Opportunities and Challenges of Emerging Technologies for the Legal Profession

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Abstract

The wave of emerging technology development is sweeping across all aspects of society. The rapid development of emerging technologies such as artificial intelligence, blockchain, and big data has exerted tremendous influence on various domains within traditional industries, and the legal services sector as well as the judicial system are certainly no exceptions. The application of emerging technologies is profoundly transforming the working modalities of legal practitioners, the delivery mechanisms of legal services, and the operational paradigms of the judicial system, among other aspects. This article will discuss the opportunities and challenges confronting the legal profession in the era of emerging technological transformation, as well as strategies for addressing these challenges and seizing the opportunities.

Full Text

Preamble

Course Term Paper Title: Challenges and Opportunities for the Legal Profession from Emerging Technologies: Legal Professional Ethics
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The wave of emerging technologies is sweeping across all aspects of society. The rapid development of artificial intelligence, blockchain, big data, and other emerging technologies has profoundly impacted every domain of traditional industries, and the legal services sector and judicial system are no exceptions. The application of emerging technologies is fundamentally transforming how legal practitioners work, how legal services are delivered, and how the judicial system operates. This paper discusses the opportunities and challenges facing the legal profession in this era of technological transformation, as well as strategies for addressing these challenges.

Keywords: emerging technologies, legal profession, opportunities and challenges

The Dramatic Transformation of the Legal World Under Emerging Technology

The legal world is undergoing dramatic upheaval. The number of legal technology startups has exploded globally, exceeding one thousand, while the application of artificial intelligence, blockchain, big data, and other emerging technologies in law is accelerating. In the United Kingdom, numerous "Alternative Business Structures" (ABS) have emerged; an increasing number of industry organizations have published research on the future of legal services; the judiciary is actively advocating for the use of new technologies; more government organizations are investing funds to promote legal technology development; and corporate legal departments are re-examining and managing their operations from the perspective of technological development.

As British scholar Richard Susskind observes: "The degree of upheaval in the legal world over the next 20 years will surpass that of the past 200 years."[1] The transformation of the legal world toward emerging technologies is unstoppable and has only just begun. This dramatic change is also happening to legal professionals themselves, presenting the legal profession with both new opportunities and challenges.

Current Application Status of Emerging Technologies in China's Legal Industry

Functional Analysis 1. Information Identification and Application
Supported by big data, cloud computing, and information security technologies, and relying on image recognition, speech recognition, text recognition, and natural language processing, artificial intelligence can identify and process massive amounts of information, thereby comprehending and integrating complex legal information. Building upon information identification, AI can extract keywords, convert data structures, and perform semantic analysis and understanding of identified information. Leveraging human-like information recognition and comprehension capabilities, AI can mine and analyze textual information. China's legal information sources are diverse, multi-typed, and structurally varied. AI's powerful information perception capabilities can facilitate automatic generation of legal documents, intelligent uploading and storage of legal information, and natural language processing can assist with case filing and information organization. Simultaneously, while identifying vast amounts of legal information, AI can establish its own legal information databases, intelligently classifying and storing various types of legal information. When seekers require relevant legal information, the system can rapidly lock onto targets and output results, significantly saving time and effort for information retrieval.

2. Big Data-Based Computation

Artificial intelligence possesses powerful computational capabilities, primarily manifested in its ability to conduct scientific data analysis based on collected and organized massive datasets, thereby supplementing human mental capacity with computing power to help legal professionals make scientific decisions and gradually deepening the delegation of decision-making from humans to AI. "AI has two important functions: first, it brings relevant opportunities before us, and second, it motivates us to take actions that benefit others. The institutions that design these incentives and manage our collective behavior are gradually shifting from humans to machines."[2] In this era of information explosion, traditional data analysis methods and decisions based on human experience can no longer meet the demands of big data decision-making. For legal professionals, decision-making is not only affected by information pressure but also constrained by decision-makers' bounded rationality, cognitive inertia, and stereotypical biases, making it difficult to achieve absolutely fair and neutral decisions.

Legislators pursue the balance of social values, but their attention and comprehension capabilities may still be constrained by bounded rationality, making it impossible to anticipate every potential problem. Consequently, legislation often lags behind and proves insufficient, requiring continuous supplementation through judicial interpretations and regulatory provisions. Judges' adjudication of cases is also influenced by personal perspectives, and the same case may yield different results when tried by different judges, leading to the phenomenon of "different judgments for similar cases." As a product of the information explosion era, AI relies on big data processing technology. Its absorption and learning of massive information resources facilitate algorithm training, enabling it to continuously maintain scientific rigor. Unlike human decision-making, AI's sole basis for decision-making is vast amounts of valid data information, while possessing information-carrying capacity many times greater than humans, thus overcoming the constraints of human inherent bounded rationality and other subjective limitations. In the legal field, AI can help legal professionals make more scientific decisions.

3. Deep Learning

An even more powerful function of AI is deep learning, which can simulate human brain mechanisms to conduct statistical analysis of large amounts of data. By establishing systematic knowledge graphs through deep learning, AI can assist with litigation management and case adjudication. For judges, AI can aid judicial trials; its greater objectivity and neutrality can help judges overcome the influence of inherent biases and personal emotional factors when rendering decisions. Simultaneously, based on massive data foundations and powerful computing capabilities, AI can quickly analyze cases and make decisions, such as rapidly calculating damages or estimating sentences. Particularly for complex and difficult cases, AI can quickly extract key information and compare it with similar cases to reach relatively scientific conclusions. AI-assisted adjudication will significantly save judicial resources and improve judicial efficiency. For legal professions such as court clerks, AI can help with litigation management, enabling automatic case diversion, intelligent scheduling of court sessions, au-

tomatic document generation, electronic case handling, and electronic evidence storage, thereby achieving intelligent and efficient litigation processes.

4. Machine Replacing Human Labor

The profound transformation of emerging technologies for the legal profession has significantly liberated some legal professionals while improving the efficiency and quality of legal work. For example, AI can replace court clerks in case information entry, replace litigation service personnel in guidance activities, and replace lawyers in pre-litigation data collection. Additionally, AI has made originally orderly legal work more flexible. Previously, judges typically needed to search for applicable laws according to the structure of normative legal documents, gradually locating the required major premise as if consulting a dictionary. AI, however, breaks this established work order by reorganizing and ranking major premises according to their practical relevance in legal application, then proactively recommending potentially needed provisions to judges.

Field Analysis 1. Public Legal Services

In 2018, the Ministry of Justice issued the "Guiding Opinions on Deepening the Construction of Public Legal Service Platforms," requiring national public legal service institutions to achieve service precision by the end of 2020, with full integration of physical, hotline, and online platforms to build a comprehensive public legal service platform and promote integrated services across the three major platforms. Various regions in China have launched new AI legal service applications, particularly provinces and cities at the forefront of AI development, which have actively responded to the Ministry of Justice's call to achieve "intelligent legal services" by the end of 2020, providing convenient and efficient public legal services to local populations through intelligent methods.

Legal Consultation

In public legal services, legal consultation represents the most prominent application scenario for AI. Legal consultation constitutes the primary business of public legal services, beginning when the public consults legal questions with service institutions. AI consultation products are continuously expanding their application fields while reducing operational difficulty, launching more conversational AI Q&A platforms to provide consultation services for disadvantaged parties. These conversational AI platforms provide relevant legal advice based on case descriptions. While these platforms still have significant room for improvement in natural language understanding, they primarily target common simple disputes in marriage, labor, private lending, intellectual property, and other areas of daily work and life, replacing lawyers in providing consultation responses. For instance, the China Legal Service Network provides intelligent legal consultation services, freely generating legal opinion letters for users covering 29 issue domains including marriage and family, traffic accidents, private lending, property disputes, and food safety, offering convenient preliminary consultation services for various legal problems encountered in daily life.

Legal Aid

Legal aid also constitutes a significant proportion of new AI applications in public legal services, primarily including lawyer recommendation and liaison, legal document drafting, and litigation procedure coordination. Public legal institutions have responded to the Ministry of Justice's initiative to integrate the three major platforms—physical, hotline, and online—by consolidating traditional offline legal aid services onto online public legal service platforms.

Notarized Debt Instruments

On September 30, 2018, the Supreme People's Court issued the "Provisions on Several Issues Concerning the Enforcement of Notarized Debt Instruments," clarifying the standardization of notarization and enforcement of debt instruments with compulsory enforcement effect, which is of great significance for constructing intelligent debt instrument enforcement systems. Objectively speaking, the blockchain for notarized debt instruments utilizes big data, cloud computing, and AI technologies to build an intelligent debt instrument enforcement system, specifically addressing the pain points of high collection costs, poor efficiency, and long cycles in inclusive finance. The key to responding to and solving inclusive finance problems lies in establishing a blockchain-based distributed storage and mutual trust system for data between financial institutions and notary agencies. Through online notarization with compulsory effect, legally effective documents are obtained to promote full-process online management before and after lending. During the loan application phase, it realizes customer warnings and avoidance of potential fraudulent customer risks; in the post-loan collection phase, notary agencies conduct verification and collection notices, reducing the collection workload of relevant financial institution departments while addressing the high costs, low efficiency, long cycles, and non-compliant collection methods of traditional collection approaches under increasingly strict collection supervision. Once non-performing loans occur, with online-issued electronic enforcement documents, cases can directly enter the court enforcement stage, significantly improving court enforcement efficiency; and after court collection fails, defaulters can be promptly included in the list of dishonest 被执行人 for punishment. The entry point for financial institutions' online loans through notarized debt instruments lies in embedding loan applications into the notarization process, introducing notary agencies to directly identify borrowers, clearly informing customers of the notarization process, and providing continuous legal consequence warnings and pre-loan alerts. Subsequently, online contracting between loan agreement parties and online storage of each transaction data are completed, constructing a complete loan evidence chain. From the financial institution's perspective, all customer information obtained through pre-loan notarization is based on customer authorization complying with statutory notarization requirements and is transmitted and stored through encryption algorithms; simultaneously, loan transaction data is also transmitted in encrypted form. Through this solution, big data on the blockchain achieves secure and reliable distributed storage at both client and financial institution ends. It is precisely this credibility of distributed storage that enables financial institutions to complete the entire pre-loan process application, post-loan non-performing

customer collection notices by notary agencies, localized applications for court compulsory enforcement, and integration with the dishonest 被执行人 list online. Therefore, the essence of notarized debt instrument blockchain lies in solving the fairness of electronic evidence storage, which can significantly improve the quality and efficiency of online debt instrument enforcement, providing a "one-stop" debt dispute resolution solution for both financial institutions and customers. The result manifests as efficient protection of substantive and procedural rights for both creditors and debtors, serving as a benchmark in promoting inclusive finance construction.

Legal Popularization and Education

Legal popularization is a critical component in building a society governed by law. Traditional legal education primarily relies on community lectures, distributing brochures, and watching promotional videos. However, relying on intelligent legal popularization robots and other AI technologies can further enhance the effectiveness of legal education, making it more accessible to younger generations. Beijing Renrenlv Intelligent Big Data Technology Co., Ltd. has built a public legal service intelligent terminal integrating "intelligent hardware + intelligent applications + mobile internet." The company fully integrates technical concepts such as AI, big data, cloud computing, and legal knowledge graphs, independently developing a series of intelligent terminals including the "Xiaolv" intelligent legal popularization and public legal service robot, touchscreen all-in-one machines, self-service teller machines, unmanned kiosks, visual self-service machines, and online intelligent legal consultation robots. Through AI, these systems achieve natural language recognition, enabling clearer problem comprehension, analysis, and response. The application of AI robots boosts the smooth implementation of local legal popularization efforts.

2. Corporate Legal Services

AI can provide various services in the commercial legal services field. Under traditional work models, legal practitioners conduct repetitive, content-intensive work through manual methods with low efficiency and high costs. AI achieves work automation through human-machine interaction, replacing manual labor with machines to help legal workers complete basic legal service tasks, significantly improving work efficiency while reducing labor costs.

Legal Retrieval

Legal retrieval consumes substantial time and energy. China already has several AI legal retrieval products that provide efficient auxiliary functions, such as the "Faxin" platform. As China's first legal knowledge and case big data fusion service platform, it provides one-stop professional knowledge solutions, similar case analysis, and intelligent similar-case recommendations for legal professionals. The similar-case recommendation service relies on natural language processing and deep learning technologies, supporting users in inputting colloquial case descriptions or uploading entire legal documents. The system automatically identifies case characteristics and matches similar cases from massive adjudications, providing users with fast and accurate services.

Document Review
Document review involves large volumes of work with low intrinsic value per task. By applying natural language recognition technology combined with deep learning, AI is gradually able to comprehend the connotations of basic legal documents and actively participate in document review, playing important roles in document organization, due diligence compliance risk control, and other legal affairs. Additionally, in contract review, intelligent contract services can provide AI contract analysis, helping users manage contracts and prevent legal risks at lower cost and higher efficiency. Current intelligent technology can already achieve refined comparison of different versions. For example, Beida Fabao's intelligent legal platform, relying on its data resources, can accurately identify differences between contract texts and contract templates.

Prediction and Evaluation
In daily operations, enterprises frequently face litigation due to various risks. Whether assessing risks themselves or predicting possible outcomes after encountering litigation, traditional manual methods have limitations in both data collection and analysis of various factors. AI applications bring new opportunities. Combining natural language recognition and deep learning technologies, AI can analyze key points of cases based on user-input case descriptions, then evaluate case outcomes by referencing adjudications in similar cases. For example, Qindun's litigation risk assessment product, based on legal elements such as facts, claims, evidence, and dispute focuses in adjudication documents, extracts case characteristics to form legal knowledge graphs, then helps parties understand litigation risks by generating legal opinion letters.

Application Directions of Emerging Technologies in Foreign Legal Services

1. Document Automation
Document automation systems can generate relatively polished and customized document drafts based on users' answers to questions. This technology began in the 1980s, initially focusing on developing will-generation systems, and was later applied to more complex scenarios such as loan documentation for large banking transactions. Document automation systems can be used both internally within law firms and enterprises and provided online. In addition to large-scale automatic document assembly systems, there are also less complex online services that provide users with basic document templates. For example, the U.S. company "LegalZoom" provides low-cost legal document preparation services for some lawyers and clients. This legal service company and its competitor "Rocket Lawyer" have served millions of clients, enjoying greater name recognition in the U.S. than many large law firms. Another U.K.-based company, "Epoq," provides systems and templates to banks and insurance companies to help them offer online services including document preparation to their own clients.

2. Uninterrupted Connectivity

Uninterrupted connectivity refers to systems that enable lawyers to remain constantly connected with clients and workplaces. Such technologies include handheld devices, tablets, wireless broadband access, high-definition video conferencing, instant messaging, social media, and email, all continuously enhanced by growing processing power and storage capacity. Together, these technologies make lawyers' "online" status more visible to their contact networks whenever devices are powered on. In turn, clients and colleagues expect to be able to reach lawyers immediately. This is disruptive to lawyers' work and social lives. Such connectivity will become more rather than less prevalent, so the disruptive impact of uninterrupted connectivity will continue to grow.

3. Electronic Legal Marketplace

The "electronic legal marketplace" can also be called an online reputation system, allowing clients to share reviews of lawyer service performance and quality online. These systems enable price comparison, allowing the prices and rates of different legal advisors and law firms to be clearly listed on websites, as well as online legal auctions (suitable for routine and repetitive legal tasks). For lawyers who benefit from clients' lack of market knowledge, electronic legal marketplace technology is highly disruptive both individually and collectively. Today, these systems (a form of social network) are still in their infancy. In a few years, they will become ubiquitous, much like the well-known printed directories that previously ranked law firms and lawyers.

4. Online Legal Guidance

Various systems on the internet can provide legal information, guidance, and even advice. Some of these online legal services are paid, while others are not. Some systems may serve low-price, high-volume scenarios, such as systems helping drivers challenge parking tickets. Others handle complex commercial work, such as Allen & Overy's online legal services, which generate over £12 million in subscription revenue annually[3]. The threat and disruption of these technologies to traditional lawyers are obvious: if clients can obtain legal guidance and documents online, online services become low-cost competitors to certain lawyers whose livelihoods depend on providing traditional, advisory, face-to-face consultation services. If robust and reliable legal services are commoditized and provided to users free of charge, this undoubtedly represents a major blow to lawyers engaged in traditional consulting businesses.

5. Legal Open Source

Broadly aligned with the open-source movement, the legal field also features sustainable large-scale online collaboration—the legal open-source movement 致力于 constructing large amounts of public and community-oriented legal materials, such as standard documents, checklists, and flowcharts. This is also a form of commoditization. Legal open source is disruptive to lawyers because legal content that was previously part of lawyers' fee-based services is now provided free of charge. Since 1992, Cornell Law School's Legal Information Institute has been publishing laws online for free and compiling materials to help people understand legal issues. They are sometimes called important "non-commercial

law" providers of public legal information. In the healthcare field, the "PatientsLikeMe" website (www.patientslikeme.com) has over 400,000 users, powerfully demonstrating how recipients of professional services can effectively share insights and experiences.

6. Closed Legal Communities

These refer to private groups formed by like-minded lawyers collaborating on private social networks. They combine characteristics of LinkedIn and Wikipedia, allowing users to build collective knowledge and experience but only for use within the community. Similar concepts have achieved significant success in the medical field: SERMO, an online community for doctors (without patients or pharmaceutical companies), has over 600,000 verified and credentialed physicians across more than 30 countries[4]. The best example of a similar phenomenon in the legal field is the original version of "Legal On Ramp," described as a collaborative system for corporate counsel lawyers, with versions also involving external lawyers and service providers. After its launch, lawyers from over 40 countries joined the site, participating in both public communities and separately established private sub-communities. The initial version of Legal On Ramp did not proceed as smoothly as SERMO, but it was later acquired by a new service provider, Elevate, making its subsequent development worth observing.

Corporate counsel lawyers are extremely interested in closed communities—they serve as both a platform for sharing the costs of certain legal services and a tool for encouraging and achieving closer collaboration with preferred law firms. For law firms that cling to the idea of serving clients individually, these communities pose a significant threat.

7. Workflow and Project Management

For large volumes of repetitive legal work, workflow systems drive standard processes from beginning to end like automatic checklists. Additionally, project management systems are more suitable for complex but less structured legal tasks and activities. Many law firms and corporate legal departments treat each such task individually, when in fact they could be processed more standardly. For law firms that bill by the hour, which have long benefited from inefficient case management and extensive transaction management, workflow and project management systems represent new efficiencies and reduced costs.

8. Embedded Legal Knowledge

In the future, legal rules will be deeply embedded in various systems and procedures in many aspects of social and work life. Users need not know the specific relevant laws, as systems with embedded legal rules will automatically screen users. For example, a vehicle will prompt its driver and passengers that they must pass a built-in breathalyzer test before the vehicle will start. This embedded system does not require vehicle users to know the specific details of the law to comply; instead, the legal rule prohibiting drunk driving is embedded in the vehicle itself. The disruption here is that once rules are embedded, lawyers are no longer needed to remind clients about legal issues. Similarly, with the

help of currently popular blockchain technology, smart contracts will be able to self-initiate and automatically execute processes and terms without lawyer involvement.

9. Online Dispute Resolution (ODR)
If the process of resolving a legal dispute, especially the formation of solutions, is completed entirely or largely through the internet, this constitutes some form of online dispute resolution (ODR). For lawyers whose work is based on traditional court litigation processes, any form of ODR—such as cyber courts, electronic negotiation, or electronic mediation—poses a challenge to their core business.

10. Document Analysis
Lawyers typically spend substantial time dealing with documents, especially when preparing for litigation. However, in recent years, properly calibrated systems have surpassed junior lawyers in accuracy and systematicity when reviewing and extracting information from massive document volumes. Drawing on external disciplines such as machine learning, big data, and analytics, the legal industry has adopted a series of new technologies. Although some of the most promising areas of machine learning (such as program-writing computers, deep neural networks, and reinforcement learning algorithms) have not yet been applied to legal practice, these emerging systems have clearly demonstrated increasingly powerful capabilities, whether analyzing batch documents or summarizing and extracting key contract clauses. This is disruptive to both law firms that profit from hiring manual labor to handle mountains of documents (whether for transactions, dispute-related projects, or contract review) and legal process outsourcing providers that offer similar services. Regardless of how low labor costs can be driven, once such automated systems are established, their costs will be even lower. Consequently, legal innovation companies that pioneer this field, such as Kira and RAVN, consistently attract significant attention within the legal industry.

11. Machine Prediction
Another major application area of machine learning technology is prediction. Technologies for mining inherent patterns and correlations in massive data are becoming increasingly sophisticated. Much legal work involves predicting possibilities, whether for case victory or settlement negotiations, or for transaction abandonment or completion. Data stored in law firm systems, combined with publicly available data, undoubtedly constitutes a foundation for future predictions on these issues. Beyond this, by aggregating search data, it may be possible to identify which specific legal problems trouble certain communities; by analyzing regulatory department behavior, compliance outcomes may be predicted in entirely new ways; and by collecting massive commercial contracts and email communications, the greatest legal risks facing an industry may be understood. The disruption here is that key insights in legal affairs and legal risk management may increasingly come from algorithms processing massive data, no longer requiring involvement from mainstream lawyers (unless they choose to collaborate with data scientists).

12. Legal Human-Machine Q&A
Human-machine Q&A is a branch of computer science dedicated to developing systems that automatically respond to questions posed by human users in everyday (natural) language. The most famous example is IBM's Watson, designed to compete on the American television quiz show "Jeopardy!" In 2011, Watson publicly defeated two of the highest-ranked human contestants in a live broadcast of the program. In the legal field, human-machine Q&A will greatly assist citizens' daily legal needs. Following Watson's approach, legal human-machine Q&A can also adopt the form of online services. Such systems store large amounts of structured or unstructured legal materials (primary and secondary sources and legal analysis), can understand legal questions expressed in natural language, analyze and categorize facts contained in questions, draw conclusions and provide legal advice, and can even express legal advice using computer-simulated voices (such as accents selected by users). These systems will not only disrupt the world of practicing lawyers but also overturn our usual understanding of legal processes.

Opportunities and Challenges for the Legal Profession Under Emerging Technology

Opportunities

1. Reducing Legal Service Costs
Lawyers have various types of clients. For enterprises, large corporations have needs to resolve major disputes or complete large transactions, while small and medium-sized enterprises are required to comply with various laws and regulations—all willing to pay for legal services. For individuals, they seek legal consultation or assistance when their rights are infringed upon or when making wills. Meanwhile, governments and other organizations inevitably need to purchase legal service products or seek other legal services in their social activities.

For these clients, the idea of obtaining legal services at lower costs aligns with their interests and expectations, and in fact, they all act accordingly. The application of emerging technologies in the legal industry precisely meets this demand, as more and more human labor will be replaced by AI, which always aligns with capital's profit-seeking nature.

2. Enhancing Judicial Access
The application of emerging technologies in the judicial field can enhance judicial access and lower judicial thresholds. For example, online legal services enable citizens and enterprises to handle some legal matters independently. Currently, online legal facilities mainly take three forms: first, free web services provided by various commercial or non-profit organizations; second, subscription-based services provided by traditional law firms; and third, paid services provided by other enterprises, including alternative business structures and legal publishers[5].

3. Breaking Court Data Silos and Establishing Data Connections

Although the court system has accumulated massive amounts of data across different types, this data exists in different production systems, stored in different data types, with separate storage and maintenance, forming isolated information islands. This physical isolation of data not only causes resource waste but also prevents deep association and integration of data. Existing case data can currently only be used relatively well for statistical analysis and query retrieval, while large amounts of case information resources, including semi-structured and unstructured data, remain underutilized.

Unlike common law countries that emphasize the principle of "stare decisis," where historical precedents can serve as references for adjudication, China, as a civil law country, emphasizes logical thinking and hierarchical structure in law, with courts strictly implementing laws enacted by legislative bodies. Analyzing the historical adjudication patterns of "similar cases" is more helpful for judicial officers to better conduct case review and adjudication. For China's legal big data, finding similar individual cases is not the goal; the purpose is to find adjudication patterns for similar cases. Therefore, current legal big data research achievements have not effectively solved the concrete business pain points faced by legal professionals in practical work, particularly falling short of the urgent needs of procuratorial and judicial personnel for precise trial assistance.

Only by breaking the dilemma of data silos and organically integrating data from various regions, types, and industries can data collaborate better, thereby 挖掘出更大更多的数据价值. Among various data silos, regional silos can be initially solved through data transmission and aggregation, and industry silos can be broken by solving physical-level data storage problems through sharing and exchange. After achieving aggregation, the urgent challenge at the current stage is to fuse and utilize various types of data according to unified legal logic. The primary problem to solve is eliminating barriers to the use of legal big data.

4. Improving Judicial Decision Precision

(1) At the court filing stage, AI can assist filing judges in accurately identifying and verifying key points such as the authenticity of parties' identities, risks of false litigation, and case sensitivity through deep integration of internal court data and external industry data, helping reviewing judges learn about risks in advance and make precise filing decisions to the maximum extent.

(2) During case adjudication stages at procuratorates and courts, AI can help judicial officers obtain accurate and detailed structures of case facts (constituting case profiles) in specific case handling processes, assist legal professionals in quickly finding similar cases on big data platforms, analyze historical adjudication patterns, and thereby make correct judgments and decisions on specific ongoing cases.

(3) At the court trial management stage, through comparative analysis of specific individual cases' adjudication standards and historical similar cases' adjudication patterns, AI assists trial management personnel in inspecting judges' adjudication accuracy, reducing the risk of "different judgments

for similar cases."

5. Enhancing Professional Skills

AI can help ordinary legal professionals obtain professional guidance from top-tier talent. First, the construction of knowledge graphs itself represents the crystallization of wisdom from a top-tier legal business expert team. For an ordinary legal professional, cognitive assistance based on knowledge graphs (case document deconstruction + case element extraction) can provide basic auxiliary functions. Additionally, regarding court adjudication documents, every responsible adjudication document can be seen as the materialization of each judge's trial experience. A similar case with rigorous legal reasoning and explanation can effectively convey an excellent judge's process of structuring, reviewing, and determining case elements, transmitting the wisdom of outstanding legal professionals.

6. Accelerating Pattern Discovery

AI can help legal professionals quickly 洞察并解释以往传统无法发现的模式和机会 from large amounts of data, improving the success probability of important research. The enhancement of legal professionals' data exploration capabilities is based not only on their own databases but also on legal-related databases from their own and other industries; not only on keyword retrieval based on word segmentation technology but also on conceptual cognition through natural semantic understanding; and not only on statistics based on structured data but also on the fusion of unstructured and structured data.

7. Intelligent System Shared Information Resource Platforms Promoting Interconnectivity

Emerging technologies have brought unprecedented opportunities for communication among legal professionals. Legal professionals face more opportunities and challenges: on one hand, they must face the learning pressure brought by new technologies, as the "law + big data" working model will become the norm in the coming years, meaning they must continuously learn new knowledge and technologies, enhance judicial capabilities, and strive to become legal professionals for the new era; on the other hand, it has brought a new starting point for interaction and exchange within the professional community. At this new starting point, legal professionals have equal status, breaking through existing barriers, with increasing interconnectivity and business interactions among professions, greatly enhancing professional identity and belonging. First, there should be a clear positioning of intelligent systems: the positioning of intelligent technology always lies in "assistance" and "improvement," not "domination" and "replacement"[6].

At the current stage, China is still in the "weak AI" phase, making it more practically meaningful to focus on how to use intelligent technology to better serve professional groups. The implementation of intelligent systems has created unified online standards for legal activity participants. For example, unified regulations have been established for document input formats, with systems such as "Smart Courts," "Smart Procuratorates," and "Smart Lawyers" inputting

documents according to uniform regulations, making documents submitted by various entities formally consistent and avoiding secondary waste of human resources during work handovers. Current smart justice remains at a relatively low level of intelligence, focusing more on formal uniformity, with immature intelligent system-assisted decision-making foundations. However, as intelligence further develops, intelligent assistance systems will play increasingly important roles in the daily lives of judicial professionals, using big data analysis to enhance decision-making scientificity. The construction of legal knowledge graphs requires participation from all legal professional entities, and intelligent systems will interconnect with each other, share information, and promote the construction of data resource sharing platforms.

8. Objective and Authentic Recording, Professional Behavior Traceability

Big data systems can leave traces of professional behavior for all legal professional entities, with their actions recorded objectively and authentically. Against the backdrop of big data, subjective factors previously present in data collection are minimized, and the objectivity and comprehensiveness of data are greatly improved. For prosecutors, information such as training participation, case prosecution, and case investigation is clearly recorded; for judges, their specialized case types, personal preferences, and thinking patterns can all be found in adjudication documents; for lawyers, their case types, fee conditions, and frequent locations are clearly displayed. Based on this wealth of data, we can create three-dimensional profiles for each legal professional individual, generating unique business cards for each legal professional entity. Every member of the legal professional community has a clear positioning, facilitating the conduct of legal activities.

9. Promoting the Construction of the Legal Professional Community

As the main body maintaining social fairness and justice, the legal profession's cooperation is particularly important. Currently, the legal professional community still faces problems such as communication barriers, lack of a unified industry evaluation system, and uneven ethical standards. The legal professional community is more like an "ideal state," lacking the soil for its formation, and legal professional groups have not exerted their due driving force for the rule of law. Following agricultural society, industrial society, and information society, the development of emerging technologies has brought major transformations to the work of various professions in society, injecting new vitality into the construction of the legal professional community, adding intelligent coloration, clearing many obstacles, and paving the way for further development. The arrival of the intelligent society has led to comprehensive transformations in people's lifestyles, thinking habits, and work habits. If our thinking remains in the past, clinging to traditional judicial habits, we will miss the major opportunities brought by the times. Although there is a deep chasm between us legal workers and the legal professional community, crossing it is only a step away.

The development of AI will inevitably bring profound changes to the legal

field, potentially even overturning existing business models and collaboration methods, changing the thinking patterns and professional interests of the legal professional community. First, its instrumental nature can help promote the construction of the legal professional community. The legal professional community requires judges, prosecutors, lawyers, and other legal professionals to clarify their positions and responsibilities while maintaining close connections, using unified legal knowledge systems, professional contexts, and professional thinking to serve the people and the country together and jointly maintain social fairness and justice. As a neutral science and technology, AI can help promote the construction of the legal professional community.

First, one way AI transforms professional work is by making it routine, reducing highly specialized tasks and replacing them with standardized, pre-designed operational processes, including both substantive work content and service delivery processes themselves. "The means of implementation include checklists, protocol agreements, standard texts, computer algorithms, and online services"[8]. By standardizing and routinizing legal business through AI, the efficiency of legal information circulation is improved, the stability of legal service quality is maintained, technical divergences arising from different legal professionals' lack of common textual understanding are reduced, and even different legal texts they produce can be mutually convertible and utilized.

Second, AI can provide unified evaluation standards for various legal professions and among legal professions, forming scientific mechanisms for mutual supervision and evaluation among legal professions, helping with performance evaluations, enhancing judges' and prosecutors' professional honor, and improving lawyers' social status. Simultaneously, it better guarantees equal communication channels among judges, prosecutors, and lawyers. This mechanism could even serve as a basis for mutual conversion between different legal professional identities, promoting common understanding and mutual respect among legal professions. After years of development, China's legal profession has formed a general division of labor, and judicial reforms have further standardized the supervisory responsibility system among professional entities. The development of emerging technologies can provide intelligent foundations for the formation of the legal professional community through unified information sharing platforms, reasonable interactive evaluation systems, and transparent supervision systems, offering broader platforms for its further development and improvement.

Third, the development of emerging technologies provides new opportunities for constructing the legal professional community. The governance of an intelligent society is a complex systematic project requiring joint participation from the state, industries, organizations, and individual citizens[9]. As an important component in maintaining social fairness and justice, the legal industry should actively participate in the governance of the intelligent society. It must consider how to maximize social order and promote the stable development of new things when existing laws and regulations are insufficient to address new problems, while actively using technology to advance business development and

exploring new models for the legal industry's development under an intelligent society through internal community cooperation. Against the backdrop of an intelligent society, judicial organs have undertaken a series of attempts, with "Smart Courts," "Smart Procuratorates," and "Smart Public Security" being carried out vigorously. From the perspective of trial-centered doctrine, Smart Courts are the center of judicial activities, providing a broad platform for the formation of the legal professional community. On this platform, exchanges among judicial entities are becoming increasingly frequent, and connections are becoming increasingly close. The core of China's future Smart Courts lies in truly opening up the courts and building "courts co-governed by legal professionals." Currently, many courts are actively trying new case-handling models and developing various intelligent assistance systems, such as Shanghai's Criminal Case Intelligent Assistance System (206 System), Beijing's "Rui Judge" intelligent research and judgment system, and Suzhou Intermediate Court's intelligent trial system. Relatively mature technologies such as OCR image recognition, speech recognition, and natural language processing technologies applied to intelligent systems have brought tangible convenience to judicial organs. Some repetitive and basic tasks have been replaced by intelligent machines, and big data can accurately and effectively analyze massive amounts of data in the shortest time, avoiding waste of human resources, effectively solving the problems of many cases and few personnel, and inconsistent judgments for similar cases, and reducing contradictions and disputes among legal professional entities. The arrival of the intelligent society has brought transformations to people's lifestyles and work habits. Specifically in the judicial field, the work of judicial professionals is becoming increasingly open, transparent, and convenient, barriers among legal professional entities are gradually diminishing, exchanges and interactions are becoming increasingly frequent, unified evaluation standards can be established, and a common understanding of the law is increasingly being formed.

Challenges

1. Reduction in Absolute Numbers of Legal Professionals, Triggering Employment Substitution Effects

The application of AI in the legal field will force stepwise evolution of the legal profession and continuous optimization of its structure. While AI helps the legal profession rationally redistribute existing judicial resources and optimize professional structure, like any machine invention in history, it will save production factor demands while improving labor productivity, triggering increased unemployment rates. AI will bring obvious employment substitution effects. As AI continues to be practiced in the legal industry, repetitive and mechanized legal transactional work will be replaced, and objective, patterned legal work will be greatly compressed. While continuously improving judicial quality and efficiency, it may replace more legal professions, causing some legal workers to lose their jobs.

The traditional view holds that the lawyer profession is an ancient, profound,

noble profession that is difficult to replace. However, with the application of AI technology in law, this traditional cognition is facing severe challenges. The halo surrounding legal professions such as judges and lawyers is gradually fading under the penetration of AI technology[10]. Regarding the court system, although AI currently mainly plays auxiliary roles and tasks in judicial trials and will not replace judges in making decisions, in the foreseeable future, it will significantly reduce the number of judicial auxiliary positions in the court system. Meanwhile, the currently vigorously promoted online dispute resolution mechanism has greatly impacted traditional judicial adjudication methods[11], which will inevitably profoundly affect the number of judges and their internal composition. The demand for judge assistants and clerk positions engaged in simple, repetitive judicial auxiliary work will significantly decrease in the future.

Regarding the lawyer industry, as AI technology is increasingly widely applied in lawyer business, the number of lawyer assistant positions will also substantially decrease. According to a ranking by Carl Benedikt Frey and Michael Osborne of Oxford University of 702 human occupations by automation potential, legal assistant and paralegal positions have an automation potential as high as 94%, placing them in the high-risk category. Lawyer professions that rely on legal assistant labor input, however, belong to the low-risk category. Some scholars have even predicted in their research that with the increase of robot lawyers, the lawyer profession will face "structural collapse" by 2030[12].

From the perspective of law firms, when applying emerging technologies is the better choice, adopting alternative processing strategies is an option for cost reduction. Law firms will gradually reduce the number of junior lawyers used or stop hiring new ones, outsourcing routine work outside the firm. Some law firms may choose to establish alternative processing functional departments internally, such as internal legal assistant teams, or build their own offshore legal institutions. Other law firms may seek opportunities from new legal services, opening up new markets, or finding their own positioning from different stages of the legal supply chain.

For law firms engaged in non-litigation business, dispute or transaction processing has numerous components that can be streamlined, and different methods can be adopted. If institutions step forward to undertake project management work for large transactions and disputes, these law firms may be reduced to subcontractors. Meanwhile, work previously assigned to junior lawyers may also be taken away by alternative suppliers. For large law firms, some clients already find their fees too expensive and sometimes too arrogant, choosing to dismantle corporate legal work and assign routine parts (such as due diligence) to cheaper local law firms or legal process outsourcing institutions, hiring elite law firms only to concentrate on the most challenging work. This poses a significant blow to large law firms' core profit model of making money from routine work undertaken by junior lawyers.

For boutique law firms, in 2016, the U.S.-based Allen & Overy law firm jointly released an online system called "Margin Matrix" with Deloitte to help banks

cope with the heavy documentation requirements brought by new rules in the global derivatives market. Many boutique law firms had hoped to handle these regulatory tasks for clients through customized approaches, and the emergence of this system was fundamentally undermining. For mid-sized firms, to survive and develop, they need to merge or seek external investment to transform their current working methods into long-term sustainable new business models. If mid-sized firms can seize these opportunities, they have the potential to replace large firms. As for small firms with only a few partners, except for those that can provide truly specialized and personalized services needed by certain clients, they will face elimination risks if they do not thoroughly transform.

For lawyers engaged in litigation business, although most oral arguments require high customization, it is clearly not cost-effective to continue entrusting some low-value or less complex disputes to litigation lawyers. In addition to dispute resolution potentially shifting toward mediation, lawyer collaboration, and other dispute resolution methods, emerging dispute control and prevention technologies may also reduce the number of cases that reach final resolution in courts, with many cases likely being intercepted before reaching the courts. Moreover, not only will lawyers appear in court less frequently, but online courts and ODR will also cause many traditional litigation lawyers to transform. The future remains optimistic for a few truly senior litigation lawyers, but junior civil litigation lawyers may need to reconsider their prospects.

2. Triggering Ethical Black Holes and Algorithmic Discrimination

The involvement of AI in the legal profession is a breakthrough for solving existing problems in judicial practice, capable of improving judicial quality and efficiency and effectively alleviating contradictions between the legal profession and real-world demands. AI can help improve work efficiency, assist judicial activities, achieve automatic case complexity-based 分流, intelligent legal information retrieval, intelligent legal consultation, automatic legal document review and generation, and litigation process automation, helping legal professionals work more efficiently while meeting societal demands for justice. AI can also help improve the quality of judicial activities, enabling rapid and effective communication between legal professionals and parties, intelligently sending litigation arrangements, guiding litigation participation, and providing parties with higher-quality litigation services. Simultaneously, by analyzing adjudication opinions in large numbers of similar cases, AI can predict outcomes for relevant cases, standardize judges' use of discretionary power, maximize the guarantee of fair and just adjudication, and promote judicial fairness. AI can also help track and evaluate criminals' physical and mental states, achieving conviction and sentencing in "zero-confession" cases. Through evidence standard guidance functions, AI can improve the scientificity of evidence review, prevent miscarriages of justice and "different judgments for similar cases," thereby effectively improving judicial quality and efficiency and reducing work pressure on legal professionals.

However, AI lacks ethical concepts and may bring some ethical problems, trig-

gering ethical black holes and algorithmic discrimination. Due to its technical nature, AI lacks understanding and recognition of social relationships and normative principles already formed in human society, consequently lacking ethical concepts that conform to human social operating systems, which may bring privacy protection and human-machine relationship dilemmas. More legal problems existing in judicial practice cannot be solved by simply applying AI's linear calculations; social ethics and humanistic rules must also be considered. Additionally, AI is essentially experience-based algorithms that encode legal cases through pre-set algorithmic programs by technical personnel, summarizing and discovering hidden patterns in historical cases to automatically generate adjudication references. In this way, human thinking and rules originally hidden in historical cases will 变相 appear in algorithmic programs, making it impossible for AI to achieve true neutrality and objectivity. "The quality of algorithms is closely related to the quality of data used, and much data is often imperfect, causing algorithms to inherit certain human biases"[13], creating algorithmic discrimination. Currently, most intelligent search engines' algorithmic recommendations actually bring about information cocoons and even "big data price discrimination," where people are increasingly exposed to homogeneous information and unconsciously placed under algorithmic control. However, AI itself does not possess consciousness or ethical concepts, "so we need to avoid errors beyond the tolerance limits of social morality caused by designers' malice, flaws, and inadequate consideration"[14].

(1) Algorithmic Discrimination

Algorithmic problems may affect judicial fairness and openness. AI with deep learning as its core mechanism relies on data-based algorithms for high-efficiency computation and storage capacity, thereby achieving amplification and expansion of human intelligence. However, algorithmic problems are mainly manifested in two aspects: first, relatively low technical levels, and second, algorithmic closure and secrecy. The former is because current AI technology applied to judicial adjudication predominantly uses knowledge graphs as the mainstream algorithm, depicting main constitutive elements and evidence structures of cases, which is still quite distant from the "knowledge graph + deep learning" algorithm claimed by AI technology enterprises. Coupled with insufficient information extraction capabilities in knowledge graph construction, the speed and accuracy of knowledge graph construction are seriously inadequate, making AI technology applied to judicial adjudication very rudimentary and weakening the practical value of AI judicial applications[15].

Although algorithmic codes and programs are objective in form and their operational results should theoretically be rational and non-subjective, practice shows that operational results are not entirely free from value judgments. The reasons for flaws are diverse: insufficient professional capabilities and cognitive levels of algorithm design architects, implicit impacts from efficiency and relevance-oriented design rather than precision and causality-oriented design, and insufficient, incomplete, low-quality, or flawed data may all lead to algorithmic discrimination.

Algorithmic discrimination is essentially unfair treatment of individuals or groups based on prejudice during automated decision-making processes, such as unfair risk allocation caused by abuse or misuse of ranking, representing errors and biases in algorithms based on data with obvious characteristics: First, algorithmic discrimination is more precise. Algorithms can accurately profile each user, and users labeled with discriminatory tags have no possibility of escape. Second, algorithmic discrimination is more diversified. While human discrimination is often based on explicit characteristics such as gender and education, algorithms can 挖掘更深层次的隐性特征 as bases for discriminatory treatment, including web browsing records, shopping records, and driving routes. Third, algorithmic discrimination is more one-sided. Human society's judgment of individuals is typically comprehensive and dynamic, while algorithms cannot obtain or process all user data. Fourth, algorithmic discrimination is more concealed. While discrimination based on race, gender, ethnicity, and other characteristics is legally prohibited, algorithms can circumvent these regulations.

For example, in the 2016 U.S. case *State of Wisconsin v. Eric L. Loomis*, the appellant Loomis argued that the COMPAS system used by the circuit court during sentencing had algorithmic discrimination that violated his due process rights. This case triggered enormous controversy and discussion. Even though the U.S. Supreme Court recognized the COMPAS system as constitutionally objective and neutral, algorithmic discrimination was discovered in the system's independent control tests. For instance, blacks had twice the recidivism risk of whites, while in practice only 20% of people reoffend, easily causing public questioning of judicial fairness in judicial practice[16]. Although AI technology application in judicial adjudication can greatly reduce judges' workload and accelerate litigation processes, the "black box" algorithm may contain pre-existing biases yet cannot be disclosed to the defense for review. Even if disclosed, the defense lacks the ability to review the algorithm, raising suspicions that it may violate constitutional due process clauses and ultimately damage judicial fairness.

For the public, the privacy of algorithmic logic and source code and their inability to be transformed into publicly released visible technologies may lead to algorithmic black boxes. Since major courts nationwide lack the independent R&D capability for AI judicial applications—for example, Smart Court construction mainly relies on government procurement bidding and technology outsourcing—major technology enterprises' core algorithmic technologies belong to intellectual property protection scope and are difficult to disclose to the public due to business secret protection and competitive needs. However, AI applications used in public fields such as judiciary should be based on the principle of openness with non-disclosure as the exception to achieve judicial fairness.

In March 2016, Microsoft's chatbot Tay on Twitter became a "bad girl" embodying gender discrimination, racial discrimination, and more during interactions with netizens. As algorithmic decision-making increases, similar discrimination

will also increase. Algorithmic discrimination is harmful. Some recommendation algorithm decisions may be harmless, but if algorithms are applied to crime assessment, credit loans, employment evaluation, and other situations concerning personal interests, because they operate at scale—not just targeting individuals—they may affect the interests of groups or races with similar circumstances, so the scale is large. Moreover, a small error or discrimination in algorithmic decision-making will be amplified in subsequent decisions, potentially creating a chain reaction—once unlucky, many subsequent instances will follow suit. Additionally, deep learning is a typical "black box" algorithm; even designers may not know how algorithms make decisions, making it technically difficult to discover whether discrimination exists and its roots in the system.

Now, why algorithms are not very objective and may 暗藏歧视: Algorithmic decision-making is often a prediction, using past data to predict future trends. Algorithmic models and data inputs determine prediction results. Therefore, these two elements become the main sources of algorithmic discrimination. On one hand, algorithms are essentially "opinions expressed in mathematical ways or computer code," including their design, purpose, success criteria, and data use, all being subjective choices of designers and developers who may embed their own biases into algorithmic systems. On the other hand, the effectiveness and accuracy of data also affect the accuracy of entire algorithmic decisions and predictions. For example, data is a reflection of social reality, and training data itself may be discriminatory. AI systems trained with such data will naturally carry the shadow of discrimination. Additionally, data may be incorrect, incomplete, or outdated, subsequently bringing about the "garbage in, garbage out" phenomenon. Furthermore, if an AI system relies on majority learning, it naturally cannot accommodate the interests of minorities. Moreover, algorithmic discrimination may be learned by algorithms with self-learning and adaptation capabilities during interaction processes. AI systems may not be able to distinguish what is discrimination and what is not during interactions with the real world. Finally, algorithms tend to solidify or amplify discrimination, making discrimination self-perpetuate throughout the entire algorithm. Orwell wrote a famous line in his political novel *1984*: "Who controls the past controls the future; who controls the present controls the past." This can also be used as an analogy for algorithmic discrimination. Ultimately, algorithmic decision-making uses the past to predict the future, and past discrimination may be consolidated and strengthened in the future in algorithms, because wrong inputs forming wrong outputs as feedback further deepen errors. Eventually, algorithmic decision-making not only codifies past discriminatory practices but also creates its own reality, forming a "self-fulfilling discriminatory feedback loop." Because if inaccurate or biased past data is used to train algorithms, the results will certainly be biased; then using this output to generate new data for system feedback will consolidate biases, potentially allowing algorithms to create reality. This includes similar problems in predictive policing and crime risk assessment. Therefore, algorithmic decision-making actually lacks imagination for the future, while human social progress requires such imagination.

(2) Privacy

Many AI systems, including deep learning, are big data learners requiring large amounts of data to train learning algorithms. Therefore, people say data has become the new oil in the AI era, bringing new privacy concerns. On one hand, AI's large-scale collection and use of data, including sensitive data, may threaten privacy, especially if large amounts of sensitive data such as medical health data are used in deep learning processes and may be revealed in subsequent processes, affecting individual privacy. On the other hand, the widespread application of user profiling and automated decision-making may also adversely affect individual rights and interests. Additionally, considering large amounts of transaction data between various services and increasingly frequent data flows, data has become a new circulating commodity that may weaken individuals' control and management over their personal data. Of course, some tools are already available to strengthen privacy protection in the AI era, such as privacy by design, privacy by default, personal data management tools, anonymization, pseudonymization, encryption, and differential privacy, all of which are continuously developing and improving standards worth adopting in deep learning and AI product design.

(3) Responsibility and Safety

Celebrities such as Hawking and Schmidt have previously warned about strong AI or super AI potentially threatening human survival. However, AI safety discussed here refers to the safety and controllability of intelligent robot operation processes, including behavioral safety and human control. From Asimov's Three Laws of Robotics to the 23 AI principles proposed at the 2017 Asilomar Conference, AI safety has always been a focus of attention. Additionally, safety is often accompanied by responsibility. Now, unmanned driving cars also have accidents. So if intelligent robots cause personal or property damage, who bears responsibility? If following existing legal responsibility rules, because the system is highly autonomous and its developers cannot predict its behavior, including the existence of "black boxes," it is difficult to explain accident causes, potentially creating a responsibility gap in the future.

There is also the issue of robot rights, namely how to define AI's humane treatment. As autonomous intelligent robots become more powerful, what roles should they play in human society? Can they obtain human-like treatment in some aspects, that is, enjoy certain rights? Can we abuse, torture, or kill robots? For example, regarding Tencent's intelligent robot "Jiajia," if someone mistakenly believes Jiajia is human and then commits indecent assault, can we prosecute them for forced indecency or insulting women? But here arises the problem of error regarding the object of the crime, because Jiajia is not a woman in the human sense. So what exactly are autonomous intelligent robots in law? Natural persons? Legal persons? Animals? Objects? In fact, the EU is already considering whether to grant intelligent robots "electronic person" legal personality with rights, obligations, and responsibility for their actions. This issue may be worth more discussion in the future.

3. Potential Impact on Current Legal Systems

While transforming the legal profession, AI can provide scientific technical norms, making law more scientific, including the scientification of law itself and legal activities. First, AI's powerful information processing functions can assist legislation, avoiding foreseeable loopholes and defects, quickly collecting and processing large amounts of information for pre-legislation evaluation and post-legislation feedback, effectively preventing most problems that may arise after law implementation, and timely adjusting decisions based on feedback information to make legislation keep pace with rapid social changes, thereby promoting continuous scientification and improvement of current legal systems. Second, AI can conduct comprehensive case analysis on big data foundations, provide guidance for evidence collection, supplement inadequacies and irregularities in evidence collection, help prevent miscarriages of justice, and promote the scientification of legal activities through technological advantages. AI can also conduct case predictions based on extensive learning from similar cases, helping judges make scientific decisions, standardizing judges' use of discretionary power, maximizing the guarantee of fair and just adjudication, and effectively promoting judicial fairness. However, as a new technical means, AI's application in the legal field will impact current legal systems.

The impact on current legal systems is reflected not only in the absence of legal systems related to AI itself but also in AI bringing new problems to existing legal systems such as intellectual property protection and tort liability assumption. Legislators cannot predict legal risks that AI may bring, such as AI infringement upon personal or property rights, AI legal status issues, and AI technical standard issues. When AI begins to be applied in the legal field, it will bring more realistic legal problems. AI-related legal issues currently lack regulation by relevant legal systems, creating legislative gaps. Legislative lag causes current laws to be unable to provide corresponding legal regulation for AI infringement or illegal situations, requiring urgent improvement of relevant legislation. Additionally, AI poses new challenges to existing legal systems, such as ownership and examination standard issues for AI inventions, whether AI can simplify judicial procedures, and AI's 消解 of legal social adjustment functions in traditional labor relations, traffic safety, and other fields, requiring legislators to comprehensively consider AI development technical factors and legal rules, policy norms, and other factors for timely improvement and reasonable regulation.

4. Human-Machine Relationship Dilemma

AI can reshape the legal environment, particularly the legal professional environment, thereby more profoundly transforming the legal profession. AI 致力于 more humane user experiences, and one of its powerful functions is interpreting and predicting human behavior through data collection, just as AI is used to predict users' consumption habits and preferences, predict economic data development patterns, and predict stock trading data. AI can also provide guidance for the development direction of the legal profession through prediction. By analyzing the development patterns of the legal profession through big data algorithms,

combining current legal professional development environments and relationships with various aspects related to the legal profession, AI can predict future development directions of the legal profession, providing legal professionals with scientific career development judgments, thereby transforming the development models of the legal profession and the legal professional environment.

However, AI application in the legal field also brings human-machine relationship dilemmas. Unlike previous technological revolutions that brought machine inventions, AI has brought unprecedented crisis feelings to humanity. Early machine revolutions in the industrial revolution aimed to replace human physical labor, with machines manufactured and completely controllable by humans themselves. AI's emergence signifies that machines have begun to possess learning capabilities and some human abilities, becoming extensions of human organs, with a trend of continuously strengthening their "human" nature, potentially ultimately replacing human intellectual labor, possessing instrumental rationality and abilities surpassing humans themselves, thereby marginalizing human activities. The relationship between humans and AI has become an issue requiring serious examination. On one hand, tendencies to favor machines at the expense of jobs may destabilize society. AI application intensifies machine substitution for human labor, and technological unemployment may increase crime and social unrest, challenging social stability and operational order. On the other hand, "entrusting AI with decision-making responsibilities will make humans increasingly dependent on AI, gradually weakening human thinking, innovation, and action capabilities. The ultimate result may be AI 'farming' humans or placing humans in protected areas, allowing humans to live comfortably and conveniently while losing motivation to explore beyond boundaries"[18]. How humans should position themselves and coexist with AI has become an urgent practical problem, and legal professionals, as a profession that works closely with AI, face even more pressing human-machine relationship dilemmas.

New Legal Professions Emerging from Technological Transformation

Emerging technologies have promoted the transformation of the legal profession. American legal scholar Frank Levy believes we should not only focus on AI's replacement of lawyers but should pay more attention to the changes AI brings to the industry[19]. As AI is widely applied in the legal profession, it will significantly reduce the costs of legal consultation and litigation. Simultaneously, when parties seek legal advice, they have more choices. "Everyone can more conveniently obtain legal advice… In the future, not only the wealthy will be able to play with the law." The information and knowledge asymmetry between lawyers and clients will be somewhat reduced with AI application.

In this sense, compared to the reduction in junior lawyer positions, AI's deeper challenge to the legal profession is that members of the legal professional community, including judges and lawyers, need to provide legal services to clients and society as a whole that are superior to those provided by machine learning

algorithm-based AI, rather than being satisfied with providing simple, repetitive legal consultation work. Because AI lawyers can provide simple legal consultation services to clients at lower cost and in less time. For example, on May 20, 2018, the Ministry of Justice's China Legal Service Network officially launched. This intelligent consultation system can simulate lawyer-client conversations and immediately and automatically generate intelligent legal opinion letters of over ten thousand words for free based on conversation content, also attaching similar case judgments, relevant laws and regulations, and action suggestions.

Just as internet applications triggered an explosion in the computer industry, creating numerous new professions such as network data analysts, software testers, and programmers, the application of emerging technologies will inevitably create more new professions. AI's full practice in the legal field will also inevitably 衍生出新的法律职业. As AI continues to penetrate the lawyer industry, many large law firms have already established positions such as knowledge engineers and technology officers. The human-machine collaboration work model requires some new job positions. "These job positions supplement the defects of AI machines, 挖掘独特的人类技能, and have a symbiotic relationship with AI, including AI system trainers, AI system interpreters, maintainers who ensure AI is properly utilized, etc."[20].

In 2004, in England and Wales, Sir David Clementi was appointed by the Lord Chancellor to review legal market access and reconsider the regulatory framework for legal service provision. He recommended significantly relaxing access restrictions and published a report that finally drove the enactment of the *Legal Services Act 2007*. Some provisions of this act allowed the establishment of new legal service institution forms called "Alternative Business Structures" (ABS), enabling non-lawyers to own and operate legal service institutions; allowing external investors such as private equity or venture capital to inject funds into legal service institutions; and permitting non-lawyers to become owners of law firms. In October 2011, new rules regarding legal service institution owners took effect. In March 2012, the Solicitors Regulation Authority began approving ABS establishments, issuing over…

…Co-operative Legal Services, affiliated with the Co-operative Legal Group. When this institution first received its license in 2012, it was approved to practice in three designated legal areas: probate, real estate disposal, and litigation, announcing plans to provide legal services at 330 bank branches, intending to add 3,000 new positions to the legal industry.

These new developments mean new service providers have emerged in the legal market—also new market competitors. These new market participants do not adopt traditional working methods. Unlike traditional legal service providers who work in expensive downtown office buildings, they do not believe hourly billing is the best charging method. When these new market participants are influenced by industrial and corporate board management methods and supported by venture capital and private equity, they often appear to have greater advantages in business management.

Although it remains to be seen whether and how other countries will respond to this trend of relaxed access, these new developments have undoubtedly triggered widespread discussion. In the United States, many relevant issues have been deeply discussed by state bar associations, with many bold reform proposals put forward. The Canadian Bar Association confronted access relaxation and a series of other issues in its 2014 report titled *The Future: Transforming the Delivery of Legal Services in Canada*.

As AI is applied in the legal field, legal professionals have gradually understood and learned AI knowledge to prevent potential negative consequences from AI embedding. When AI intervenes in legal data information management and assists legislation, it requires legal professionals to cooperate with algorithm engineers and AI experts to help AI adapt to current legal ethics requirements. This necessitates more interdisciplinary talents and professions at the intersection of AI and law. When AI intervenes in legal activities, legal professionals' work becomes increasingly specialized, work content becomes increasingly pure and concentrated, and legal professions are increasingly required to possess higher professional qualities, truly making the legal industry a highly specialized field. Simultaneously, AI technology application also requires specialized personnel for technical management and joint control with interdisciplinary talents at the intersection of law, making the emergence of more new legal professions an inevitable result of multiple practical needs.

How the Legal Profession Should Respond to Emerging Technology Transformation

Even today, with various emerging technologies emerging endlessly and continuously developing, humans remain the most important subjects in social development. Traditional legal professionals must first recognize this point to avoid being intimidated by the powerful capabilities of various emerging technologies. Faced with continuous breakthroughs and applications of emerging technologies, legal professionals should more objectively analyze the roles and impacts of emerging technologies in legal professional activities, continuously learn about them, improve their ability to utilize AI, actively understand various emerging technologies, make them good helpers for their own innovative development, thereby coexisting harmoniously with them and better participating in promoting the rule of law and social development, thus solidifying legal professionals' social subject status in the AI era.

Clarify Human's Principal Status

Given the impact of emerging technologies, especially AI, on all walks of life and the anticipation of its realization, many social workers, including legal professionals, are fearful of the social transformation brought by AI and other emerging technologies, afraid that human value will ultimately be completely 消解, even falling into "technological determinism," believing that technology is the

determining factor of social development, ignoring human subjective initiative, underestimating social constraints on science and technology, and consequently falling into self-denial cognition and losing their own development enthusiasm. In reality, the invention of AI and other new technologies, on one hand, serves as an engine driving industry innovation and development, and on the other hand, forces the upgrading and development of current professions. Only by fully recognizing AI's positive utility can legal professionals seize career development opportunities in the AI era and achieve progress and development. Faced with the 来势汹汹 of AI technology, legal professionals should actively understand AI and avoid falling into "technological determinism."

Currently, many countries worldwide continuously recognize the important significance of AI for social development and formulate corresponding policies and take active measures to promote AI development. AI and other emerging technologies are also continuously integrating into the legal industry, with more new concepts being accepted and more practices being applied. Legal professionals should actively utilize AI's powerful working capabilities to promote higher-quality and more efficient completion of legal work, understand and learn its working models and operational principles, make AI basic operating systems more compliant with human society's ethical rules and legal provisions, thereby promoting deep integration between AI and legal work and achieving intelligent and efficient justice.

Engage in More Creative Work

The application of emerging technologies in legal work not only brings opportunities to the legal industry but also many challenges. Some legal practitioners may face the possibility of being eliminated. As some low-end, repetitive legal work no longer requires human involvement, it is foreseeable that remaining legal work will become more difficult. Legal professionals need to face this reality. To maintain their core competitiveness, legal professionals must adapt to the trend of scientific and technological development, actively engage in creative legal work to continuously improve their own value. In the future, legal knowledge and services will become increasingly commoditized under AI operation, and legal services will be 肢解 into standard production processes and stages. The living space for legal service workers will also be increasingly compressed. Legal workers must clarify their positioning and enhance the creativity of their work to 应对新兴技术对法律职业的挑战. Currently, new professions such as legal application developers, legal data analysts, and legal database managers are emerging, numerous legal technology companies have been established, and many legal departments need the participation of more interdisciplinary talents combining law and technology. Traditional legal professionals should continuously supplement their skills to become innovative talents needed by the times, continuously improving their own value to avoid being eliminated by era development.

Guard the Defense Line of Legal Spirit

Although emerging technologies can improve the quality and efficiency of legal work and replace and create some legal professions, since AI and other emerging technologies do not possess ethical normative consciousness already formed and widely recognized in human society, legal professionals, as gatekeepers of legal services, must shoulder the responsibility of guarding legal fairness and justice, avoiding situations that undermine fairness and justice due to technical factors such as algorithmic discrimination and algorithmic dictatorship. This depends on legal professionals' adherence to legal faith and legal rationality. "If legal professionals lack legal faith, they will profane the law and abuse statutory power. Legal faith can prompt different legal professionals to abandon differences, recognize each other, maintain the common rationality of the legal profession, form a legal professional community, and jointly safeguard legal authority"[21]. Legal professionals in the AI era must adhere to legal ideals and beliefs, avoiding both relative fairness and justice caused by human bounded rationality and justice disasters brought by AI algorithmic dictatorship. The AI era must still take humans as the main body of the legal profession, with AI serving as a supplement to legal work, strengthening legal professionals' work functions and quality and efficiency, forming a collaborative relationship between legal professionals and legal AI, with each performing its own duties and jointly serving the maintenance of social fairness and justice.

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Note: Figure translations are in progress. See original paper for figures.