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Big Data & Legal Informatics

Robert Plant, Associate Professor, School of Business Administration, University of Miami
11/6/2013
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Big data has thus far been mainly connected to consumer-orientated domains, but its role in professional domains has been growing.

In Medicine, big data has been utilized to create a persuasive case for evidence-based healthcare; treatment of chronic diseases and health management in conjunction with data from pharmaceutical companies; wellness programs with insurers; and clinical areas such as genetics and gene therapy.

Big data in the legal space
The use of big data in the legal profession has also been growing, if in a somewhat less visible manner. The term "Legal Informatics" is being increasingly applied in this emergent field and ties together work in legal knowledge representation (ontologies) with big data concepts and techniques. The use of computation within the domain of the law is not new, as pioneers in the 1970s and 1980s, such as McCarthy's Taxman project, used languages such as LISP and Prolog to examine the representation of law within the constructs of logic programming.

Resistance to the use of computers in the legal professional also resonates within the established practices. In 1979, researcher Claude Fabien wrote in a paper for the Canadian Law Information Council that: "it is preferable for the lawyer to do his research on the original statutory and case-law texts, not amended or altered by an intermediary whose intervention might insert an element of distortion between the lawyer and the sources of law," inferring that no intelligent system should be used to replace the human cognitive element.

Databases in current law
Today, law firms, corporate councils, government departments, as well as law schools routinely use databases such as LexisNexis as prosthetics for accessing court documents, and speeding their research in areas such as litigation research, which previously would have been tedious, lengthy, and expensive to perform. LexisNexis's database of cases and documents is approximately 500 Terabytes in size and stored on 11 large mainframes and computing services including more than 300 mid-range Unix servers.

Quantitative legal prediction
However, systems such as LexisNexis only represent stage one of the Legal Informatics landscape -- the next step is to connect these to not only text mining systems, but to autonomous AI systems that can perform deductive reasoning over the data. Legal data is largely text but could include other items of inventory such as photos in case files, videos, and audio transcriptions, thus easily fulfilling the volume and variety dimensions of the big data definition.

One domain for such big data applications is "Quantitative Legal Prediction," in which the data is used, for example, to predict if a company even has a case to make within a given context. Another use is to predict the outcome of a set of evidence if presented to a court, allowing the legal team to optimize its presentation of a case. A third use is for council to predict the cost of fighting a case.

An early QLP model was created in 2002 by a team lead by Washington University Professor Theodore Ruger, in which they created a statistical model to predict the outcome for every case before the Supreme Court in 2002 and compared it to human expert prediction; the model predicted 75 percent of the courts affirm/reverse results correctly, the human experts, only 59.1 percent.

Commercial Legal informatics
Commercial Legal informatics, and QLP services, are becoming available through firms such as tyMetrix, which have developed an analytics database that includes performance data provided to them by more than 17,000 law firms worldwide. This enables them to guide their clients on cost outcomes for possible case resolution. The depth and scope of the data enables that model to be tuned by industry, geography, duration, task, and human capital expenses by experience level rates and fees.

With the developments in machine learning, data analytics, and the availability of systems that can reason over a variety of data types, the next QLR frontier is to press the analysis to make legal cases for presentation to the court. The potential to create a legal Watson, that could argue for a plaintiff in court or act as a super Para-legal, cannot be far away; the technology is proven.

Watson, who can process 200 million pages of structured and unstructured content to answer its queries, is now being applied to management of decisions in lung cancer treatment at Memorial Sloan-

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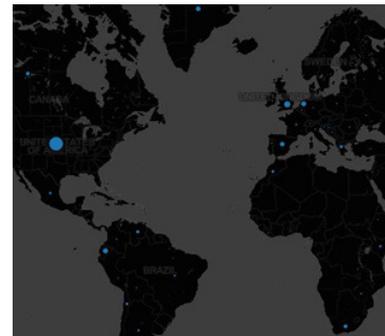
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Kettering Cancer Center. In that domain, Watson has shown a rise in capability over its two years in "residence" to be accurate in its decisions 90 percent of the time.

Clearly, big data systems are still evolving in both medical and legal informatics, but perhaps it won't be long before clients being offered the choice between a low-priced, under-informed and overworked legal team, and a low-priced, very informed Watson legal consultation, will go with the technology and not the human.

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AlphaEdge, User Rank: Exabyte Executive
11/30/2013 | 11:13:32 PM

Re: God knows, lawyers create data
Interesting perspective on this issue. Legal informatics is new to me.

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Pradeepta Mishra, User Rank: Exabyte Executive
11/28/2013 | 8:19:29 AM

Re: Room for sentiment in the courts?
The evidence collection process is one integral part of legal profession. With the growing number of digital devices and application it is vehemently complex to arrive at a conclusion. Even the lawyers need to know the case and analyze the facts and evidences in order to argue in the court with conviction. The court cases swing to the side which presents a good analysis and synthesis of the case and this can only be achieved through proper analysis of the evidence and errors. Hence in future the big data analytics has greater relevance for the legal profession.

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legalcio, User Rank: Exabyte Executive
11/13/2013 | 3:19:38 PM

Re: God knows, lawyers create data
A smaller firm can be a lot leaner and more responsive Saul. But they also lack a depth of experience and resource, especially for large and complex cases. Technology can leverage that somewhat, especially in large litigation cases where the technology is size agnostic; any size firm can host a discovery with a vendor. Fail fast isn't so much an issue. A firm may fail but clients usually follow their attorney to the next firm.

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Saul Sherry, User Rank: Blogger
11/13/2013 | 6:00:44 AM

Re: God knows, lawyers create data
To that end @legalcio are those smaller/start ups also blessed with the lean/agile capabilities? Or are the consequences too great for a 'fail fast' mindset in the legal arena?

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legalcio, User Rank: Exabyte Executive
11/11/2013 | 9:10:14 AM

Re: God knows, lawyers create data
I don't think younger firms have an advantage, Saul. Most legal cios that I know are well versed in the technology that runs the firm and can advocate for the BI leverage to take advantage of that data. There may be a reluctance to invest in BI systems, and there may not be the experience necessary in firm management to start looking at what BI can offer, other than profitability. Even profitability is difficult to measure if you haven't examined all potential billable hours, all potential overhead, etc.

I do think startup firms have an advantage in that younger attorneys just out of law school aren't finding work in larger firms, and are starting their own practices. They are the most technology savvy attorneys ever, and don't need to invest in real estate or a lot of overhead. SaaS solutions can enable two or three young graduates to work out of their homes, be aggressive in pricing, and still access all of the legal data products the big firms access.

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Saul Sherry, User Rank: Blogger
11/11/2013 | 2:54:02 AM

Re: God knows, lawyers create data
Do they tend to be younger firms @legacio? Or is it more based on who is in the C-suite and the direction they have been leading the company?

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Saul Sherry, User Rank: Blogger
11/11/2013 | 2:53:03 AM

Re: God knows, lawyers create data
Luckily we have @legalcio on hand to share those opinions! What's your take @SharCo? How would you feel if a lawyer was to do the ground work on your case through an automated programme?

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SharCo, User Rank: Petabyte Pathfinder
11/10/2013 | 12:00:37 PM

Re: God knows, lawyers create data
Legalcio presents a lot of good points. More so, it will be interesting to see how big data can change how things are done in the legal system and how law firms will go about with their work.

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legalcio, User Rank: Exabyte Executive
11/8/2013 | 7:54:10 AM

Re: God knows, lawyers create data
I think firms are very good at using and managing data for legal work Saul. Where the challenge lies is using data to run the firm, which is why alternative fee arrangements are a challenge. There's a big difference in billing by the hour and billing by project. The data to make those budget decisions exists in firms' accounting systems, but they haven't analysed data in that manner. It's an exercise in BI, where firms fall short too. There are some firms that do it better than others, and I suspect we'll all look to them as a guide.

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Saul Sherry, User Rank: Blogger
11/8/2013 | 4:38:36 AM

Re: God knows, lawyers create data
Ha! @legalcio would you say that's the same case for those law houses who have already been embracing data... or is it a bit like the Netflix/Lovefilm tussle... one is releishing the challenge because they have done all the ground work?

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