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Thinking About Technology – Watson, Answer Me This: Will You Make Librarians Obsolete or Can I Use Free and Open Source Software and Cloud Computing to Ensure a Bright Future?

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Thinking about Technology . . .

Watson, Answer Me This: Will You Make Librarians Obsolete or Can I Use Free and Open Source Software and Cloud Computing to Ensure a Bright Future?*

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In February 2011, Watson, IBM's "smart" computer, defeated two former Jeopardy champions. While the application of the technology may support some legal research functions, the current state of the technology probably will not allow Watson to replace law librarians in the near future. Yet, given the economic realities of our firms and institutions, librarians do need to consider technologies that may reduce the considerable cost associated with discovering and maintaining access to legal information. Free and open source software and systems and cloud-based initiatives may provide innovative approaches librarians should consider.

¶1 Watson, IBM's "question and answer" computer, recently defeated two human *Jeopardy* champions.[1] Watson's success has led to questions about whether the technology behind it could be used to perform tasks previously completed by humans. The tasks are not unique to any one field and, in fact, include a number of fields traditionally classified as professional, including medicine and law.[2]

¶2 Despite the success of Watson, a review of the physical and technology support requirements of Watson makes it clear that librarian positions are not in immediate jeopardy (pardon the pun):

> IBM used 200 million pages of content stored on 4 terabytes of disk space, as much as 16 terabytes of memory . . . , about 2,800 processor cores and approximately 6 million logic rules to determine the best answers. Watson took up 10 server racks, each with 10 IBM Power 750 servers and two large refrigeration units all of which was housed in its own room on IBM's Yorktown Heights campus.[3]

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1. Ian Paul, *IBM Watson Wins Jeopardy, Humans Rally Back*, TODAY @ PC WORLD (Feb. 17, 2011, 5:13 A.M.), http://www.pcworld.com/article/219900/ibm_watson_wins_jeopardy_humans _rally_back.html ("As IBM has said on several occasions, the goal was not to create a self-aware super computer that can run amok such as HAL 9000 from *2001: A Space Odyssey* or Skynet from *The Terminator*. But a question and answer machine like the ship computer in *Star Trek: The Next Generation*.").

2. Applications of the Watson technology in the medical field are already being planned. *Id.* Use of the Watson technology to perform legal research was suggested by IBM General Counsel Robert C. Weber. Robert C. Weber, *Why 'Watson' Matters to Lawyers*, NAT'L L.J. (Feb. 14, 2011), http://www.law.com/jsp/nlj/PubArticleNLJ.jsp?id=1202481662966&Why_Watson_matters_to _lawyers&slreturn=1&hbxlogin=1.

3. Paul, *supra* note 1.

Based on the current rate of technological advancement, some have speculated that in fifteen to twenty years Watson programming will be able to work on a laptop.[4] But cost projections for when Watson will first become available, a few years from now, are approximately three million dollars.[5] A modified Watson program, designed to work more slowly and to review less information, might come at a significantly reduced rate of $300,000.[6]

¶3 Additionally, although Watson's performance on *Jeopardy* may have resulted in a "victory," a review of the challenge illustrates that Watson did not operate without error. As one blog pointed out, there were several issues with Watson's functional abilities:

> When sentence structures become complex, or the question is asking contestants to consider two indirectly related factors or ideas, Watson tends to get confused. His confidence drops and his reaction times slow.
>
> . . . .
>
> . . . . IBM programmers didn't think Watson would ever have an issue with using the same incorrect response or wrong response structure as a contestant answering before him. Well he ran into the problem twice last night . . . .[7]

¶4 Further, Robert C. Weber of IBM's description of Watson indicates there will be a continuing need for professionals experienced in content management:

> With the technology underlying Watson, called Deep QA, you could have a vast, self-contained database loaded with all of the internal and external information related to your daily tasks . . . . Pose a question and, in milliseconds, Deep QA can analyze hundreds of millions of pages of content and mine them for facts and conclusions . . . .[8]

An experienced professional will have to be involved in selecting this content for Watson to mine and in ensuring that it remains current.[9] Aren't those key competencies of law librarians? Also, the law does not lend itself to a simple right or

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4. Clive Thompson, *What Is I.B.M.'s Watson?*, N.Y. TIMES, June 20, 2010, § MM (Magazine), at 30, 37.

5. Lucas Mearian, *Can Anyone Afford an IBM Watson Supercomputer? (Yes)*, COMPUTERWORLD (Feb. 21, 2011), http://www.computerworld.com/s/article/9210381/Can_anyone_afford_an_IBM _Watson_supercomputer_Yes_?taxonomyId=67&pageNumber=1.

6. *Id.*

7. Adrain Covert, *IBM Jeopardy Challenge, Night 2: Watson Runs Wild*, GIZMODO (Feb. 16, 2011, 12:00 A.M.), http://gizmodo.com/#!5761636/ibm-jeopardy-challege-night-2-watson-runs-wild.

8. Weber, *supra* note 2. It is the availability of this content that has led at least one commentator to characterize comment about Watson's lack of access to the Internet as a "red herring." Gordon Haff, *What IBM's Watson Tells Us About the State of AI*, CNET NEWS (Feb. 14, 2011, 9:33 A.M. PST), http:// news.cnet.com/8301-13556_3-20031781-61.html. However, it would be interesting for Watson's developers to discuss the effects on Watson's search times and confidence rankings if the computer were provided with Internet access. How would Watson evaluate the reliability of information on various web sites? Evaluation of information resources is an information literacy skill that many humans seem to have difficulty mastering.

9. Jason Eiseman, *What IBM's Watson Means for Law Librarians*, JASON THE CONTENT LIBRARIAN (Feb. 11, 2011), http://www.jasoneiseman.com/blog/?p=446, appears to amusingly illustrate that librarians provide the "voice" behind the Watson by providing content; however, there is a deeper meaning: useful technology commentary requires more than simply saying that a particular development is going to greatly affect a particular industry or profession. Rather, we must analyze how the technology is being used and how it might be useful in creating a positive influence for a particular field.

wrong answer; rather, in most legal systems, questions about the reasoning and authority for a position are essential. If Watson were limited to producing a final simple answer, its application in law might be in question. However, according to Dr. David Ferrucci, of IBM's T.J. Watson Research Center: "In addition to [a] set of top answers [Watson produces] evidence profiles that will help humans make decisions over large bodies of content . . . [W]ithout Watson technology, they just get a list of a million documents and they stop reading after the top five."[10] Even so, Weber acknowledges, "Deep QA won't ever replace attorneys; after all, the essence of good lawyering is mature and sound reasoning, and there's simply no way a machine can match the knowledge and ability to reason of a smart, well-educated and deeply experienced human being."[11] The same could be said about law librarians.

¶5 Given that, at least in the near future, law librarians probably don't have to worry about being made obsolete by Watson-like technology, can we become complacent about our ability to efficiently meet the information needs of our employers? Certainly not. So, perhaps we should begin to consider some alternatives to the costly software and systems that we currently use. Free and open source software and systems and cloud technology may be alternatives worthy of consideration.

What Are Free and Open Source Software and Systems?

¶6 While free software and open source software are terms often used interchangeably or designated together as FOSS, those who developed the ideas see an important distinction between these terms. Richard Stallman, who initiated the GNU Project that ultimately was responsible for the development of the Linux operating system, insists on using the term free software. Stallman objects to the open source movement, in part because of the willingness of those on the open source side to allow for the mixing of proprietary products and open source software, which he feels undermines the idea of software freedom.[12] Unlike freeware, open source software is copyrighted and may be distributed with license terms that ensure the continued availability of source code.[13]

¶7 There are obviously similarities between free and open source software: "With Free and Open Source Software, you pay no licensing fees, updates are discretionary not obligatory, updates do not cost you anything, maintenance is provided free of charge, and you are always at liberty to change, abandon, reject or accept whatever digital upgrades you like."[14] For what has been described as open source integrated library system (ILS) software, differing business models have been used. Some open source ILS software, such as Evergreen, has been developed

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10. Todd Miller, *The Backstory of IBM's Watson Supercomputer—an Interview with Dr. David Ferrucci*, SF GATE (Apr. 25, 2011, 8:26 A.M.), http://www.sfgate.com/cgi-bin/blogs/tmiller/detail?entry_id=87676.

11. Weber, *supra* note 2.

12. David Bretthauer, *Open Source Software: A History*, 21 INFO. TECH. & LIBR. 3, 9 (2002).

13. *Id.* at 3.

14. Steven A. Reisler & Elaine Y.L. Tsiang, *Commoners Toiling in the Vineyards of the Law*, OR. ST. B. BULL., Dec. 2010, at 34, 35.

by communities of libraries and "can be accessed and adapted by others. . . . [T]he open source ILS software is free for libraries to download, use and modify."[15] However, OPALS (Open Source Automated Library System) provides a model where the library does not pay for the software but pays an annual subscription fee to use the software and for support.[16] The OPALS model is sometimes referred to as Software as a Service (SaaS). LibLime, which provides support for the Koha open source ILS, and Equinox, which provides support to the Evergreen open source ILS, have adapted the SaaS model.[17]

Cloud Computing and Open Source in Legal Organizations

¶8 Cloud computing following a SaaS model is gradually becoming more popular in legal organizations.[18] Firms and other legal organizations are increasingly relying on cloud providers for web conferencing, case management, and electronic discovery.[19] While cloud computing was available in the 1990s, it has only been in the past few years, with the advent of improvements in technology, that performance issues have been overcome and cloud computing has become a viable and cost-effective option.[20] Yet experts advise caution when considering cloud computing. Continued access to data, "privacy, confidentiality, and jurisdictional and regulatory issues" and customer service are all issues of concern.[21]

¶9 Use of open source software in law offices is also garnering support.[22] One article suggested using open source software and paying programmers to maintain and customize it for specific firms and attorneys.[23] This model has some similarities to the SaaS model described above. Under both models, while the firm or

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15. DESIREE WEBBER & ANDREW PETERS, INTEGRATED LIBRARY SYSTEMS: PLANNING, SELECTING, AND IMPLEMENTING 7 (2010).

16. *Id.*

17. KAREN A. COOMBS & AMANDA J. HOLLISTER, OPEN SOURCE WEB APPLICATIONS FOR LIBRARIES 7 (2010).

18. Sixteen percent of those responding to the ABA's 2009 Legal Technology Survey reported using online software services. This is an increase of three percent over the 2008 ABA survey. Dennis Kennedy, *Working in the Cloud: Tips on Success with Online Software Services*, A.B.A. J., Aug. 2009, at 31, 31–32.

19. *Id.* at 32.

20. *See* Larry Port, *ASP vs. SaaS: Fun with Acronyms or a Sweeping Technological Shift?*, PEER TO PEER, June 2009, at 54, 54–55.

21. Kennedy, *supra* note 18, at 32.

22. Dennis Kennedy, *Free Can Be Good: Add Open Source to Software Considerations*, A.B.A. J., Mar. 2011, at 34, 34. It is interesting that the ABA Legal Technology Survey inquires about use of SaaS but does not, with very limited exception, request responses detailing use of open source resources. An inquiry to the ABA Legal Resource Technology Center disclosed that the "only question . . . asked in the 2011 survey that . . . touches on open source is 'Which type of operating system does your primary computer use,' and one of the options is Linux." E-mail from Stephen Stine, Research Specialist, ABA Legal Tech. Resource Ctr., to author (Apr. 26, 2011) (on file with author). This year's ABA Tech Show did include a program by Rodney Dowell and Dennis Kennedy entitled "The Open Source Powered Law Firm." The slideshow is available at http://www.americanbar.org/content/dam /aba/events/law_practice_management/ts2011_the_opensource_powered_law_firm.authcheckdam .pdf.

23. *See* Reisler & Tsiang, *supra* note 14, at 36.

attorney must dedicate some financial resources to the technology, those financial resources are not allocated to licensing. Additionally, even with the cost of programmer services for open source software, there are likely to be cost savings:

> The cost savings lie in the absence of licensing fees, the availability of help 24/7 from a worldwide network of FOSS programmers, the ease with which programmers can "pop open the hood" of your software to diagnose and repair problems, the greater security, confidentiality and protection FOSS provides from digital evil-doers, and the frequent no-cost upgrades. FOSS also bends over backward to achieve backward compatibility with pre-existing software and hardware. So if a system has worked well for you in the past, then the FOSS world will not force you to upgrade.[24]

¶10 Indeed, some suggest that cost savings is actually the reason firm technology departments have resisted open source software. Reduced budgets for technology might in turn diminish the power of the technology department in organizational politics.[25] While this may be true in some firms, it is certainly not a rule without exception. Law firms are using open source resources for tasks ranging from basic PDF creation[26] to bandwidth monitoring and security scans.[27] There is even an open source software peer group of legal technology professionals organized by the members of the International Legal Technology Association, which serves as a resource for IT staff looking to adopt open source solutions.[28] Even so, there are some obstacles to using open source software in firms, for example, the absence of indemnification provisions that are required by some firms.[29]

¶11 Lack of education in technology for law students and lawyers may also be an obstacle. The lack of skills-based and practice-oriented courses, including technology support for practice, is often lamented by law students.[30] Law librarians, who are traditionally engaged in teaching legal research, a skills-based course, can also become more involved in offering increased instruction regarding law office management issues, including technology.[31]

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24. *Id.*

25. *See* Jason Mark Andersen, Comment to *Open Source in Law Firms—Unimaginable or Brilliant?*, 3 GEEKS AND A LAW BLOG (July 8, 2009, 3:19 P.M.), http://www.geeklawblog.com/2009/07/open-source-in-law-firms-unimaginable.html (saying a number of IT experts told the author that "the IT department's power base depends on the size of its budget, so IT leaders will oppose an approach that reduces the budget and thereby reduces this power").

26. Mark Manoukian, *Breaking the Shackles: Creative Solutions with Open Source*, PEER TO PEER, June 2009, at 43, 44.

27. John Mark Walker, *Law Firm IT Director Discovers Open Source*, OSTATIC (Jan. 11, 2010), http://ostatic.com/blog/law-firm-it-director-discovers-open-source.

28. *See id.*

29. Manoukian, *supra* note 26, at 47.

30. *E.g.*, "As a law student I don't really have much to contribute to that because, to be honest, we're not really taught about the practical aspects of working in the legal profession . . . . [I]t's hard for a law student to grasp exactly how—and how much—an open source approach to the legal profession could benefit lawyers." Alan Bunbury, comment to Luis Villa, *A Community of FOSS Lawyers?*, OPENSOURCE.COM (Mar. 31, 2010), http://opensource.com/law/10/3/community-lawyers.

31. *See* Kenneth J. Hirsh & Wayne Miller, *Law School Education in the 21st Century: Adding Information Technology Instruction to the Curriculum*, 12 WM. & MARY BILL RTS. J. 874 (2004) (discussing a survey of law schools teaching law practice technology and describing a course taught at Duke Law School).

Open Source in Law Libraries

¶12 Unlike some attorneys, law librarians often have either formal education or on-the-job training involving technology and, as suggested above, may provide instruction to students on technology used in legal practice.[32] As is evident to all law librarians, our positions increasingly involve technology. In the academic environment, it is not unusual for the director of the law library to also serve as the director of the information technology department.[33]

¶13 Many librarians consider the operation of the integrated library system (ILS) as their most prominent technology-related issue. "The ILS is probably the most critical technology component of a library. And, it can be one of the more expensive components of a library."[34] Yet, historically librarians have been reluctant to consider alternatives to the proprietary ILS. Victoria Szymczak describes the situation as follows: "[T]here seems to be a real reluctance to critically evaluate the sacred ILS. These vendors, unlike the Wexis's of the world, seem to get a free pass when [librarians] talk about service, cost and transparency."[35] Nonetheless, in 2009–2010, circumstances, particularly economic conditions, led law librarians to become increasingly interested in learning about open source alternatives to costly proprietary ILS products. This growing interest was evidenced by inclusion of programs on the topic at several law librarian conferences.[36] The attention to and interest in open source products followed, somewhat belatedly, the lead of nonlaw libraries, which, by 2009, had adopted open source systems to the extent that such systems were classified as a "routine option."[37] One reason law libraries may not have been among the early adopters of open source systems, including Evergreen, was the delay in development of particular modules. Specifically, delay in the development of a serials module was often a source of concern. Early adopters of open source ILS, such as Evergreen, had to find workarounds to overcome the challenges associated with integrating open source software with proprietary resources designed to assist in the discovery of electronic periodicals. Additional challenges in incorporating print serials also had to be overcome.[38]

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32. There are programs at law librarian conferences on how to teach such courses. *See, e.g.,* MAALL 2008 Preliminary Program 7 (rev. Oct. 1, 2008), *available at* http://www.aallnet.org/chapter/maall/08maallprelimprograms.pdf (program G-1: "ABA Tech Show and How It Can Educate Your Law Students About . . . Technology").

33. Carol Watson & Larry Reeves, *Technology Management Trends in Law Schools,* 103 LAW LIBR. J. 443, 443, 2011 LAW LIBR. J. 27, ¶ 1.

34. Victoria Szymczak, *Do You Like Your ILS?,* LAW LIBRARIAN BLOG (Feb. 27, 2011), http://law professors.typepad.com/law_librarian_blog/2011/02/do-you-like-your-ils.html.

35. *Id.*

36. *See, e.g.,* "Implementing an Open Source Library System," presentation at Mid-America Ass'n of Law Libraries (MAALL) Annual Meeting, Oct. 15, 2009, *description available at* http://law .missouri.edu/maall/descriptions.html#c3 (focusing on implementation of the Evergreen open source ILS system at a public library); "Open Source ILS: What a Service-Oriented System Brings to You and Your Library," presentation at AALL Annual Meeting, July 11, 2010, *description available at* http://aall10.sched.org/event/f67d4af155243e748638c899ae993298 (discussing advantages and challenges of implementing an open source ILS).

37. Marshall Breeding, *Investing in the Future,* LIBR. J., Apr. 1, 2009, at 26, 29.

38. *See* Guoying Liu & Huoxin Zheng, *Access to Serials: Integrating SFX with Evergreen Open Source ILS,* 29 LIBR. HI TECH 137 (2011).

¶14 Despite the challenges of implementing open source systems, the providers of proprietary systems were aware of the growing demand by librarians to exercise additional customization and control over an ILS. Proprietary product providers responded with initiatives offering a more open approach. For example, in 2008 Ex Libris launched its Open Platform Program, "which emphasizes the APIs [application programming interfaces] available in each of its products and provides a space for libraries to collaborate and share code and ideas."[39] Ex Libris also began supporting EL Commons, a repository for code developed by its library customers.[40]

Cloud Computing in Law Libraries

¶15 Even with these attempts by the suppliers of proprietary ILS products, librarians aware of the costly nature of those products continue to seek more economical alternatives. Recently, attention seems to have shifted from FOSS ILS alternatives to cloud-based solutions. The current buzz in cloud computing for libraries focuses on OCLC's Web-Scale Management Services (WMS). As described by Marshall Breeding, "WMS combines the functionality already available in WorldCat for cataloging, resource sharing, and discovery with the capability to perform circulation, acquisitions, and license management, thereby obviating the need for the library to operate an integrated library system."[41] Thus, it is not surprising that when David Rapp of *Library Journal* asked ten executives in the ILS industry about the "single most compelling factor that will have an impact on ILSs and the industry in the future," OCLC's Andrew Pace said it would be cloud computing.[42]

¶16 But there have already been some objections and challenges to OCLCs cloud-based WMS. Just as with open source ILS systems, during initial development certain functionalities, including acquisitions and serials modules, are not yet available.[43] In addition to other challenges, there is a pending suit claiming OCLC's involvement and advantages in providing such services is a result of action in violation of antitrust laws.[44] Further, in April 2011, outages in Amazon's hosting services resulted in the unavailability of other web sites and caused some to question moving their computing services to the cloud.[45] Academic law libraries became intensely aware of the possible difficulties with cloud-based services when the CALI web site was unavailable for more than a day due to Amazon's difficulties.[46]

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39. Marshall Breeding, *The New Frontier*, LIB. J., Apr. 1, 2011, at 24, 26.

40. Breeding, *supra* note 37, at 30.

41. Breeding, *supra* note 39, at 24.

42. David Rapp, *The Future of the ILS*, LIB. J., Apr. 1, 2011, at 36, 36.

43. Jack Ammerman, the associate university librarian for Boston University, provides a thorough summary of the current status of WMS as well as an explanation of key terms involved. Jack Ammerman, Report on OCLC Web-Scale Management Services (WMS) (unpublished paper, Dec. 6, 2010), *available at* http://dcommon.bu.edu/xmlui/bitstream/handle/2144/1386/OCLC-WMS .doc?sequence=1. Ammerman also discusses OCLC's projection that it can reduce cost by thirty to forty percent as compared to a "standard ILS." *Id.* at [3].

44. Complaint, Skyriver Tech. Solutions v. OCLC Online Computer Library Ctr., Inc., CV 10-3305, 2010 WL 3141124 (N.D. Cal. July 28, 2010).

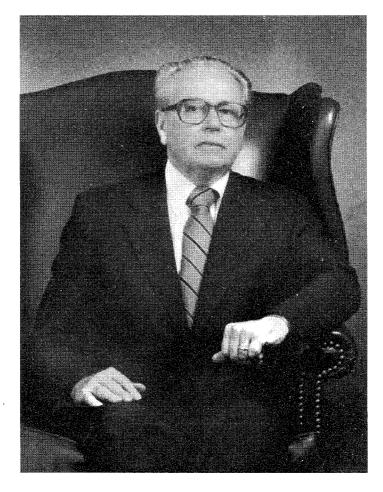45. Steve Lohr, *Amazon's Trouble Raises Cloud Computing Doubts*, N.Y TIMES, Apr. 23, 2011, at B1.

46. The suggested alternative was to direct students to the older option of accessing CALI lessons via the CALI DVDs distributed to law schools each year. Austin Groothuis, *Sorry About That . . .*, CALI (Apr. 22, 2011, 11:42 A.M.), http://www.cali.org/blog/2011/04/22/sorry-about.

¶17 No one technology is the answer for every legal environment, but as adaptable professionals, we must continue to consider the opportunities that may be created by rapid technological advancement. It has already been suggested that the work process efficiencies that could result from OCLC's fully developed WMS could be used to justify support staff reductions in traditional library service areas.[47] Perhaps we should instead be focusing on the opportunities the increased efficiencies could create. Technology may create opportunities to work collaboratively on developing new technological applications,[48] expand current services for patrons, or become involved in new digitization projects. We need to be ready to seize these opportunities.

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47. *See, e.g.,* "Library Management Services in the Clouds: More Reality Than Dream Program: Discussion," presentation at the Am. Library Ass'n Midwinter Meeting (Dec. 9, 2010), http://media suite.multicastmedia.com/player.php?p=fauhu86m (question of Bonnie Juergens, Amigos Library Services, regarding efficiencies and staff reductions; question is at approximately 4.5 minutes).

48. One of the marketed features of OCLC's WMS and related systems is that it will provide "a place for [sharing] library-developed, third-party and OCLC applications." This allows participating libraries to "go to the application gallery, locate applications or services of interest and then easily 'plug them into' your OCLC service or other external applications." *The Features of Web Scale*, OCLC, http://www.oclc.org/webscale/features.htm (last visited May 9, 2011).

Tribute to Earl C. Borgeson

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