# FROM MODELS OF CAPITALISM TO MODELS OF REGULA-TION: COMPARING THE UNITED STATES AND CHINA IN REGU-LATING ARTIFICIAL INTELLIGENCE

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#### Abstract

This publication compares the regulatory approaches to artificial intelligence (AI) in the national institutional context of the United States and China. Through comparative normative analysis it is demonstrated that China has been ahead to adopt more binding AI regulations than the U.S., which relies on a less centralized and more market governed and ethical approach. This observation corresponds to the two different capitalist economic models – 'liberal' in the United States and 'state-permeated' in China, according to the Varieties of Capitalism (VoC) comparative literature. The risk of AI overdevelopment has brought the two global economies closer to attempting to adopt risk-averse domestic regulations and seeking global partnerships for regulating AI global diffusion. Future competition between the two technologically most savvy nations is expected in promoting their own standardized values and practices and in inspiring further academic research.

Keywords: capitalist models, regulation, Artificial Intelligence

JEL: P10, P51, O38

# Introduction

The academic debate has increasingly focused on the role of the state in globalization and technological progress. Capitalism and its institutions have so far helped diffuse technologies related to recent global artificial intelligence  $(AI)^2$  development. In parallel, AI technologies have mastered huge transformative powers to change the way governments and markets interact. Governments of

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<sup>&</sup>lt;sup>2</sup> The Organisation for Economic Co-operation and Development (OECD) "AI principles", adopted by OECD Member States in 2019, define AI as: "An AI system is a machine-based system that is capable of influencing the environment by producing an output (predictions, recommendations or decisions)". Hereafter in this text under the more generic term "AI" the author will mean Generative AI, as well as general purpose AI (GPAI) models of deep data learning, designated by the Al Office to "pose systemic risk," have additional requirements per the EU AI Act.

leading nations have been developing national strategies for growth and global competitiveness of their domestic AI industries, at the same time as they have set in place regulatory rules. Innovation and technological development have increasingly been bundled with the development good governance and safety practices. Smuha (2021, p. 3), for example, speaks of "the race to regulate AI" and "a new field of global regulatory competition… finding the most appropriate balance between protecting innovation and innovation itself".

The United States presently hosts some of the leading technological giants, such as Facebook, Amazon, Google, IBM, Microsoft and Apple, which have significantly impacted the AI global market. In 2023, 61 notable AI models originated from the U.S., against the European Union's 21 and China's 15 (Stanford University, Human-centered Artificial Intelligence, 2024). Furthermore, U.S. AI developers, such as Facebook (Llama) have become proponents of open source AI development. China, for its part, has benefited from U.S. developed open source codes for AI algorithmic programming to spur its own AI technological development. A recent study by Coleman Parkes Research Ltd. involving 1,600 leaders in various global industries showed 83 percent of China-based respondents were using GenAI. The U.S. was with a share of 65 percent (Kapital weekly, 2024).

*The object* of this article is AI's recent development in both the U.S. and China. *The subject* is AI regulatory policies enacted by the federal/central governments in the two countries. The author will use an institutional analysis that will focus on regulatory approaches towards Generative AI, or GenAI, in both global economies, and will exclude military and other national security issues. The publication draws the China-related information from English language translations of original Chinese government documents and from publications by international Chinese scholars.

# Comparing the U.S. and China in Regulating AI

#### **Theoretical Basis**

In 2001, Peter Hall and David Soskice (2001, p. 6) promoted the concept of "Varieties of Capitalism" (VoC) to define select advanced industrial economies as either liberal market or coordinated market models of capitalism (LMEs and CMEs), based on how companies build and develop their develop with local institutions and other market participants. In their seminal introduction article to "Varieties of Capitalism: The Institutional Foundations of Comparative Advantage" (2001) referring to other scholars before them, Hall & Soskice argued that "deregulation has been far reaching in liberal market economies of Britain, the United States, New Zealand and Australia, but much less extensive in

the coordinated market economies of Northern Europe and east Asia" (p. 59-61, cf Vogel 1996, Story and Walter 1997, Wood 1997, Ellis, 1998, King and Wood 1999). Drawing on previous business system theories of the 1960s, VoC initially took a strong firm centered focus and held partial or full disregard for the market role of the state. Bringing the state back to the models of capitalism, the literature on VoC subsequently addressed a third variety of capitalism, a mixed economy featuring state's increasing roles in society. Over time, Chinese political economy has been viewed as a mixed-type model, with elements of much state intervention through the dominant role in the economy of the Chinese Communist Party (CCP). In more recent academic literature, Noelke et al. (2013, 2018) proposed a capitalist model of economy which they called State-permeated Economy (SME) model in which the state was presented as holding economic as well as political control.

### AI Regulatory Approach in the United States

No comprehensive federal laws or regulations exist that are specifically guiding AI development in the United States (U.S.). The number of AI-related regulations has, however, increased in the past five years (Stanford University, Human-centered Artificial Intelligence, 2024). In 2019, then-President Donald J. Trump signed 26 Executive Orders (E.O.) that directed the National Institute of Science and Technology (NIST) to develop an AI policy framework. The 2019 National AI R&D Strategic Plan of 2019 set up key goals for federal investments in AI R&D, along with making sure that citizens' rights and safety are observed in the process. The National AI Initiative (NAII) Act of 2020 has facilitated federal investments and new public-private partnerships in AI-related R&D, aiming to keep the U.S. as world's leader in developing responsible AI systems. On October 30, 2023, President Biden signed an Executive Order (14110 E.O.), to ensure that America leads the way in both developing and managing the risks of AI". The E.O. endorses eight guiding principles and priorities, including ensuring safety and security and promoting responsible innovation and development. The E.O. also promoted the Department of Commerce to be the federal institution with large responsibility for overseeing the AI development process.<sup>3</sup> The Department takes authority over the NIST, which in January 2023 released the Artificial Intelligence Risk Management Framework (AI RMF), aimed to minimize potential negative impacts of AI systems, such as threats to civil liberties and rights.

<sup>&</sup>lt;sup>3</sup> Specifically, the Department should require from industry to share information on the development of so-called "frontier models" (large-scale machine learning models at or outside the limits of current technology), including disclosure of frontier AI computing resources and frontier AI developments by foreign companies in the U.S. controlled cloud space.

Released in 2022 by the White House's Office of Science and Technology Policy (OSTP), the Blueprint AI Bill of Rights is focused on developing the form of AI that protects civil rights and promotes democratic values in the U.S. Presented as a non-binding "framework of national declared goals and values", the Blueprint AI Bill of Rights contains five principles of good governance: 1) secure and efficient systems; 2) protection against algorithmic discrimination; 3) protection of personal data, 4) possession of information about the automated systems in use; and 5) possibility for a human alternative to the automated systems in use.

# Self-regulating 'Big' AI Industry

Announced by the White House in July 2023, major U.S. industry had agreed to share information with all levels of government about the risks of AI development. Amazon, Anthropic, Google, Inflection<sup>4</sup>, Meta, Microsoft and OpenAI all volunteered to self-regulate their business by signing a document called "Ensuring Safe, Secure and Trusted AI". Voluntary commitments included third-party security testing of tools known as red-teaming (a technique using ethical hacking to test an AI system's safety – *explanation mine*), research on AI related bias, and data privacy concerns. The agreement came shortly after OpenAI CEO Sam Altman stood a Congress testimony in May 2023 in which he favored a more interventionalist approach by federal government to mitigate the risk of an increasingly powerful AI. Judging by its name, OpenAI, in which Microsoft currently holds a substantial 49-percent share, has been a strong proponent of open-source AI – suggesting the company generally holding no strong view on regulating developing technologies.

The U.S. Congress has over time become more actively enagaged in endorsing attempts for drawing up new federal legislation on AI. Legislators from the two key political parties proposed a series of legislative proposals - from creating an independent federal office to oversee AI and requirements for the licensing of these technologies, to introducing liability for civil rights and privacy violations and a ban on deceptive AI-generated content in elections.<sup>5</sup>

<sup>&</sup>lt;sup>4</sup> Inflection's cofounder Mustafa Suleyman joined Microsoft in 2024 to develop Microsoft's Copilot.

<sup>&</sup>lt;sup>5</sup> Proposed by two senators in September 2023, the Bipartisan Framework for U.S. AI Act defines five key policy considerations for future legislation: to establish a licensing regime administered by an independent oversight body; ensure legal accountability for harms; defend national security and international competition; promote transparency; and protect consumers and kids. *Source:* Center for Security and Emerging Technology. A Democrats sponsored Algorithmic Accountability Bill of 2022 will in future require companies to have an impact assessment of their AI systems, create transparency about

#### State Legislation Goes Off the 'Ethical' Line

Various state laws have sought to fill in the gap at federal level, most notably focusing on citizens' data privacy and consumer protection. The states of California, Colorado and Virginia have emerged as state-level AI regulatory leaders. In 2018, California passed the California Consumer Privacy Act (CCPA) aimed to guard private data privacy and protection, taking an approach similar to the 2018-passed EU General Data Protection Regulation (so called GDPR). The CCPA provides the residents of California with the right: "to know what personal data is being collected; whether the data are being sold or disclosed and to whom; to refuse the sale of citizens' personal data or to refuse the access to their personal data; and to request that a business should delete any personal data". In May 2024, Colorado passed a bill on consumer protection "in interactions with artificial intelligence" that seeks to regulate the AI focusing on specific details in the AI development process, i.e. focusing AI company developers.

#### U.S. Voluntary Global Partnership for Regulation

The Biden-signed 14110 E.O. states that the U.S. should be a global leader in AI development and adoption "by engaging with international allies and partners, leading efforts to develop common AI regulatory and accountability principles, and advancing responsible global technical standards for AI."<sup>6</sup> The E.O. directs the Secretary of State, in coordination with other agencies, "to lead efforts, beyond the military and intelligence domains, to expand engagement with international allies and partners in relevant bilateral, multilateral and multi-stakeholder forums, to improve those allies' and partners' understanding of existing and planned directions and policies related to AI". The E.O.'s overarching goal is to support voluntary commitments in advancing responsible global technical standards for the development and use of AI beyond the military and intelligence domains.

The U.S. stands among 47 countries-signatories of the Organization for Economic Cooperation and Development (OECD) principles and guidelines in AI. The country is a founding member of the Global Partnership on Artificial Intelligence (GPAI), a voluntary, multi-stakeholder initiative launched in June 2020, focused on collaboration through working groups about creating responsible AI and data governance, "in a manner consistent with democratic values and human rights" (U.S. Department of State). The U.S. became a signatory in November

how such systems are used, and empower consumers to make informed choices about AI systems.

<sup>&</sup>lt;sup>6</sup> In one such effort, in July 2024, regulators from the UK, the US and the EU signed a joint agreement aimed to boost the AI safety and competitiveness (Reuters, 2024).

2023 of the so-called Bletchley declaration that has marked a significant first step in globalizing risk solutions to AI technology development<sup>7</sup>.

# AI Regulatory Approach in China

China's promotion of AI follows a policy-making strategy, which was initially addressed by President Xi Jinping in 2013 when he defined advanced technology as "the sharp weapon of the modern state" (New York Times 2018). The 13th Five-Year Plan (2016 - 2020) specified AI as key for achieving economic growth and the 14<sup>th</sup> Five-Year Plan (2021 – 2025) suggested more government investment in AI. In 2017, China's State Council issued a strategic document entitled "A New Generation Artificial Intelligence Development Plan" (AIDP). The AIDP stated that ,,the development of AI has entered a new stage", although it recognized that China was facing some key deficiencies such as, .... the lack of major original results in the basic theory, core algorithms, key equipment, high-end chips ... " (Webster et al, 2020). The AIDP outlined a three-step strategy to overcome these deficiencies and guided China through achieving future AI development goals; by 2020 AI should become an important driver of China's economic growth; by 2025, a new generation of the AI theory and technology system shall be initially established in China and by 2030, China's AI theories, technologies, and applications should achieve a world-leading level, making China a world leader in AI innovation..." (ibid.).

Over the past three years, China has rolled out some of the world's first binding national regulations on AI. In October 2021, nine agencies<sup>8</sup> published "Guiding Opinions on Strengthening Overall Governance of Internet Information Service Algorithms" ("the Opinions") for regulating algorithms use in Internet. The rules created new requirements for how algorithms are built and deployed, and for what information AI developers must disclose to the government and the public (Sheehan, 2023). The Opinions adhered "to the guidance of Xi Jinping's Thoughts on Socialism with Chinese Characteristics for a New Era" and required participation

<sup>&</sup>lt;sup>7</sup> Signed also by the EU and China, in 2023, the declaration from the UK held AI summit has sought international cooperation to resolve issues from the intentional misuse of AI technology. Bletchley Park is known as the place where the British mathematician, cryptographer and ,,the father of theoretical computer science" Alan Turing used his electrochemical machine to crack German army codes to help the advance of allied forces against Germany at the end of WWII.

<sup>&</sup>lt;sup>8</sup> Including the Cyberspace Administration of China, the Central Propaganda Department, the Ministry of Education, the Ministry of Science and Technology, the Ministry of Industry and Information Technology, the Ministry of Public Security, the Ministry of Culture and Tourism, the State Administration of Market Regulation, and the National Radio and Television Administration.

from all provincial, autonomous regions, and municipal cybersecurity offices, Party Committee propaganda departments, etc. They served as the building stone for the Algorithm Recommendation Regulation of March 2022 that is focusing on regulating the use of algorithm recommendation technologies for Internet based information.

Over the past several years, in particular, China has been criticized for widely promoting the use of AI engineered deep fakes as a propaganda tool against anti-Communist Party opposition and anti-regime sentiments. The regulation on "deep synthesis"9, China's self-invented definition of "deep machine learning", has targeted AI applications used to generate "deep fakes".<sup>10</sup> Issued jointly by three central government regulators, including China's cyber watchdog, the Cyberspace Administration of China (CAC), the Provisions on the Administration of Deep Synthesis Internet Information Services ("the Provisions") require, in Article 4, that, "the provision of deep synthesis services shall respect social morals and ethics, adhere to the correct political direction, public opinion orientation, and values to promote progress and improvement in deep synthesis services". The regulation, in Article 11, requires strong responsibility for companies to selfact against "deep fake" risks, more particular in that "deep synthesis service providers shall establish and complete mechanisms for dispelling rumors, and where it is discovered that deep synthesis information services were used to produce, reproduce, publish, or transmit false information...".

#### Ethical Norms for New Generation AI

Under the powerful Ministry of Science and Technology (MOST), the National New Generation Artificial Intelligence Governance Professional Committee published in 2021 *Ethical Norms for New Generation Artificial Intelligence* ("Ethical Norms"). The document defines the norms as "aiming to incorporate ethics into the entire AI life cycle and to promote fairness, justice, harmony, and security while avoiding such problems as bias, discrimination, privacy and information leaks" (Article 1). The "Ethical Norms" document lists four types of 'norms' for AI governance, including management norms, R&D norms, supply norms, and use norms. It does not specify how these norms are to be enforced, nor does it mention any penalties for those who violate the norms.

<sup>&</sup>lt;sup>9</sup> "Deep synthesis" is defined as: the use of technologies such as deep learning and virtual reality, which use generative sequencing algorithms to create text, images, audio, video, virtual scenes, or other information.

<sup>&</sup>lt;sup>10</sup> "Deep fake" refers to the act of faking content (images in the general case) by leveraging tools from machine learning and artificial intelligence.

### Draft Artificial Intelligence Law

A few months after the global introduction of OpenAI's ChatGPT (November 2022), China started working on drafting a "model" Artificial Intelligence Law. Developed by the Chinese Academy of Sciences initially, the draft's first version in August 2023 proposed forming a new agency, the National AI Office as well as created a negative list that should separate legitimate from ill-intentional, fake efforts in AI development. The draft AI law steps up on the Interim Measures to Govern Generative AI Service Provision in China ("the Measures"). Published in August 2023, the Measures are focused on the broad use of Gen AI calling for "respect for China's "social morality and ethics" and for upholding "Core Socialist Values"<sup>11</sup>. Further codifying AI use, in 2022 China released its first national standards for autonomous driving, and in 2023 the CAC announced plans to restrict businesses' use of facial recognition technology, promoting the plans as a way "to protect citizens' privacy" in favor of non-biometric methods. China has received a wide criticism for using AI based facial recognition software on its people for cracking down on the indigenous Uyghurs Muslim population (The Guardian, 2023).

#### China's Competitive Global Approach

The Chinese government has been making attempts to impose its own model of global AI cooperation. The Artificial Intelligence Development Plan has targeted China's efforts to deepen international cooperation on AI laws, regulations and rules (Webster et al, 2020). China advanced its ambitions to lead international AI cooperation when in his keynote address on the occasion of the 10-year-anniversary of Belt and Road Initiative in October 2023, President Xi announced the Global AI Governance Initiative. The Initiative called upon all countries ,,to work together to prevent risks and develop AI governance framework norms and standards based on broad consensus. China's international leadership ambitions were demonstrated one more time in July 2024 when the 78th UN General Assembly adopted a China-sponsored resolution to enhance international AI cooperation, presented by official Chinese media as highlighting "global consensus on AI governance and China's leadership" (Xinhua July 2, 2024).

Table 1 below shows a comparative summary of key AI framework in the U.S. and China.

<sup>&</sup>lt;sup>11</sup> An English summary can be found in Wikipedia, at Interim Measures for the Management of Generative AI Services – Wikipedia.

United States		China	
Document Type	Key Points	<b>Document</b> Type	Key Points
National AI R&D Strategic Plan (2019) (updated in 2023)	Sets out key priorities and goals for federal investments in AI R&D, ensuring people's rights and safety get observed.	A New Generation Artificial Intelligence Development Plan (2017)	Develops AI based on science and research to fast make up with AI development, lays out milestone deadlines to ensure China's future global AI leadership.
National AI Initiative (NAII) Act (2020)	Facilitates federal investments and new public-private partnerships in AI R&D to keep the U.S. as a world leader in AI development. and use of responsible AI systems.	"Guiding Opinions on Strengthening Overall Governance of Internet Information Service Algorithms" (October 2021)	Creates new requirements for algorithms and information disclosure by AI developers, governance mechanism that requires participation from provincial, autonomous regions, party committees, etc.
Executive Order (14110 E.O.) (October 2023)	Sets out guiding principles and priorities to promoting responsible innovation and development. Firms up AI institutional framework.	The Provisions on the Administration of Deep Synthesis Internet Information Services (January 2023)	Promote progress and improvement in deep synthesis services, sets out strong responsibility for companies against "deep fake" risks.
Artificial Intelligence Risk Management Framework (AI RMF) (2023)	Seeks to minimize potential negative impacts of AI systems, such as threats to civil liberties and rights.	Ethical Norms for New Generation Artificial Intelligence (Ethical Norms). (September 2021)	Incorporates ethics into AI's life cycle while avoiding bias, discrimination, privacy and information leaks.
The Blueprint AI Bill of Rights (2022)	Seeks to secure AI ethical principles to protect against algorithmic discrimination, personal data; creates the possibility for a human alternative to the automated systems.	Interim Measures for the Management of Generative Artificial Intelligence Services (August 2023).	"The Gen AI regulation". Sets in broadly the use of Gen AI, while safeguarding national security and public interest, calls for "respect for China's "social morality and ethics" and for upholding "Core Socialist Values".

# Table 1: Key AI governance framework in the United States and China

Source: Official publications

#### EU's AI Act

The study of EU's AI Act, the world's first comprehensive AI legislative effort, will make a difference in comparative models literature on AI. The EU legislation presents a showcase study for potentially being the most effective form of combining AI technological innovation, development and diffusion with risk mitigation arising from AI's wider and broader adoption. The AI Act takes a comprehensive approach to AI regulation with regard to data privacy and data use, consumer protection, and intellectual property rights. The act takes a special focus on high-risk AI use cases, such as for biometric data, critical infrastructure, employment, industrial relations and democratic processes.

The United States has demonstrated path-dependency when the State of California adopted the California Consumer Protection Act in 2018, which is functionally and ideationally close to the EU's General Data Protection Regulation (GDPR). Both the U.S. and EU share democratic values and institutional workings free of political ideology and many coercive norms. On the other hand, China and the EU find a common ground in the way central authorities coordinate with local government (in the case of China) and sovereign member states (in EU context). The different institutional configurations and the role of the state in these separate visibly the two AI regulatory models. The EU has held a different socio-economic path, reflected in a mode of governance driven by democratic values, public accountability and transparency of processes. China has demonstrated a one-party political system characterized with endorsing less democratic principles and more centralized ideology in socio-economic relations. These fundamental differences converge the EU more to the U.S. than to China in cooperating on common global AI regulations in future.

#### **Macroeconomic Modelling of AI**

The macro-economics of Artificial Intelligence (AI) includes the AI effect on productivity, jobs, and market competition. Hence, modelling AI can be areaspecific, such as for specific services sector or industry, or it can take a broader market perspective such as predicting AI's potential effect on job replacement or new job creation, or on market competition.

While past and current research still owes to AI macroeconomic modelling, studying the impact of AI on labor has recently expanded. Acemoglu and Restrepo (2018) provide a theoretical framework on the labor impact of new technologies and productivity gains in many services. Growth in productivity is explained with the effect from boosting aggregate income effect in both public and private services sector. Acemoglu (2024) expands what he calls a task-based performance model with research on AI's microeconomic effects driven by cost savings and productivity

improvements. The author concludes that if AI is used to create new tasks and products, these will also add to both GDP and productivity growth. But the possibility that new tasks generated by AI may be manipulative on welfare, for example, reduces the overall impact and can make the effect smaller (Acemoglu, 2024, p. 43).

#### AI from a Neoclassical Growth theoretical perspective

Neoclassical Growth Theory gives a supply-side theoretical perspective in explaining growth variances using major factors of production. The theory holds a linear equilibrium that results from the positive effect created by the increasing amounts of labor and capital in production. Accordingly, the accumulation of capital and the use of technology are both important drivers for enhancing labor productivity. The theory views technological change as an endogenous factor that secures long-term economic advancement, which can posit a different outcome than short-term gains through temporary equilibria.

The production function of neoclassical growth theory used to measure the growth takes the following simple equation form.

$$Y = AF(K, L)$$
 whereby,

Y denotes gross domestic product (GDP); K – the share of capital, L – the amount of less-skilled labor in an economy, and A is a pre-determined level of technology. Increasing any one of the inputs varies the effect on GDP and on economic equilibrium.

Because of its direct functionality with other variables, AI retains a positive correlation with less-skilled labor, and any AI driven input would increase growth indirectly through higher labor productivity. As AI technology proliferates, production will demonstrate increasing labor and capital returns because of endogenous technical progress. AI input increases generate efficiency gains beyond physical capital and labor return. AI's constant technological advances accentuate the effect of Total Factor Productivity (TFP) on growth. This modelling concept when using AI can hold constant both capital and labor for an AI-induced effect on labor productivity and growth. Alternatively, it can hold both capital and labor dynamically positioned as variables within the model. The efficiency emphasis from adding an AI variable into the model reflects TFP's complete effect on growth (through technological innovation and AI's practical adoption).

#### Conclusion

The United States has championed the Liberal Market Economy (LME) model in which the state institutions have adopted and enacted a liberal approach to business and labor, limiting their role to rule making and conflict resolution (Hall & Soskice, 2001). The U.S. federal government has provided an AI framework that lacks a strong normative focus. Federal authorities have conceded an increasing number of legislative norms and rules on data privacy and consumer protection to the sub-federal level (the states) adoption implementation. Federal government has endorsed open partnership globally around ethics-based principles and norms. Major U.S. companies have sought federal government as a partner and for its assistance to mitigate AI risks.

China's development has built around an institutional context that focuses on the leading role of the state in what comparative political economists have coined as State Permeated Economy (SME) (Noelke et al, 2013, 2018). In an SME centric model, the state's control is not only economic but also political (Ibid). Dominated by the leading role of the communist party, China's approach draws on a strong ideological mindset, binding regulations and stakeholder accountability in the process. Globally, China has sought to impose a unilateral leadership of AI while preserving membership role in the world's progressing partnership efforts on AI.

Despite obvious variances in the two models, characteristic of the different role of the state in them, in AI regulation both the U.S. and China demonstrate some similarities. Authorities in the two global economies are advancing efforts to develop AI R&D, ensure innovation and implement adoption practices that go concurrently with mitigating the risk from AI overexpansion. Regulations aimed to achieve trustworthy, reliable and transparent AI technological development concentrate on data privacy and consumer protection, as well as on codifying large language data/algorithmic models and their use. Importantly, both the U.S. and China are ambitious to advance their AI global leadership by supporting partnerships (in the case of the U.S.) or pulling up support in a more formally or informally coordinated manner (China).

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