine lawyering and preserving lawyers' monopoly. Moreover, the global nature of machine intelligence will continue to put pressure on the U.S. market for

legal services, regardless of the laws of the United States. The message here is that the machines are coming, and bar regulation will not keep them out of the profession or do much to delay their arrival.

This Article proceeds in two Parts. Part I describes the relentless growth of computer power in hardware, software, and data collection capacity. This Part emphasizes that machine intelligence is not a one-time event that lawyers will have to accommodate. Instead, it is an accelerating force that will invade an ever-larger territory and exercise a more firm dominion over this larger area. We then describe five areas in which machine intelligence will provide services or factors of production currently provided by lawyers: discovery, legal search, document generation, brief generation, and prediction of case outcomes. Part II discusses how these developments may create unprecedented competitive pressures in many areas of lawyering. This Part further shows that bar regulation will be unable to stop such competition. Because bar regulation will be ineffective, we expect an age of unparalleled innovation in legal services, as startups compete to deliver important components of legal tasks in new ways.

## I. THE MANY AVATARS OF MACHINE INTELLIGENCE IN LAW

In this Part, we first consider the general rise of machine intelligence. Second, we consider how this rise may affect five areas of legal practice. Third, we suggest that, over time, these transformations will change legal practice, helping superstars at the expense of journeymen lawyers. Fourth, we respond to some possible objections to the proposition that machine intelligence will make a fundamental difference to the legal profession.

### A. *The Rise and Rise of Machine Intelligence*

Computers have been accelerating in power according to “Moore’s Law.” This law reflects the regularity that the number of transistors that can be fitted onto a computer chip doubles every eighteen months<sup>2</sup> to two years.<sup>3</sup> For over forty years, computers have been growing at a similarly exponential rate.<sup>4</sup> Computers are to the late twentieth century and early twenty-first century what the steam machine was to the nineteenth—the primary dynamo and symbol of progress.<sup>5</sup>

Recently, researchers confirmed that Moore’s Law remains accurate and further noted that a similar exponential growth occurs in the telecommunication and storage of information.<sup>6</sup> In a 2011 article, two

---

2. See Dan L. Burk & Mark A. Lemley, *Policy Levers in Patent Law*, 89 VA. L. REV. 1575, 1620 n.147 (2003).

3. See *Moore’s Law*, INTEL CORP., <http://www.intel.com/content/www/us/en/silicon-innovations/moores-law-technology.html?wapkw=moores+law> (last visited Apr. 26, 2014).

4. See Burk & Lemley, *supra* note 2, at 1620 n.147.

5. See HENRY ADAMS, *THE EDUCATION OF HENRY ADAMS* 379–90 (Henry Cabot Lodge ed., 1918) (discussing the Virgin as the symbol of the Middle Ages and the steam engine as that of the nineteenth century).

6. See Martin Hilbert & Priscila López, *The World’s Technological Capacity To Store, Communicate, and Compute Information*, SCIENCE, Apr. 1, 2011, at 60, 64.

researchers calculated that the computing capacity of information, which they define as the communication of information through space and time guided by an algorithm, is growing by approximately 58 percent a year—very close to the eighteen-month doubling posited by Moore’s law.<sup>7</sup> The temporal communication aspect of information, such as broadband capacity, has been growing at 28 percent per year, doubling in approximately thirty-four months.<sup>8</sup> The spatial capacity for storage has been growing at 23 percent per year with a doubling time of about forty months.<sup>9</sup> The latter capacities provide the infrastructure for the growth of “big data”—the increasingly accurate representation of our world in digital form.

We generally think in linear terms. But when we understand its power, exponential growth should command our attention. The computational power in a cell phone today is a thousand times greater and a million times less expensive than all the computing power housed at MIT in 1965.<sup>10</sup> Assuming that computers continue to double in power, their hardware dimension alone will be over two hundred times more powerful in 2030.<sup>11</sup>

To be sure, the question remains of how long Moore’s Law will continue. Intel, the largest chipmaker, has projected that Moore’s Law will extend until at least 2029.<sup>12</sup> In any event, substantial evidence suggests that computing has been growing at an exponential rate since before the rise of the chips that power our machines today.<sup>13</sup> Other methods are under study, such as optical computing or quantum computing, which can provide continued rapid growth.<sup>14</sup>

Looking at the exponential increase in hardware capability actually understates the change in computational capacity in two ways. A study considering improvements in a computer task used a benchmark for measuring computer speed over a fifteen-year period.<sup>15</sup> It suggested that the speed of performing the task had been improved by 1,000 times through increases in hardware capacity. But improvements in software algorithms also increased computer speed to an even greater extent.<sup>16</sup>

Computers interconnect among themselves and with human intelligence. The most salient and obvious mechanism is the internet. But this

---

7. *See id.*

8. *See id.*

9. *See id.*

10. Ray Kurzweil, *Making the World a Billion Times Better*, WASH. POST, Apr. 13, 2008, at B4.

11. *See* HANS MORAVEC, *ROBOT: MERE MACHINE TO TRANSCENDENT MIND* 7 (1999).

12. Jeremy Geelan, *Moore’s Law: “We See No End in Sight,” Says Intel’s Pat Gelsinger*, SYS-CON MEDIA (May 1, 2008), <http://java.sys-con.com/read/557154.htm>.

13. *Id.*

14. For a helpful introduction to quantum computing, see GEORGE JOHNSON, *A SHORTCUT THROUGH TIME: THE PATH TO THE QUANTUM COMPUTER* (2003).

15. EXEC. OFFICE OF THE PRESIDENT: PRESIDENT’S COUNCIL OF ADVISORS ON SCI. & TECH., *REPORT TO THE PRESIDENT AND CONGRESS: DESIGNING A DIGITAL FUTURE: FEDERALLY FUNDED RESEARCH AND DEVELOPMENT IN NETWORKING AND INFORMATION TECHNOLOGY* 71 (2010), available at <http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-nitrd-report-2010.pdf>.

16. *Id.*

interconnection is a process, not a single event. The internet will not only connect more and more people, but also more and more physical objects through RFID tags—the so-called “internet of things.”<sup>17</sup> The internet will also become more sensate as more sensors are attached to it, connecting it to the environment as well as the objects of the world around us.

The greater power of computation, as represented in hardware, software, and connectivity, was behind the creation of Watson, the IBM machine that beat the best *Jeopardy* champions of all time in 2011.<sup>18</sup> *Jeopardy* is a game of complexity and breadth, requiring players to disentangle elements that seem unique to human understanding, including jokes, rhymes, and language games. This combination of natural language capability, together with the capacity to analyze issues containing different kinds of information and ambiguity, make Watson’s application relevant to the discussion of machines in the practice of law. Watson won by exploiting the improvements in all three areas discussed above—hardware, software, and connectivity—all capacities that can be expected to rapidly improve. As a result, Watson is a harbinger of the growing scope of machine intelligence in daily life.

Indeed, IBM considers Watson so important that it has created a division around the machine, investing \$1 billion in the machine’s development.<sup>19</sup> IBM is using its program to aid in medical diagnosis.<sup>20</sup> At a recent competition on how to make use of Watson, the winning entry centered on the legal field, using Watson to search for relevant evidence in data and predict how helpful the evidence will be to winning the case.<sup>21</sup> This kind of intelligence will progressively transform legal practice, displacing many tasks lawyers perform today. While we will look at many manifestations in law, all machine-driven legal services will use sophisticated algorithms both to structure data in various forms, such as legal documents, and to make predictions about future events, like case outcomes.

Before looking at some of the current and forthcoming forms of machine intelligence in the legal profession, it is important to recognize two central propositions about the progress of machine intelligence. First, before the combination of hardware, software, and connectivity progresses to a certain point, machine intelligence represents no substitute for human activity. For example, decades after computers were invented, they presented no

---

17. Michael Chui et al., *The Internet of Things*, MCKINSEY Q., Mar. 2010, at 70, 74.

18. See John Markoff, *Computer Wins on ‘Jeopardy!’: Trivial, It’s Not*, N.Y. TIMES, Feb. 17, 2011, at A1.

19. Quentin Hardy, *IBM Is Betting That Watson Can Earn Its Keep*, N.Y. TIMES, Jan. 9, 2014, at B9.

20. Margalit Gur-Arie, *IBM’s Watson Starts Its Medical Career*, KEVINMD.COM (Mar. 30, 2013), <http://www.kevinmd.com/blog/2013/03/ibms-watson-starts-medical-career.html>; see also *Elementary Solution: IBM’s Watson To Sequence Cancer DNA*, KHALEEJ TIMES (Mar. 21, 2004), [http://www.khaleejtimes.com/kt-article-display-1.asp?section=diversions&xfile=/data/diversions/2014/March/diversions\\_March11.xml](http://www.khaleejtimes.com/kt-article-display-1.asp?section=diversions&xfile=/data/diversions/2014/March/diversions_March11.xml).

21. Mariella Moon, *IBM Watson’s Supercomputer Has a New Job, As a Lawyer*, DIGITAL TRENDS (Mar. 13, 2013), <http://www.digitaltrends.com/computing/watson-usc-competition/#!CqOoE>.

challenge to an average chess player, let alone grand masters. But once machine intelligence reaches a level where it becomes competitive with humans, it continues to improve, soon surpassing human skills. Second, because increases in the power of computing are exponential rather than linear, computers may be able to undertake complicated legal tasks relatively sooner than it initially took computers to do simpler legal tasks. For instance, in 2004, not a single autonomous vehicle drove farther than eight miles on a course through the desert.<sup>22</sup> But before the middle of the next decade, researchers predict that driverless cars will transport passengers in highway and urban driving.<sup>23</sup> Similarly, in the past forty years, legal computer programs have perfected only keyword searches. However, because of technological acceleration, in less time computers will be able to pick and choose for themselves the best precedent to cite in a brief. Even if computational capacity doubles only every two years, the next decade will witness more than thirty times as much increase in power as the previous one. Thus, although machines are just beginning to perform legal tasks, we can expect substantial progress in the decade ahead and likely even more in the decades beyond.

#### *B. Five Areas of Law on the Cusp of Machine Intelligence Invasion*

In this section, we briefly describe five areas that machine intelligence will dramatically change in the near future: (1) discovery; (2) legal search; (3) document generation; (4) brief and memoranda generation; and (5) prediction of case outcomes. Developments in predictive analytics, which we will discuss at greatest length in connection with case outcomes, will affect all five of these areas. But we have decided to use familiar categories defined by legal tasks to describe the effects of machine intelligence rather than focus more abstractly on computer methods. This approach also allows us to highlight specific innovations and startups that are early indications of the disruptions lawyers will face.

New information technology has already transformed some tasks, like discovery. Others, like brief writing, have not yet been fundamentally altered. But there are already signs that such fields will be transformed, because information technology is already being developed in allied fields, like journalism, to perform skills similar to those of lawyers. Because the exponential growth in computation is relatively regular, it is possible to estimate when various benchmarks may be reached. This section does not provide a comprehensive depiction of developments in each of the five areas; that kind of thick description would require five different articles. But, sketching the arc of machine intelligence in disparate areas of legal

---

22. Marsha Walton, *Robots Fail To Complete Grand Challenge: \$1 Million Prize Goes Unclaimed*, CNN.COM (May 6, 2004, 10:44 AM), <http://www.cnn.com/2004/TECH/ptech/03/14/darpa.race/>.

23. See *Autonomous Vehicles: Self-Driving Vehicles, Autonomous Parking, and Other Advanced Driver Assistance Systems: Global Market Analysis and Forecasts*, NAVIGANT RES., <http://www.navigantresearch.com/research/autonomous-vehicles> (last visited Apr. 26, 2014).

practice underscores our overall conclusion: machines are coming, and once they become part of the legal practice, their performance will exponentially improve.

### 1. Discovery

Machine intelligence is most advanced in discovery, probably because legal discovery represents the application of general methods of machine search to the review of legal documents. In its simpler, but still helpful, form, electronic discovery, or e-discovery, is the process by which computers search a database for keywords that lawyers agree are marks of relevance.<sup>24</sup> But keyword search is a relatively blunt instrument. Such searches may be both over- and underinclusive because keywords may be absent from some relevant documents and yet present in some irrelevant documents.

Predictive coding has fundamentally transformed the prospects for e-discovery. In predictive coding, lawyers look at a sample of the larger set of documents. Computer technicians help construct algorithms that predict whether a document is relevant.<sup>25</sup> Of course, predictive coding is imperfect, because it can miss some documents. But, imperfection is the norm even when lawyers perform document review, where fatigue, boredom, and other frailties—which do not affect machines—can substantially reduce the accuracy of document review. As a result, some courts have approved predictive coding as a tool of discovery that essentially will make the final decisions of relevance, because they believe the price and performance of e-discovery is at least equal to that of the traditional kind.<sup>26</sup> The U.S. Department of Justice's antitrust division has sometimes approved predictive coding for the review of antitrust cases under the Hart-Scott-Rodino Antitrust Improvements Act of 1976.<sup>27</sup> As with other information technology, e-discovery will be more commonplace as it becomes more accurate and less expensive.<sup>28</sup>

E-discovery is already changing the discovery practices of large commercial litigation—which consumed much time of junior litigation

---

24. See Steven C. Bennett, *E-Discovery by Keyword Search*, PRAC. LITIGATOR, May 2004, at 7, 9.

25. See Joseph H. Looby, *E-Discovery—Taking Predictive Coding Out of the Black Box*, FTI J. (Nov. 2012), <http://ftijournal.com/article/taking-predictive-coding-out-of-the-black-box-deleted>.

26. See, e.g., *Moore v. Publicis Groupe*, 287 F.R.D. 182, 193 (S.D.N.Y. 2012).

27. Geoffrey Vance & Alison Silverstein, *McDermott and DOJ Embrace Predictive Coding; 5 Lessons Learned During Fast-Paced Merger Review*, L. TECH. NEWS (July 9, 2013), <http://www.lawtechnologynews.com/id=1202609909310/McDermott-and-DOJ-Embrace-Predictive-Coding?slreturn=20140305004807>; see also Hart-Scott-Rodino Antitrust Improvements Act of 1976, Pub. L. No. 94-435, 90 Stat. 1383 (codified in scattered sections of 15 U.S.C.).

28. That is not to say that e-discovery will not raise important legal questions of its own, particularly at the beginning of its adoption, such as how it will affect the proportionality principle in discovery. For an excellent discussion of such questions, see Charles Yablon & Nick Landsman-Roos, *Predictive Coding: Emerging Questions and Concerns*, 64 S.C. L. REV. 633 (2013).



associates years ago. Now, large law firms have set up e-discovery units within their firms. But new service providers independent of law firms are also springing up. Modus, for instance, is an example of a corporation that both digitizes records and helps with predictive algorithms.<sup>29</sup> Thus, lawyers will face competition from companies outside the profession that want to offer discovery services to lawyers. These companies are likely more innovative, specialized, and less attached to traditional ways of thinking about the issue. The timeline for law firms to adopt e-discovery is likely to be quite quick, with firms using some form of predictive coding in essentially all large-scale litigation within the next decade.

## 2. Legal Search

Searching for the law by combing through precedents has been an important part of legal work for centuries. Machine intelligence will not only perform more of this work than lawyers, but will also perform it more efficiently. Just as computers have progressively replaced humans in complex calculations (people who made such calculations were in fact called computers a hundred years ago), so will machine intelligence replace the legal search function of lawyers.<sup>30</sup>

Computerized legal research began in the mid-1960s when the Ohio State Bar Association tried to create an electronic system to sort through legal opinions.<sup>31</sup> That system became the foundation for the Lexis legal search system, which was introduced to the public in 1974.<sup>32</sup> Westlaw was offered soon after, but its utility was limited, because it did not allow researchers to search the full text of legal opinions.<sup>33</sup> At the same time, the Lexis system was handicapped because it contained an incomplete database of case law.<sup>34</sup> These problems have largely been corrected, and both Westlaw and Lexis are now staples of legal research.

Such research has already been an important element of legal practice, replacing less efficient research from casebooks. And as hardware and software capacity relentlessly improves, research is poised to become more efficient in accurately finding the case law and evaluating it for persuasiveness. Watson signals one improvement: the change from the use of keywords to semantics. Previously, computerized legal search depended on search for the right keywords. For example, a keyword search for

---

29. See generally MODUS, <http://www.discovermodus.com/> (last visited Apr. 24, 2014).

30. For a longer discussion of the history of legal search, see John O. McGinnis & Steven Wasick, *Law's Algorithm* (Northwestern Univ. Sch. of Law Pub. Law & Legal Theory Series No. 12-22, 2013), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2130085](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2130085).

31. F. Allan Hanson, *From Key Numbers to Keywords: How Automation Has Transformed the Law*, 94 LAW LIBR. J. 563, 573 (2002).

32. *Id.*

33. *Id.*

34. *The LexisNexis Timeline*, LEXISNEXIS, [http://www.lexisnexis.com/anniversary/30th\\_timeline\\_fulltxt.pdf](http://www.lexisnexis.com/anniversary/30th_timeline_fulltxt.pdf) (last visited Apr. 26, 2014).

“bonds” did not necessarily bring up cases concerning debentures. That limitation will disappear with the rise of semantic search.

Semantic search will allow lawyers to input natural language queries to computers, and the computers will respond semantically to those queries with directly relevant information. If one searches for assumption of risk, the search may bring up cases that did not use these words but nevertheless deployed the same concept.<sup>35</sup> We are already beginning to see startups bring more structure to the data comprised in a case, focusing on the matters relevant to legal issues.<sup>36</sup> This winnowing of data is a step toward semantic search, because it makes cases conceptually tractable. Just as Watson has effectively used pattern recognition to make use of concepts rather than words, so will machine intelligence exploit deeper pattern recognition to provide a kind of semantic search.<sup>37</sup> LexisNexis is already taking steps in this direction. But other search engines are starting to compete in this space as well.<sup>38</sup>

All cases are not created equally in their precedential value: they are more or less persuasive depending on the court and judge who decides the case and the force that the precedent has acquired over time. They may also have different weights depending on the kind of argument in which lawyers use them and on the court and judge to whom the lawyer presents them. Thus, even when lawyers find precedents by means of a computer, they rely on their judgment when deploying it.

But machine intelligence will also make judgments about the strength of precedent. Network analysis can now evaluate the strength of a precedent by considering how much other cases rely on it.<sup>39</sup> A recent start-up allows searches of legal briefs, potentially connecting the briefs to the results of cases in particular courts.<sup>40</sup> Such services will also help gauge the strength of legal precedent as it is tested in subsequent case law, both generally, and also in the context of particular courts and judges. Machine intelligence will not only uncover precedent but will also guide lawyers’ judgments

---

35. See McGinnis & Wasick, *supra* note 30, at 32.

36. An example of such a startup is Judicata. JUDICATA, <https://www.judicata.com/> (last visited Apr. 26, 2014). It creates structured data from case law, thus allowing attorneys to screen cases for specific procedural or factual details that make them more or less powerful as precedents. See Lora Kolodny, *Khosla Ventures, Peter Thiel Back Legal Research Startup Judicata*, WALL ST. J. (May 28, 2013, 1:34 PM) <http://blogs.wsj.com/venturecapital/2013/05/28/khosla-ventures-peter-thiel-back-legal-research-startup-judicata/>.

37. For a discussion of progress in the semantics of legal search, see Johnathan Jenkins, *What Can Information Technology Do for Law?*, 21 HARV. J.L. & TECH. 589, 597–604 (2008).

38. For instance, Ravel Law already offers free legal search. See generally RAVEL, <https://www.ravellaw.com/> (last visited Apr. 26, 2014).

39. See James H. Fowler et al., *Network Analysis and the Law: Measuring the Legal Importance of Precedents at the U.S. Supreme Court*, 15 POL. ANALYSIS 324, 335 (2007).

40. BriefMine provides a database of legal briefs and opinions. The core idea is to use search algorithms to relate the legal briefs to the relevant opinion. Through such connections, BriefMine hopes to help lawyers understand how the winning brief contributed to victory in the subsequent opinion. See generally BRIEFMINE, <http://briefmine.com/about> (last visited Apr. 26, 2014).

about the use of precedent, as most lawyers can neither comprehensively evaluate the strength of precedent or recall all possible precedents to mind.

As powerful as a semantic search that gauges precedential power will be, this kind of search is only the first phase of the improvement of legal search.<sup>41</sup> In this first phase, the search engine will identify the relevant cases and then evaluate their optimal use. Still, in this phase, the lawyer will do all the issue spotting and use the search engine only to identify the relevant cases. In the second phase, the search engine itself will identify the issues implicated within a given set of facts and then suggest the case law likely to be on point for the issues it identified. This second phase will further reduce the role of the lawyer in legal research.

The speed of this change will depend on general improvements in search technology because that market is so much larger than the market for legal search. We expect that the first phase of perfecting semantic search, including the evaluation of the strengths and uses of precedent, will come in the next ten to fifteen years.

### 3. Documents As Forms

Legal forms are hardly new. Since the middle ages when lawyers used forms of action, templates helped reduce the cost of law. But machine intelligence will revolutionize the use of legal forms. Most obviously, machine intelligence will help tailor these forms to meet individual situations. For instance, a client of LegalZoom can already submit information about his assets and his intentions for disposal of his estate to generate a draft of a will.<sup>42</sup> Trust and estate planning is already ripe for this kind of mechanization because this area of law has relatively few kinds of forms and unique factual situations that arise for the large majority of people.

But as computers and software become more powerful, computer-generated forms will have an even wider scope in legal practice. Already, new companies, like Kiiac, attempt to use machine intelligence to generate a wider variety of documents.<sup>43</sup>

In the future, documents will also improve as they become more closely connected to results. With the growing interconnectedness of data, machines can relate specific contracts to all court decisions about them, creating a dynamic of practical critique for continual improvement of legal forms.

---

41. See McGinnis & Wasick, *supra* note 30, at 33 (discussing the first and second phase of legal search).

42. Reid Kress Weisbord, *Wills for Everyone: Helping Individuals Opt Out of Intestacy*, 53 B.C. L. REV. 877, 918 n.159 (2012).

43. See generally КИИАС, <http://www.kiiac.com/index.htm> (last visited Apr. 26, 2014). Kiiac is not the only company in this space. LawDepot is a website that can create customized legal documents. See generally LAWDEPOT, <http://www.lawdepot.com/> (last visited Apr. 26, 2014). Hotdocs is a software platform that automates the process of producing transactional legal documents and forms. See generally HOTDOCS, <http://www.hotdocs.com/> (last visited Apr. 26, 2014).

Of course, at first, lawyers will still be very involved in marking up the first drafts that machines create. But even at this stage, the savings can be very large. For instance, Fenwick & West, a firm whose principal office is in Silicon Valley, developed a program that automatically creates the documents for incorporating startups.<sup>44</sup> Matt Kesner, their technology officer, said: “It reduced the average time we were spending from about 20 to 40 hours of billable time down to a handful of hours . . . . In cases with even extensive documents, we can cut the time of document creation from days and weeks to hours.”<sup>45</sup>

In the future, machine processing will be able to automate a form, tailor it according to the specific facts and legal arguments, and track its effect in future litigation. As hardware and software capacity improves, so too will the generated documents. We predict that within ten to fifteen years, computer-based services will routinely generate the first draft of most transactional documents.

#### 4. Documents As Briefs and Memos

Machine intelligence will not stop with automating forms. Legal forms are easier to automate than legal memos or briefs because they often depend on more formulaic inputs. At first these documents will serve as very rough drafts and will require very substantial additions and rewriting. Nevertheless, computer-generated drafts can still be valuable and comparable to the efforts of associates—even research assistants without law degrees—who generate drafts that an experienced associate can then shape into a far more polished product. And, as with other advances in machine intelligence, programs become more useful over time. That progression is evident in other technology, such as word processing and speech-to-text programs.

Analogous programs already encroach on traditional journalism. Just this year, the *Los Angeles Times* used a computer to write a story of breaking news about an earthquake.<sup>46</sup> Its so-called Quakebot connected to information from the U.S. Geological Survey and created a publishable story from the data.<sup>47</sup> The technology startup Narrative Science has similar programs that can write simple stories about business and sports.<sup>48</sup> While these programs are simple now, more powerful computers and more advanced algorithms will produce a more sophisticated program.

---

44. Farhad Manjoo, *Will Robots Steal Your Job?: Software Could Kill Lawyers. Why That's Good for Everyone Else*, SLATE (Sept. 29, 2011), [http://www.slate.com/articles/technology/robot\\_invasion/2011/09/will\\_robots\\_steal\\_your\\_job\\_5.html](http://www.slate.com/articles/technology/robot_invasion/2011/09/will_robots_steal_your_job_5.html).

45. *Id.*

46. Catherine Taibi, *It's All Over: Computers Are Now Writing Stories, and Doing a Good Job*, HUFFINGTON POST (Mar. 18, 2014), [http://www.huffingtonpost.com/2014/03/18/la-times-robot-journalism-earthquake\\_n\\_4985929.html](http://www.huffingtonpost.com/2014/03/18/la-times-robot-journalism-earthquake_n_4985929.html).

47. *Id.*

48. See Steve Lohr, *In Case You Wondered, a Real Human Being Wrote This Column*, N.Y. TIMES, Sept. 11, 2011, at BU3.

Ultimately, these kinds of programs will be able to provide drafts of briefs and memos, as well as connect to legal research programs, which will provide data for the writing program. As with legal search, we expect substantial progress in programs over the next fifteen years until they deliver very useful drafts. In the decade or two after that, such programs may deliver more finished products, at least for low-value transactions.

### 5. Legal Analytics

Predictive analytics is a new discipline that combines data with analysis to make predictions. Computational power allows substantial data to be collected and organized. Patterns can then be found among the data.<sup>49</sup> Machine learning can help analyze regularities within the patterns. With the help of these models, known data can be used to predict what will happen in situations that have not yet occurred.<sup>50</sup> The missing data may be unknown and indeed unknowable if the data consists of future events, like the outcome of a legal case. Predictive analytics is all the rage across the corporate world.<sup>51</sup>

Using big data to guide decisions is one of the most important trends of the last decade.<sup>52</sup> It has intensified so much that universities now offer courses, and indeed degrees, in data analytics.

Predictive analytics is now coming to law.<sup>53</sup> Indeed, law, with its massive amounts of data from case law, briefs, and other documents, is conducive to machine data mining that is the foundation of this new predictive science. Legal data include fact patterns, precedents, and case outcomes. For instance, one form of legal analytics would use fact patterns and precedent to predict a case's outcome, thereby better equipping lawyers to assess the likely result of litigation.

Of course, lawyers make implicit judgments about litigation prospects when advising clients whether to bring a lawsuit, settle, or go to trial. But their advice is based on their intuitions and limited to their direct or indirect experience of law. The advantage of predictive analytics is that it provides a mechanism both to access a vast amount of information and systematically mine that information to understand the likely outcome of the case at hand.

Legal analytics is not a distant prospect; already, academics and companies are putting it into action. For example, political scientists

---

49. See ERIC SIEGEL, PREDICTIVE ANALYTICS: THE POWER TO PREDICT WHO WILL CLICK, BUY, LIE, OR DIE 15 (2013).

50. See *id.*

51. See Steve Lohr, *The Age of Big Data*, N.Y. TIMES, Feb. 12, 2012, at SR1 (suggesting that corporate America now needs a million and half new data-literate employees to work in the area).

52. See VIKTOR MAYER-SCHÖNBERGER & KENNETH CUKIER, BIG DATA: A REVOLUTION THAT WILL TRANSFORM HOW WE LIVE, WORK, AND THINK 6–12 (2013).

53. The best full-scale analysis in the legal literature is Daniel Martin Katz, *Quantitative Legal Prediction—or—How I Learned To Stop Worrying and Start Preparing for the Data-Driven Future of the Legal Services Industry*, 62 EMORY L.J. 909 (2013).

created a model of U.S. Supreme Court decisionmaking, based on previous Court decisions, that more accurately predicted future outcomes than a set of Supreme Court experts.<sup>54</sup> A new company, Lex Machina, has gathered historical data from thousands of instances of patent litigation<sup>55</sup> and is already being used to predict outcomes in that field.<sup>56</sup> Lex Machina provides consulting services itself and also sells data to those who want to do their own modeling.<sup>57</sup>

Admittedly, patent law is a relatively self-contained area of law. Further, Supreme Court decisions regarding patent law, while touching on many issues, revolve around the votes of only nine justices. Thus, patent law and the relevant Supreme Court decisions are perhaps the relatively easy legal concentrations for analytics to model. Patent law also involves more high-value cases than many other areas of law and, thus, it is more lucrative to use predictive analytics in patent litigation than in other practice areas. But given the exponential improvement in the price performance of computers, the same approach will be taken to other areas of law within a decade. Predictive analytics will be imperfect, providing likelihoods rather than certainties. But predictive analytics can still displace some lawyers by making better predictions than they do.

To be sure, legal analytics will still leave a role for lawyers. A lawyer's judgment may still add some value to the predictions derived from machine intelligence, even if the machine prediction alone is better than the lawyer's prediction alone. Over time, however, legal analytics will reduce the value of a lawyer's assessment in at least some cases.

The rise of legal analytics will also have an effect on the number of cases that go to trial and the amount of discovery. Whenever the parties agree on the amount a case is worth, the case is likely to settle.<sup>58</sup> The convergence does not need to be perfect for two reasons. First, the expense of legal fees on both sides creates a larger window in which settlement is sensible, because both sides will be better off settling for an amount between their estimates of the case's value to save legal fees. Second, in many cases, at least one side is risk averse and would prefer the certainty of settlement to the risks of litigation.<sup>59</sup> As legal analytics provide better estimates of a case's value, parties will converge more rapidly toward an agreement that falls within the settlement window created by legal fees and risk aversion.

---

54. Theodore W. Ruger et al., *The Supreme Court Forecasting Project: Legal and Political Science Approaches to Predicting Supreme Court Decisionmaking*, 104 COLUM. L. REV. 1150 (2004).

55. See Tam Harbert, *Lex Machina Arms Corporate Leaders and Patent Attorneys with Predictive Analytics*, DATAINFORMED (June 6, 2012, 11:50 AM), <http://data-informed.com/lex-machina-arms-corporate-leaders-and-patent-attorneys-with-predictive-analytics/>.

56. *Id.*

57. *Id.*

58. Robert A. Weninger, *Amended Federal Rule of Evidence 408: Trapping the Unwary*, 26 REV. LITIG. 401, 412 n.25 (2007).

59. Dana A. Kerr, *The Effect of Ownership Structure on Insurance Company Litigation Strategy*, 34 J. LEGAL STUD. 273, 276 (2005).

## 6. Future Trends

The areas of legal practice on the cusp of change through legal search—discovery, search, document generation of both forms and briefs, and predictions of case outcomes—comprise the bulk of tasks in many legal practices. As a result, those who engage in the routine elements of such services will face increasing competition from machines.

Moreover, as machine intelligence commoditizes many aspects of law, information technology will accelerate greater transparency that will, in turn, accelerate such lawyers' loss of market power over legal services. Most obviously, the transparency will come in the form of consumers' increased ability to compare the prices of legal services. But new services will also arise to help consumers compare the quality of lawyers. Startups are presently devising metrics that use available data to compare the performance of lawyers.<sup>60</sup>

But even if average lawyers will be disadvantaged, some superstars may earn even greater returns. First, with great metrics of comparison, discerning who the superstars are will be easier.<sup>61</sup> Second, superstars can extend their research through technology: they deliver their innovative solutions to problems faster and to a broader range of clients.<sup>62</sup> Some of these innovations will be in traditional lawyering, such as creating new forms of familiar transactions and shaping surprising and novel arguments. Partners may also be able to substitute machines for associates, thereby gaining more leverage at lower cost. Third, for a range of important transactions and litigation, even small improvements in outcomes make it worthwhile for clients to pay for noncommoditized legal services. Even if the machine intelligence provides very good services, mixing in human intelligence may assure the best possible result. Accordingly, we may see an even more bimodal distribution of legal salaries, perhaps with a smaller group of even more highly compensated lawyers.

Machine intelligence may also help lawyers, through skill or better organization, increase delivery of very low-priced services. Unmet legal needs exist across the nation, generally for low- and middle-income people who cannot afford the prices lawyers charge. These legal needs include matters as varied as counseling on small-business matters and writing prenuptial agreements. Lawyers can use machines to help generate relevant forms, thereby reducing the costs of providing services and making the services more broadly affordable.

Machines may affect some other areas of law to a lesser extent, because machines cannot easily add as much value to certain tasks lawyers perform.

---

60. An example is Avvo. AVVO, <http://www.avvo.com/> (last visited Apr. 26, 2014).

61. We already see this phenomenon in judicial opinions. Because opinions are readily accessible now, small differences in quality lead to large differences in citation rates. See William M. Landes et al., *Judicial Influence: A Citation Analysis of Federal Courts of Appeals Judges*, 27 J. LEGAL STUD. 271, 275 (1998).

62. See Sherwin Rosen, *The Economics of Superstars*, 71 AM. ECON. REV. 845, 857 (1981).

For instance, machines will not argue in court and thus will not replace those who specialize in oral advocacy. Nevertheless, machines will indirectly affect the practice of trial and appellate lawyers. With more accurate predictions of case outcomes, fewer trials should occur because more parties will settle. And even trial practice requires research, discovery, and production of documents—all tasks that machine intelligence will radically alter.

Lawyers are more likely to excel if they are specialists in novel laws and regulations.<sup>63</sup> Machines will generally be most effective at finding patterns in past data to predict the future. But if the current time is radically disconnected from the past or involves small amounts of specialized information, machines will have less data to analyze. Consider, for example, hypothetical banking legislation, equivalent in scope and novelty to the Dodd-Frank legislation of 2010,<sup>64</sup> passed ten years hence. As they lobby for and interpret new regulations in the early years of the new legal regime, lawyers working on that legislation will add a lot of value for their clients. Given the world's ongoing technological acceleration, lawyers who specialize in areas connected to that acceleration, like intellectual property, may also continue to prosper.

Lawyers do more than undertake legal analysis. They bond with their clients, thereby fostering relationships of trust, which allow the lawyer to facilitate clients to see their long-term legal self-interest, even when clients' passions and confusions cloud that interest.<sup>65</sup> Machines are unlikely to perform this bonding function and, thus, will be unlikely to substantially affect this important aspect of the lawyer-client relationship.

The overall effect of the machine invasion thus will be quite mixed for lawyers, but particularly difficult for nonspecialized lawyers of average or worse than average ability. For consumers at every level, the progress of machine intelligence is excellent news, offering lower prices and more transparency. It is especially good for the underserved middle class and even the poor who are more likely to access legal services at prices they can afford.

---

63. Cf. Russell G. Pearce & Eli Wald, *The Relational Infrastructure of Law Firm Culture and Regulation: The Exaggerated Death of Big Law*, 42 HOFSTRA L. REV. 109, 119 (2013).

64. See Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub L. No. 111-203, 124 Stat. 1376 (2010) (codified in scattered sections of 7, 12, 15, 22, 31, and 42 U.S.C.).

65. See Stephen Ellmann, *Client-Centeredness Multiplied: Individual Autonomy and Collective Mobilization in Public Interest Lawyers' Representation of Groups*, 78 VA. L. REV. 1103, 1139–40 (1992) (“The bond between lawyer and client fuels, and is fueled by, the heart of client-centered counseling—the careful, even elaborate, process in which lawyer and client work together to identify the relevant considerations on which the decision should be based. This process makes sense only if it is believed that people are prone to overlook or misjudge important issues bearing on their decisions, and that correcting such errors is an essential predicate to their making decisions that truly serve their own interests.” (citations omitted)).



## 7. Answers to Common Objections

One common objection is that lawyers have always adapted to technological change and, in doing so, even increased their incomes: typewriters replaced quill pens, word processors replaced typewriters, and carbon paper came and went. Lawyers continued to prosper and grow in numbers. What is the distinction for the legal profession between the technological changes of the past and those of the future?

The key differences are two. First, the technology is now beginning to substitute for core legal skills, unlike copying and transcription. The physical acts of writing and copying were not core legal skills. Indeed, lawyers generally depended on copyists or secretaries to complete these tasks. But now machines are climbing the value-added ladder, encroaching on the domain of lawyers. Second, the rate at which machines are improving, and thus substituting for lawyers, is faster than ever before.

Another objection is that these changes will create litigation about their proper scope, thus creating more, not less, demand for legal services. We address below the question of bar regulation. But there will also be debate about how to integrate such changes into the legal order. For instance, e-discovery has prompted new questions and will continue to do so. These are merely transition costs, since the issues about e-discovery will ultimately be relatively settled. And the savings from e-discovery—the huge amount of lawyer time required for litigation document review—will expand as the practice expands and deepens with computational advances. The larger point is that technological change, including change in legal technology, does impose transition costs, but transition is short term and the savings gains will be cumulative and increasing in the long term.

A third objection is that these machines can never replace lawyers' judgment. First of all, not all tasks that modern lawyers undertake require much judgment. Drawing up simple wills, for instance, is fairly routine. Also, machines can make judgments. Watson displayed his confidence levels in different possible answers at *Jeopardy*, and this technology will soon be employed in medical diagnostics.<sup>66</sup> It is difficult to argue that such a program is not exercising some of the same judgment required for legal tasks. We agree that many tasks will still require lawyers' judgment, but judgment will be required in fewer areas. Even in those areas, lawyers will exercise judgment with the aid of substantial machine intelligence.

Finally, some have argued that the promise of big data, which is a foundation of predictive analysis, is overstated.<sup>67</sup> For instance, it is said that big data can show only correlation but not causation.<sup>68</sup> Thus, in one of our examples, it might be objected that even if we show that a judge cited

---

66. See Adrienne Jane Burke, *How IBM's Watson Will Advise Oncologists on Patient Care*, *TECHONOMY* (Mar. 20, 2014, 2:05 PM), <http://techonomy.com/2014/03/ibms-watson-will-advise-oncologists/>.

67. Gary Marcus & Ernest Davis, *Eight (No, Nine!) Problems with Big Data*, *N.Y. TIMES*, Apr. 7, 2014, at A23.

68. *Id.*

certain kinds of cases, it would not show that these cases were what prompted his decision. But this correlation might well prompt investigation that would tell us things that would help a lawyer persuade the judge. And even if the judge's decisionmaking remains a black box, it seems that a lawyer would be well advised to rely on the kind of cases that showed up in the judge's decisions, other things being equal. It is also said that data works less well on small samples.<sup>69</sup> We agree, and this is one reason why we think the future is brighter for lawyers in fast-changing, specialized areas of law. But in other better-settled areas of law, there is a very large amount of relevant data. More generally, we agree that big data is currently an imperfect tool, but like many other sophisticated, imperfect tools, it can substitute for substantial amounts of human labor, and some of the labor will be that of lawyers.

## II. REGULATORY BARRIERS WILL NOT PREVENT MACHINE INTELLIGENCE FROM UNDERMINING LAWYERS' MONOPOLY

Part II builds on the foundation described in Part I: machine intelligence will play an increasing role in the legal services market to the extent that it provides quality, lower cost legal services, or inputs into lawyers' services. Except for superstars, highly specialized practices in areas subject to rapid legal change, and in-court appearances, machine intelligence already provides lawyers with significant competition, and this competition is only likely to increase. The legal profession has, for the most part, accepted machine intelligence as an input and has even modified its rules to accommodate this development.<sup>70</sup> At the same time, the legal profession has continued to promote unauthorized practice of law statutes that, on their face, create barriers to machine intelligence providing legal services or input to nonlawyers offering legal services.<sup>71</sup> Nonetheless, despite unauthorized practice laws, the legal services market has largely become de facto deregulated with regard to machine intelligence, as Benjamin Barton and other commentators have noted.<sup>72</sup> But even increased unauthorized practice enforcement in the United States would likely fail to stem the delivery of legal services through machine intelligence given the way the internet permits legal services providers throughout the world to deliver to U.S. consumers.<sup>73</sup>

### A. *The Significant Market Power of Machine Intelligence*

Machine intelligence has already begun to significantly compete with lawyers and undermine their monopoly. Today, sizeable financial industries use machine intelligence to deliver legal services, even though

---

69. *Id.*

70. *See infra* Part II.B.1.

71. *See infra* notes 106–15 and accompanying text.

72. *See infra* notes 116–26 and accompanying text.

73. *See infra* notes 124–25 and accompanying text.

the most economically significant developments have occurred in only three of the five areas we identify in Part I.

The three areas that have proven most profitable are legal research, discovery, and document generation. First, the oldest and most lucrative area is legal research. As we noted in Part I, the application of machine intelligence to legal research began in the mid-1960s and for-profit businesses, such as Lexis and Westlaw, entered the field in the 1970s.<sup>74</sup> Bloomberg LLP joined the competition in 2010.<sup>75</sup> As of that time, the legal search industry had “generate[d] \$8 billion a year in revenue.”<sup>76</sup> Second, the application of machine intelligence to discovery resulted in global market revenue of \$3.6 billion in 2010 (\$1.1 billion in software and \$2.5 billion in services), with growth to \$9.9 billion anticipated by 2017 (\$2.5 billion in software and \$7.4 billion in services).<sup>77</sup>

Third, document generation, while less established, is growing dramatically. LegalZoom, Rocket Lawyer, Nolo, and Law Depot, among others, offer online consumer and small-business services using machine intelligence. Major financial players have entered the market with Permira and Kleiner Perkins owning an interest in LegalZoom<sup>78</sup> and Rocket Lawyer raising funds from Google Ventures.<sup>79</sup> In 2011, for example, Rocket Lawyer had “70,000 users a day and has doubled revenue for four years straight to more than \$10 million.”<sup>80</sup> LegalZoom appears to be the industry leader with 2 million customers in its first ten years through 2011, and half a million in 2011 alone.<sup>81</sup> Its revenue has grown from “\$103 million in 2009, \$120 million in 2010, \$156 million in 2011, rising to almost \$47 million in the first three months of 2012,”<sup>82</sup> an annual rate of \$188 million. In 2011 alone, “more than 20 percent of new California limited liability companies were formed using [LegalZoom].”<sup>83</sup> Another large market is contract management, an industry that uses software to “automate[] the creation, tracking and monitoring of contracts and agreements” for business

---

74. See *supra* notes 31–34 and accompanying text.

75. See Russell Adams, *Bloomberg Hangs Shingle: Financial-Data Firm Enters Legal Research, Challenging Westlaw, LexisNexis*, WALL ST. J., July 8, 2010, at B8.

76. *Id.*

77. *The E-Discovery Market Is Growing Fast*, EDISCOVERY BUS. (Feb. 8, 2013), <http://ediscoverybusiness.com/the-e-discovery-market-is-growing-fast/>.

78. Viola Caon, *Permira Funds To Acquire \$200m of LegalZoom Equity*, INVESTMENT EUR. (Jan. 7, 2014), <http://www.investmenteurope.net/investment-europe/news/2321352/permira-funds-to-acquire-usd200m-of-legalzoom-equity>.

79. Daniel Fisher, *Google Jumps into Online-Law Business with Rocket Lawyer*, FORBES (Aug. 11, 2011), <http://www.forbes.com/sites/danielfisher/2011/08/11/google-jumps-into-online-law-business-with-rocket-lawyer/>.

80. *Id.*

81. Benjamin H. Barton, *A Glass Half Full Look at the Changes in the American Legal Market* 17 (Univ. of Tenn. Legal Studies Research Paper No. 210, 2013), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2054857](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2054857).

82. *Id.* at 18.

83. *Id.* at 17 (quoting LegalZoom.com, Inc., Registration Statement (Amendment No. 3 to Form S-1) (July 23, 2002), available at <http://www.sec.gov/Archives/edgar/data/1286139/000104746912007341/a2209713zs-1a.htm>).

clients, including multinational corporations.<sup>84</sup> A \$400 million industry as of 2013, experts anticipated annual growth of 10 to 20 percent.<sup>85</sup>

Accordingly, in these three areas alone, machine intelligence has made significant progress in undermining lawyers' monopoly. Machine intelligence already accounts for billions of dollars of legal services, and we can expect continued, exponential increases in the ability of machine intelligence to provide quality services at lower prices than human lawyers in these areas, as well as in the emerging areas of generating legal memoranda and predicting case outcomes.<sup>86</sup> The only potential impediments to the rapid growth of machine intelligence in lawyering are legal barriers.

*B. Why Legal Barriers Will Not Obstruct the Increasing Use of Machine Intelligence To Provide Legal Services*

Some commentators, including Larry Ribstein,<sup>87</sup> William Henderson,<sup>88</sup> Ray Campbell,<sup>89</sup> and Gillian Hadfield,<sup>90</sup> have suggested that legal obstacles will hinder the application of machine intelligence to legal services. While we agree with commentators' skepticism of the unauthorized practice statutes and concede that those statutes pose some limited risk to the expansion of machine intelligence, we believe they will ultimately fail to stop the progress of machine intelligence in legal services. First, the ethics rules do not prohibit lawyers from employing machine intelligence to perform work previously or potentially done by lawyers. Second, even though unauthorized practice laws formally prohibit businesses that include nonlawyer investors or managers from providing legal services,<sup>91</sup> the unauthorized practice laws have not been applied successfully to police machine intelligence products.<sup>92</sup>

1. Input into Lawyers' Work

The legal profession has accepted, and even embraced, machine intelligence as an input. To facilitate this development, the American Bar Association (ABA) clarified its rules to permit and, in some instances,

---

84. *Capterra Names Top 20 Companies in Contract Management Software Industry*, PRWEB (Oct. 15, 2013), <http://www.prweb.com/releases/2013/10/prweb11204284.htm>.

85. *Id.*

86. *See supra* Part I.B.4–5.

87. Larry E. Ribstein, *The Death of Big Law*, 2010 WIS. L. REV. 749, 807–08.

88. William Henderson, *Are We Asking the Wrong Questions About Lawyer Regulation?*, TRUTH ON MARKET (Sept. 19, 2011), <http://truthonthemarket.com/2011/09/19/william-henderson-on-are-we-asking-the-wrong-questions-about-lawyer-regulation/>.

89. Ray Worthy Campbell, *Rethinking Regulation and Innovation in the U.S. Legal Services Market*, 9 N.Y.U. J.L. & BUS. 1, 45–51 (2012).

90. Gillian Hadfield, *Legal Barriers to Innovation: The Growing Economic Cost of Professional Control Over Corporate Legal Markets*, 60 STAN. L. REV. 1689, 1720–21, 1724–25 (2008).

91. *See infra* notes 106–11 and accompanying text.

92. *See infra* notes 116–23 and accompanying text.

require the use of machine intelligence.<sup>93</sup> In doing so, the ABA has categorized machine intelligence as either an inanimate tool, much like a computer, or as a nonlawyer assistant. To the extent that machine intelligence is an input, lawyers must use it if necessary to provide competent services and should use it if it will help offer excellent services. An inanimate tool poses no threat under the rules, and nonlawyer assistance is acceptable so long as lawyers do not share fees with the nonlawyers and are unable to interfere with lawyers' professional judgment.<sup>94</sup> In purchasing and deploying machine intelligence as an input, even from an outside consultant, lawyers do not share fees and do not surrender their control of the delivery of legal services.

The ABA has emphasized the importance of machine intelligence to the competence of lawyers. Despite the fears of some that lawyers generally "lack . . . technological competence,"<sup>95</sup> the ABA embraced machine intelligence inputs in new language added in 2012 to Model Rule of Professional Conduct 1.1 as Comment 8. This comment posits that "[t]o maintain the requisite knowledge and skill [necessary to provide competent representation], a lawyer should keep abreast of changes in the law and its practice, including the benefits and risks associated with relevant technology."<sup>96</sup> Mastery of technology relevant to providing legal services, including machine intelligence, has therefore become an express duty of a competent lawyer, as well as an essential obligation of the exemplary lawyer.

At the same time, the ABA resolved issues regarding whether lawyers could lawfully employ nonlawyer-owned firms that provide machine intelligence services and whether such a machine intelligence input was consistent with the general approach that lawyers could employ or retain nonlawyers, so long as the lawyers controlled and supervised their input.<sup>97</sup> Some commentators objected that the use of machine intelligence services was in a different category than supervising paralegals in that "lawyers lack the requisite knowledge to supervise such a vendor."<sup>98</sup> Dana Remus, for example, has argued that lawyers generally do not possess "the proper analytical tools to assess whether a particular technology is adequate for the

---

93. See *infra* notes 95–105 and accompanying text.

94. MODEL RULES OF PROF'L CONDUCT R. 5.3–4 (2013).

95. Dana A. Remus, *The Uncertain Promise of Predictive Coding*, 99 IOWA L. REV. (forthcoming 2014) (manuscript at 21), available at [http://works.bepress.com/dana\\_remus/1/](http://works.bepress.com/dana_remus/1/).

96. MODEL RULES OF PROF'L CONDUCT R. 1.1 cmt. 8; see Darla W. Jackson, *Lawyers Can't Be Luddites Anymore: Do Law Librarians Have a Role in Helping Lawyers Adjust to the New Ethics Rules Involving Technology?*, 105 LAW LIBR. J. 395, 396 (2013).

97. See, e.g., Remus, *supra* note 95 (manuscript at 20) (describing bar ethics opinions that permit the "delegation of document review to off-shore document processing firms, where legal work is supervised but not performed by lawyers licensed within United States jurisdictions. The American Bar Association (ABA) and several state commissions have issued formal opinions concluding that outsourcing to these firms does not constitute unauthorized legal practice as long as licensed U.S. attorneys retain strict supervisory roles").

98. *Id.* (manuscript at 21).

task, or whether it is working properly when employed, raising questions about the scope of lawyer supervision.”<sup>99</sup>

Rejecting such concerns, the ABA in 2012 amended the Model Rules in ways that facilitate lawyers’ use of machine intelligence.<sup>100</sup> New language in the comment to Rule 5.3, which governs lawyers’ “Responsibilities Regarding Nonlawyer Assistance,” specifically acknowledges that “lawyers may use nonlawyers outside the firm to assist the lawyer in rendering legal services to the client.”<sup>101</sup> The comment expressly states that nonlawyer assistance can include firms that rely on machine intelligence, such as e-discovery consultants, and offers as specific “[e]xamples . . . hiring a document management company to create and maintain a database for complex litigation, . . . and using an Internet-based service to store client information.”<sup>102</sup> Lawyers can ethically use these services so long as the lawyer “make[s] reasonable efforts to ensure that the services are provided in a manner that is compatible with the lawyer’s professional obligations.”<sup>103</sup> Moreover, in language that encourages lawyers to use outside providers of machine intelligence services even when the client chooses the services provider, the comment states that the lawyer can share responsibility for monitoring the outside firm. By permitting lawyers to “share responsibility,” this comment gives lawyers more leeway than the general rule that a lawyer is fully responsible for supervising nonlawyer assistants and vendors.<sup>104</sup> The comment specifically states that “[w]here the client directs the selection of a particular nonlawyer service provider outside the firm, the lawyer ordinarily should agree with the client concerning the allocation of responsibility for monitoring as between the client and the lawyer.”<sup>105</sup>

## 2. Input into Nonlawyer Delivery of Legal Services

When nonlawyers who are not working for lawyers provide legal services using machine intelligence, they infringe state laws that prohibit the unauthorized practice of law by nonlawyers. Under these laws, nonlawyers may only act as scribes in filling out forms or publish legal forms with blanks for consumers to complete or books that provide general guidance to the public.<sup>106</sup> As a general matter, unauthorized practice laws prohibit nonlawyers from providing personalized legal assistance.<sup>107</sup> Nonlawyers violate the letter of unauthorized practice laws when they sell

---

99. *Id.*

100. Jackson, *supra* note 96, at 395.

101. MODEL RULES OF PROF’L CONDUCT R. 5.3 cmt. 3.

102. *Id.*

103. *Id.*

104. *Id.* R. 5.3. As one critic has noted, “Through these new provisions, the ABA abdicates a portion of the profession’s supervisory responsibilities over discovery practice to clients and other professionals.” Remus, *supra* note 95 (manuscript at 21).

105. MODEL RULES OF PROF’L CONDUCT R. 5.3 cmt. 4.

106. See Derek A. Denckla, *Nonlawyers and the Unauthorized Practice of Law: An Overview of Legal and Ethical Parameters*, 67 FORDHAM L. REV. 2581, 2581 (1999).

107. See, e.g., Fla. Bar v. Brumbaugh, 355 So. 2d 1186 (Fla. 1978).

software or other machine intelligence that provides personalized legal assistance. This is true regardless of whether the program provides individually tailored answers to legal questions or personalized documents, such as wills, contracts, or articles of incorporation.<sup>108</sup> Typically, in such programs, the machine intelligence engages in a dialogue with the consumer where the machine asks a series of questions and, depending upon the consumer response, asks further questions or generates legal language.<sup>109</sup> At the end of the process, the machine intelligence generates a legal document tailored to the specific consumer.<sup>110</sup> When nonlawyers, or businesses with nonlawyer owners or investors, employ machine intelligence in this way, they have engaged in the unauthorized practice of law.<sup>111</sup>

For example, in the leading case of *Unauthorized Practice of Law Committee v. Parsons Technology, Inc.*,<sup>112</sup> the Texas Unauthorized Practice of Law Committee sued to enjoin Parsons Technology from selling Quicken Family Lawyer (QFL), a software program that helped consumers create a variety of legal documents, including wills, trusts, and residential landlord-tenant leases.<sup>113</sup> The court explained:

When the user accesses a document, QFL asks a series of questions relevant to filling in the legal form. With certain questions, a separate text box explaining the relevant legal considerations the user may want to take into account in filling out the form also appears on the screen. As the user proceeds through the questions relevant to the specific form, QFL either fills in the appropriate blanks or adds or deletes entire clauses from the form. For example, in the “Real Estate Lease—Residential” form, depending on how the user answers the question regarding subleasing the apartment, a clause permitting subleasing with the consent of the landlord is either included or excluded from the form.<sup>114</sup>

Applying the rule that individually tailored services constituted unauthorized practice of law, the court found that QFL violated the Texas prohibition on unauthorized practice of law and granted an injunction to the Unauthorized Practice of Law Committee.<sup>115</sup>

Although these laws technically create an obstacle to machine intelligence providing legal services, in practice, the market for these services has become de facto deregulated.<sup>116</sup> Even William Henderson,

---

108. See, e.g., Catherine J. Lanctot, *Scriveners in Cyberspace: Online Document Preparation and the Unauthorized Practice of Law*, 30 HOFSTRA L. REV. 811, 821 (2002).

109. See *infra* notes 113–14 and accompanying text.

110. See *infra* notes 113–14 and accompanying text.

111. See *infra* note 115 and accompanying text.

112. No. Civ.A. 3:97CV-2859H, 1999 WL 47235 (N.D. Tex. Jan. 22, 1999), *vacated and remanded per curiam*, 179 F.3d 956 (5th Cir. 1999).

113. See *id.* at \*1.

114. *Id.* at \*2.

115. *Id.* at \*7, \*10.

116. Benjamin H. Barton, *The Lawyer’s Monopoly—What Goes and What Stays*, 82 FORDHAM L. REV. 3067, 3068 (2014). As Barton—and this paragraph—explain, Ray Campbell mistakenly limits de facto deregulation to legal services for corporate clients.

who worries that unauthorized practice of law inhibits innovation, has observed that “[i]n ten years, much of the deregulation agenda will come to pass without any formal deregulation. U.S. consumers and businesses are already voting with their feet.”<sup>117</sup> Apparently, while the public has not yet challenged lawyers’ monopoly on providing human legal services, it feels entitled to have the freedom to purchase legal services provided by software and other forms of machine intelligence. Indeed, within a short period of time after the district court decision in *Parsons Technology*, the Texas legislature expressly permitted the sale of computer software, such as QFL, as well as “similar products” that provided individualized legal services.<sup>118</sup> Similar lawsuits in Missouri<sup>119</sup> and Washington against LegalZoom have created only “bumps in the road”<sup>120</sup> that have resulted in “little change in [the] business.”<sup>121</sup> As Benjamin Barton has noted, LegalZoom “has simply ignored the threat of [the unauthorized practice of law], getting bigger and more prevalent all the time. This is actually its most powerful tool. The larger, older, and more common *LegalZoom* gets, the less likely a court will find [unauthorized practice of law] and the more likely that a legislature might attempt to overrule an adverse decision.”<sup>122</sup> Indeed, the only significant opposition to nonlawyer providers of legal services has been to human assistance combined with machine intelligence, and not to machine intelligence alone.<sup>123</sup> The combined human and computer assistance is the only area where LegalZoom has been forced to significantly alter its business plan.

Moreover, even in the unlikely event that state regulators were to seek successfully to outlaw U.S. businesses from providing machine intelligence delivery of legal services, they would not be able to prevent the delivery of such services in the United States. As Laurel Terry has noted, the legal services world is now flat.<sup>124</sup> On the internet, providers based in other countries could readily provide U.S. residents with machine intelligence services providing legal assistance or advice under relevant U.S. law. These providers could be based in the United Kingdom, which now permits

---

117. Henderson, *supra* note 88.

118. *Unauthorized Practice of Law Comm. v. Parsons Tech., Inc.*, 179 F.3d 956, 956 (5th Cir. 1999) (per curiam) (quoting H.B. 1507, 76th Leg., Reg. Sess. (Tex.1999)).

119. Nathan Koppel, *Seller of Online Legal Forms Settles Unauthorized Practice of Law Suit*, WALL ST. J. (Aug. 23, 2011, 11:47 AM), <http://blogs.wsj.com/law/2011/08/23/seller-of-online-legal-forms-settles-unauthorized-practiced-of-law-suit/>.

120. Barton, *supra* note 81, at 16.

121. *Id.* at 15 (quoting Daniel Fisher, *Silicon Valley Sees Gold in Internet Legal Services*, FORBES (Oct. 5, 2011), <http://www.forbes.com/sites/danielfisher/2011/10/05/silicon-valley-sees-gold-in-internet-legal-services/>) (alteration in original).

122. BENJAMIN H. BARTON, GLASS HALF FULL: AMERICA’S LAWYER CRISIS AND ITS UPSIDE 135 (forthcoming 2014) (manuscript at 135) (on file with *Fordham Law Review*).

123. Campbell, *supra* note 89, at 46 (describing the contribution of unauthorized practice of law suits to bankruptcy of We the People, a business that sold “legal forms to consumers from franchised storefront offices”); Henderson, *supra* note 88.

124. See generally Laurel S. Terry, *The Legal World Is Flat: Globalization and Its Effect on Lawyers Practicing in Non-global Law Firms*, 28 NW. J. INT’L L. & BUS. 527 (2008).



nonlawyer providers of legal services,<sup>125</sup> or in other legally sophisticated countries, such as China or India.

Accordingly, those commentators, such as Hadfield, Henderson, and Ribstein, who argue that the unauthorized practice laws will seriously inhibit innovation in machine intelligence delivery of legal services, are not correct.<sup>126</sup> Although unauthorized practice of law statutes undoubtedly inhibit innovation to some degree, they present only a manageable obstruction. The de facto legalization of machine intelligence when offered without human assistance will only provide a greater incentive to developing more sophisticated and profitable machine intelligence services.

### III. WHY OPPOSITION TO MACHINE INTELLIGENCE DELIVERY OF LEGAL SERVICES PERSISTS

As we explained in Part I, the exponential development of machine intelligence in legal services is inevitable, and the application of machine intelligence to legal services will result in better quality legal services at a lower cost. In Part II, we explained how regulatory barriers will not prevent this advance. Given that machine intelligence is inevitable and will only improve the delivery of legal services and increase access to justice, why does opposition to machine intelligence in legal services persist? We suggest that this opposition derives from two sources: first, fear of machine intelligence and second, fear of the implications for lawyers' monopoly.

The fear of machine intelligence takes two forms. One commentator argues that machine intelligence will never be able to provide legal services competently.<sup>127</sup> We know from the success of machine intelligence in other fields that this fear is demonstrably false. Over time, machine intelligence will inevitably outperform human lawyers in completing most legal services.<sup>128</sup> Another commentator worries that lawyers will not be competent to evaluate machine intelligence.<sup>129</sup> But as in other areas of technological advance, human legal experts will continue to assess the outputs of machine intelligence, even if as individuals they are unable to understand fully how that machine intelligence works. Moreover, until the advent of true artificial intelligence, some human experts will retain the ability to program and assess the programming of machine intelligence in delivering legal services.

Absent justification, the fear of machine intelligence in lawyering appears more likely connected to the commitment to preserving lawyers' monopoly. Machine intelligence not only threatens lawyers' monopoly in practice, it also challenges the two elements that are necessary to justify

---

125. See generally John Flood, *Will There Be Fallout from Clementi? The Repercussions for the Legal Profession After the Legal Services Act 2007*, 2012 MICH. ST. L. REV. 537.

126. See *supra* notes 87–90.

127. Campbell, *supra* note 89, at 12 (“At a fundamental level, the form legal document is inferior to the services of a competent attorney.”).

128. See *supra* Part I.A, I.B.6–7.

129. Remus, *supra* note 95 (manuscript at 21–22).

lawyers' monopoly.<sup>130</sup> The first element is the belief that legal expertise is inaccessible to nonlawyers. The second element is the belief that lawyers, in contrast to business people, work to serve the public good. Accordingly, even though the public does not have expertise necessary to regulate legal services, it can trust lawyers to regulate themselves in the public interest and need not fear that lawyers' monopoly will result in rent seeking.<sup>131</sup>

But if machine intelligence can provide services as expert as those lawyers could offer, or could provide nonlawyers with access to legal expertise, then the first ground for protecting lawyers' monopoly—inaccessible expertise—fails. The other primary justification for professional privilege is lawyers' commitment to, and protection of, the public good. The delivery of legal services by machine intelligence suggests that legal services are a commodity. The commodification of legal services highlights the reality that legal services, and therefore access to justice, are bought and sold. As with other commodities, more money can buy better quality. And better quality legal services translates into better outcomes, suggesting that justice is not equal under the law and that lawyers' monopoly does not function to promote the public good.<sup>132</sup> As a result, the fear that machine intelligence will undermine the ideological foundations of lawyers' monopoly is a very real one.

#### CONCLUSION

The market for electronic legal services is at a relatively early, yet significant, stage in terms of the disruptive effect of machine intelligence in undermining lawyers' monopoly. As machine intelligence in lawyering develops exponentially, it will take an increasingly larger role in five areas of legal practice: discovery, legal search, generation of documents, creation of briefs and memoranda, and predictive analytics. Eventually, machine intelligence will prove faster and more efficient than many lawyers in providing those services. Lawyers will continue to provide services that cannot be commoditized if they are superstars, practice in highly specialized areas of law subject to rapid change, appear in court, or provide services where human relationships are central to their quality. Otherwise, no effective barriers to the advance of machine lawyering in legal practices exist—not even in the law and ethics of lawyering. Lawyers will continue to embrace machine intelligence as an input and fail to prevent nonlawyers from using it to deliver legal services. Ultimately, therefore, the disruptive effect of machine intelligence will trigger the end of lawyers' monopoly

---

130. See Russell G. Pearce, *The Professionalism Paradigm Shift: Why Discarding Professional Ideology Will Improve the Conduct and Reputation of the Bar*, 70 N.Y.U. L. REV. 1229, 1238–40 (1995).

131. See *id.* at 1239–40; Russell G. Pearce & Sinna Nasseri, *The Virtue of Low Barriers to Becoming a Lawyer: Promoting Liberal and Democratic Values*, 19 INT'L J. LEGAL PROF. 357, 365–66 (2012).

132. Cf. Geoffrey C. Hazard, Jr., Russell G. Pearce & Jeffrey W. Stempel, *Why Lawyers Should Be Allowed To Advertise: A Market Analysis of Legal Services*, 58 N.Y.U. L. REV. 1084, 1112–13 (1983).

and provide a benefit to society and clients as legal services become more transparent and affordable to consumers, and access to justice thereby becomes more widely available.