Review

Economic and Financial Analysis of Artificial Intelligence's Impact on Law and Legal Profession

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Abstract:
Chat Generative Pre-trained Transformer (ChatGPT) and other Large Language Models (LLMs) present a significant disruption to the legal profession. Their ability to generate text in a way that closely resembles human writing and the nature of their training which equips them with large amounts of data present significant competition to individual lawyers and an opportunity for large increase in their productivity. They also mean changes on firm level. Technology firms have already entered the market, offering legal LLMs and other solutions to augment the work of lawyers and other legal experts. However, due to the nature of the legal profession, proprietary solutions are probably preferred over the long term. Those require significant capital expenditures by law firms, which are currently restricted by legal obstacles to outside capital being invested in law firms. Bar association rules will probably have to be relaxed to maintain competitiveness with firms from countries with looser regulation.

Keywords: large language models, LLMs, law, lawyers, bar association, investment, finance.

1. Introduction

It has been more than a year since Open Artificial Intelligence (OpenAI) unveiled ChatGPT and enabled free use of the model during the research preview phase (OpenAI, 2022). ChatGPT was, until then, the most significant contact between artificial intelligence and the public. It is a model which the public can use with added value (Marr, 2023). ChatGPT is not only available to researchers and academics, but to the general public, in a way that was easy, intuitive and free to use (Roose, 2022). Its consequent popularity was unprecedented. In 5 days since its official launch on 30th November 2022 (OpenAI, 2022), ChatGPT had more than 1 million users (Marr, 2023), and in two months since launch, it became the "fastest-growing consumer application in history" (Hu, 2023) with 100 million monthly active users (Hu, 2023; The Economist, 2023b)[1]. In comparison, it took TikTok 9 months to reach the same number of monthly active users (Gordon, 2022). The use of ChatGPT was not limited to personal use but quickly became a valuable tool for professionals (Zinkula & Mok, 2024; Brower, 2023; Mancini, 2023) with OpenAI already offering enterprise solutions of its product (OpenAI, 2023c). Specifically, ChatGPT is useful for jobs that require dealing with long texts, either writing or reading them (Brower, 2023) and is expected to significantly impact labour market in those industries (Eloundou et al., 2023; Zinkula & Mok, 2024; UBS, 2023) – with law and legal industry being the prime candidate for disruption. ChatGPT has in the last year left a significant mark on law, both from academic and business perspectives, and promises to significantly change law and legal industry as we know it.

We discuss economic and financial impact of artificial intelligence on legal industry. In the 1st part, a general overview of technology and some applications to legal profession are presented. The 2nd part focuses on selected financial and economic changes that ChatGPT has had and is expected to have on the legal profession.

2. ChatGPT and Large Language Models (LLMs)

ChatGPT and its new and improved version, GPT-4, are Generative Pre-trained Transformers (GPTs) and are both members of the large language models family (Eloundou et al., 2023). Large language models, or LLMs, are statistical models, which use probability to generate text (Roose, 2022; Wu et al., 2023) that is practically indistinguishable of human writing (Wu *et al.*, 2023) – on which they were trained. Indeed, the most recent of OpenAI's LLMs, the GPT-4, has passed the Bar Exam, an entry barrier to becoming a lawyer, scoring in the 90th Percentile (OpenAI, 2023b). While GPT-4 is already a multimodal LLM, which means its inputs can include not only text, but also voice and images (Heaven, 2023; OpenAI, 2023a; OpenAI, 2023b), we primarily focus on the written output of the model(s), which are the most relevant to the legal profession.

A common misconception when talking about LLMs is that the models know and understand human language and can understand their own output (Brower, 2023; McKinsey, 2023). That is (probably) not the case – as explained above, they are merely complex statistical models without any intrinsic understanding of the underlying material (Titus, 2024). The huge reams of data on which LLMs are trained (Knight, 2023; The Economist, 2023a; The Economist, 2023d) make this possible, but also extremely costly and time consuming. By OpenAI estimates, training the newest GPT-4 cost more than $100m (Knight, 2023).

Given the functioning of LLMs and the statistical nature of their methods, the inputs human users provide is very important (Cowen & Tabarrok, 2023) and has become an art in and of itself– and has led to even OpenAI providing guidelines for ChatGPT usage (OpenAI, n.d.). The output can only be as good as the input is.

An obvious consequence of LLMs is that they tend to hallucinate. Hallucinations are factual errors in the output generated by LLMs. Hallucinations occur because LLMs are incapable of evaluating their output as true or false, but merely print out the best prediction they can, given the input. LLMs do not understand the meaning behind words and text (Wu *et al.*, 2023). Thus, ChatGPT's answers should be taken *cum grano salis* and critically

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[1] Meta's Threads have since beaten its record in just 5 days (Paul and Sriram, 2023; Nolan, 2023), however, ChatGPT's success is much more notable as majority of Threads users created profile through Instagram, another one of Meta's social networks (Chowdhury, 2022; Nolan, 2023).

evaluated. The critical analysis part and our touch with reality is still an area where humans have the advantage, despite LLMs overtaking most of us when it comes to grammar, ability to express ourselves in a coherent manner and the overall language ability.

3. Financial and economic impact of LLMs on law and legal industry

This tendency to hallucinate has proven to be a professional embarrassment and quite costly to some lawyers (The Economist, 2023c; Weiser, 2023; Verma and Oremus, 2023). However, that has not discouraged exploring potential applications of LLMs and more broadly artificial intelligence to the legal profession. Indeed, the largest international law offices have invested significantly into either developing their own LLMs or adapting current ones for use in law (Skolnik, 2023). These law firms are joined by new competitors, mostly from technology sector, which hope to disrupt the industry (see for example Thomson Reuters, n.d.; Casetext, n.d.; Robin AI, n.d.; Harvey, n.d.; and others).

Generally, there are three ways law firms can invest in proprietary development of LLMs or LLMs' adaptation to the needs of the legal profession. They can, firstly, commission the development of LLMs, either in-house or by contracting the work to certain service providers, in which case the LLMs are the property of the law firm[2], secondly, they can create subsidiaries which focus on LLM development and adaptation for use in law, and lastly, they can invest or purchase the companies developing the LLMs (Armour & Sako, 2020).

All of the aforementioned strategies, however, require significant capital and long-term investment horizon, both of which are incompatible with the current structure and regulations of law firms across the world. Specifically, law firms cannot have investors who are not themselves lawyers or members of the Bar Association regulating the profession in the country. That severely limits the ability to attract outside capital needed to develop LLMs. That leaves just internal sources of capital, namely capital from partners, which can come either from retained earnings or new investments from current partners. Both financing options are generally incompatible with incentives of most lawyers, as the investment will only pay off over the longer term, when the majority of current partners will not be there to benefit from them (Armour & Sako, 2020). Furthermore, the LLMs or other assistants tend to benefit young and inexperienced workers the most, while older workers, see a lower increase in productivity (Brown 2023), further disincentivising investments.

Some jurisdictions, such as United Kingdom, have more relaxed rules which enable law firms to attract outside capital, and take advantage of different corporate structures that enable better risk management of such LLM development projects (Armour and Sako, 2020). Developing LLMs in-house or at least for their own use is very important to law firms due to the confidential nature of their business and the ability to retain competitive advantage by keeping certain legal solutions their competitors have not yet thought of confidential. The privacy concerns of law offices will probably discourage cooperation between LLM service providers, i.e. LLM models developed by technology companies and offered to law firms on a subscription, pay-as-you-go or otherwise basis, until the privacy concern can be allayed. The aforementioned reasons suggest that over long term, law firms primarily stationed in jurisdictions with looser restrictions, will have a significant competitive advantage over the firms located in other jurisdictions. That will probably lead to loosening of law firms' regulations elsewhere or the aforementioned firms (gradually) acquiring the smaller firms operating in those jurisdictions.

4. Conclusion

The implications of LLM revolution on legal industry will probably be extensive and comprehensive. LLMs could mean to law what tractors meant to farmers. However, only the future will show their true effect. Whatever it will be, it will most likely be gradual, and part of general evolution of the industry. The investment horizon of law firms should therefore lengthen and rules regarding possible inflows of outside capital held by non-lawyers relaxed if law firms are to stay competitive.

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[2] This approach is different than for example subscribing or otherwise paying for the use of software developed and intellectually protected by a technology company or competitor. The aproaches mentioned in the body are proprietary solutions of the law firm itself, or solutions that acording to intellectual property rights belong to the law firm in question.

Armour, John and Sako, Mari, AI-Enabled Business Models in Legal Services: From Traditional Law Firms to Next-Generation Law Companies? (December 16, 2019). Available at SSRN: https://ssrn.com/abstract=3418810 or http://dx.doi.org/10.2139/ssrn.3418810

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