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REVIEW

Approach to global regulations around AI

Aproximación a las regulaciones mundiales en torno a la IA

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ABSTRACT

Regulation of artificial intelligence (AI) varies significantly globally, reflecting different approaches and priorities. These trends underscore the need to balance technological innovation with rights protection and security. The purpose of this article is to examine the main trends and challenges in the regulation of AI, with a comprehensive view of how the governments of the European Union, China and the United States address this complex and crucial issue due to their involvement as great government powers at the economic and social pyolytic level. The study was based on a bibliographic review whose search was intentional towards publications from journals indexed in electronic databases such as Scopus, Web of Science and Google Scholar. The findings demonstrate that the European Union has established a comprehensive framework with the AI Law, imposing specific restrictions and requiring transparency to establish a global standard similar to the GDPR. China, for its part, is transitioning from a fragmented approach to more unified regulation. The introduction of a holistic AI law and the creation of a national AI office indicate an effort to consolidate its regulatory framework, improving consistency and efficiency in risk management. In the United States, regulation remains gradual and decentralized, with initiatives at both the federal and state levels. Although efforts like the AI Bill of Rights are significant, the lack of a unified framework poses coherence and applicability challenges.

Keywords: AI Regulation; AI Law; Transparency; Systemic Risks; Decentralization.

RESUMEN

La regulación de la inteligencia artificial (IA) varía significativamente a nivel mundial, reflejando diferentes enfoques y prioridades. Estas tendencias subrayan la necesidad de equilibrar la innovación tecnológica con la protección de derechos y la seguridad. El presente artículo tiene como finalidad examinar las principales tendencias y desafíos en la regulación de la IA, con una visión comprensiva de cómo los gobiernos de la Unión Europea, China y Estados Unidos, abordan este complejo y crucial tema por su implicación como grandes potencias globales a nivel político económico y social. El estudio se basó en una revisión bibliográfica cuya búsqueda estuvo intencionada hacia publicaciones de revistas indexadas en bases de datos electrónicas como Scopus, Web of Science y Google Scholar. Los hallazgos demostraron que La Unión Europea ha establecido un marco integral con la Ley AI, imponiendo restricciones específicas y exigiendo transparencia para establecer un estándar global similar al GDPR. China, por su parte, está en transición de un enfoque fragmentado a una regulación más unificada. La introducción de una ley de IA holística y la creación de una oficina nacional de IA indican un esfuerzo por consolidar su marco regulatorio, mejorando la coherencia y eficiencia en la gestión de riesgos. En Estados Unidos, la regulación sigue siendo gradual y descentralizada, con iniciativas tanto a nivel federal como estatal. Aunque esfuerzos como el AI Bill of Rights son significativos, la falta de un marco unificado plantea desafíos de coherencia y aplicabilidad.

Palabras clave: Regulación de IA; Ley AI; Transparencia; Riesgos Sistémicos; Descentralización.

INTRODUCTION

Artificial intelligence (AI) has emerged as one of the most disruptive technologies of the 21st century. It is at the center of multiple transformations in major sectors of society, from healthcare and education to manufacturing and entertainment.[1,2,3,4,5] As its influence grows, so does the need for regulatory frameworks to ensure its safe and ethical development and use.[6,7,8]

The rapid evolution of AI has led to both significant opportunities and risks. On the one hand, AI applications promise unprecedented advances in efficiency and innovativeness.[9] However, concerns arise about data privacy, the transparency of algorithms, and the potential for discriminatory biases in automated systems. Undoubtedly, the present challenges have initiated a global debate on the need for appropriate regulation that balances the promotion of technological innovation with the protection of the rights and safety of individuals.[2,7,10,11]

It has been demonstrated over the last few years that the advance of artificial intelligence has reinforced the spread of cyber attacks, which are considered new forms of interference in the sovereign prerogatives of states and their citizens. They also constitute an extremely destabilizing threat because they impact all areas of society, from the government to the public and private sectors.[12,13,14,15,16,17]

Along the same lines, the efforts of the medical sciences to implement research increasingly focused on technological advances that are expected to have great advantages for this sector in the future are well known. These efforts seek to take advantage of the potential of new technologies to improve medical treatments and procedures, which could have a significant impact on the quality and efficiency of health care.[3,18,19,20]

However, there is a fundamental dilemma surrounding bioethics, a key area for addressing emerging ethical challenges in digital health. According to Zafra et al.[4], artificial intelligence raises concerns about confidentiality and algorithmic systems, as they require high-quality standards, with adequate protection of patient information and attention to equity in access to these technological advances.

Likewise, in the educational field, the implementation of artificial intelligence has proven to be an extremely valuable tool, especially with regard to the personalization of learning for students of any kind.[1,21-25] However, this sector also faces setbacks related to the inappropriate or irresponsible use of these technologies. Their implementation in the educational context must be carried out in an ethical manner and with proper controls in order to avoid biases, privacy violations, or negative impacts on the learning experience of students.[26,27,28,29,30]

One of the main challenges in the regulation of AI is its multifaceted nature and the speed of its development. In this regard, AI systems can operate in a wide variety of contexts, from virtual assistants to autonomous vehicles, each with unique regulatory implications. In addition, the ability of AI to learn and evolve raises questions about responsibility and accountability, especially in cases where algorithms make critical decisions without direct human intervention.[13,31]

Several studies have identified that regulatory responses to AI vary significantly across regions, reflecting differences in political, economic, and cultural priorities.[10,32,33,34,35] The European Union has taken a proactive approach, seeking to establish a comprehensive framework that addresses risks and promotes transparency. In contrast, the United States has opted for a more gradual and decentralized approach, with individual states implementing their regulations. China, on the other hand, follows a reactive model, regulating specific technologies as they emerge, but with plans to unify these efforts under a more balanced and comprehensive national law in the near future.[36,37,38,39,40]

This perspective implies the need to establish an effective regulatory framework for AI, which framework requires collaboration between governments, industry, and civil society. Consequently, these regulations must be flexible enough to adapt to rapid technological evolution but also robust enough to protect users and ensure ethics in the development and use of AI. That said, this article aims to examine the main trends and challenges in the regulation of AI, with a comprehensive view of how the governments of the European Union, China, and the United States are addressing this complex and crucial issue because of their involvement as major global powers at the political, economic and social level.

METHOD

The approach of this article was based on a documentary review since it allowed the collection and analysis of information from the bibliographic sources consulted; it also facilitated the understanding and interpretation of the phenomenon under investigation, in this case, the regulations surrounding AI.[41,42,43]

Initially, a detailed search of academic literature was conducted with special emphasis on scientific articles. The main sources included publications from journals indexed in electronic databases such as Scopus, Web of Science, and Google Scholar. The search patterns used were combinations of the following categories: AI Regulation, China, United States, and European Union.

Subsequently, the selection of the articles was carried out by determining different criteria:

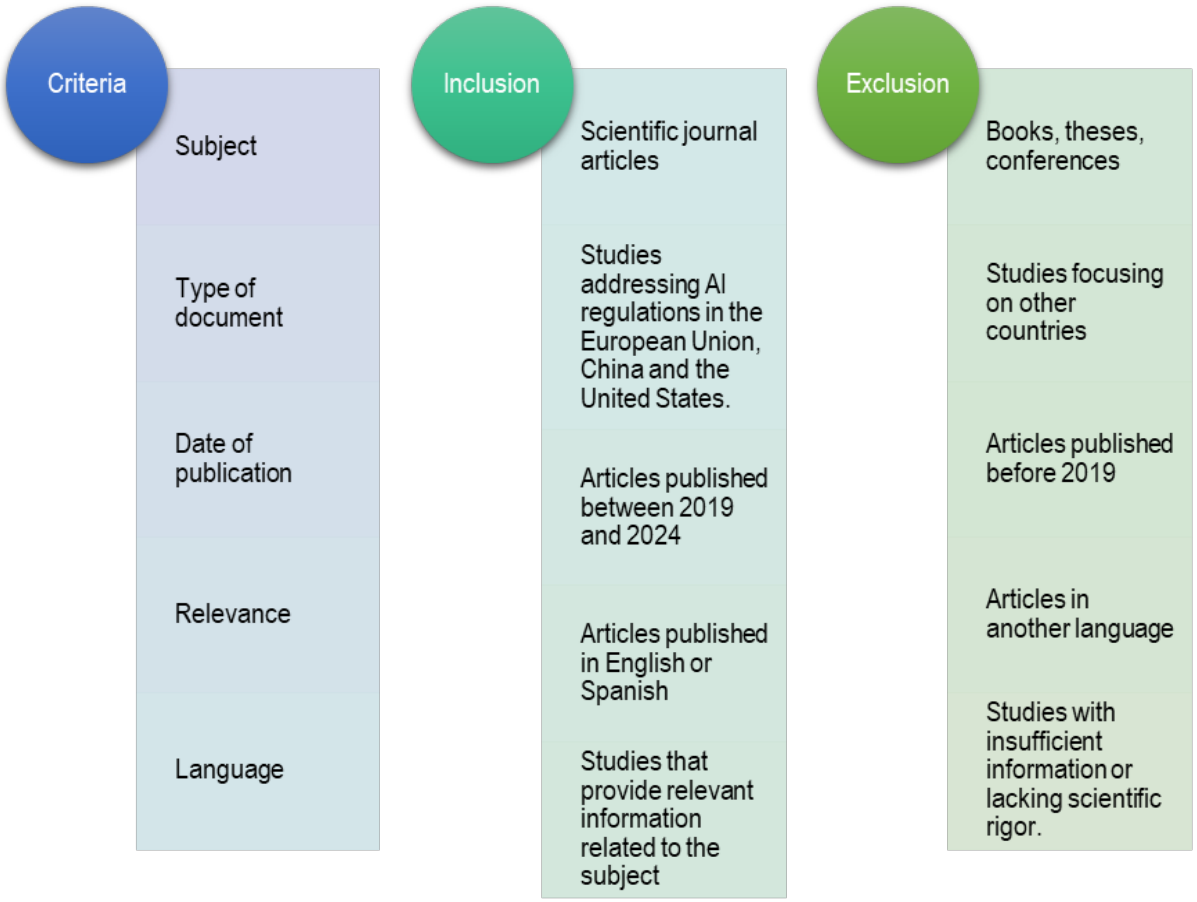

Figure 1. Selection criteria

During the development of this procedure, a rigorous review of the titles and abstracts of the articles identified through the search was carried out. Subsequently, relevant information was extracted from the selected articles based on the objectives of the study, the context of the research, the methodologies employed, the main findings, and the conclusions obtained.

Once the information had been compiled and organized, a comprehensive thematic analysis of the findings was carried out. This analysis focused on identifying common patterns, significant differences, and innovative approaches to AI regulation.

Finally, the procedure concluded with the synthesis of the evidence found, which was distributed according to the particularities of the contexts selected as relevant to the study.

RESULTS AND DISCUSSION

Comprehensive and Transparent Approach in the European Union (EU)

According to the literature reviewed, the European Union (EU) is configured as a unique political and economic association at the global level, composed of 27 European countries whose main objective of this regional bloc is to promote peace, stability, and the welfare of its citizens. Likewise, the results indicate that the EU plays a fundamental role in international governance, exerting a relevant influence in the global sphere.[38,44,45]

This organization has established a comprehensive regulatory framework with the adoption of the IA Act on April 21, 2021. The evidence found highlights it as a pioneering law that imposes specific restrictions on certain uses of artificial intelligence and requires greater transparency on the part of companies. This legislative framework is one of the most ambitious globally, from a perspective based on risk to AI systems and ethics principles.[6,37,46,47]

The AI Act requires companies to thoroughly document the development of their AI models and take responsibility for any harm that may result from systems classified as high-risk. Findings indicate that this regulation includes a requirement to conduct impact assessments to identify and mitigate potential threats prior to deploying such systems.[36,37,47]

Similar to the preceding law, the General Data Protection Regulation (GDPR) constituted a benchmark in data protection by being one of the first entities to regulate AI in such a comprehensive manner. This regulation

also includes the creation of a list of prohibited AI systems, such as real-time facial recognition databases in public spaces and emotional recognition technology in work and educational contexts.[2,24,26] In addition, companies developing AI models must be more transparent about how they train their models and must report serious incidents and details about the energy consumption of their systems.[39,48,49]

Although both of these regulations have strong support in the academic literature[6,36,46,46,47,50], it is important to recognize that these legal frameworks do not eliminate the risks faced by humans in the use of artificial intelligence. While these European Union initiatives lay the groundwork for other countries to follow suit and ensure transparency, safety, and accountability in the use of AI globally, gaps need to be addressed to ensure effective and comprehensive regulation of these technologies.[51,52]

Reactive and Fragmented Approach in China

China is seen as a leading power in the field of artificial intelligence. There is full consensus that the Chinese government has made significant investments and implemented deliberate strategies to drive the development and application of AI solutions in a variety of sectors.[53,54,55,56]

In the case of China, a more fragmented approach to AI regulation is contemplated, addressing specific technologies as they emerge. This approach allows for rapid reaction to technological advances and the risks they bring, which is evident in the regulation of algorithmic recommendation services, deepfake technologies, and automated content generators. However, this approach also has limitations, as it needs a unified vision.[57,58,59,60]

This fragmented approach could change with the possible introduction of a more holistic AI law. Accordingly, China's State Council, the country's top government body, is proposing a comprehensive AI law on its legislative agenda. Among its purposes is to establish a more unified and comprehensive regulatory framework that would encompass the entire spectrum of AI technology.[55,59,61]

Currently, Chinese AI companies are already subject to numerous regulations. For example, any foundational AI model must be registered with the government prior to its release to the public. This registration allows for tighter control and continuous monitoring of technological developments, ensuring that they adhere to established regulations.[53,55,62]

The evidence found supports China's desire to maintain control over AI development while ensuring that this technology is used safely and ethically. Conversely, it still requires the transition to a more comprehensive AI law that provides a more coherent and comprehensive regulatory framework.

Gradual and Decentralized Approach in the U.S.

In the United States, regulation of artificial intelligence (AI) is more gradual and decentralized, reflecting the diverse and rapidly evolving nature of this technology. Despite significant initiatives such as the AI Bill of Rights and executive orders for the safe and reliable development of AI, concerns persist about the applicability and effectiveness of these measures.[11,63]

The U.S. Congress continues to debate the appropriate regulatory structure for AI. This debate should focus on how to balance the promotion of innovation in the field of artificial intelligence to maintain competitiveness and technological progress while ensuring that this innovation occurs ethically and responsibly, respecting the individual and collective rights of citizens.[8,59,64,65,66]

Even so, this country has been characterized by the use of AI regulations in its states. Consequently, several states have moved forward with their laws in specific areas. For example, New York has implemented laws that regulate the use of AI in hiring decisions, while California has strengthened its data privacy laws to include specific provisions on AI.[67,68]

At this point, it is possible to assert that this decentralized approach allows states to experiment with different regulatory approaches, which can result in a rich diversity of policies tailored to specific local contexts. However, the lack of a unified federal regulatory framework can lead to inconsistencies in enforcement and compliance challenges for organizations that must adapt to multiple state regulations.

CONCLUSIONS

The study reveals that The European Union has set a significant precedent with the adoption of the AI Law, which imposes specific restrictions and seeks to establish a global standard for the regulation of artificial intelligence, similar to the impact of the GDPR on data protection. On the other hand, China is in the process of transitioning towards a more unified and holistic regulation of AI, with the possible introduction of a law covering the entire technology spectrum and the creation of a national AI bureau to oversee its development, reflecting an effort to consolidate and strengthen its regulatory framework. In the United States, AI regulation remains piecemeal and decentralized, with initiatives at both the federal and state levels presenting challenges in terms of consistency and enforceability despite significant efforts such as the AI Bill of Rights.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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