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EDITORIAL

AI in legal services: new trends in AI-enabled legal services

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1 Introduction

As AI continues to transform many industries, including the legal service industry, experts around the work are unanimous in predicting exponential growth in AI as a paramount technology to bring new tools and features to improve legal services and access to justice. PWC showed in its annual AI predictions report, legal tech solutions providers will most surely adapt and adopt existing AI tools and transform them into tools to help legal businesses to grow. From AI-powered judges, AI robot lawyers and AI-powered features for contract or team management tools, this trend will continue to find its use in the day-to-day work of layers and change the legal sector.

When Professor Richard Susskind wrote the book The Future of Law in 1996 [1], he predicted that in the future, lawyers and clients would communicate via e-mail. This prediction was seen as shocking at the time, especially to people working in the legal profession. However, communications via e-mail became a reality for lawyers and their clients very soon after the book was published. This story provides an insight into the challenges faced in bringing the traditionally conservative legal system into the cutting edge business environment where AI can thrive.

Professor Susskind recently published a new book titled "Online Courts and the Future of Justice" [2], where he argues that technologies like AI are going to bring about a decade of change in the legal sector and transform the legal systems as we know it. Although automating our old ways of working plays a part in this, even more, critical is that artificial intelligence and technology will help give more improve individuals access to justice.

The idea is that in the near future people will use the court system submit evidence and arguments to the judge online or through some form of electronic communication. Essentially, in this scenario the judgments could move from the courtroom to online. In a digital society, we should certainly be able to institute extended courts where we go beyond decisions made by judges to some kind of diagnostic system to guide people regarding their legal options and how to assemble evidence and provide alternative ways for dispute resolution.

The future legal system could use AI technology to help solve disputes without requiring lawyers or the traditional court system. It is entirely conceivable within a relatively small number of years that we will have systems that can predict the outcomes of court decisions based on past decisions by using predictive analytics. Imagine if people had the option instead of waiting for a court date (and support from the traditional legal system) to use a machine learning system to make a prediction about the likely outcome of a case and then accept that as a binding determination.

Some of the biggest obstacles to developing a legal system such as this is the lack of multidisciplinary research in this area, bringing together researchers from social, engineering and computer sciences together to address the key challenges posed by our modern society.

Ultimately, technology can help us improve outcomes and give people a way to resolve public disputes in ways that previously were not possible. While this transformation might not solve all the struggles with the legal system or the access-to-justice issue, it can offer a dramatic improvement enabled by AI as service.

2 Future trends in AI as a service in law

So far, the emphasis on technology in the legal system has been to support lawyers and their staff in some of the work they do, such as e-mail, accounting systems, word processing

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and more [3]. Now, we are beginning to see the merits of using technology to automate some tasks such as document analysis or document drafting—essentially moving from the back office to the front office.

AI in legal services has been seen in the recent past as a method for automating tasks via software to achieve the same outcome as if a law practitioner had done the work [4]. However, the latest developments in AI have allowed solutions to go way beyond this historical perspective. Today, AI solutions in the legal services can be grouped into one of the three areas: document analysis, legal research and practice automation [5].

The broad category of document analysis includes contract analysis, document review, e-discovery and due diligence [6]. Companies old and new offer AI-powered document analytical tools [7]. For example, JPMorgan has used its proprietary program Contract Intelligence, nicknamed "COIN," to decrease its annual contract review time by 360,000 h [8]. Newer companies like Kira Systems, eBrevia and many others offer time and thus cost-saving benefits based on their use of AI for due diligence and contract analysis [9].

AI-based legal research tools offer a variety of analytical and predictive capabilities [10]. Many legal research companies have created brief analysis tools that identify relevant cases not included in an uploaded brief [11]. Some offer litigation analytical tools that analyze precedent case data and other data to aid lawyers in predicting case outcomes [12]. The Supreme People's Court in China created an AI-based tool called FaXin to help judges identify precedents [13]. A company called Intraspexion leverages deep learning to predict and warn users of their litigation risks [14]. Predictive analytical company CourtQuant has partnered with two litigation financing companies to help evaluate litigation funding opportunities using AI [15]. Intellectual property lawyers can use AI-based software from companies like TrademarkNow and Anaqua to perform IP research, brand protection and risk assessment [16].

The practice automation category refers to the use of AI solutions to perform tasks ranging from document automation to e-billing management [17]. Neota Logic's PerfectNDA tool leverages the company's AI platform to streamline the process of creating non-disclosure agreements [18]. LegalMation uses AI to automate generation of various litigation-related documents such as pleadings and discovery requests. WeVorce and Hello Divorce automate divorce-related processes via AI [19]. Allstate uses AI to automate claim summary generation [20]. In the UK, Keoghs has created multiple AI-powered systems that automate litigation for personal injury claims [21]. In patent prosecution, Specifio's AI-based software automatically drafts a first-draft patent application from a user-provided set of claims. CLOEM S.U.S.A. generates variants of input claims to help patent drafters properly define the scope of their invention [22].

As shown by these three categories, AI could introduce improved efficiencies and cost savings to legal service delivery. The lower-cost services enabled by the use of AI could even increase access to legal services [23]. Ultimately, researchers at Deloitte, McKinsey and elsewhere predict that automation technologies like AI could someday automate significant portions of legal jobs and improve legal service delivery and became valuable assets for their firms.

Nevertheless, despite all the latest AI developments in relation to legal services, there are a number of interesting areas of future development and potential fruitful research.

3 Future areas for research

The development and use of AI for the provision of legal services is limited with regard to three main aspects, namely (1) data; (2) algorithms; and (3) implementation.

Data are a critical part of AI systems as both training material for developing AI algorithms and input material for the actual use of AI. The development and use of AI algorithms in the provision of legal services is limited by a lack of easily accessible and analyzable datasets [24]. The saying goes that most law firms are "document rich and data poor" and public data such as judicial decisions and opinions are either not available or so varied in format as to be difficult to use effectively [25]. Furthermore, poor quality or flawed datasets can cause AI systems to output-biased results [26] Datasets may have poor quality or flaws for a variety of reasons. For example, the data may exhibit human bias, such as recruiters' gender discrimination of job candidates. Data collection or preparation techniques may result in statistical biases in the dataset such as unrepresentative samples (selection bias) [27]. Datasets may even be intentionally manipulated or corrupted to yield discriminatory analyses [28]. Beyond data quality issues, significant data privacy and cybersecurity concerns also arise with the use of massive quantities of data by AI systems [29].

Algorithmic limitations also impact the use of AI in the legal industry. As mentioned in the above examples, all AI systems currently available perform only very specific set of tasks. AI works best when there are clear data patterns and definitive answers; it performs poorly when applied to the abstract or open-ended situations requiring judgment, such as the situations that lawyers often operate in [30]. In these circumstances, human expertise and intelligence are still critical to the development and the available AI solutions still not sophisticated enough to understand and adapt to nuances and to respond to expectations and layered meaning, and comprehend the practicalities of human experience. Thus,

AI still a long way from completely replace people in the legal profession.

There are many concerns that AI algorithms are inherently limited in their accuracy, reliability and impartiality [31]. These limitations may be the direct result of biased data, but they may also stem from how the algorithms are created. Further research is necessary on programmers' decision-making processes and methodologies when coding and training an AI algorithm [32]. For example, how software engineers choose a set of variables to include in an algorithm, deciding how to use variables, whether to maximize profit margins or maximize loan repayments, can lead to a biased algorithm [33]. Programmers may also struggle to understand how an AI algorithm generates its outputs—the algorithm may be unpredictable, thus validating "correctness" or accuracy of those outputs when piloting a new AI system may be challenging. But some researchers argue that limited accuracy is sometimes "'good enough' for particular tasks" or that algorithms can be useful despite their imperfections. Research on the types of AI for particular use cases and perhaps a specific methodology for the creation of algorithms for solution development in particular scenarios would be invaluable in fostering confidence and increasing adoption of AI services in the legal industry [34].

The use of AI is further limited by challenges arising during an organization's AI implementation process and this aspect could also benefit from further research focus. Firstly, understanding the business model impact of AI solutions in this particular sector which have many business models based on hours billed, such as those commonly used by law firms, may not incentivize the efficiency improvements that AI systems can provide [35]. Secondly, effective deployment of AI requires a clearly defined use case and work process, strong technical expertise, extensive personnel and algorithm training, well-executed change management processes, an appetite for change and a willingness to work with the new technologies. Potential AI users should recognize that effectively deploying the technology may be harder than they would expect. Indeed, the greatest challenge may be simply getting potential users to understand and to trust the technology, not necessarily deploying it [36].

Introducing these AI systems as services, however, could narrow the gap between the users' trust and technology deployment. These AI services with rich function descriptions, explicitly defined inputs and expected outputs can be flexibly and easily orchestrated with no or little coding to increase the efficiency in system prototyping and implementing for the users to simulate and test different scenarios which could build users' confidences.

4 Conclusion

The intersection of AI and law has been a topic of research and discussion for at least fifty years. But the development and deployment of AI are accelerating. Future research in this area must be multidisciplinary and representative of the key challenges which will be faced in the deployment of AI solutions as services to improve the legal practice. Perhaps the next decade will be as life changing to legal professionals and to society as users of legal systems. Despite AI's limitations, and perhaps because of them, lawyers should consider how the rise of AI will impact their profession and their ethics in the years to come. Legal professionals generally should explore how they might leverage the opportunity now to improve legal service delivery via new processes and technology and contribute to the development of AI-based services while ensuring the ethical development of AI solutions in this area.

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