

Exploring the future of UAE judiciary: AI integration, bias mitigation, and systemic enhancements

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Abstract

In an era marked by unprecedented advancements in artificial intelligence (AI), the legal landscape of the United Arab Emirates (UAE) stands poised at the intersection of tradition and innovation. This publication delves into the multifaceted realm of law within the UAE, envisioning its future trajectory through the lens of AI integration, bias mitigation strategies, and systemic enhancements. By navigating through the intricate dynamics of AI applications in legal proceedings, this study aims to shed light on the transformative potential of technology in bolstering the efficacy and accessibility of the judicial system. Moreover, it critically examines the pervasive issue of bias within legal frameworks, proposing proactive measures to mitigate its impact and ensure equitable dispensation of justice. Through an exploration of systemic improvements, including digitalization initiatives and jurisdictional reforms, this research underscores the imperative of adapting legal structures to meet the evolving needs of society. By synthesizing theoretical insights with empirical analysis, this thesis offers actionable recommendations for policymakers, legal practitioners, and technologists, envisioning a future where the UAE legal landscape emerges as a global exemplar of innovation, fairness, and efficiency.

Keywords

Legal landscape, judicial system, technology integration, digitalization initiatives.

1. Introduction

The exploration of AI technology in evaluating its impact on the judiciary needs to be thorough and specific. Given that many potential applications of AI remain theoretical, it is essential to clearly define the AI systems being examined to avoid vague generalizations. Subsequently, it is important to establish a benchmark system for comparison. This allows a meaningful analysis between the current judicial system and the hypothetical AI-enhanced version, evaluating any gains or losses in value.

Currently, Dubai's judiciary prioritizes vitality, probability, and sustainability in resource allocation as any ideal judicial system should maintain these core values. Contrastingly, the current UAE judiciary operates on a retributive justice model, aiming for punitive measures akin to "an eye for an eye." This approach diverges from the global trend towards restorative justice methods, which are considered more effective. Moreover, UAE aim to become a global leader in fairness and justice, suggesting a shift towards values that may not align with the present system by the time AI is integrated.


At this stage, it is not feasible to directly compare the outcomes of a hypothetical AI system with the existing system, as we cannot measure the AI's effectiveness against its intended results. However, comparing the values and methodologies of the current international justice system with those upheld by the UAE, both now and in the future, against an AI system designed with international standards. This comparison will help in understanding how AI could be adapted to meet both local and international justice standards.


There are various fields of AI like data mining, pattern recognition, intelligent agents, etc.

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which can be applied to different aspects of the judicial system. AI was first used in the field of criminal justice when computer programs were written to identify the convicts suitable for parole in the United States [11]. Later, a more wide-ranging application was seen in the form of the development of expert systems for legal counseling mainly in the USA and Europe. An expert system is intelligent computer software which can emulate the decision-making ability of a human expert in a specialized field. This software can assist a judge or a lawyer in legal decision making. Such software can be based on various AI models, data, and case laws and can range from a simple program providing legal information to a complex system as a virtual lawyer making and pleading cases in court. This concept can be replicated in the UAE judiciary system in the Arabic language, provided the development of an Arabic expert system. AI can also be useful in automating the court proceedings with the help of audio and video recording analysis. Other application areas include document management, case scheduling, prediction of judicial outcome, prison administration, and recidivism safety.

Judicial lawmaking, where judges interpret and apply laws to set precedents, sees potential support from AI in enhancing decision-making and predicting case outcomes. AI could aid judges by efficiently conducting legal research and analyzing decision patterns, thereby illuminating trends and relevant legal arguments. Furthermore, AI can predict judicial decisions by examining historical data and identifying factors influencing past rulings. However, this technology is bounded by limitations like data bias and lack of transparency, which may skew outcomes and obscure decision pathways. Ethical concerns also arise, particularly regarding the independence of judicial lawmaking and the potential perpetuation of historical biases. Consequently, while AI offers valuable tools that can augment the legal process, it cannot substitute the depth of human judgment required in judicial lawmaking. Care must be taken to ensure that AI supports rather than supplants the judicial process, maintaining the balance of human oversight with technological advancement. The traditional justice system heavily banks on human decisions which are vulnerable and sometimes fallacious leading to biased judgment. The cost of such errors, both in terms of wrongful judgment and delayed justice, is high. AI may fulfill all these criteria.

The introduction and exploration of AI technologies that are specifically tailored to suit the unique legal landscape of the UAE represent a novel area of research. Unlike generalized AI applications seen globally, this study investigates how customized AI tools can enhance judicial efficiency, accuracy, and fairness within the specific cultural and legal context of the UAE.

1.1. Subject and Object of Publication

1.1.1. Object of Publication

The object of this study is the UAE judicial system and its procedural and administrative components considering the future of Artificial Intelligence. It is undoubtedly seen, AI if given enough time, which might be years, can produce a perfect system to cope up with the case and generate a judgment derived from the past cases. AI in medical science has proved the fact that it is more accurate and precise than human decisions.

The possibilities of enhancing the system based on the judgment predictions are high. This means the AI system can propose judgments to the case and being in the learning phase, it can compare the proposed judgment with the judgment of the case and related past cases. It can link those judgments with similar past cases and understand the case law and courtroom procedures. This would result in the development of a better understanding of the law and the judgments delivered by the court.

1.1.2. Subject of Publication

The integration of AI technologies within the UAE judiciary to enhance decision-making processes and mitigate biases.

2. Overview of AI technologies in the legal domain of UAE

The UAE's vision for Artificial Intelligence stands as a cornerstone of its ambitious goals outlined in the UAE Centennial 2071 initiative. This strategy is not merely about technological advancement; it represents a holistic approach to revolutionizing governance and societal development. By leveraging AI, the UAE aims to enhance government efficiency and responsiveness, paving the way for a smarter, more interconnected society.[1]

Central to this vision is the implementation of an integrated digital infrastructure capable of swiftly addressing challenges and delivering effective solutions across various sectors. The UAE aspires to lead the global AI race, positioning itself as a hub for AI investments and innovation. Through strategic initiatives, the nation seeks to create new markets brimming with economic opportunities, fostering growth and prosperity.

Remarkably, while countries worldwide are embracing AI, the UAE has emerged as a trailblazer by establishing the world's first dedicated AI office in 2017, led by Minister His Excellency Omar Sultan Al Olama. This bold move underscores the UAE's unwavering commitment to harnessing AI's transformative potential and spearheading progress on the global stage.

In a significant move towards accelerating the integration of AI technology, His Highness Sheikh Mohammad Bin Rashid Al Maktoum unveiled two groundbreaking AI initiatives during a Dubai retreat, underscoring the pivotal role of AI in shaping the future trajectory of the nation. These initiatives stand as cornerstone endeavors in the UAE's relentless pursuit of technological advancement and innovation.

The first initiative, the AI Talent Hunt Programme, represents a visionary endeavor aimed at establishing a global AI laboratory within the UAE. This transformative initiative seeks to harness both national and international expertise, fostering collaboration on pioneering AI solutions and projects. By leveraging a diverse pool of talent, the UAE aspires to spearhead groundbreaking innovations in the field of AI, positioning itself as a hub of excellence in technological research and development.

Complementing this ambitious undertaking is the AI Challenge Programme, a collaborative venture forged between the National Programme for Artificial Intelligence and tech giant Microsoft. Through this strategic partnership, the UAE aims to accelerate the adoption of AI technologies while simultaneously nurturing national talent capacity. By providing a platform for skill development and knowledge exchange, this initiative aims to empower individuals with the tools and expertise necessary to thrive in an AI-driven future.

In alignment with the objective of the Digital Transformation in the UAE, the aim of which is to transform the entire government into a "fully digital" entity, the Government has established a set of strategic objectives. One of these objectives is to contribute to the UAE's growth by "providing the necessary enablers to create a knowledge-based economy". It is worth noting that the UAE law recognizes digital signatures as having the same legal status as manual signatures. While the new technologies for the legal industry like online court services and blockchain dispute resolution start to emerge, it is likely that the use of AI in providing legal services will continue to grow. This brings about a critical question: How can we ensure that bias is mitigated, and that ethics are enhanced when we integrate AI into the legal sector in the UAE?

In recent years, the impact of AI in changing the ways that legal services are delivered, and the regulatory environment has been much debated. From a regulatory point of view, a framework governing AI in the legal sector is currently absent, and there are no specific binding regulations or guidelines in the UAE. However, AI is far from being unregulated and its use in the legal industry must comply with different laws and regulations. For instance, compliance with existing laws such as data protection and professional ethics is required. The potential risks of bias in decision making by using AI have been identified by legal scholars. As bias can be inherent in the datasets from which a machine learning program learns, there is a possibility that AI could output discriminatory results without a human operator realizing that a process of discrimination is being perpetuated. Be that as it may, the phrase "ethics" is defined as standards of human

behavior that is concerned with what is right and wrong. Ethical concerns not only include ensuring that the implementation of AI is compliant with the existing laws, but also encompass broader professional considerations such as the duty to protect the confidentiality and privacy of clients and the obligation to maintain a high standard of service. Such ethical considerations are also relevant and applicable to the development of AI.

2.1. Navigating the Future of UAE's Governance of Artificial Intelligence and Blockchain Technology

In the United Arab Emirates, a pivotal step towards embracing the transformative potential of artificial intelligence and blockchain technology has been taken by the government with the establishment of the UAE Artificial Intelligence and Blockchain Council. This council serves as a cornerstone for orchestrating the integration of AI technology into various facets of society and the government sector. Its primary objective is to cultivate an environment conducive to AI innovation while upholding principles of privacy and ethics.

In tandem with this overarching initiative, the UAE Regulations Lab (RegLab) and the Sandbox, particularly in the insurance sector, have been launched. These pioneering endeavors are meticulously crafted to proactively anticipate and develop future legislative frameworks governing nascent technologies, notably AI. Through these platforms, innovators are afforded the opportunity to test and refine their creations within a controlled setting, ensuring adherence to rigorous standards.

Moreover, recognizing the profound impact of AI on the financial landscape, regulatory authorities including the Central Bank of the UAE have taken strides towards facilitating the seamless adoption of enabling technologies such as AI within financial institutions. Draft guidelines have been issued to provide a roadmap for financial entities navigating the complexities of integrating AI into their operations, although formal regulations and standards are still pending. In addressing the critical issue of liability inherent in AI deployment, the UAE draws upon its existing legal framework, encompassing statutes like the Civil Code, Consumer Protection Law, and Product Safety Law. These foundational principles furnish a basis for navigating liability concerns associated with defective AI systems. However, the intricacies of assigning responsibility in cases of AI malfunction present notable challenges, with principles of shared liability and special care for controlled objects coming into play.

In essence, the UAE's proactive approach towards AI regulation and governance underscores its commitment to harnessing technological innovation for societal advancement while conscientiously mitigating associated risks. Through collaborative endeavors between governmental bodies, regulatory agencies, and industry stakeholders, the UAE endeavors to chart a course towards a future where AI enriches lives while upholding principles of accountability and ethical conduct.

Globally, the use of AI in the legal sector varies widely, with some countries focusing on regulatory frameworks, ethical guidelines, and specific applications of AI in legal practice. For example, in the United States and Europe, there is significant discussion about ethical considerations, transparency, and accountability in AI applications, including legal services. The European Union has proposed regulations specifically aimed at governing AI, focusing on high-risk applications and fundamental rights.[9]

2.2 Ethical considerations and fostering global leadership.

AI adoption in the legal sector is a significant step, but it is growing, with varying levels of usage and regulatory approaches across different regions. For instance, while the UAE is actively integrating AI across various sectors and aims to be a leader in AI by 2031 with its approach to invest in key industries and people, contributing to the nation's prosperity and technological

advancement. The United Arab Emirates distinguishes itself in the usage of AI both generally and within the legal sector through a combination of visionary leadership, strategic initiatives, and regulatory frameworks aimed at fostering innovation and technological advancement. The UAE's strategy aligns with its broader goals of economic diversification and leadership in technology innovation, as outlined in its Centennial 2071 vision.

The UAE's choice to implement AI in the legal sector and courts is driven by a vision to enhance efficiency, accuracy, and accessibility within the judicial system. AI technologies offer the potential to improve the delivery of legal services by analyzing cases, applying laws, and evaluating possible resolutions, which could significantly support the work of judges and legal practitioners. For instance, AI can assist in legal research and analysis by sifting through vast volumes of information, identifying patterns, and presenting relevant findings, thus aiding in decision-making processes.

The adoption of AI in legal services aligns with the broader strategy of digitization across various sectors in the UAE. Courts worldwide are transitioning from paper-based to electronic and online systems, allowing documents to be filed and accessed electronically and cases to be managed online. AI and allied technologies represent the next major wave of change, capable of supporting and improving judicial decision-making. This technological integration is part of a global trend where industries, including the legal sector, are being transformed by digitization and AI.[2]

Furthermore, the legal professional in the UAE is recognizing the need to adapt to rapid technological advancements. Law firms in Dubai, for instance, are upskilling their staff and enhancing their tools to effectively represent clients in cases involving emerging technologies such as smart contracts and autonomous vehicles. This adaptation is crucial for maintaining pace with the rapid deployment of AI tools in the UAE, ensuring that legal professionals are equipped to handle cases involving AI and other advanced technologies.

The challenges and opportunities presented by AI in the legal sector are significant. Skepticism and resistance to change within the traditionally conservative legal market can act as roadblocks to AI adoption. However, the pressures of increased efficiency, competitive advantage, and client satisfaction necessitate the integration of AI technologies. Law firms that fail to invest in AI risk falling behind in the market, as AI-driven process optimization can improve project management, increase transaction volumes, and enhance the quality of legal advice provided to clients. UAE's focus on AI in the legal sector is part of a strategic effort to modernize and improve the efficiency of the judiciary, aligning with global trends in legal technology adoption. The initiative reflects a commitment to embracing innovation, enhancing the delivery of legal services, and ensuring the legal system remains responsive to the needs of a rapidly evolving digital landscape.[3][4]

2.3 AI Integration in legal proceedings and impacts in the UAE Courts

Within UAE, specifically the Dubai International Financial Centre (DIFC) Courts maintain guidelines for the use of Large Language Models (LLMs) and Generative Content Generators (GCGs) in legal proceedings. These AI tools are recognized for their ability to assist in the preparation and presentation of cases by saving time and costs. However, the DIFC Courts also caution about potential risks such as providing misleading information, breaching confidentiality, infringing intellectual property rights, and violating data protection legislation. Parties are expected to be transparent about their use of AI-generated content and to not overly rely on such technologies.

AI technologies are also making an impact in broader court functionalities such as transcription, translation, and judicial guidance. For transcription, AI can create real-time text records of spoken words in courtrooms, enhancing the accessibility and efficiency of judicial services. AI translation tools can provide immediate language translation for participants in court proceedings, helping to overcome language barriers and ensure more inclusive legal processes. Lastly, AI can assist judges by analyzing legal data to help in legal research and potentially guide

decision-making processes, although this application remains cautious and supplementary to human judgment.[5]

Furthermore, UNESCO highlights the increasing use of AI in judicial systems worldwide, including providing investigative assistance and automating decision-making processes. The organization emphasizes the importance of addressing the challenges and opportunities related to AI in the justice sector, especially its implications for human rights and the rule of law.[7]

These initiatives and applications illustrate the UAE's proactive approach in integrating AI into the legal sector, aiming to enhance efficiency and accessibility while ensuring the responsible use of technology in alignment with legal and ethical standards.

3. Mitigating bias, systematic enhancements, and ethical reflections within AI integration in UAE's legal sector

Implementing AI in the UAE's legal sector brings a mix of challenges and systematic improvements. The UAE has been proactive in adopting AI across various sectors, including the legal field, as part of its Centennial strategy and Vision 2021. The AI Strategy aims to enhance government performance and provide a range of services across key sectors. It also sets ambitious goals such as saving 50% of annual government costs using AI and establishing an incubator for AI innovations.

However, with the opportunities come significant challenges. One of the primary issues is automated decision-making by companies, which can lead to biased outcomes reflecting biases in the underlying data. The "black box" difficulty with AI, where the decision-making process is not transparent, poses another challenge. The UAE's DIFC Data Protection Law addresses some of these concerns by giving data subjects the right to object to decisions made solely on automated processing. Nonetheless, there is a need for more policy discussion and clarification on laws applicable to emerging technologies.[10]

Another area of concern is the ethical and legal challenges posed by AI, such as liability issues, AI personhood, protection of data privacy and private life, intellectual property rights, agreements, and competition law. The current legal framework may not adequately address these issues, raising questions about liability for AI's acts or omissions, the potential for "electronic personhood" for more complex robots, and the implications for intellectual property when AI creates or innovates.

While UAE is making strides in integrating AI into its legal sector, continuous monitoring, legislative action, and policy discussions are necessary to address the ethical and legal challenges posed by AI. This balanced approach will ensure that the UAE can maximize the benefits of AI while minimizing its potential risks.

In the UAE, the integration of AI in various sectors, including the legal sector, is part of a broader strategy to foster innovation and economic development. The UAE's Strategy for Artificial Intelligence, launched in 2017, aims to enhance government performance and provide services across key sectors. The strategy also includes establishing an incubator for AI innovations and employing AI in customer service, among other objectives. The UAE's approach demonstrates a commitment to leveraging AI to achieve the objectives of the UAE Centennial 2071, aiming for a diversified, knowledge-based economy.

The adoption of AI also presents challenges, particularly in terms of bias and discrimination that AI systems can perpetuate. Biased AI decisions can exacerbate existing disparities, particularly affecting vulnerable and marginalized communities. Addressing these issues requires ethical AI practices to safeguard the rights of these communities. The research methodology to understand algorithmic bias combines literature reviews, case studies, and ethical analyses, employing a multidisciplinary approach to offer a comprehensive understanding of the issue. To mitigate bias in AI systems, it's essential to employ various strategies throughout the AI development lifecycle. These strategies can be categorized into pre-processing, in-processing, and post-processing algorithms.[8]

The importance of bias mitigation in AI extends beyond just technical adjustments. It involves fostering fairness, trust, and transparency in AI systems. By identifying and mitigating biases, AI systems can treat individuals from various groups equally, irrespective of their protected characteristics like race or gender. Bias-free AI systems build trust among users and stakeholders and prevent the reinforcement of existing societal biases.

For effective bias mitigation, it's crucial to use diverse and representative data, develop bias-aware algorithms, and engage in continuous monitoring and evaluation of AI systems. This comprehensive approach ensures the development of fair, ethical, and inclusive AI systems that promote equitable outcomes for all individuals.

Specific instances, such as Amazon's gender-biased recruitment algorithm and the racial bias in the COMPAS risk assessment tool used in the U.S. criminal justice system, illustrate the real-world consequences of biased AI. These examples highlight the importance of fairness and diversity in AI training data to prevent systematic discrimination against certain demographics.

For the UAE, addressing AI bias in the legal sector and beyond involves continuous monitoring, legislative action, and policy discussions to clarify applicable laws for emerging technologies. The establishment of an AI Council in the UAE, tasked with proposing policies to create an AI-friendly ecosystem and issue a government law on the safe use of AI, is a step towards managing and optimizing the use of AI responsibly. The Think AI Initiative and AI training programs for government employees further exemplify the UAE's commitment to fostering ethical and responsible AI adoption.

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