T15P05 / Regulating AI: Governance Challenges and Policy Implications

Topic : T15 / SCIENCE AND TECHNOLOGY POLICY
Chair : Devyani Pande (National Law School of India University)
Second Chair : Shaleen Khanal (LKY School of Public Policy, National University of Singapore)
Third Chair : Araz Taeihagh (National University of Singapore)

GENERAL OBJECTIVES, RESEARCH QUESTIONS AND SCIENTIFIC RELEVANCE

The governance of artificial intelligence (AI) is witnessing rapid developments with the passage of the EU-AI Act, the world's first comprehensive law on AI. As a disruptive technology, AI has the potential to solve global challenges like climate change, improve efficiency in various sectors like manufacturing, health, education, and transportation. However, there are socio-technical, ethical, and safety challenges of AI adoption that have been discussed extensively (Agrawal et al., 2019; Burton et al., 2020; Calo, 2017; Etzioni & Etzioni, 2017; Ruschemeier, 2023; Sood & Lim, 2023; Tan & Taeihagh, 2021). The proliferation of generative AI along with general and narrow AI has led to distinctive and unique challenges to this landscape.

In this backdrop, governance of AI has received considerable attention with governments following varied approaches ranging from self-regulation and market-based approaches and a mix of entrepreneurial and regulatory governance (Djeffal et al., 2022). For instance, while the EU follows a horizontal approach without differentiating sectors for harmonization, the US adopts a sectoral approach (Haie et al., n.d.). The EU-AI Act delineates AI systems on the basis of their risks—unacceptable, high, limited, and minimal risk, while the UK government classifies risks of AI as societal harms, misuse risks, and autonomy risks (ibid.). Such differences will have ramifications for global governance of AI and the impact of the actions of different actors like the big tech (e.g. OpenAI, Meta, Google, Microsoft) involved in developing and integrating AI technologies in products and services (Khanal et al. 2024). With the pace of innovations of such companies moving faster than legislations and policies, insights into the governance of AI systems to balance innovation and regulation will be imperative for policymaking.

The panel will explore facets related to regulation of AI focusing on the following (not limited to) questions:

· What are the different frameworks used to understand the risks and formulate governance mechanisms for AI?

· How are governments balancing the innovation across sectors with the risks of AI?

· To what extent do the current governance mechanisms for AI in the global north and south address the challenges of adoption of AI?

· What are the challenges associated with implementation of existing AI governance mechanisms in the global north and south?

· What is the role of policy learning in adoption and governance of AI, especially for middle and low income countries?

CALL FOR PAPERS

The EU-AI Act had laid the foundation for governance and regulation of AI in the world. As this legislation was being deliberated, generative AI has been introduced along with narrow and general AI, making the regulation of AI complex. The use of generative AI has had implications in the education, healthcare, finance, and entertainment sectors(Chen et al., 2023; Mc Kinsey, 2023; Sood & Lim, 2023). In jurisdictions all over the world, especially in the global north, governments are taking steps to overcome the socio-technical challenges of AI by setting up institutes and including actors such as the technology companies.

The significance of actors such as the technology companies cannot be understated in the regulation of AI since innovation and deployment of AI by them is outpacing the legislations. Several governments have also made strides in proposing guidelines and legislations and examining the evolving rules and processes will be significant for policymaking for AI.

The panel invites papers involving research related to strategies for governing AI, be it narrow or general AI

or generative AI. The papers can involve empirical work involving surveys, theoretical work on different conceptualisations of regulation of AI or evolving models focusing on the actors and their strategies towards innovation and regulation of AI.

The papers can focus on the following research questions:

· Theoretical, conceptual, or empirical studies to understand the regulatory strategies for AI in the global north and south.

· Investigating the appropriateness and effectiveness of such strategies as well as different facets of regulation and governance of AI with implications for policymaking in different jurisdictions.

· Analysis of actors involved in the operation and deployment of AI and consequences for the regulation.

· Single and comparative case studies across different countries, sectors and types of AI to study their governance.

Traditional and systematic literature reviews on governance of AI, conceptual research on regulation of AI, and surveys examining the actors and their actions with implications for policymaking for AI will be suitable for the panel.

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Session 1

Friday, July 4th 10:15 to 12:15 (B9)

Discussants

Devyani Pande (National Law School of India University)

What is the relationship of trust in high-risk AI systems and institutional trust with policy preferences of public? Variations across Singapore, Seoul, and Tokyo

Shaleen Khanal (LKY School of Public Policy, National University of Singapore)

Devyani Pande (National Law School of India University)

Araz Taeihagh (National University of Singapore)

Abstract: Mechanisms of building public trust in emerging technologies are intrinsically linked to public's preferences towards policy instruments (Migchelbrink & Raymaekers, 2022; Aïmeur et al., 2016). To understand public trust in high-risk AI systems, studies have explored various drivers of trust in technology, technical features, role of actors, and institutions (Avin et al., 2021). However, study on public preferences about the policy instruments to govern AI systems is lacking. Evaluating public perceptions towards policy measures to combat risks of high-risk AI systems will throw light on factors significant for improving public trust in their operation and adoption. The two key research questions of this study are: 1) How does trust in policy actors such as the government, big tech companies, and civil society shape policy preferences of the public towards high-risk AI? and 2) How do policy packages and policy preferences shape public trust towards high-risk AI systems? Does trust in AI impact policy preferences towards these systems? To understand the public's policy preferences, we classify policy measures on high-risk AI systems into 6 key categories based on their function: information dissemination related measures, measures for research and development or piloting, safety-based implementation measures, standardization rules for personnel involved in operations and decisions, rules for adoption of the systems, and transparency-related rules. We have conducted public surveys in the cities of Singapore, Seoul, and Tokyo where governments have been pro-active in adopting AI systems and have proposed guidelines for their regulations. Given the significant divergence in public trust in high-risk AI systems, and policy actors among these cities, this makes for a unique context to study public preferences for policy measures and actors. Using responses from sample size of 3600 respondents across three cities of Singapore, Seoul, and Tokyo, we conduct the research in two stages. In the first stage, we describe the public preference towards different policy measures and the trust in actors to regulate high-risk AI systems. In the second stage, we conduct a structural equation modelling to examine the relationship between trust in actors and policy preferences; and impact of policy preferences on trust in high-risk AI systems. The results provide empirical evidence for regulation of high-risk AI systems and recommendations for improving the trust in their operation and adoption.

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Regulatory Policy and Implementation for AI Governance - Reflections on AI Usage Guideline at Taipei City

Naiyi HSIAO (National Chengchi University)

Regulatory Policy and Implementation for AI Governance - Reflections on AI Usage Guideline at Taipei City

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Abstract

The widespread adoption of Artificial Intelligence (AI), particularly the generative AI (GenAI), have been penetrating all public service and administrative domains in government. More and more AI use cases have demonstrated to help public organizations enhance efficiency, effectiveness, and quality outcome. Nevertheless, the costs to realize the AI expected benefit and accompanying risk remain challenging and largely under-explored and evidenced.

Responding to both benefit and risk of AI adoption, Taipei City Government (TCG), governing the capital city of Taiwan, started AI innovation program under its Smart City Initiative since early 2024 and meanwhile drafted AI Usage Guideline (AIUG). The author participated in the AIUG drafting process and collected secondary data via a series of discussion with both TCG agencies and various domain experts outside TCG. After AIUG enacted in September 2024, the author started conducting further interviews with the public servants at TCG agencies proposing the AI pilot projects coupled with AIUG compliance. The current study, under the AI adoption contexts above, aims to explore how TCG deals with AI governance issues, as well as how AIUG may be actually implemented and improved in the agencies to ensure responsible balance between the expected AI benefit and potential risk.

The empirical evidences at this point show that AIUG enacted at TCG has contributed to the proposing AI pilot projects sorting out the relevant governance issues, particularly for those strictly prohibited as outlined in the EU AI Act. For the AI use cases at high, moderate, and low risk categories, however, the TCG public servants have reported vague judgments and usually required assistance of information technology (IT) professionals. The collaboration between various business domains and IT public servants appears the most important factor for the successful regulatory implementation of AIUG. Due to the rapidly evolving AI techniques, however, in some use cases even AI professionals at TCG have to rely on contracted AI service providers to identify the potential risk and the proper technical deployment. Moreover, some uncertainty stem from innovative characteristics of AI applications in which neither service providers nor users fall short of foreseeing the potential costs required by AI use cases, as well as more solid potential risks.

The preliminary results above inspire how the regulatory models of AI governance should be effectively designed and implemented at the local government. The promising innovative and regulatory model seemingly points to an agile fashion of the AI project management with iterative problem finding, solution formation and testing. Particularly, the AI governance model requires the essential boundary-spanning collaboration among public service and IT units, as well as among diverse stakeholders including private AI service providers and civil society organizations concerning AI governance issues.

Can't We All Just Get Along? Opportunities and Challenges for AI Governance Cooperation Among the United States, European Union, and China

Nora von Ingersleben-Seip (University of Amsterdam)

Recent policy discussions have raised the question whether the United States, China, and the European Union can fruitfully cooperate on the governance of AI – or if China's inclusion in international AI governance efforts would rather enable the country to undermine efforts to foster AI that respects human rights and fundamental freedoms. We argue in this paper that the potential for cooperation among the three powers is determined by four factors: First, the nature of the AI governance frameworks under consideration (specifically, whether these frameworks deal – from the perspective of the government – with rights or risks

related to AI). Second, the level of distributional conflict engendered by such frameworks and the extent to which "freeriding" is enabled by them. Third, the political and policy adjustments that must be made to implement them. And fourth, whether such frameworks are negotiated in multilateral or multi-stakeholder (or even entirely private) fora. In the second part of the paper, we establish the usefulness of this analytical model by studying current efforts at cooperative AI governance among the United States, the EU, and China. The data on which we draw are limited, but they provide preliminary support for our theoretical model, as they show that the four factors impact cooperation. To do a first test of our analytical framework, we study a wealth of documents related to current efforts at cooperative AI governance among the three powers. These include official regulations, policy proposals, government representatives' statements, as well as secondary materials such as expert commentary, academic literature, think tank reports, and media coverage. These diverse sources provide a well-rounded view of the evolving landscape of global AI governance and policymaking. The evidence we collected provides preliminary support for our theoretical framework, highlighting emerging patterns of international cooperation on AI. Whether the United States, the EU, and China manage to cooperate on AI governance matters. Without meaningful cooperation among these three top AI powers, transaction costs increase for businesses that operate in all three markets at the same time, sometimes to such a degree that the businesses in question are forced to leave one or two of these markets. More importantly for the fate of humanity, without cooperation there is a much larger chance that the world will witness the emergence of AI that undermines human rights and fundamental freedoms.

Narrating AI Regulation in Germany: Stories of an Emerging Technology in the Bundestag (2017–2025)

Anne Goldmann (Universität Duisburg-Essen)

Since 2017, artificial intelligence (AI) has gained increasing political attention in various national states (Djeffal et al., 2022) – and so in Germany (Goldmann, 2022). The legislative period 2017-2021 saw various political initiatives, signaling political momentum and a growing interest in AI governance. However, despite ongoing technological progress and increasing public awareness, political initiatives at national level in Germany have recently stagnated. Instead, regulatory discussions have shifted to the European level, culminating in the adoption of the AI Act.

This paper applies the Narrative Policy Framework (NPF) (Jones et al., 2023) to examine how AI-related narratives in the German Bundestag evolved between 2017 and 2025. Using a qualitative content analysis of parliamentary debates, it identifies dominant storylines, key actors, and shifts in narrative patterns over time (Stone, 2012). The study is guided by the following research question:

How have AI-related narratives in the German Bundestag evolved, and what role do they play in shaping national AI governance?

To answer this question, this study analyzes Bundestag minutes to examine how policymakers construct AI-related narratives. The case study approach aligns with the NPF's focus on narratives as drivers of policymaking and enables an in-depth analysis of their interaction with European and global policy trends

The study aims to:

a) Identify main narratives, including different storylines and the most relevant actors.

b) Trace narrative shifts in the national AI debate over time.

This research contributes to the understanding of how narratives shape the governance of emerging technologies (Bareis & Katzenbach, 2022; Guenduez & Mettler, 2023; Paltieli, 2022) by offering an empirical case study of AI policymaking in Germany. Given the increasing political and economic importance of AI, understanding the discursive struggles surrounding its governance is crucial for assessing the direction of national and European AI policies. By situating German AI debates within the broader regulatory landscape, this paper highlights the complex interplay between political storytelling and policy decisions in the governance of emerging technologies (Ulnicane et al., 2021).

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AI Governance amidst of the great power rivalry: Examining the critical role of the Big Tech

Hongzhou Zhang (Nanyang Technological University)

The rapid emergence of artificial intelligence (AI) as the most transformative technology in recent decades has intensified global discussions about the need for inclusive and effective governance frameworks. While AI offers immense opportunities, it also presents existential risks that necessitate robust global cooperation. However, the intensifying geopolitical rivalry between the United States and China has created a "cold war" dynamic, with AI at the forefront of their competition. This rivalry, characterized by a focus on military applications and national security concerns, has become a significant obstacle to global AI governance efforts.

Existing research predominantly emphasizes the role of national policies and state-level initiatives in governing AI on a global scale. This paper argues that such analyses overlook the critical role of Big Tech companies, which have been leading AI development. Unlike nuclear or space technologies, AI's trajectory is shaped largely by private sector innovation, led by the Big Tech. Big Tech is not only exerting unprecedented financial and political influence but also increasingly acting as quasi-state actors, actively participating in geopolitics and global governance, including in the context of U.S.-China tensions. This study addresses the research gap by examining the role of Big Tech in global AI governance amidst great power rivalry. It explores how these companies influence and are influenced by geopolitical dynamics, assesses their potential to contribute to inclusive governance frameworks, and highlights the challenges their dual roles as innovators and political actors pose to global cooperation. The findings underscore the need for a nuanced approach that integrates Big Tech into global governance strategies while mitigating risks associated with their growing influence in the AI domain.

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Session 2Session 2

Friday, July 4th 16:00 to 18:00 (B9)

Discussants

Shaleen Khanal (LKY School of Public Policy, National University of Singapore)

Regulating AI for Social Good: Ethical and Regulatory Governance for AI

M. Jae Moon (Yonsei University)

Artificial intelligence (AI) affects every aspect as well as every sector of society. While we have come to pay increasing attention to its significance and impact as a game changer, we do not yet know how and to what extent it affects the replacement and creation of jobs, industrial transformation, and lifestyle changes. This lack of knowledge causes uncertainty and risk related to AI. As a result, there has been growing demand to regulate and moralize AI in order to minimize AI-caused uncertainty and risk while sustaining its positive impacts. Specifically, the public demands specific and proactive approaches to coping with them. Responding to these demands, governments and key international actors in different countries have attempted to provide regulatory frameworks and to hammer out ethical guidelines. The purpose of this study is to review the uncertainty and risk issues of disruptive technologies like AI and to assess their socio-economic and political impacts, particularly how key stakeholders (i.e., governments, industries, international organizations, NGOs, etc.) can craft ethical guidelines and principles, as well as to review how different countries shape AI regulatory frameworks.

The literature suggests that as technological advances fundamentally change the paradigm of regulatory mechanisms, a conventional regulatory politics framework (Wilson, 1980) is not capable of dealing with the nature of these technologies (i.e., AI, gene editing, blockchain, etc.) simply because defining who should benefit and who should bear the costs is quite uncertain and dynamic. Because of uncertainty regarding both the cost-benefit distributions and the opportunities and risks of emerging disruptive technologies, countries have adopted differing regulatory approaches to various technologies. In general, governments enact regulations to correct market failures, pursue collective and public interest goals, and prevent potential social problems caused by excessive pursuit of private interests. However, individual regulations do not always meet public expectations or help achieve intended social goals.

This study uses cross-country comparative case studies to examine the similarities and differences in the regulatory actions in light of the levels of certainty as well as tolerance for social risks of the technologies in given countries using the example of regulatory approaches to autonomous vehicles, which are a product of artificial intelligence and robotics technology. Particularly, we examine the EU, U.S. and three Asian countries: China, Japan, and Korea. The three Asian countries were selected because they are major economic players in the region that are all interested in the potential implications of disruptive technologies for their economic and social development. E and U.S. are included as the basis for the comparison since it is more market-oriented than other countries; the three Asian countries are considered paternalistic in their approach to markets.

This study will first discuss technology uncertainty and social risk in the context of AI technologies. Then, we will review the development of ethical guidelines for AI by different actors as a loosely institutional effort to moralize AI technologies with a specific focus on the different regulatory positions of selected countries. Finally, this study will discuss policy implications and offer policy recommendation.

Building Policy Learning Frameworks for AI Adoption in Africa

Caroline Ikiriinya (University of Nairobi)

Edwin Grimsley (Baruch College)

The rapid development and adoption of artificial intelligence (AI) technologies present both transformative opportunities and significant challenges for governments globally. While AI holds the potential to address critical issues such as healthcare access, agricultural productivity, and financial inclusion, African nations face unique challenges in adopting and governing these technologies. These challenges include limited infrastructure, a lack of regulatory frameworks, and the need to balance innovation with the protection of human rights and ethical considerations. As global governance frameworks for AI continue to evolve, especially in the global north, African countries are increasingly looking for ways to adapt these models to their own local contexts.

This paper proposes the development of policy learning frameworks that would allow African governments to effectively adopt AI technologies while mitigating risks and maximizing benefits. Given the rapidly evolving nature of AI and the regulatory landscape, it is crucial for African nations to learn from existing governance models in countries such as the EU, US, and UK, while considering the unique political, economic, and social realities they face. The study examines how AI governance frameworks in the global north—designed to address issues like accountability, transparency, and ethical use of AI—can be adapted to fit the African context, where issues such as infrastructure gaps, digital literacy, and socio-economic inequality are more pronounced.

The research further explores the role of international collaboration in the policy learning process, emphasizing the importance of knowledge sharing and partnerships between African governments, international organizations, and private sector actors. Such collaborations can help bridge the knowledge and resource gap that many African nations face in regulating AI technologies. By participating in global discussions and aligning with international standards, African countries can ensure that AI adoption is not only innovative but also responsible and inclusive. The study highlights the need for a tailored approach to AI governance that takes into account the continent's diversity and developmental goals, such as addressing poverty, inequality, and access to education.

This paper contributes to the growing body of research on AI governance by focusing on the specific needs of African countries, offering practical frameworks for policy adaptation and emphasizing the critical role of international cooperation in AI regulation. It aims to inform African policymakers about how to balance the rapid pace of technological advancement with the ethical and social challenges that come with AI adoption, ensuring that the benefits of AI are distributed equitably and sustainably across the continent.

The AI (Regulation) Race, Industrial Development, and International Economic Governance

Alexandros Bakos (Hamad Bin Khalifa University)

The AI race signifies the fierce global competition among countries and corporations, particularly the United States and China, to lead in artificial intelligence advancements for economic and strategic dominance. The AI race is morphing into an 'AI regulation race', that is a global competition among nations to develop and implement legal frameworks for governing AI – each with their own interpretations on how to balance innovation with ethical, safety, and national security concerns. One regulatory approach that has gained prominence in this context involves the use of new industrial policies. Powers that have historically relied on market-based policies, such as the US and the EU, are now embracing industrial strategies with a view to promoting Industry 4.0. They provide for a more holistic approach while promoting government intervention in spearheading digital development.

The paper explores how the race to regulate AI through industrial policies impacts international economic governance. Unlike old industrial strategy tools, new industrial policies are outward oriented and seek to reinforce a state's comparative advantages while remaining integrated in the global economy.

Nonetheless, new industrial policies allow governments to move away from multilateral (legal) frameworks and to engage in more flexible and selective structures of global economic governance. This is reflected in the rise of master frameworks, such as the Indo-Pacific Economic Framework for Prosperity (IPEF), the Americas Partnership for Economic Prosperity (APEP), and the India-Middle East-Europe Economic Corridor (IMEC). For instance, the latter establishes a vision that would transform the Gulf into what has been called "a digital anchor", creating deeper links between Europe, the Gulf, and India. Ultimately, it reflects a flexible, but self-reinforcing structure.

Through outward-looking industrial policy, states selectively deepen strategic and geopolitical ties to

like-minded partners. Beyond this, they reserve the right of eventual engagement. The conclusion of agreements, usually of a plurilateral nature, with their partners (for instance, to regulate aspects of the digital economy) is left for future determination. Nonetheless, the already existing ties, the nature of new industrial policies, and, for present purposes, the borderless characteristics of the digital economy, make it likely that such engagement is forthcoming.

The Right to have a "Right to Explanation": A Global South Perspective

Devesh Pandey (National Law School of India University)

Anubhav Bishen (National Law School of India University)

The Right to have a "Right to Explanation": A Global South Perspective

AI systems increasingly influence critical decisions in healthcare, lending, recruitment, and public benefits distribution. However, when these systems exhibit biases or make controversial decisions, a fundamental issue emerges: the lack of transparency in explaining how these decisions are made. While biased outcomes often stem from flawed training data, the responsibility for transparent and accountable decision-making lies with the organizations deploying these systems. When human officials make decisions, affected individuals can request and receive explanations. In contrast, organizations often deflect accountability for AI decisions by citing technical limitations like the 'black box' problem or data issues, leaving impacted individuals - particularly those from marginalized communities - without meaningful recourse.

AI systems create an accountability gap through opaque decision parameters and over-reliance by both government officials and private sector employees, who assume AI outputs are inherently accurate and reliable without proper verification. To address these challenges, the legislation in Global North has evolved to protect the rights of individuals falling within high-risk AI systems. The General Data Protection Regulation has come up with recitals and European Union Artificial Intelligence Act has come up statutory provision of the 'right to explanation' to protect from biased or discriminatory algorithmic decision making.

This paper undertakes an Indian perspective on the 'right to explanation'. First, the paper begins with the promise of AI in India at the policy level. In doing so, the paper goes through the problems that present in the tradition Public Distribution System (PDS), a government of India run program that distributes food grains with a focus on the poor. The use of technology, especially AI, has emerged as a panacea that claims to solve issues of discrimination, corruption, logistical problems, etc in the PDS system. Second, the paper, through the use of Martha Minow's Doctrinal Restatement method - which refers to case law to highlight issues and acknowledges the difference between settled law and emerging issues and explains the problems of using AI in tackling bias and discrimination in PDS. The paper will explain how discrimination and bias can persist in high-risk AI systems if companies designing these systems continue to hide behind the 'black box' argument and refuse to explain AI decisions Third, the paper elaborates on how the problems faced by the Global South regarding the 'right to explanation' are structurally different. The paper argues that India has weak governance structures related to accountability and transparency, both in general and specifically in digital governance. Fourth, the paper discusses the solutions available to tackle bias and discrimination in AI, and explains where universalized Global North designs face problems in Southern territories like India. Fifth, the paper normatively discusses the shortcomings of the Digital Personal Data Protection Act 2023 by highlighting the inadequacy of the current framework in addressing the right to explanation in India and finally proposes solutions to enhance and strengthen the right to explanation to ensure transparency in AI systems decision-making processes.

AI Governance in Algorithmic Trading: Some Regulatory Insights from the EU AI Act

Alessio Azzutti (University of Glasgow)

The frenzied race toward Artificial Intelligence (AI) adoption is causing profound transformations within the financial sector, rendering capital markets an increasingly complex system. These dramatic and sweeping changes are most pronounced in data-intensive and high-performance computing domains, such as algorithmic trading. While AI-powered trading offers numerous benefits to financial firms, markets, and society, it also raises significant concerns regarding potential risks to market quality, integrity, and stability. Recent studies underscore the dangers posed by AI advancements, particularly when not accompanied by robust governance and regulatory frameworks, which could lead to new and heightened risks of market abuse. Amidst this risk-prone environment, there is growing recognition among policymakers and financial regulators of the pressing need to regulate AI deployment. This emerging awareness is crucial, as effective AI governance is essential to ensure that the benefits of technological innovation are not overshadowed by its inherent risks. In this very direction, the EU AI Act stands out as a landmark effort in establishing

comprehensive AI regulation. Hence, this Article critically examines this fundamental piece of (global) legislation and compares it to sectoral regulation on algorithmic trading. By focusing on key legal provisions, the analysis demonstrates the potential superiority of the EU AI Act's regulatory requirements for providers of "high-risk" AI systems over those for deployers of algorithmic trading systems under MiFID II. The Article concludes with some ideas for future risk-based regulation of AI applications in financial trading.

(Virtual) Governing Risks of Generative Artificial Intelligence: An Analysis of Sectoral Innovation Systems in Financial Services and Healthcare

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Generative artificial intelligence has broad applications that span diverse domains, including automated decision-making, content creation, and personalized services. Despite its immense potential, GenAI also introduces various risks that stem from its technical architecture and deployment environment. It is crucial to understand what kinds of risks are involved in developing and deploying GenAI in different sectors and what approaches can be taken to properly govern the risks in facilitating innovation. This study examines the implementation of GenAI in the financial services and healthcare sectors by looking at adoption patterns, emerging risks, and risk management approaches in a sectorial innovation system framework. Data was collected by conducting 37 interviews between February and May 2024 with stakeholders across financial services, healthcare, technology firms, and regulatory bodies.

Our findings reveal distinct patterns in GenAI ecosystem development across sectors. In financial services, GenAI adoption has been driven by the need to enhance operational efficiency and decision-making. Use cases such as automated credit underwriting, personalized investment recommendations, and trading algorithms illustrate the sector's reliance on generative models. However, explainability and performance remain central concerns. Financial institutions must ensure that decisions made by GenAI systems can be substantiated to regulators, clients, and other stakeholders, particularly to avoid legal liabilities under consumer protection laws. Moreover, the performance of GenAI models in trading and investment decisions has been scrutinized, as these systems are trained on historical data and may struggle to adapt to dynamic market conditions. In healthcare, GenAI holds promise for applications such as medical diagnosis, research, and clinical support. However, the sector's emphasis on patient-centricity introduces unique challenges. Healthcare professionals prioritize accuracy and robustness in GenAI outputs, as even minor inaccuracies can have profound consequences for patient outcomes. In addition, IT infrastructure limitations, including data privacy concerns and compatibility issues with electronic health record systems, hinder the scalability of GenAI solutions. The sector's reliance on sensitive patient data also necessitates rigorous cybersecurity measures, further complicating the deployment of generative models.

This study identified two broad categories of risks associated with GenAI adoption. Technical risks include concerns about model accuracy, explainability, and robustness. In financial services, explainability is critical for ensuring that generative models' outputs align with legal and ethical standards. In healthcare, accuracy and robustness are paramount, as clinicians rely on GenAI systems to support decisions that directly impact patient care. Implementation risks stem from regulatory uncertainty, data protection requirements, and infrastructure constraints. In financial services, regulatory uncertainty is a significant barrier to scaling GenAI solutions. Institutions face difficulties in navigating evolving regulatory landscapes, which could render their investments in GenAI non-compliant. Outsourcing and third-party collaborations, while offering cost-effective solutions, exacerbate these challenges by introducing additional layers of risk related to data security and model transparency. In healthcare, infrastructure limitations and data-sharing restrictions hinder the broader deployment of GenAI. Hospitals often lack the necessary IT infrastructure and machine learning expertise to develop and deploy generative models in-house, leading to a reliance on partnerships with academic institutions. These differences underscore the importance of sector-specific policy interventions.