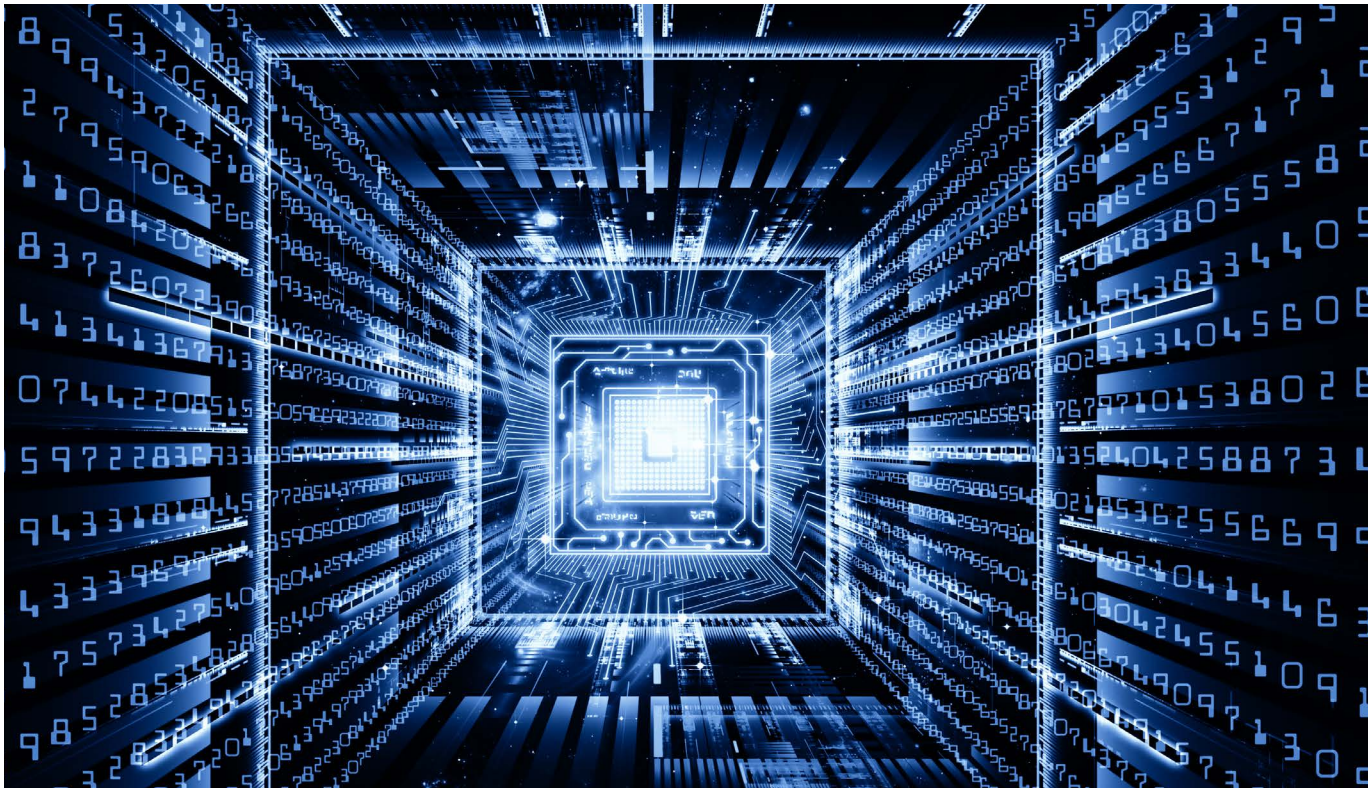

Part I: ARTIFICIAL INTELLIGENCE & ITS IMPACT ON LEGAL TECHNOLOGY: TO BOLDLY GO WHERE NO LEGAL DEPARTMENT HAS GONE BEFORE!

by Sterling Miller

AI is more than just a buzz word – it is cognitive computing that has changed the way people interact with their peers, employers, and clients. Take a deep dive into the implications of this transformative technology for your legal department.

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"Space, the final frontier. These are the voyages of the Starship Enterprise. Its five-year mission: to explore strange new worlds, to seek out new life and new civilizations, to boldly go where no man has gone before."[1]

Some of the best scenes in the television show "Star Trek" (the original version) are those involving the crew members (usually Mr. Spock) asking the computer a question and the computer spitting out the answer in the form of a conversation. When I was younger, I thought this was utterly amazing and, of course, I wanted my own computer that would answer any question I cared to ask it. This was around the time when typewriters and were king and the first calculators (addition, subtraction, multiplication, and division only) were coming on the market, so needless to say, a computer that could talk and interact was quite a ways off. Yes, I'm a bit creaky and have been around awhile, but I am pleased to say that I have never been a "get off my lawn" type of person when it comes to technology in the legal profession or otherwise. To the contrary, I have always embraced it, believing that technology can help lawyers do more, do it better, and do it at lower cost. So why the technology history tour?

Artificial intelligence (AI) is just beginning to come into its own in terms of its use by lawyers and within the legal industry. What's the impact of this technology on the legal profession? Within the next few years, we will find ourselves on the cusp of a revolution in the practice of law led by the adoption of artificial intelligence – in particular, by in-house lawyers. Much like email changed the way we do business every day, AI will become ubiquitous – an indispensable assistant to practically every lawyer. Those that do not adopt and embrace the change will get left behind. Those that do will ultimately find themselves freed up to do the two things there always seems to be too little time for: thinking and advising.

Like many, you may be wondering about what AI products are out there or on the way, and how you use them. Welcome to the first of a four-part series on artificial intelligence and its impact on the legal industry, specifically how in-house legal departments will be affected by it. Over the course of the series I will discuss what AI is, how it can be used by legal departments, and what you – as an in-house lawyer – should be doing next regarding AI.

WHAT IS ARTIFICIAL INTELLIGENCE?

Before we discuss the impact of AI on the legal profession, it's important to define it. The term artificial intelligence can be a bit misleading, at least when it comes to application in the legal field. No, we're not talking about some type of walking and talking robot from "The Terminator" with a briefcase and tie (though that would be pretty cool). Perhaps a better description, and one that is catching on, is cognitive computing. This means teaching computers how to learn, reason, communicate, and make decisions. Cognitive tools are trained vs. programmed – learning how to complete tasks traditionally done by people, where the focus is looking for patterns in data, testing the data, and finding/providing results. Or, as I like to think about it, a research assistant who can sift through the dreck and tell you what it found. Why is this important? Because, according to IBM, 2.5 quintillion bytes of data are being generated every day. In case you're not up-to-date on a quint, that's 2,500,000,000,000,000,000 bytes. Every day. The ability of any human to review and comprehend that level of data without help is the definition of impossible.

GOING DEEPER

The recent explosion in AI is due to a fundamental rule of technology: Moore's Law. In 1965, Gordon Moore, a scientist at Intel, made a prediction based on his observation that the number of transistors per square inch on integrated circuits had doubled every year since their invention. His law predicts that this trend will continue, and growth in computer power will double roughly every two years while the cost of that computing power will go down. Simply put, more computer for less money. When coupled with the ever-lower cost of storing electronic data, you have the basis for the rapid rise

in AI capabilities and availability. In fact, experts predict that spending on AI by companies will grow from $8 billion in 2016 to $47 billion in 2020, up almost 600%.[3]

The reason for the huge increase in AI spending is simple: There are huge productivity gains and cost savings available from freeing humans from routine tasks that computers can handle, allowing people to focus on tasks that truly add value, things that computers really cannot do or do well. As we'll see in future installments of this series, this goal rationale fits particularly well with the legal industry.

More importantly, legal departments will need to be ready for this change and adapt quickly to the use of AI. For example, a number of M.B.A. programs are introducing AI courses. Harvard, MIT, Stanford, and France's INSEAD School of Business along with several other top-line M.B.A. programs have added courses on AI applications.[4] As CEOs and CFOs become more accustomed to using AI, they will expect the other members of the C-Suite – including the general counsel and legal department – to follow suit. In-house lawyers that embrace AI, will become more valuable to the next generation of CEOs and CFOs.

HOW IT WORKS

At its core, AI is the science of teaching computers how to "learn, reason, perceive, infer, communicate, and make decisions like humans do."[5] The initial goal is called machine learning, where the machine (a computer) begins to make decisions with minimal programming. Instead of manually writing rules for how the computer should interpret a set of data, machine learning algorithms (i.e., sets of instructions for solving particular problems) allow the computer to determine the rules itself. Beyond machine learning lies an even bigger goal, deep learning. Deep learning uses more advanced algorithms to perform more abstract tasks such as recognizing images.[6]

Ultimately, with machine learning or deep learning, computers actually become better at their tasks with experience. Fundamental to this learning are the three core processes of how cognitive computing works: 1) gather information, 2) analyze and try to understand the information, and 3) make decisions based on this understanding.[7] As all lawyers know from experience, this process is iterative and we become better the more times we undertake the task – especially if we are corrected and guided in our work by someone more experienced (just like being a young associate at a law firm). For the legal industry, it works exactly the same way with artificial intelligence.

According to Bob Arens, Research Scientist at Thomson Reuters, unlike humans, "[Computers] have no inherent capability of associating pieces of information. You can give information to a computer about apples, bananas, and fruit in general, but on its own, it will never come up with the realization that apples and bananas are both fruit."[8] Connecting these concepts is where humans come in. For example, you can teach a computer to determine the relationship between words in a news article and a specific category by creating a set of training data, in this case a list of articles that are all given category tags. When the machine reads an article categorized as "sports" and sees the word football, it increases the likelihood that the word football predicts a story about sports. On the flip side, if the computer sees the word football in an article on politics (e.g., a political football), a vote will go toward the "politics" category. As the computer reads more articles, it can figure out which words are the strongest predictors of certain topics and weigh them accordingly.[9] Over time, humans interact with the computer to correct mistakes and – in the instance of deep learning, the system self-corrects through a process called propagation. Regardless of how, all of these inputs work in combination until the computer learns the task with an acceptable degree of accuracy.

Another part of learning involves the computer filtering out things so that the answers are not over-inclusive. For example, a computer bringing back 10,000 results is not usable by the lawyer. The computer must learn what is relevant to the person searching and make suggestions that are usable in terms of narrowing the search results to a workable amount. Again, since machines have no inherent ability to limit the answers, this falls to the human teacher and, in the case of deep learning, through propagation – which still requires a human component at first.

On top of the learning comes the interface, or how do people and the machine interact? For years, the most common way has been to enter information or queries into a computer, press Enter, and wait for the answer. These types of searches have run on Boolean logic, i.e., keyword searches. This means that each search is linear and bears no relationship to past or future searches. With AI, that changes as each search becomes part of the learning process and each search and answer (and correction if necessary) makes the machine that much better for the next task. And, just like my "Star Trek" example, the way most people want to interact now is by talking to the machine. This is called natural language processing (NLP), and we see it, for example, in how we interact via speech with the Apple® Siri® and Amazon® Alexa. We'll talk more about this in Parts II and III of the series.

Now you have the basis for the great leap forward in artificial intelligence, the legal industry, and specifically the potential for legal departments, i.e., the ability of machines to learn tasks that previously were done by lawyers and the ability of lawyers to extract pertinent information by either typing a query directly or by asking the machine to perform a task. While the latter is the most exciting and most sci-fi, the former is likely to be the most used method of AI for the legal industry, and specifically legal departments, for the foreseeable future. Moreover, the development of evermore sophisticated algorithms means the demise of relying on Boolean logic and keyword searches.

AI brings the ability to search for concepts (e.g., contract review and analysis for due diligence), to identify changes in tone of email communications (including looking for code words used to otherwise try to disguise the true nature of the conversation), and even to draft where the computer understands what needs to be drafted and prepares the document.

CONCLUSION

C-Suite executives are becoming savvier and tied into the use of AI for purposes of business operations, with the unspoken expectation that their legal department will follow suit. The capability of using AI throughout the legal industry, and specifically in legal departments, is poised to take machines beyond simple keyword search tools, to partners with whom lawyers will team up to deliver better, faster, and cheaper legal services to the company. We have an early look at the potential impact of this technology on the legal industry, but does that mean an army of robo-lawyers will take over the profession? Tune into Part II of this series to find out.

[1] "Star Trek" (TV Series 1966-1969)

[2] "How Artificial Intelligence is Transforming the Legal Profession," *ABA Journal*, posted April 1, 2016 (Julie Sobowale).

[3] "Artificial Intelligence Looms Larger in the Corporate World," *The Wall Street Journal*, posted January 11, 2017 (Steven Norton).

[4] "Tomorrow's Business Leaders Learn to Work with AI," *The Wall Street Journal*, posted November 30, 2016 (John Simons).

[5] Id.

[6] Id.

[7] "Cognitive Computing: Transforming Knowledge Work," Thomson Reuters "AnswersOn" Blog, posted January 24, 2017 (Dr. Khalid Al-Kofahi).

[8] "Cognitive Computing: Under the Hood," Thomson Reuters "AnswersOn" Blog, posted January 27, 2017 (Bob Arens).

[9] "CIO Explainer: What is Artificial Intelligence," *The Wall Street Journal*, posted July 18, 2016 (Steven Norton).

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