The End Game

Encroachment on the Practice of Law
by Service Providers and Technology

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October 2011

To date, legal service providers and technology serve the practice of law in a supportive role. They are increasingly performing legal tasks. Will innovation empower attorneys to reach new markets or just take away part or all of their business?

Introduction

The next few years will witness an explosion of computing power and software capability. While we may differ in opinion as to pace of change, the continuing efficiencies of specialty providers, such as Legal Process Outsourcers (LPOs), and the growing power of technology will at some point have significant impacts on the practice and business of law. The question is when? Some think that tie has already arrived as the Law Blog recently posted:

"Technology watchers expect the population of robot workers to be as high as 13 million in 2012, according to Singularity Hub, and lawyers aren't exempt from the mechanized labor that is often thought to threaten assembly-line jobs. E-discovery software makers expect that the need for lawyers could fall dramatically, with claims that their products can enable a single attorney to do work that previously required 500 lawyers, as illustrated in this report by the New York Times." Legal Sector Loses Jobs In September, Robots OnThe Horizon.

1. Today--Approaches to Knowledge Management (2012)

Mainstream consensus continues to hold that Knowledge Management (KM) is not about technology, but rather people and process. More and more, however, it is apparent that human capacity combined with technology can deliver better results compared to human endeavor alone. As this trend continues — as predicted by Moore's Law—there will come a point when computers are more capable than humans at performing certain tasks. Indeed, from an engineering viewpoint that time is not far away: by 2020, the computer will have the same capacity as the human brain (When will computer hardware match the human brain?) and by 2050 a computer will have the equal computing capacity as all humanity.

Even as technology continues to evolve, the lessons of KM have been successfully adopted in some segments of the market. While law firms, with few exceptions, have not broadly applied KM, LPOs have applied process efficiencies to streamline the delivery of specialty services, such as discovery review, back-office support, library services, etc.. These efforts have been implemented largely without the aid of advanced technology and have allow the service providers to grow at rates significantly faster than law firms.

2. Speeding Towards The Singularity (2045)

Can technology perform human tasks?

Ray Kurzweil, author of *The Singularity Is Near*, popularized the concept that the moment the computer exceeds human capacity, it will help design its successors, at ever increasing speeds, creating a technology singularity, or event horizon, beyond which we cannot see. Kurzweil's insight, along with many others, is that technology innovates exponentially, not linearly. This logarithmic rate of change, which is occurring across all aspects of the technology spectrum, produces explosive growth, sometimes called the "hockey stick effect."

"Here's what the exponential curves told [Kurzweil]. We will successfully reverse-engineer the human brain by the mid-2020s. By the end of that decade, computers will be capable of human-level intelligence. Kurzweil puts the date of the Singularity—never say he's not conservative—at 2045. In that year, he estimates, given the vast increases in computing power and the vast reductions in the cost of same, the quantity of artificial intelligence created will be about a billion times the sum of all the human intelligence that exists today."
Read more: http://www.time.com/time/magazine/article/0,9171,2048299,00.html#ixzz1aUdQsuWC

Of course, there are many who doubt that computers can become truly intelligent. For example, Professors Dreyfus and Dreyfus describe 5 Stages of Learning in their book Mind Over Machine as a process that cannot be emulated by silicon and logic. More recently, a New York Times opinion post, in response to IBM's Watson computer winning performance on Jeopardy, asserted that Watson Still Can't Think. But it does not matter whether or not we believe a machine is "thinking." It is results that count. When we consider any situation from the perspective of outcome or results, what is the difference between intelligence, judgment, and brute force?

Others contend, such Paul Allen, co-founder of Microsoft, that while the singularity may very well occur; it is a very long way off. Paul Allen: The Singularity Isn't Near. Allen points out that achieving the singularity will require enormous developments in software (not just improvements in hardware capacity) and replicating human capacity is unlikely to occur at an accelerating pace. In fact, Allen asserts, we will likely hit a "complexity brake" because "[a]s we go deeper and deeper in our understanding of natural systems, we typically find that we require more and more specialized knowledge to characterize them, and we are forced to continuously expand our scientific theories in more and more complex ways."

Once again, the core doubt is based on the fact that the human brain is exquisitely complex and therefore cannot be replicated. But, as one comment to Allen's article states, the doubt whether computer can perform human tasks is based on the "premise that singularity can only occur when human intelligence can be engineered. It's far more likely that the inevitable accumulation of thousands of smart objects that don't even attempt to mimic human cognition will lead to systems that have inhuman intelligence, with the ability to outperform humans on so many different tasks that the intellectual contributions of all but the most creative humans will simply be unnecessary." Or, as another comment predicts: the singularity is "the point at which the productivity growth rate permanently surpasses the economic output growth rate. Once that occurs, the economy must continuously shed (human) jobs."

3. The Next Steps--The Growing Power of Technology (2011-2020)

What legal tasks can be automated?

We do not need to wait until singularity to see the effects of innovation. Technology will have profound impact well before computers can fully replicate human capability, or rather perform human tasks. In the

context of law, we can predict areas of development and assess how they will affect the practice of law.

Phase 1: Search Tools (2000-2010)

LEGAL TASK: Find relevant material *Example*: Find authoritative case law on a point of law *Example*: Find a sample clause for a particular transaction type	**Data Analytics Tools** ***Research Analysis****: Westlaw Next* *See,* ThomsonReuters Labs-Research and Development

One the core legal task is to find relevant material. Search tools allow us to expand the scope of our research. But we still have to read and analyze the search results and, therefore, this stage of technology has had little impact of law firm staffing. Nevertheless, LPOs have adopted search tools together with efficient practices and created a multi-billion dollar e-Discovery business, in effect taking this opportunity away from law firms. However, as this technology grows in capability, software is increasingly performing the work of contract lawyers and document coders, potentially slowing the growth the service providers.

Phase 2: Organizational Tools (2010-2020)

LEGAL TASK: Identify legal rules and principles *Example*: Identify the relevant legal issues in a case *Example*: Identify the required and optional terms for a particular transaction type	**Information Analytics Tools** ***Discovery Analysis****: Recommind's Predictive Coding* ***Contract Analysis****: KIIAC*

After finding relevant material, the next key task is to identify—or in computer terms, reverse engineer—the relevant rules and principles embedded in the source set of documents or search result set. This is the main focus of the next stage of technology evolution, whereby software analyzes case law and identifies the legal issues, or reviews a set of legal agreements and determines the standard and deal-specific elements of any type of transaction.

A number of companies are approaching this challenge, each applying a different technique to providing the computer with guidance to classify the data set and map the objects to a set of rules and principles.

1. **Expert Guidance**: NeotaLogic provides a rich tool set for experts to define a legal rules framework, which can be used as a training set to classify and map source materials to the rules. Its Logic System "combines individually powerful reasoning methods—decision trees, decision tables, if/then rules, calculations, weighted factors, spreadsheets, case-based reasoning and others—into a single expert engine that can manage problems of great complexity and subtlety for thousands of users and millions of transactions." Using the logic framework as a guide, the rule set can analyze very large data sets, classify the data objects, feed the results into powerful data visualization tools, and produce maps of the law.

2. **Document Sampling**: Recommind uses a sample set of documents as exemplars to identify the distinguishing characteristics and match other similar documents. In a company White Paper, Predictive Coding is explained as a method that starts "with a small number of documents identified by a subject matter expert as a representative 'seed set', Predictive Coding uses machine learning technology to identify and prioritize similar documents across an entire corpus – in the process literally 'reviewing' all documents in a corpus, whether 10 megabytes or 10 terabytes." Dr. Jan Puzicha, Recommind White

Paper, *Predictive Coding Explained*.

3. **Structural Analysis**: My company, KIIAC, creates Information Analytic tools for transactional practice using the structure of the documents to identify the component patterns. The Contract Analysis engine can analyze any set of contracts and induce the deal elements by creating a deal checklist identifying the required and optional clauses. For each deal term, the software then identifies the range of standard and deal-specific language. With expert guidance, software can create model forms as a starting point for new drafting project, or automatically analyze an existing agreement and report how the agreement compares to a selected standard, showing what clauses are consistent, which are divergent, and which clauses may be potentially missing.

Phase 3: Outcome Analysis Tools (2020-2030)

LEGAL TASK: Determine the best approach *Example*: Propose the strongest arguments with the highest outcome of success *Example*: Structure a transaction to achieve desired business objectives	**Knowledge Analytics Tools** ***Reasoning Analysis****: Neota Logic*

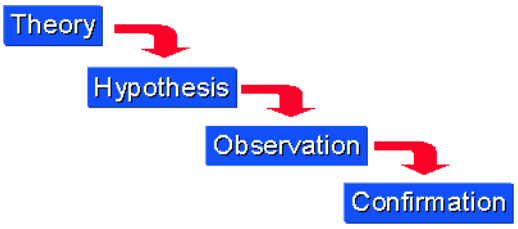
Finally, once we have identified the relevant source materials, analyzed the intellectual building blocks, the next stage will apply this intelligence to deliver results. For example, once the computer has found all relevant case law on a particular issue, extracted the operative legal rules and principles, it can examine previous outcomes, and determine the probabilities of likely winning arguments. In the case of transactional analysis, the system cannot benefit from any equivalent concept of the winning argument. But it can analyze multiple sources of information, such as author, jurisdiction, industry, asset type, deal type and potentially hundreds of other data points and predict likely outcomes.

4. Evolving Nature of the Technology

How will technology make the advances?

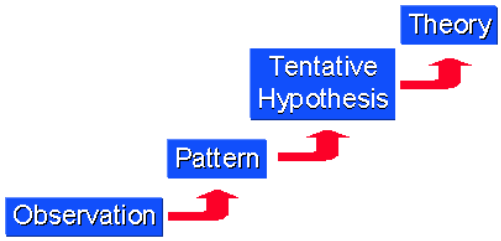
There are two main approaches to capturing knowledge. First, the deductive (or top-down) method, favored by traditional KM, captures experience of experts and records their knowledge. Second, the inductive (or bottom-up) method, applied by computer systems, analyzes source material and captures relevant data, information and knowledge.

4.1. Deduction--An Expert Approach



Deductive reasoning starts with a limited number of simple statements or assumptions, incrementally adding more complex statements through logical constructs, as illustrated by William M.K. Trochim (Deduction & Induction). Typically, expert reasoning is captured in a programming language, using “if-else-then-except, except, except....” logic statements. In practice, the approach best lends itself to highly domain specific solutions. Indeed, despite a number of attempts, efforts to capture all human thought have fallen well short of their goals.

4.2. Induction--A Machine Approach



Inductive reasoning creates general principles by starting with many specific instances, and from this raw set of material, it groups the material by shared characteristics and finds patterns of similarity. This is the technique used by both Recommind and KIIAC (although both systems can also be refined by human guidance).

Part of the success of bottom-up techniques may be attributable to the fact that the human brain appears to be an inductive engine. We learn through examples and by watching others. However, early in the development of AI, most technologists approached the challenge by building top-down, logical, rules-based engines. The approach met with little success.

When IBM Deep Blue computer bested Kasparov at chess, it was not by mimicking human thought, but rather by analyzing past chess moves and assessing the probabilities of success. In the same manner, Google's translate engine does not learn the rules of sentence structure as we did in grammar school, it was fed with multiple examples of the same text in different languages, which the algorithms used to "learn" the corresponding expressions in different languages.

4.3 Combining Classification, Extraction and Rules Engines.

While rules-based (deductive) approaches may not be practical for general purpose solutions, they will play a significant role in specialized situations after the inductive engines have run their analysis. Moreover, it is highly probable that we will have access to hundred's of different classifiers, extraction and rules engines, each specializing in performing different discrete tasks. Potentially, next generation analytics can be designed to analyze the results of each of the underlying analytics and determine which performs best in particular circumstances.

5. Impact on the Profession

How will these advances impact the profession?

Technology is progressively moving up the food chain. To date powerful search technology allows us to tap into larger and larger data resources and find relevant material. But, it had done little to reduce attorney hours, because lawyers must still read and review the search results. The emerging field of **Data Analytics** is increasingly being applied to review and code materials produced in the discovery process, reducing the need for armies of contract and staff attorneys.

Information Analytics, such as Contract Analysis, reduces the time required to analyze legal agreements and create model forms. Initially, this will empower practice support lawyers to create and maintain enterprise-wide precedent management systems, and support alternative fee strategies. When combined with Contract Standards the software can help create both law firm-specific and market standards, potentially reducing the price for transactional services. When contract analysis is combined with document automation technologies, it will significantly reduce the time required to review and generate legal documentation with the effect of reducing need for (or price of) associates.

Knowledge Analytics, pioneered by firms such as Neota Logic, shows how technology can capture, record and apply expertise to very complex problems, and very large data sets. Today, the expert

systems are highly specialized. Their number and power grows each year, as evidenced by the list of examples on NeotaLogic's web site. As the analytics grow in breadth and capability, it is possible to foresee how they can be augmented with something like current object-orientated programming techniques, allowing the knowledge objects to "call" upon each other, and combine their expertise. If, and when, this is possible, the technology will encroach upon a substantial portion of legal tasks with the effect of reducing the need for all levels of lawyers, including experienced partners.

Conclusion

For many, the question whether technology can automate legal tasks is more a question of when it will occur. The typical answer is: "hopefully, after I retire." Collectively, this response translates into an appeasement strategy whereby law firms appear to be ceding markets to service providers and technology with each innovation.

The combined impacts of global competition—fueled by the recession—and the growing capability of technology are the most powerful forces affecting law firms in the next few years. For some the changes represents enormous opportunity. Yet few law firms are thinking about these critical issues. Should firms compete against service providers or content providers? Should firms collaborate with outsourcers or others? How should law firms price their services? Should firm enter commodity markets? What staff will they require? Should firms invest in advanced analytical technology?

On some level, the lack of attention is understandable. It is hard to see the effects of exponential growth in the early years. As growth takes hold, the speed increases enormously. Just as in the case of the lily pond in which the lilies double in size each day, on the day before the pond is completely covered, open water still covers half the pond.