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Editorial introduction

Introduction: Technological Modernization in a Multipolar World¹

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Abstract

This editorial introduces a Special Issue on “Technological Modernization in a Multipolar World.” It is stimulated by the growing tension between established Western narratives of modernization and the emergence of alternative technological trajectories across diverse geopolitical contexts. Rather than treating modernization as a unified process, this collection of articles approaches it as a contested and pluralistic phenomenon shaped by competing imaginaries, institutional arrangements, and value frameworks. Individual contributions examine how technological systems function as sites of negotiation through which societies articulate and transform their identities, governance structures, and future orientations. Organized around conceptual, digital, ecological, and reflexive perspectives, this set of articles advances a reflexive understanding of technological modernization as an open-ended process unfolding through differentiation with interdependence, it furthermore highlights the challenge of sustaining dialogue across divergent yet interconnected pathways.

Keywords: Technological modernization; Sociotechnical imaginaries; Non-Western perspectives; Epistemic orders; Plural modernities

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¹ This editorial was prepared with the assistance of large language models (including ChatGPT and Gemini) in drafting and language refinement. All content has been reviewed and revised by the guest editors, who take full responsibility for its accuracy and interpretation. Given that all three guest editors also contribute articles to this special issue, the use of AI tools was intended, in part, to offer a fourth, ostensibly neutral and balanced perspectives on the contributions.



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Редакторская заметка

Введение: Технологическая модернизация в многополярном мире²

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Аннотация

Данная редакционная статья представляет специальный выпуск, посвященный “Технологической модернизации в многополярном мире”. Она вызвана растущим напряжением между устоявшимися западными представлениями о модернизации и появлением альтернативных технологических траекторий в различных геополитических контекстах. Вместо того чтобы рассматривать модернизацию как единый процесс, этот сборник статей рассматривает ее как спорное и плюралистическое явление, формируемое конкурирующими представлениями, институциональными механизмами и ценностными рамками. Отдельные статьи исследуют, как технологические системы функционируют как площадки для переговоров, посредством которых общества формулируют и трансформируют свою идентичность, структуры управления и будущие ориентации. Организованный вокруг концептуальной, цифровой, экологической и рефлексивной перспектив, этот сборник статей развивает рефлексивное понимание технологической модернизации как открытого процесса, разворачивающегося посредством дифференциации с взаимозависимостью, и, кроме того, подчеркивает проблему поддержания диалога между различными, но взаимосвязанными путями.

Ключевые слова: Технологическая модернизация; Социотехнические представления; Незападные перспективы; Эпистемические порядки; Плюралистические современности

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² Редакционная статья была подготовлена с помощью больших языковых моделей (включая ChatGPT и Gemini) при составлении и уточнении текста. Весь контент был проверен и отредактирован приглашенными редакторами, которые несут полную ответственность за его точность и интерпретацию. Учитывая, что все три приглашенных редактора также вносят свой вклад в этот выпуск, использование инструментов искусственного интеллекта было призвано, отчасти, предложить четвертую, предположительно нейтральную и сбалансированную точку зрения на представленные материалы.



INTRODUCTION

Modernization has long been narrated as a historically singular process, often anchored in Western trajectories of scientific rationality, industrial production, and institutional differentiation. Within such accounts, technology appears not merely as a set of tools or infrastructures, but as a formative force shaping social organization, temporal horizons, and normative expectations. Yet in a contemporary world increasingly defined by geopolitical plurality and the uneven circulation of technoscientific capacities, this narrative no longer holds unchallenged authority. Modernization, rather than unfolding along a unified path, emerges as a field of competing interpretations and contested futures.

Across diverse contexts – from China and Russia to India and Brazil – technological development is being pursued through configurations that do not straightforwardly reproduce Western institutional models or normative commitments. These developments invite a reconsideration of a foundational question: to what extent can technological modernization be separated from the cultural, political, and ethical frameworks with which it has historically been entangled? Or does technology itself operate as a carrier of implicit epistemologies and value structures that resist such separation?

This Special Issue takes this tension as its point of departure, and explores technological modernization as a contested and pluralistic process. Rather than treating modernization as a unified trajectory, the articles in this volume examine how technological systems become sites of negotiation – where competing imaginaries, institutional arrangements, and value frameworks are articulated, challenged, and reconfigured, and through which societies define their identities, values, and future orientations.

REFRAMING MODERNIZATION: CONCEPTUAL FOUNDATIONS

The first cluster of contributions reconsiders the conceptual foundations of modernization, challenging linear and universalist accounts.

The results of a wide-ranging interdisciplinary workshop on the topic are surveyed in the opening contribution by Ping Yan, Hui Zhang, and Alfred Nordmann. For its interrogation of established narratives of modernization, the workshop drew for inspiration on the work of Sheila Jasanoff and others, emphasizing sociotechnical imaginaries and the plurality of culturally embedded visions that orient technological development. The analysis foregrounds a central tension: whether technological achievements can be appropriated independently of the epistemic and ethical commitments that have historically sustained them, thereby framing non-Western modernization as a process of selective adaptation and ongoing reinterpretation (Yan et al., 2026, see also Borchert-Wright, 2026).

Alexandra Kazakova, Siyu Wang, and Carl Mitcham approach modernization through the lens of engineering, distinguishing between its analytical and political meanings. By conceptualizing modernization as a form of “social engineering,” they highlight the role of engineers in shaping both infrastructures and institutional arrangements. Their analysis of China illustrates how technological development can be



embedded within distinct philosophical traditions while simultaneously challenging Eurocentric assumptions about engineering and modernization (Kazakova et al., 2026).

The contribution by Svitlana Shcherbak (2026) examines Russian “conservative modernization” as a case in which technological development is articulated within a civilizational framework. By distinguishing between normative visions of the future and descriptive strategies of implementation, this article reveals the coexistence of liberal, conservative, and technocratic elements, showing how modernization becomes a site of political reinterpretation and ideological negotiation.

Together, these contributions establish modernization as an open-ended process shaped by competing imaginaries, institutional configurations, and cultural contexts.

TECHNOLOGY, POWER, AND EPISTEMIC ORDERS

A second group of articles examines how technological modernization reorganizes knowledge and power, particularly in the context of digital technologies.

Elena Seredkina, Guzel Seletkova, and Alexander Mikhailovsky conceptualize large language models as political actors rather than neutral tools. Through comparative analysis, they demonstrate how AI systems reproduce culturally embedded normative orientations, giving rise to distinct “cognitive orders” and challenging assumptions of technological universality (Seredkina et al., 2026).

A complementary study by Khumai Bairamova and colleagues investigates inequalities in speech corpora and linguistic resources. By introducing the “Digital Resource Saturation Index,” they show how disparities in data availability constrain technological development and shape the prospects for sovereign AI systems. Their analysis highlights how linguistic inequality reflects structural conditions of governance and institutional coordination rather than purely technical limitations (Bairamova et al., 2026).

Taken together, these contributions demonstrate that technological modernization in the digital age is inseparable from transformations in knowledge production, power structures, and governance.

ECOLOGICAL PERSPECTIVES AND NORMATIVE RECONFIGURATIONS

A third cluster situates modernization within ecological debates, focusing on how different cultural traditions conceptualize the relationship between technological development and nature.

Marina Vasilyeva (2026) offers a comparative analysis of ecological aesthetics in Western and Far Eastern contexts. She contrasts traditions emphasizing individual responsibility and grassroots environmentalism with those that are grounded in philosophies of harmony and often implemented through centralized governance. Her analysis highlights the emergence of hybrid forms of ecological consciousness under global environmental pressures.



Within a specifically Marxist and contemporary Chinese framework, Luyang Ye and Guolin Wu present and discuss a philosophical account of nature's intrinsic value. By proposing a relational theory of value that integrates human and natural creativity, they seek to overcome the divide between anthropocentrism and ecocentrism, articulating a normative basis for aligning technological development with ecological sustainability. Their account is aligned, moreover, with official reasoning within Chinese leadership (Ye & Wu, 2026).

Together, these contributions position ecological concerns as central to contemporary modernization, where universal challenges intersect with culturally specific value frameworks.

PLURAL MODERNITIES AND PERFORMATIVE FUTURES

Two final contributions address the plurality of modernity and the performative role of future-oriented knowledge.

Lisa Borchert-Wright (2026) continues earlier discussions by conceptualizing modernity as inherently plural and context-dependent. She examines how technological artifacts carry values that are reinterpreted across cultural settings, thus highlighting the coexistence of multiple modernities shaped by differing historical and intellectual traditions.

Turning to alternative pathways for the modern world on a global scale, Andreas Brenneis and Jörn Wiengarn finally analyze the performative dimensions of predictive modeling through a comparison of two Club of Rome reports. Introducing the concept of "performative modes," they show how models present orientations and decisions by mobilizing different narrative strategies, from warning to action-oriented hope (Brenneis & Wiengarn, 2026).

TOWARD A PLURAL AND REFLEXIVE UNDERSTANDING

Considered together, the contributions in this Special Issue demonstrate that technological modernization is neither a uniform trajectory nor a purely technical process. It is a contested field in which technological systems, cultural values, political institutions, and ecological considerations intersect.

In a multipolar world, modernization unfolds through diverse yet interconnected pathways. The challenge is no longer whether modernization can occur outside the West, but how its multiple forms can be understood, evaluated, and brought into dialogue.

Accordingly, as guest editors, we did not approach "non-Western modernization" as a settled category, but as an evolving field of inquiry. This Special Issue seeks to bring diverse perspectives into dialogue without presupposing a unified framework or outcome.

Rather than converging toward a single narrative, the contributions reveal a landscape defined by differences and tensions. If twentieth-century modernization was characterized by convergence, contemporary technological modernization may be better understood as differentiation within interdependence. Sustaining dialogue under such



conditions remains a central challenge for future work in philosophy of technology and technology governance.

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