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Artificial Intelligence and Intellectual Property Law: A Study of Globally Shared Legal Information Retrieval Ecosystem of Multinational Corporations

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Abstract

This research investigates the incorporation of Artificial Intelligence (AI) within the intellectual property (IP) management frameworks of multinational corporations (MNCs) operating in Saudi Arabia. The primary emphasis is placed on the establishment of a globally harmonised legal information retrieval ecosystem within the Kingdom. Presently, MNCs in Saudi Arabia are progressively adopting AI-driven solutions to optimise IP protection, a trend driven by the growing complexity of digital infrastructures and the transnational nature of corporate activities. To address this subject, the study adopts a qualitative methodology combined with a normative juridical perspective, grounded in an interpretivist epistemology. The results underscore a range of critical challenges associated with AI integration into IP systems. Chief among these are concerns regarding data confidentiality, the legitimacy of authorship, and the legal status of AI-generated content. Additionally, the dynamic evolution of the Saudi legal framework reflects a broader international imperative for regulatory transformation in this domain. While AI contributes significantly to enhanced operational efficiency and facilitates international alignment in IP management practices, it also introduces a host of complex technological, ethical, and data-related risks. Notably, concerns surrounding algorithmic transparency, the compatibility of data systems, and unresolved legal questions related to AI-generated IP emerge as pivotal issues for decision-makers and legal practitioners. The research provides substantive recommendations for the responsible and ethically grounded integration of AI into global legal regimes governing IP and innovation governance.

Keywords: Artificial Intelligence (AI), Intellectual Property (IP), Multinational Corporations (MNCs), Legal Information Retrieval, IP Management, Cross-Border Governance, Data Privacy, AI-Generated IP, Legal Tech, Innovation Management.

Introduction

With the advancement of technology, the methods employed by multinational corporations to manage and safeguard intellectual property have undergone substantial change (Unnikrishnan, 2024). The utilisation of AI systems has become highly significant and widespread (Picht et al., 2022). In Saudi Arabia, the number of MNCs has witnessed notable growth. According to Dutton (2024), there has been a 477% rise in the number of MNC headquarters in recent times. Within this context, AI systems have gained considerable relevance, as contemporary MNCs employ this technology in their IPM processes. The convergence of AI and intellectual property law presents both opportunities and challenges on an international scale.

Saudi-based MNCs operate across multiple legal jurisdictions, necessitating effective access to shared legal knowledge to navigate the complex and evolving

landscape of intellectual property. This demand has contributed to the emergence of AI-powered globally shared legal information retrieval ecosystems. As noted by Nikiforova et al. (2024), public data ecosystems involve intricate socio-technical systems that are instrumental in enhancing data use, thereby supporting improved decision-making. Nevertheless, incorporating AI into legal information systems also gives rise to pressing concerns about data privacy within Saudi MNCs. Although AI can enhance operations and user engagement, data privacy remains a significant issue (Ikwuanusi et al., 2023). Understanding the functioning of such ecosystems is crucial, yet their impact on IP law and corporate governance is equally vital to ensure fair and effective protection of intellectual assets in an increasingly digital and interconnected global environment.

There is an increasing dependence on AI for the retrieval of legal information (Deroy et al., 2024; Nadjia, 2024). Several academic works have examined the adoption of AI in the domain of IP law (Chesterman, 2024; Mbah, 2024b; Pinarbasi et al., 2024; Salle and Rini, 2025). However, to the best of the researcher's knowledge, a considerable gap persists in understanding how multinational corporations in Saudi Arabia can effectively manage the complexities of intellectual property law across various jurisdictions through AI-based systems. In this regard, the absence of standardisation, variations in legal systems, concerns over data security, and the ethical deployment of AI technologies constitute major barriers to achieving global compliance (Dhruvitkumar, 2024; Kolade et al., 2024). Like their international counterparts, Saudi MNCs function within a digitally integrated global environment (Spinellis, 2023). Therefore, it is essential to examine the globally shared ecosystem designed for legal information retrieval. Accordingly, this study seeks to explore the integration of Artificial Intelligence into intellectual property management practices among multinational corporations in Saudi Arabia. It further aims to analyse the various dimensions and challenges that may limit the effectiveness of AI-supported legal systems within Saudi MNCs.

Method

The current study adopts a normative juridical approach to examine the research topic. Through this framework, the researcher has qualitatively investigated the integration of Artificial Intelligence into the intellectual property management systems of multinational corporations in the Kingdom of Saudi Arabia. The application of qualitative methodology has enabled an in-depth examination of multiple dimensions concerning AI and IPM within Saudi-based MNCs. Additionally, this study is grounded in the interpretivist philosophical paradigm. Interpretivism emphasises the subjective understanding of legal and institutional constructs (Alharahsheh and Pius, 2020). Accordingly, this research seeks to explore the interaction between varying legal structures and corporate practices in the context of an evolving digital landscape. An inductive research approach has also been employed (Soiferman, 2010). This method facilitated the derivation of insights from existing legal provisions, regulatory frameworks, and practical corporate experiences. As a result, the broader implications for managing intellectual property rights have been thoroughly examined. Primary data was obtained from authoritative legal sources and publications addressing AI-related issues. Furthermore, secondary data was collected from peer-reviewed academic journals and legal databases, including HeinOnline, JSTOR, NEXIS, Westlaw, and Wiley Online Library. The data was analysed using a content analysis method, which enabled a structured and comprehensive evaluation in alignment with the study's objectives.

Literature Review

AI's Role in Transforming IP Law

Artificial Intelligence is considerably reshaping intellectual property law in various respects. The incorporation of AI has transformed the processes through which intellectual property is generated, administered, and safeguarded. According to Rossi and Bianchi (2024), as AI technology continues to develop, its impact on IP law deepens, offering both challenges and opportunities concerning the protection of AI-driven innovations. Paul (2024a) notes that AI-enabled systems assist in navigating the complexities of patent drafting and adherence to jurisdiction-specific requirements. Similarly, Balasubramanian (2024) highlights that AI can accelerate the search process by analysing extensive trademark databases, thereby improving the precision of trademark assessment and pattern recognition.

Nonetheless, these technological advancements challenge traditional notions of intellectual property, including authorship, ownership, and originality, which are traditionally associated with human creativity.

Moreover, the deployment of AI prompts significant ethical and legal concerns regarding issues such as accountability, transparency, and the attribution of rights (Boch et al., 2022; Mensah, 2023). Despite these concerns, the integration of AI systems enhances the capacity for monitoring (Adeniran and Onebunne, 2024), enabling MNCs to optimise resource allocation and reinforce the protection of intellectual property across their global operations.

AI in Shared Legal Information Retrieval Ecosystem

Artificial Intelligence plays a central role in the advancement of shared legal information retrieval ecosystems. Scholars contend that natural language processing, machine learning, and data mining constitute essential components of AI, enabling the efficient processing of extensive legal datasets (Alarie et al., 2018; DoCarmo et al., 2021; Frankenreiter and Nyarko, 2023; Katz et al., 2023). Such capabilities contribute to improved legal decision-making and a reduction in research time (Getman et al., 2023; Kabir and Alam, 2023), thereby facilitating cross-border compliance. AI-powered platforms also possess the capacity to identify legal trends, detect potential risks, and offer jurisdiction-specific recommendations. Nonetheless, Mbah (2024a) underscores the necessity for global harmonisation of privacy standards, given the variation in regulatory frameworks across jurisdictions. The efficiency of these AI-based systems is contingent upon the precision of data and their capacity to interpret dynamic legal environments. Akpobome (2024) highlights that platforms such as LexisNexis and Westlaw have incorporated AI functionalities, equipping legal professionals with sophisticated research tools that generate tailored insights based on precedent and developing legal norms. As such, AI-driven legal retrieval ecosystems are instrumental in enhancing legal intelligence.

Intersection Between AI and IP Law

The convergence of AI and IP law constitutes a dynamic and rapidly developing domain, presenting significant challenges to established legal frameworks. AI technologies are increasingly capable of generating inventions with limited human involvement (Lim, 2018). This progression raises fundamental questions concerning authorship, ownership, and the extent of protection afforded under current IP regimes (Salle and Rini, 2025). Conventional IP laws rest on the premise of human creativity (Mbah, 2024b), rendering the protection of AI-generated content legally ambiguous. In addition, AI is reshaping IP administration by automating patent searches (Paul, 2024b), thereby delivering notable efficiencies for legal practitioners and multinational enterprises. Nonetheless, the integration of AI into IP processes introduces legal ambiguities and ethical challenges (Mbah, 2024b), particularly with regard to issues of transparency, accountability, and the potential for bias in AI-generated legal decisions (Alabi, 2024; George et al., 2024). Given the rapid advancement of AI technologies, there is a pressing need for revised legal interpretations and enhanced international collaboration to ensure that IP law continues to operate in a fair and effective manner.

Results

This section primarily examines the integration of AI in the intellectual property management of multinational corporations, subsequently addressing the various challenges within the global legal information retrieval ecosystem and its corresponding legal frameworks. Finally, it explores the implications of AI for the IPRs of multinational corporations.

AI Integration in MNCs' IP Management

AI is reshaping international business environments, especially in the management of intellectual property (Menzies et al., 2024). Technologies such as machine learning, natural language processing, and image recognition enhance the detection, monitoring, and enforcement of IPR infringements, improving decision-making speed and accuracy (Pokrovskaya, 2024). For Saudi MNCs operating across multiple jurisdictions, AI aids in retrieving legal information and navigating complex, inconsistent international IP laws (Nelson, 2024). Saksupapchon (2025) highlights that companies like IBM, Obeebo Labs Ltd., and Black Hills IP Holdings LLC focus their patent filings on the U.S. market, while others, like AON Risk Services Inc., have a global approach, prioritising IP data and landscaping. Companies such as IPwe Inc., Clarivate plc, and Arctic Alliance Ltd. integrate AI in IP management to enhance valuation, transaction processing, and workflow automation, thereby securing a competitive edge. Saudi MNCs can similarly leverage AI to respond effectively to the rapidly evolving innovation landscape.

Challenges in the Global Legal Information Retrieval Ecosystem (LIRE)

Technological Challenges

Technological challenges pose a significant barrier to the effective integration of AI in the global legal information retrieval ecosystem. A major issue is the interoperability of AI systems across jurisdictions, where legal terminologies, languages, and formats differ (Kiani and Shafiee, 2022). The accuracy of AI outputs relies heavily on the quality of training data, and insufficient or biased data can lead to flawed legal recommendations, particularly in IP management for Saudi MNCs (Nivedhaa, 2024). Another challenge is the lack of transparency in AI algorithms, often referred to as the "black box" nature, which makes it difficult for legal professionals to trust or understand how decisions are made (Chaudhary, 2024; Hassija et al., 2024). Additionally, frequent updates to legal statutes and case laws require AI systems to be continually maintained, demanding significant technical resources. The integration of AI into legacy legal infrastructures also presents complications, as many existing systems are not designed for advanced automation. These technological limitations must be addressed to fully harness AI's potential in transforming global IP management and legal information retrieval for Saudi MNCs.

Data Privacy Challenges

AI integration has significantly transformed IP management, privacy, and cybersecurity. While AI reduces human workload, it also raises ethical and data-related concerns. AI is effective in detecting plagiarism and monitoring IP (Adenubi et al., 2024). However, the use of AI-generated work for innovations and patents has sparked concerns over data credibility. The large volume of data involved in AI integration often leads to privacy issues, with cybersecurity threats risking misuse of personal or transactional data, thereby undermining the credibility of patents or copyrights (Novelli et al., 2024). Consequently, robust measures are needed to ensure data protection in AI-generated IP, alongside the development of legislation to support or legalise such creations.

Other Challenges

In addition to technological and data privacy challenges, several legal and ethical issues emerge within the context of AI-generated content in the global legal information retrieval ecosystem of MNCs. For example, in Saudi Arabia, traditional patent and copyright laws do not recognise AI as an author or owner (Almarzoqi and Albakjaji, 2022). This restricts the ability of MNCs' legal information retrieval systems to effectively integrate AI-driven IP management. Furthermore, issues such as bias and misinformation are prevalent in the integration of AI into Saudi Arabia's IP legal framework. AI algorithms are often shaped by the biases of their creators, potentially influencing legal outcomes related to patents and copyrights. Additionally, managing large volumes of AI-generated data can lead to misinformation, which may undermine the global legal information retrieval systems of MNCs. Moreover, the introduction of AI-generated content raises concerns about its impact on human creativity, challenging the traditional concepts of patenting and intellectual property. These challenges must be addressed when developing a legal framework that governs AI-generated IP.

Legal Frameworks for AI-Generated IP

With ongoing advancements in AI technology, the legal frameworks governing AI-generated IP are evolving. This shift is particularly evident in areas such as patent and copyright law. Traditional IP laws have been designed primarily to address human-created works. In contrast, the autonomous content generation capabilities of AI challenge the concepts of ownership and authorship under conventional IP laws. One significant issue is determining the rightful owner or entity that controls the rights to AI-generated outputs. Traditional copyright laws typically require a human author to grant protection to a work (Novelli et al., 2024). Similarly, patent laws traditionally necessitate a human "inventor," which raises questions about the AI's capacity to be recognised as an inventor. To address this, the concept of "sui generis," a unique protection form, has been proposed. This form is not included in standard IP legal frameworks but could potentially apply to AI-generated works (Hardman and Housel, 2023).

IP Legal Framework in Saudi Arabia

Over the past two decades, Saudi Arabia has implemented significant reforms in its IPRs as part of its strategy to diversify its economy. As part of its Vision 2030 initiative, the country aims to reduce its dependence on oil by promoting technology and innovation. To achieve this, Saudi Arabia has focused on strengthening IP protections to attract foreign investment

and MNCs. Consequently, the country has enacted various laws and regulations that align with international standards set by bodies such as the World Intellectual Property Organization (WIPO). The nation's patent law has become a central component of its IP system, granting important rights to inventors and ensuring that innovations meet the criteria of industrial applicability, novelty, and non-obviousness (Almarzoqi and Albakjaji, 2022). These efforts are intended to help Saudi Arabia transition to a knowledge-based economy.

In addition, copyright registration has become essential for artists, creators, and authors in Saudi Arabia to protect their works. The copyright laws safeguard scientific, artistic, and literary creations, fostering an intellectual and cultural environment. The government has also implemented measures to protect brand identities through trademarks. The Trademark Registry provides exclusive rights to business logos, symbols, and names, promoting fair competition and consumer confidence. Furthermore, Saudi Arabia has enacted legal provisions to protect industrial designs, safeguarding the ornamental and aesthetic aspects of products and encouraging innovation in product design, which contributes to the overall development of related goods (Batic, 2024).

In addition to protecting products and innovations, Saudi Arabia's legal framework has incorporated key laws and regulations to safeguard trade secrets and other confidential business information, helping both national and international businesses maintain a competitive edge. Recognising the importance of IPRs, the Saudi government has focused on enforcing various IP laws and providing remedies that grant crucial rights to innovators and creators. Within this framework, IP technology and licensing have become vital for facilitating agreements that foster the development of new and advanced technologies, promoting effective collaboration between industries and inventors in Saudi Arabia (Batic, 2024). However, it is evident that Saudi Arabia's patent laws have not fully addressed the integration of AI within the realm of IP. This gap needs to be addressed, as AI has the potential to significantly enhance the Vision 2030 goals. Although Saudi Arabia's patent laws align with global standards, they require amendments to accommodate the challenges posed by AI-generated intellectual property.

AI Implications for MNCs' IPRs in Global Context

Several legal structures and landmark cases have addressed the interaction between AI and IPRs. Some of these key cases have established important precedents in the AI and IPRs domain. Below, a few of these significant cases, which have influenced the development of legal principles in this area, are discussed (Upadhyay and Rathee, 2020).

- ***Thaler v. US Patent and Trademark Office (USPTO):*** In this case, the United States Patent and Trademark Office (USPTO) rejected patents created using the "Device for Autonomous Bootstrapping of Unified Sentience" (DABUS), an AI device. The court ruled that the inventors must be natural persons, thereby reaffirming the human-centric nature of traditional patent law. This decision was upheld by the US District Court, reinforcing the conventional legal framework for patents (Fleming, 2007).
- **The Decision of UK IP Office on DABUS:** In the UK, patent applications naming DABUS as the primary inventor were also rejected. The court reinforced that an individual must be designated as the "inventor," further highlighting the human-centric nature of patent law (Stephen Thaler v. Commissioner of Patents, 2022).
- **Project Nightingale by Google:** Although not directly related to AI integration in IP, this case has raised significant concerns regarding the ownership of work. In this project, healthcare data was collected by Google to aid AI development. The project faced criticism over the use and ownership of data, especially when evaluated under traditional IPR frameworks (Schneble et al., 2020).
- **DABUS Case in Saudi Arabia:** Saudi Arabia is the only MENA country to receive a patent application for DABUS, an AI invention titled "FOOD CONTAINER AND DEVICES AND METHODS FOR ATTRACTING ENHANCED ATTENTION" (filed under "521422019"). The Saudi Authority for Intellectual Property (SAIP) is still evaluating decisions on AI-generated IP (Alyafi, 2025).

These cases highlight the legal limitations surrounding AI-generated IP. Thus, significant legal reforms are necessary to address these challenges.

Conclusion

The intersection of AI and IPRs significantly shapes the evolving legal landscape, presenting various technological, data privacy, and legal challenges that affect the global LIRE of MNCs. As AI continues to advance, it will challenge the limits of conventional IP frameworks in Saudi Arabia, underscoring the need

for legal reform and adaptation. Consequently, Saudi Arabia's future IP laws must strike a balance between fostering technological innovation and safeguarding IPRs to ensure ethical and economic benefits. International collaboration is essential to create harmonised regulations and IP standards, addressing the global impact of AI on IP law in MNC contexts. This research contributes to this discourse by offering legal and policy recommendations for AI-generated IP in Saudi Arabia, thereby enhancing the research's innovative value.

Recommendations

AI integration in IP legal systems is crucial for MNCs, particularly in Saudi Arabia, to enhance the global LIRE and drive innovation, compliance, and efficiency. The following recommendations are proposed to improve these systems:

- The Saudi government should establish standardised protocols for AI integration in IP law, facilitating interoperability among global MNCs. This includes data harmonisation and system classification, ensuring effective information retrieval.
- Encouraging collaborations between MNCs and national IP offices is vital for developing AI tools aligned with legal frameworks. These partnerships will foster the creation of AI-driven solutions to enhance MNCs' IP management.
- MNCs should adopt AI tools for legal research related to IP, helping them access large volumes of legal data, such as patent filings, IP decisions, and case laws. This will be crucial for efficiently managing the role of AI in their innovation processes.

Research Implications

This study significantly contributes to the literature on AI-generated IP within the context of Saudi Arabia's legal system. It is also crucial in suggesting legal reforms to enhance the LIRE for MNCs in Saudi Arabia. The research highlights the challenges MNCs may encounter when integrating AI into their IP management systems. Furthermore, the study provides vital policy recommendations for managing AI-generated IP in Saudi Arabia. MNCs can take essential steps to implement standard protocols aimed at improving their AI-generated IP. These protocols should focus on preventing various issues such as data privacy concerns, legal uncertainties, and enhancing compliance with evolving IP laws.

Limitations and Future Research

This study has certain limitations that may affect its overall effectiveness. Firstly, it concentrates on the role of AI-generated IP legal frameworks in shaping the LIRE of MNCs in Saudi Arabia, thus limiting the study's scope and influencing its results. Additionally, secondary qualitative data was utilised to address the study's aim, which, due to its secondary nature, hinders real-time understanding of the topic under investigation. The research also focused primarily on the influence of AI on MNCs' IP management in a legal context, introducing research bias that limits the discussion on the implementation of conventional IP law in LIRE. For future research, a comparative analysis between a civil or common law country could be undertaken to assess the impact of AI on IP law. Moreover, primary quantitative or qualitative studies involving policymakers and legal teams from MNCs could provide insights into the real-time influence of AI on IP management. Finally, future research could delve into conventional IP law, exploring its integration with AI to enhance the understanding of IP management within MNCs.

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