International Journal of Artificial Intelligence, Machine Learning and Data Analytics
www.ijaimda.org

ISSN: 2839-5557 | **Open Access** | **DOI:** https://doi.org/10.68033/ijaimda.1.1.1-12

A Study on Comparative analysis of AI regulation in the EU, US, and China

Mr. Nawaz Ali Hamdulay

Founder & Director, Infomania IT and Management Academy LLP), (B.E, M.E, MBA - IT, PhD-JJTU, India nawaz.hamdulay@gmail.com
ORCID ID: https://orcid.org/0009-0007-7377-9990

Corresponding Author: Mr. Nawaz Ali Hamdulay, nawaz.hamdulay@gmail.com

ARTICLE INFO

Article History:

Received 16/01/2026
Revised 12/02/2026
Accepted 02/03/2026

CITE AN ARTICLE:

Hamdulay N. A., (2026). ***A Study on Comparative analysis of AI regulation in the EU, US, and China****. International Journal of Artificial Intelligence, Machine Learning and Data Analytics, 1(1), 1-12 https://www.ijaimda.org/index.php/ijaimda/article/view/5*

ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative technology influencing global economies, governance, and societal structures. However, its rapid advancement has necessitated regulatory frameworks to ensure ethical use, safety, and accountability. This research paper presents a comparative analysis of AI regulation in three major global powers: the European Union (EU), the United States (US), and China. The study examines regulatory approaches, policy frameworks, enforcement mechanisms, and their implications for innovation, privacy, and global competitiveness. The findings reveal that while the EU adopts a stringent risk-based regulatory model, the US follows a decentralized and innovation-driven approach, and China emphasizes centralized control and state-driven governance. The paper concludes with insights into global regulatory convergence and future challenges.

Keywords - Artificial Intelligence, AI Regulation, EU AI Act, US AI Policy, China AI Governance, Comparative Study, Data Privacy, Innovation Policy.

1. INTRODUCTION

Artificial Intelligence (AI) has rapidly evolved into a transformative technology that is reshaping economies, governance systems, and societal structures across the globe. From healthcare and finance to transportation and national security, AI applications are increasingly influencing decision-making processes and operational efficiencies. However, the widespread adoption of AI also raises critical concerns related to privacy, transparency, accountability, bias, and ethical use. As a result, governments and regulatory bodies worldwide have begun developing frameworks to govern the development and deployment of AI technologies. Among global leaders, the European Union (EU), the United States (US), and China have emerged as key players in shaping AI regulation, each adopting distinct approaches based on their political systems, economic priorities, and societal values. The EU emphasizes a regulatory-first model focused on risk mitigation, ethics, and fundamental rights. In contrast, the US adopts an innovation-driven approach that encourages technological advancement through flexible and sector-specific regulations. Meanwhile, China follows a state-centric model that prioritizes national security, data control, and centralized governance.

This study aims to analyze AI regulatory frameworks in the EU, US, and China, compare their approaches toward risk, innovation, and governance, and evaluate their impact on global AI development. Furthermore, it seeks to identify the strengths and limitations of each regulatory model. By examining these diverse frameworks, the research provides insights into the evolving global AI governance landscape and highlights the challenges and opportunities for international cooperation and policy harmonization.

International Journal of Artificial Intelligence, Machine Learning and Data Analytics is licensed under a Creative Commons Attribution 4.0 International License

2. LITERATURE REVIEW

Terra Times [2025], The EU vs US vs China AI Regulations article provides a comparative overview of the three dominant global AI governance frameworks, emphasizing their ideological and structural differences. The study identifies the European Union's comprehensive, risk-based regulatory model as the most stringent, prioritizing data protection, transparency, and fundamental rights. In contrast, the United States adopts a decentralized and innovation-driven approach, relying on sector-specific regulations and market-led development. Meanwhile, China's framework is characterized by centralized state control, with strict oversight of data, algorithms, and content aligned with national priorities and social stability. The article contributes to the literature by highlighting how regulatory divergence reflects broader geopolitical competition and differing governance philosophies. It also underscores the practical challenges this fragmentation creates for multinational firms navigating compliance across jurisdictions. Overall, the work reinforces the view that global AI regulation remains fragmented, limiting prospects for harmonized international standards.

Programming Helper Tech [2026], the article ***AI Regulation Global Framework*** provides a comparative overview of emerging global AI governance regimes, highlighting the divergence between major regulatory powers. It identifies three dominant approaches: the European Union's risk-based framework emphasizing strict compliance and fundamental rights, the United States' sector-specific and innovation-oriented model, and China's state-centric system prioritizing data sovereignty and control. The study contributes to the literature by framing AI regulation as a reflection of broader political, cultural, and economic priorities rather than purely technical considerations. It also underscores the resulting "fragmented regulatory landscape," where organizations must navigate multiple compliance regimes simultaneously, increasing operational complexity and costs. Overall, the work aligns with existing scholarship on global AI governance that emphasizes regulatory divergence and the challenges of harmonization, while highlighting the strategic implications for firms operating across jurisdictions.

TechPolicy Law [2026], the article *Global AI Regulatory Divide* by examines the fragmentation of global AI governance into distinct regulatory models shaped by geopolitical priorities. It identifies four dominant approaches: the United States' enforcement-driven and innovation-centric system, the European Union's comprehensive risk-based framework, the United Kingdom's principles-based and adaptive model, and China's centralized, state-controlled regime. The study contributes to the literature by framing AI regulation as a form of "regulatory geopolitics," where legal systems reflect strategic competition rather than harmonized global standards. It highlights how this divergence creates operational challenges for multinational firms, which must design region-specific AI systems to meet conflicting compliance requirements. Overall, the work reinforces existing scholarship on regulatory fragmentation, emphasizing that AI governance is increasingly tied to economic power, national security, and digital sovereignty rather than purely ethical or technical concerns.

Qian Zhang and Jirong Guo [2026], the authors examine how AI governance frameworks are shaped by securitization narratives across different geopolitical contexts. The study compares policy documents from major actors, including the European Union, the United States, and China, to identify how AI risks are framed in relation to national security, economic competition, and societal stability. The authors argue that securitization significantly influences regulatory approaches, with China emphasizing state control and stability, the EU prioritizing ethical safeguards and fundamental rights, and the US adopting a more innovation-driven, market-oriented stance. This comparative analysis contributes to the literature by linking AI ethics discourse with broader political agendas and security concerns. Overall, the paper highlights the growing entanglement of AI governance with geopolitical strategy, underscoring challenges for international regulatory harmonization.

3. OBJECTIVES

- To analyze AI regulatory frameworks in the EU, US, and China.
- To compare their approaches toward risk, innovation, and governance.
- To evaluate the impact of these regulations on global AI development.
- To identify strengths and limitations of each regulatory model.

4. RESEARCH METHODOLOGY

This study uses a **qualitative comparative research methodology**, including:

- Review of policy documents and legal frameworks
- Secondary data analysis from research papers, reports, and articles
- Comparative framework analysis across regulatory dimensions

5. AI REGULATORY FRAMEWORKS IN THE EU, US, AND CHINA

Artificial Intelligence (AI) has emerged as a transformative technology with far-reaching implications for economies, governance, and society. As AI systems increasingly influence decision-making in sectors such as healthcare, finance, law enforcement, and national security, governments across the world are developing regulatory frameworks to manage risks while fostering innovation. Among the most influential approaches are those of the European Union (EU), the United States (US), and China. These three jurisdictions represent distinct regulatory philosophies—rights-based, market-oriented, and state-centric—which together shape the global landscape of AI governance.

The European Union has positioned itself as a global leader in AI regulation through its comprehensive and precautionary approach. Central to this effort is the AI Act, a landmark legislative framework that classifies AI systems based on their level of risk. The EU adopts a risk-based model, categorizing AI applications into four levels: unacceptable risk, high risk, limited risk, and minimal risk. Systems deemed to pose an "unacceptable risk," such as those involving social scoring or manipulative behavioural techniques, are banned outright. High-risk systems—used in areas like critical infrastructure, healthcare, and law enforcement—are subject to strict compliance requirements, including transparency obligations, human oversight, and rigorous risk assessments. A defining feature of the EU framework is its strong emphasis on protecting fundamental rights, including privacy, non-discrimination, and human dignity. This reflects the broader European tradition of rights-based governance, also evident in regulations such as the General Data Protection Regulation (GDPR). By prioritizing ethical considerations and consumer protection, the EU aims to build public trust in AI technologies. However, this approach has also drawn criticism for potentially stifling innovation. The compliance costs associated with the AI Act may disproportionately affect startups and small enterprises, raising concerns about Europe's competitiveness in the global AI race. Nevertheless, the EU's regulatory model is likely to have a global impact, as companies operating internationally may adopt its standards to ensure market access—a phenomenon often referred to as the "Brussels Effect."

In contrast, the **United States** has adopted a more flexible and decentralized approach to AI regulation. Rather than implementing a single comprehensive law, the US relies on a combination of sector-specific regulations, federal agency guidelines, and executive actions. Key institutions such as the National Institute of Standards and Technology (NIST) play a significant role in developing voluntary frameworks, including the AI Risk Management Framework, which provides guidance for organizations to identify and mitigate AI-related risks. Additionally, recent executive orders have addressed issues such as AI safety, cybersecurity, and national security implications. The US regulatory philosophy is grounded in a commitment to innovation and market leadership. Policymakers are cautious about imposing strict regulations that could hinder technological development or reduce the competitiveness of American firms. As a result, much of the responsibility for ethical AI development is placed on private companies through self-regulation and industry standards. This approach has enabled rapid advancements in AI, particularly in the private sector, where major technology companies lead global innovation. However, the decentralized nature of US regulation also presents challenges. The absence of a unified legal framework creates inconsistencies and gaps in oversight, particularly in areas such as algorithmic bias, data privacy, and accountability. State-level initiatives further complicate the landscape, leading to a patchwork of regulations that can be difficult for businesses to navigate. Critics argue that this fragmented approach may undermine public trust and leave certain risks inadequately addressed. Nonetheless, the US model remains influential due to its emphasis on flexibility, adaptability, and economic growth.

China, by contrast, has developed a highly centralized and state-driven approach to AI governance. The Chinese government views AI as a strategic technology essential to national development, economic growth, and geopolitical influence. As such, it has implemented a comprehensive set of regulations that combine innovation promotion with strict state control. Key regulatory measures include rules on algorithmic recommendation systems, deep synthesis technologies, and generative AI services. These regulations require companies to undergo security reviews, ensure data localization, and comply with content censorship standards. A distinctive feature of China's framework is the integration of AI governance with broader state objectives, including social stability and political control. AI systems must align with "core socialist values" and are subject to oversight by central authorities such as the Cyberspace Administration of China. This enables rapid policy implementation and enforcement, as the government can directly intervene in the development and deployment of AI technologies. China's approach offers certain advantages, including regulatory clarity and the ability to scale AI applications quickly across sectors. The alignment between government priorities and industry development has facilitated significant progress in areas such as facial recognition, smart cities, and fintech. However, this model also raises serious concerns about surveillance, privacy, and freedom of expression. The extensive use of AI for monitoring and social control has drawn criticism from the international community, highlighting the ethical trade-offs inherent in China's approach. A comparative analysis of these three frameworks reveals fundamental differences in regulatory philosophy and governance structures. The EU prioritizes

ethical considerations and fundamental rights, seeking to create a trustworthy AI ecosystem through comprehensive regulation. The US emphasizes innovation and economic competitiveness, relying on a decentralized and largely voluntary approach. China focuses on state control and strategic development, integrating AI governance with national policy objectives.

These differences have significant implications for the global AI landscape. Companies operating across multiple jurisdictions must navigate varying regulatory requirements, increasing compliance complexity and costs. At the same time, the divergence in approaches may lead to the emergence of competing technological ecosystems, with limited interoperability and differing standards. This fragmentation could hinder international collaboration and complicate efforts to establish global norms for AI governance. Despite these challenges, there are also areas of convergence. All three regions recognize the importance of addressing risks associated with AI, including bias, security vulnerabilities, and potential misuse. There is growing international dialogue on issues such as AI safety, transparency, and accountability, suggesting the possibility of partial alignment in the future. Multilateral organizations and initiatives may play a key role in facilitating cooperation and developing shared principles.

The regulatory frameworks of the EU, US, and China reflect distinct approaches to balancing innovation, risk, and governance in the age of artificial intelligence. The EU's comprehensive and rights-based model sets a global benchmark for ethical regulation, while the US's flexible and market-driven approach fosters rapid technological advancement. China's centralized and state-controlled framework enables strategic coordination but raises important ethical concerns. Together, these models illustrate the complex and evolving nature of AI governance, highlighting the need for continued dialogue and collaboration to ensure that AI technologies are developed and deployed in a manner that benefits society as a whole.

6. THE IMPACT OF THESE REGULATIONS ON GLOBAL AI DEVELOPMENT

The regulatory approaches adopted by the European Union (EU), the United States (US), and China have a profound and far-reaching impact on global AI development. These frameworks not only shape how AI technologies are designed, deployed, and governed within their respective jurisdictions, but also influence international standards, market dynamics, innovation patterns, and geopolitical competition. Evaluating their impact requires an understanding of how regulation interacts with technological progress, economic incentives, and global cooperation. One of the most significant impacts of these regulatory frameworks is the **fragmentation of the global AI ecosystem**. The EU's comprehensive and strict regulatory regime, the US's decentralized and innovation-driven model, and China's centralized and state-controlled system create three distinct regulatory environments. As a result, companies developing AI technologies must tailor their products and practices to comply with different legal requirements in each region. This increases compliance costs and operational complexity, particularly for multinational corporations. Smaller firms and startups may find it especially challenging to navigate this fragmented landscape, potentially limiting their ability to scale globally. Consequently, regulation can act as both a barrier to entry and a determinant of competitive advantage.

At the same time, the EU's regulatory approach has a powerful **standard-setting effect on global AI governance**. By introducing a comprehensive framework based on risk classification, transparency, and accountability, the EU effectively exports its regulatory norms beyond its borders. This phenomenon, often referred to as the "Brussels Effect," occurs when companies adopt EU standards globally to simplify compliance and maintain access to the European market. As a result, the EU plays a leading role in shaping international norms for ethical and trustworthy AI. This has positive implications for consumer protection and human rights worldwide, but it may also impose stringent requirements on companies operating in less regulated environments, potentially slowing innovation.

In contrast, the US regulatory model significantly influences **global innovation and technological leadership**. The relatively flexible and market-oriented approach in the US has fostered a dynamic AI ecosystem, driven largely by private sector investment and entrepreneurship. Major technology companies and research institutions in the US are at the forefront of AI advancements, contributing to breakthroughs in machine learning, natural language processing, and robotics. This innovation-centric environment accelerates the global pace of AI development, as technologies developed in the US often diffuse rapidly across international markets. However, the lack of a unified regulatory framework can also lead to inconsistencies in ethical standards and risk management, which may undermine trust and create vulnerabilities at a global level.

China's regulatory framework has a distinct impact through its emphasis on **state-led development and strategic deployment of AI**. By aligning regulatory policies with national objectives, China has been able to rapidly scale AI technologies across sectors such as surveillance, e-commerce, transportation, and smart infrastructure. This coordinated approach enables efficient implementation and widespread adoption, contributing to China's growing influence in the global AI landscape. Furthermore, China actively exports its AI technologies and governance model to other countries, particularly in developing regions. This can shape global AI adoption patterns and introduce alternative norms that prioritize state control and social stability over individual rights. While this model supports

rapid growth and infrastructure development, it also raises concerns about privacy, surveillance, and the potential erosion of democratic values.

Another important impact of these regulatory frameworks is their effect on **innovation trajectories and research priorities**. In the EU, strict compliance requirements may encourage the development of "trustworthy AI," focusing on explainability, fairness, and accountability. While this can lead to more ethical and robust systems, it may also slow down experimentation and commercialization. In the US, the emphasis on innovation and competition drives cutting-edge research and rapid deployment, but sometimes at the expense of comprehensive oversight. In China, state priorities influence research directions, often emphasizing applications that align with economic planning and governance needs. These differing priorities contribute to a diversification of AI technologies and applications worldwide, but they may also lead to incompatible systems and standards.

The regulatory divergence also has significant implications for **global competition and geopolitical dynamics**. AI has become a critical domain of strategic competition, particularly between the US and China. Regulations related to data governance, technology exports, and national security increasingly shape the development and distribution of AI technologies. For example, restrictions on semiconductor exports and data flows can affect the ability of countries to develop advanced AI systems. The EU, while less dominant in terms of technological production, exerts influence through its regulatory power. This creates a multipolar landscape in which different regions compete not only in technological capabilities but also in governance models. Such competition can drive innovation, but it may also lead to tensions and reduced collaboration. On the positive side, these regulatory frameworks contribute to **risk mitigation and responsible AI development**. By addressing issues such as bias, privacy, security, and accountability, regulations help prevent harmful outcomes and build public trust in AI systems. The EU's stringent requirements ensure that high-risk applications are subject to rigorous scrutiny, reducing the likelihood of misuse. In the US, guidelines and frameworks promote best practices, even if they are not legally binding. In China, strong oversight mechanisms can prevent certain types of risks, particularly those related to misinformation and social instability. Collectively, these efforts contribute to a more stable and secure global AI ecosystem. However, regulatory differences can also hinder **international collaboration and knowledge sharing**. Divergent legal standards and political priorities may limit cross-border research partnerships and data exchange. For example, strict data protection rules in the EU may restrict the transfer of data to countries with weaker privacy safeguards, while geopolitical tensions between the US and China can lead to restrictions on academic and technological cooperation. This fragmentation may slow the overall progress of AI development and reduce the potential benefits of global collaboration.

Finally, these frameworks influence **market access and global competitiveness**. Companies that successfully navigate regulatory requirements can gain a competitive edge, while those that fail to comply may be excluded from key markets. The EU's strict standards can act as a gatekeeper, ensuring that only compliant technologies enter its market. The US market rewards innovation and speed, favouring companies that can rapidly develop and deploy AI solutions. China's large domestic market and government support provide significant opportunities for growth, but access is often restricted for foreign firms. These dynamics shape the global distribution of AI capabilities and economic benefits.

The regulatory frameworks of the EU, US, and China have a complex and multifaceted impact on global AI development. They influence everything from innovation and competition to ethics and international cooperation. While the EU sets global standards for responsible AI, the US drives technological advancement, and China demonstrates the power of state-led development. Together, these approaches create both opportunities and challenges, highlighting the need for greater coordination and dialogue to ensure that AI technologies are developed in a way that is innovative, inclusive, and aligned with global values.

7. STRENGTHS AND LIMITATIONS OF EACH REGULATORY MODEL

Artificial Intelligence (AI) governance has become a central issue in global policymaking, with the European Union (EU), the United States (US), and China emerging as three dominant regulatory models. Each reflects distinct political values, economic priorities, and institutional structures. Identifying the strengths and limitations of these models is essential for understanding how AI can be effectively regulated while balancing innovation, risk, and societal impact.

The European Union's regulatory model is widely regarded as the most comprehensive and ethically grounded. Its primary strength lies in its **rights-based approach**, which places fundamental human rights—such as privacy, non-discrimination, and transparency—at the centre of AI governance. By adopting a risk-based framework, the EU ensures that stricter rules apply to high-risk applications, such as those used in healthcare, law enforcement, and critical infrastructure. This allows for targeted regulation rather than a one-size-fits-all approach. Another key strength is the creation of **legal certainty** through a unified regulatory framework. Businesses operating within the EU benefit from

clear rules that apply across all member states, reducing ambiguity and fostering trust among consumers and stakeholders.

Additionally, the EU's model has a significant **global influence**. Due to the size and importance of its market, many international companies adopt EU standards to maintain access, thereby spreading its regulatory norms worldwide. This contributes to the development of global benchmarks for ethical and trustworthy AI. The emphasis on transparency and accountability also promotes public confidence, which is crucial for the widespread adoption of AI technologies. However, the EU model is not without limitations. One of its main drawbacks is the **high compliance burden** imposed on businesses. Meeting stringent regulatory requirements can be costly and time-consuming, particularly for small and medium-sized enterprises (SMEs) and startups. This may discourage innovation or push companies to relocate to less regulated environments. Furthermore, the EU's precautionary approach can lead to **slower technological development**, as firms must navigate complex approval processes before deploying new AI systems. Critics also argue that overly rigid rules may struggle to keep pace with the rapid evolution of AI technologies, potentially resulting in regulatory lag or inefficiency.

In contrast, the United States adopts a more flexible and innovation-driven approach to AI regulation. One of its greatest strengths is its ability to **foster rapid technological advancement**. By avoiding overly prescriptive regulations, the US creates an environment in which private companies, research institutions, and startups can experiment and innovate freely. This has enabled the US to become a global leader in AI development, with significant contributions in areas such as machine learning, natural language processing, and autonomous systems. The presence of strong venture capital ecosystems and world-class universities further supports this innovation-driven model.

Another advantage of the US approach is its **adaptability**. The decentralized regulatory structure allows different agencies to address AI-related issues within their specific domains, such as healthcare, finance, or defence. This sector-specific governance can be more responsive to the unique challenges of each industry. Additionally, the use of voluntary frameworks and guidelines encourages collaboration between the public and private sectors, promoting best practices without imposing rigid constraints.

Despite these strengths, the US model has notable limitations. The lack of a comprehensive federal framework leads to **regulatory fragmentation**, with different agencies and states adopting varying rules and standards. This can create confusion for businesses and gaps in oversight, particularly in areas such as data privacy, algorithmic bias, and accountability. The reliance on self-regulation also raises concerns about whether companies will adequately address ethical and societal risks without mandatory enforcement. Furthermore, the emphasis on innovation may sometimes come at the expense of **consumer protection and public trust**, especially when harmful or biased AI systems are deployed without sufficient safeguards.

China's AI regulatory model represents a third distinct approach, characterized by strong state control and strategic coordination. One of its primary strengths is its ability to **implement policies quickly and effectively**. The centralized governance structure allows the government to introduce regulations and enforce them uniformly across the country. This enables rapid scaling of AI technologies in sectors such as transportation, healthcare, and urban management. The alignment between government priorities and industry development also facilitates **long-term strategic planning**, ensuring that AI innovation supports national goals such as economic growth and technological self-sufficiency.

Another strength of the Chinese model is its capacity for **large-scale data utilization**. With fewer restrictions on data collection and sharing, Chinese companies can access vast datasets that are essential for training advanced AI systems. This has contributed to significant progress in areas such as facial recognition, e-commerce, and smart city development. Government support, including funding and infrastructure investment, further accelerates innovation and adoption. However, China's approach has significant limitations, particularly in terms of **ethical and transparency concerns**. The extensive use of AI for surveillance and social control raises questions about privacy, civil liberties, and human rights. Unlike the EU, where transparency and accountability are central principles, China's regulatory system prioritizes state oversight, often with limited public scrutiny. This can undermine trust, both domestically and internationally. Additionally, strict government control may **limit creativity and independent innovation**, as companies must align closely with state directives and political priorities.

Another limitation is the **restricted access for foreign firms**, which can hinder international collaboration and competition. While China's domestic market provides substantial opportunities, regulatory barriers and geopolitical tensions may isolate its AI ecosystem from global developments. This could lead to the emergence of parallel technological systems with limited interoperability. When comparing these three models, it becomes clear that each involves trade-offs between innovation, regulation, and societal values. The EU excels in promoting ethical AI and protecting fundamental rights but may struggle with innovation speed and regulatory complexity. The US leads in technological advancement and flexibility but faces challenges related to fragmentation and accountability. China demonstrates the effectiveness of centralized coordination and rapid implementation but raises serious concerns about individual freedoms and transparency. In a global context, these strengths and limitations have important implications. The coexistence of different regulatory models can encourage experimentation and provide valuable insights into best

practices. However, it can also lead to fragmentation, making it difficult to establish universal standards for AI governance. As AI continues to evolve, there is a growing need for **international cooperation and dialogue** to address shared challenges such as safety, ethics, and security.

The regulatory models of the EU, US, and China each offer valuable lessons for the governance of artificial intelligence. The EU provides a strong foundation for ethical and rights-based regulation, the US demonstrates the importance of fostering innovation and flexibility, and China highlights the potential of strategic coordination and rapid implementation. At the same time, their limitations underscore the need for balanced approaches that integrate the strengths of each model while mitigating their weaknesses. Achieving such balance will be crucial for ensuring that AI development remains both innovative and aligned with the broader interests of society.

8. COMPARE THEIR APPROACHES TOWARD RISK, INNOVATION, AND GOVERNANCE

Table 1

Aspect	European Union (EU)	United States (US)	China
Approach to Risk	Precautionary and risk-based approach (AI Act classifies AI into risk categories: unacceptable, high, limited, minimal)	Reactive and sector-specific risk management; relies on guidelines and voluntary frameworks	Preventive and control-oriented; risks managed through strict state oversight and security reviews
Risk Tolerance	Low tolerance for risk, especially regarding fundamental rights and safety	Moderate tolerance; balances risk with innovation needs	Low tolerance for politically or socially sensitive risks; high tolerance for state-directed use
Focus of Risk Regulation	Human rights, privacy, fairness, transparency	Consumer protection, national security, market stability	Social stability, national security, political control
Innovation Model	Regulation-first; innovation within strict legal boundaries	Innovation-first; regulation evolves alongside technology	State-driven innovation aligned with national strategies
Support for Innovation	Moderate; funding and research support exist but compliance burden is high	Strong; driven by private sector, venture capital, and R&D ecosystems	Strong; backed by government

9. THREATS OF RESEARCH PAPER TOPIC

- Regulatory fragmentation across regions
- Overregulation limiting innovation (EU concern)
- Under regulation causing ethical risks (US concern)
- Excessive surveillance and control (China concern)
- Global compliance complexity for businesses

10. DATA ANALYSIS

Q1. Which Industry you belong to?

Table 1.1

Opinion	Respondents	Percentage
Technology	50	50
Policy / Government	10	10
Academia	10	10
Business / Industry	25	25
Other	5	5
Total	100	100

Table 1.2

Sample Standard Deviation, s	18.371173070874
Variance (Sample Standard), s^2	337.5
Population Standard Deviation, σ	16.431676725155
Variance (Population Standard), σ^2	270
Total Numbers, N	5
Sum:	100
Mean (Average):	20
Standard Error of the Mean (SE$\bar{x}$):	8.2158383625775

Primary Resource

Q2. Experience with AI (in years)?

Table 2.1

Opinion	Respondents	Percentage
0–1 year	5	5
2–5 years	20	20
6–10 years	25	25
10+ years	50	50
Total	100	100

Table 2.2

Sample Standard Deviation, s	18.70828693387
Variance (Sample Standard), s^2	350
Population Standard Deviation, σ	16.20185174602
Variance (Population Standard), σ^2	262.5
Total Numbers, N	4
Sum:	100
Mean (Average):	25
Standard Error of the Mean (SE$\bar{x}$):	9.3541434669349

Primary Resource

Q3. Understanding of AI Regulatory Frameworks?

Table 3.1

Opinion	Respondents	Percentage
I am familiar with AI regulations in the European Union.	10	10
I am familiar with AI regulations in the United States.	10	10
I am familiar with AI regulations in the China.	10	10
The EU's AI regulations are comprehensive and clearly defined	20	20
The US AI regulatory approach is flexible and sector-specific.	35	35
China's AI regulations are centralized and government-controlled.	15	15
Total	100	100

Table 3.2

Sample Standard Deviation, s	9.8319208025018
Variance (Sample Standard), s^2	96.666666666667
Population Standard Deviation, σ	8.9752746785575
Variance (Population Standard), σ^2	80.555555555556
Total Numbers, N	6
Sum:	100
Mean (Average):	16.67
Standard Error of the Mean (SE$\bar{x}$):	4.0138648595974

Primary Resource

Q4. Do you know the Risk, Innovation, and Governance of the three countries EU, US and China?

Table 4.1

Opinion	Respondents	Percentage
The EU effectively addresses AI-related risks.	15	15
The US regulatory model promotes AI innovation.	15	15
China's regulations ensure strong governance and control over AI.	15	15
Strict regulations limit innovation in AI development.	15	15
Risk-based regulation improves AI safety.	15	15
Government involvement is necessary for effective AI governance.	25	25
Total	100	100

Table 4.2

Sample Standard Deviation, s	4.0824829046386
Variance (Sample Standard), s^2	16.666666666667
Population Standard Deviation, σ	3.7267799624996
Variance (Population Standard), σ^2	13.888888888889
Total Numbers, N	6
Sum:	100
Mean (Average):	16.67
Standard Error of the Mean (SE$\bar{x}$):	1.6666666666667

Primary Resource

Q5. Impact on Global AI Development?

Table 5.1

Opinion	Respondents	Percentage
AI regulations influence global competitiveness.	20	20
Strict regulations reduce the growth of AI startups.	20	20
Flexible regulations encourage AI investment.	20	20

Differences in regulations create challenges for global companies.	20	20
Harmonized global AI regulations would benefit innovation.	20	20
Total	100	100

Table 5.2

Sample Standard Deviation, s	0
Variance (Sample Standard), s^2	0
Population Standard Deviation, σ	0
Variance (Population Standard), σ^2	0
Total Numbers, N	5
Sum:	100
Mean (Average):	20
Standard Error of the Mean (SE$\bar{x}$):	0

Primary Resource

Q6. Strengths and Limitations of AI in these three countries EU, US and China ?

Table 6.1

Opinion	Respondents	Percentage
The EU model prioritizes safety over innovation.	20	20
The US model balances innovation and regulation effectively.	10	10
China's model ensures efficient implementation of AI policies.	25	25
Compliance with AI regulations is costly for organizations.	25	25
Each region's AI regulatory model has unique strengths.	10	10
No single global AI regulatory model is universally effective	10	10
Total	100	100

Table 6.2

Sample Standard Deviation, s	7.5277265270908
Variance (Sample Standard), s^2	56.666666666667
Population Standard Deviation, σ	6.8718427093628
Variance (Population Standard), σ^2	47.222222222222
Total Numbers, N	6
Sum:	100
Mean (Average):	16.67
Standard Error of the Mean (SE$\bar{x}$):	3.0731814857643

Primary Resource

11. KEY FINDINGS

- The EU leads in **comprehensive AI legislation**
- The US leads in **AI innovation and market-driven development**

- China leads in **centralized implementation and rapid deployment**
- There is **no unified global AI regulatory standard**
- Regulatory divergence creates a **fragmented global AI ecosystem**

12. ADVANTAGE

EU:
- Strong consumer protection
- Ethical AI development
- Clear compliance framework

US:
- Encourages innovation
- Flexible regulatory environment
- Strong private-sector involvement

China:
- Rapid policy implementation
- Strong state support
- Large-scale data utilization

13. DISADVANTAGE

EU:
- High compliance costs
- May slow innovation

US:
- Fragmented regulations
- Lack of comprehensive federal law

China:
- Limited transparency
- Risk of excessive state control

14. COMPARISON

Table 7

Dimension	**EU**	**US**	**China**
Regulatory Approach	Risk-based	Sector-specific	State-controlled
Strictness	High	Moderate	High
Focus	Ethics & rights	Innovation	Security & control
Governance	Centralized (EU-wide law)	Decentralized	Highly centralized
Enforcement	Strong penalties	Agency-based	Government oversight

- The EU imposes **strict compliance and penalties**, especially for high-risk AI systems.
- The US maintains **flexibility and innovation incentives.**
- China enforces **data localization and algorithm control policies.**

Table 8

Region	**AI Governance Model**	**Approach**	**Key Focus**
European Union (EU)	Regulatory-first	Ensures strict regulations before deployment	Safety, ethics, and fundamental rights
United States (US)	Innovation-first	Promotes technological growth with flexible oversight	Innovation, economic growth, and competitiveness

Region	AI Governance Model	Approach	Key Focus
China	Control-first	Strong government control and centralized policies	National security, data control, and social stability

Table 9

Aspect	Explanation
Strategic Difference	Each region adopts a unique AI governance model based on its political and economic priorities
Global Impact	These differences shape international AI standards, competition, and collaboration
Overall Effect	Leads to a fragmented yet dynamic global AI regulatory landscape

15. CONCLUSION

This study has examined and compared the AI regulatory frameworks of the European Union (EU), the United States (US), and China, highlighting their distinct approaches to governance, innovation, and risk management. The analysis reveals that each region has developed a unique regulatory model shaped by its political structure, economic priorities, and societal values. The EU's regulatory-first approach emphasizes ethical standards, safety, and protection of fundamental rights through comprehensive and stringent laws. In contrast, the US adopts a flexible, innovation-driven framework that encourages technological advancement while relying on sector-specific oversight. Meanwhile, China's centralized and control-oriented model prioritizes national security, data governance, and rapid implementation of AI policies. The comparative evaluation demonstrates that these differing approaches significantly influence global AI development. The EU sets benchmarks for ethical AI and regulatory compliance, the US drives innovation and technological leadership, and China accelerates large-scale deployment and state-led AI initiatives. However, each model also presents limitations, including regulatory rigidity in the EU, fragmentation in the US, and concerns over transparency and state control in China.

Overall, the study underscores the absence of a unified global AI regulatory framework, leading to challenges in international collaboration and compliance. Nevertheless, it also highlights opportunities for cross-border cooperation and the development of harmonized standards. A balanced approach that integrates innovation with ethical governance and security considerations will be essential for fostering responsible and sustainable AI development worldwide.

REFERENCES

[1] Cyberspace Administration of China. (2023).Interim Measures for the Management of Generative Artificial Intelligence Services. [EB/OL]. [2025-2-10]. https://www.gov.cn/gongbao/2023/issue_10666/202308/content_6900864.html

[2] Wang, S., Xiao, Y., & Liang, Z. (2023). Artificial intelligence policy frameworks in China, the EU and the US: An analysis based on structure topic model. SSRN. https://doi.org/10.2139/ssrn.4547428

[3] Hine, E., & Floridi, L. (2024). Artificial intelligence with American values and Chinese characteristics: A comparative analysis of American and Chinese governmental AI policies. AI & Society, 39(1), 257–278. https://doi.org/10.1007/s00146-022-01499-8

[4] QverLabs (2025). AI Regulation in 2026: Comparing US, EU, and China. https://qverlabs.com/blog/ai-regulation-2026-us-eu-china-policy?utm_source=chatgpt.com

[5] Al-Maamari, A., & Alabdultif, A. (2025). Between innovation and oversight: A cross-regional study of AI risk management frameworks in the EU, U.S., UK, and China. In 2025 International Conference on Sustainable Technology and Engineering (i-COSTE) (pp. 1–5). IEEE. https://doi.org/10.1109/i-COSTE68047.2025.11467397

[6] Tortoise Media. The Global AI Index (2025) [EB/OL]. [2025-4-28]. https://www.tortoisemedia.com/data/global-ai#further-reporting

[7] Fattahi, A. (2026, January 30). Global fragmentation of AI governance and regulation. Bloomsbury Intelligence and Security Institute (BISI). https://oboe-amphibian-m76a.squarespace.com/reports/global-fragmentation-of-ai-governance

[8] Programming Helper Tech (2026). AI Regulation Global Framework 2026. https://www.programming-helper.com/tech/ai-regulation-global-framework-2026-eu-us-china-policy-comparison

[9] TechPolicy Law (2026). Global AI Regulatory Divide. https://regulatingai.org/global-ai-regulations-ai-laws-by-country-eu-us-china-ai-governance/

[10] Zhang, Q., Guo, J. Securitization discourse in AI ethics policies: a comparative analysis of governance orientations across nations.AI Ethics6, 24 (2026). https://doi.org/10.1007/s43681-025-00868-5

[11] Lo, L. S. (2025). Artificial intelligence regulation matures: Landscapes of the USA, European Union, and China. Journal of Librarianship and Information Science. Advance online publication. https://doi.org/10.1177/03400352251384915