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Perspective

Artificial Intelligence and Global Development: Toward a Cooperative Framework for Inclusive Technological Progress

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Abstract: Artificial intelligence (AI) has emerged as a transformative general-purpose technology with global implications for productivity, innovation, and social welfare. While much of the frontier development occurs in advanced economies, the implications for developing countries, the Global South, are equally significant and interconnected. This paper argues that the transition from Artificial Narrow Intelligence (ANI) to general-purpose AI, or so called Artificial General Intelligence (AGI), although uncertain in timing, presents both shared challenges and opportunities for global cooperation. Developing countries risk heightened vulnerabilities due to accelerated automation trends and limited welfare systems, yet they also hold immense potential to drive inclusive service-led innovation. Drawing on emerging literature in technological change and development economics, this paper presents a balanced perspective that emphasizes interdependence between the Global North and South. It proposes a framework where (i) capability building, (ii) responsible innovation, and (iii) knowledge sharing enable mutually beneficial outcomes. The study concludes with concrete policy recommendations for advancing a sustainable and human-centered AI transformation across all regions. In particular, this paper highlights the emerging role of compute governance—the regulation and allocation of computational resources—as a tractable and material lever for ensuring that the benefits of frontier AI are distributed equitably between the Global North and South.

Keywords: artificial intelligence; global development; technological change; service economy; north–south cooperation; AI governance; compute governance; digital public infrastructure

1. Introduction

Artificial Intelligence (AI) is redefining how societies produce, consume, and govern. While innovation is concentrated in the Global North, the economic, social, and political consequences of AI diffusion are globally interdependent rather than regionally contained. Historical experience with prior technological revolutions demonstrates that latecomer economies may leapfrog, but only when institutional arrangements prevent technological dependence [1,2]. As of 2025, over 90% of frontier AI compute capacity is concentrated in the United States and China, while the entire African continent accounts for less than 1% of global AI research output, underscoring the depth of the asymmetry that any governance framework must address [3,4].

AI represents both continuity and rupture. The potential shift from Artificial Narrow Intelligence (ANI) to more general-purpose form of AI, i.e., Artificial General Intelligence (AGI) would not only transform economic

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structures but also reshape global governance and equity considerations. Advanced ANI systems already reshape labor markets, service delivery, and state capacity; hypothetical AGI trajectories amplify, but do not necessarily create these structural dynamics, questioning whether current global governance arrangements are fit for scale, speed, and asymmetry [5,6]. Crucially, the material substrate of AI capability—computational resources, or "compute"—is both quantifiable and geographically concentrated, making it a uniquely tractable lever for international governance compared to other dual-use technologies [3].

For the Global South, the core challenge is not catching up technologically per se, but avoiding a new equilibrium of "AI-enabled dependency" characterized by data extraction, imported models, and limited domestic capability formation. At the same time, AI opens space for service-led development pathways, notably in digital finance, health, education, and creative sectors, where complementarities with Northern demand are strongest. The objective of this paper is therefore to articulate a cooperative framework—anchored in compute governance, capability building, and institutional design—where both Global North and South benefit from AI-driven transformations in the service economy while mitigating the risks of a new digital dependency.

2. Theoretical Background and Emerging Literature

Recent work in technological change and development emphasizes that the impacts of AI depend on preexisting structural conditions and governance quality [7–9]. While technology enhances productivity in advanced economies, developing countries face differentiated impacts, particularly where institutional capacity, education, and digital infrastructure are weaker [10,11]. However, this asymmetry does not imply a zero-sum dynamic. Rather, the diffusion of AI across global value chains creates interdependence: advanced economies depend on digital labor, raw materials, and data from the South, while developing countries rely on Northern technologies, standards, and investment flows. A cooperative approach, anchored in shared standards, fair digital trade, and technology transfer, can yield mutually beneficial outcomes [12,13].

The literature on technological capabilities [14], digital divide [15], and global value chains [16] emphasizes that local learning and institutional adaptation determine how technologies translate into development gains. Thus, the Global South's success in leveraging AI will depend not only on national policies but also on international partnerships that expand collective capabilities, for example, through shared research infrastructures, open data frameworks, and South–North academic cooperation.

An emerging strand of this literature focuses specifically on the governance of computational resources—or "compute governance"—as a regulatory lever for managing AI development [3,17]. Unlike data or algorithms, compute is physically instantiated, measurable in floating-point operations e.g., FLOPS, and subject to established supply chain controls. This tractability makes compute a uniquely promising instrument for international AI governance. Proposals range from compute monitoring regimes analogous to nuclear safeguards, to market-based mechanisms such as permit systems that could allocate training capacity in ways that balance innovation incentives with safety requirements [18]. For the Global South, the compute governance agenda is doubly relevant: it simultaneously shapes who can develop frontier systems and determines the terms on which computational resources are shared globally. Ensuring that developing countries participate in the design of compute governance frameworks—rather than merely being subject to them—is thus a prerequisite for equitable AI development [19]. These considerations complement the broader capabilities and digital divide literatures by highlighting a concrete, material dimension of AI inequality that existing theoretical frameworks have underemphasized.

3. Discussions: Contemporary Development Picture—Shared Challenges and Opportunities

3.1. Structural Asymmetries and Complementarities

Many developing economies face the risk of "premature deindustrialization," where manufacturing declines before achieving high productivity [1,20]. Yet, AI could also enable them to leapfrog industrial bottlenecks through service-led growth. For example, digital outsourcing, online education, telemedicine, and creative industries have become new export frontiers [21]. These complement advanced economies' demand for services and innovation, creating interdependent markets rather than competition [22]. India's digital public infrastructure stack—including Aadhaar, UPI, and the India Stack—illustrates how emerging economies can build foundational layers that enable AI-powered services at population scale, while ASEAN's digital economy grew from approximately $32 billion in 2015 to over $300 billion in 2024, much of it driven by AI-enabled platforms in finance, logistics, and e-commerce [23,24].

Still, structural asymmetries persist. Without adequate welfare and digital safety nets, automation could amplify labor market instability. Such instability risks deepening inequality and social unrest, which in turn can erode political trust and global security as economic dislocation fuels migration pressures and geopolitical tensions [25].

Coordinated international initiatives, such as global reskilling partnerships and inclusive AI funding mechanisms, are essential to balance the benefits across regions [26]. Moreover, the geographic concentration of advanced AI chips—with over 80% of cutting-edge semiconductor fabrication capacity located in Taiwan, South Korea, and the United States—creates a structural bottleneck that amplifies existing asymmetries. Without deliberate policies to expand compute access, such as subsidized cloud computing partnerships or regional AI training centers, the Global South risks being locked out of frontier AI development entirely [3,17].

3.2. The Service Economy as a Bridge

AI-enabled services offer the greatest potential for mutual benefit between the Global North and South. Education technologies can link global learners and experts, reducing geographic and income barriers while allowing high-quality educational content from both hemispheres to circulate more equitably [27]. Healthcare AI can facilitate cross-border teleconsultations, disease surveillance, and diagnostics, expanding access to scarce medical expertise in underserved areas [28]. Digital financial services exemplify this dynamic: M-Pesa in East Africa and GCash in the Philippines have demonstrated that AI-augmented platforms can achieve financial inclusion at scale, processing billions of transactions annually while generating data assets that further improve credit scoring and fraud detection for underserved populations [23]. Similarly, creative industries, powered by generative AI and digital platforms, can export cultural capital from the South to global audiences, creating new channels for soft power and economic diversification [29].

These complementarities suggest that the rise of AI can foster *co-development* rather than dependence, provided that intellectual property, data, and digital infrastructure are governed equitably. Collaborative frameworks that promote equitable data governance and localized AI innovation can enhance resilience and inclusivity in the Global South. Concrete institutional mechanisms—such as data trusts, regional compute consortia, and interoperable digital public goods—provide actionable pathways for translating these principles into practice [3,30].

4. Recommendations: From Dependency to Partnership

4.1. Rethinking Global Development Models

The ongoing shift from artificial narrow intelligence (ANI) toward more general and integrated AI capabilities challenges the traditional sequencing of development. Rather than replicating the industrialization-led trajectory of the Global North, developing countries can cultivate service-based innovation ecosystems powered by AI and digital connectivity. This transformation underscores global interdependence: advances in AI innovation in the North and capacity-building in the South are mutually reinforcing, forming the basis for shared prosperity and resilient global welfare [2,31]. Institutionally, this requires moving beyond technology transfer as a one-directional flow and toward co-design models in which Global South actors shape the research agenda, governance architecture, and deployment priorities of AI systems from the outset. Regional institutions such as the African Union's Digital Transformation Strategy and ASEAN's Framework on Artificial Intelligence Governance provide emerging templates for such participation [24,32].

4.2. A Global Cooperative Framework for Inclusive AI Development

Building an inclusive global AI future requires more than technological breakthroughs, it demands coordinated efforts to ensure that *innovation and inclusion* advance together. The transition toward increasingly general AI capabilities highlights the need for a cooperative framework that balances innovation in the Global North with capability development and opportunity creation in the Global South.

Three strategic priorities underpin such cooperation. First, addressing capability gaps through joint investments in education, data infrastructure, and research partnerships can close North–South divides. Shared initiatives in STEAM and AI training, linking universities, technical institutes, and innovation hubs, can enhance human capital and foster adaptive capacity across regions. Second, responsible innovation through ethical and regulatory alignment across jurisdictions is vital to promote fairness, transparency, and safety in AI systems while preventing misuse and reinforcing public trust. Inclusive governance, where Global South representatives participate actively in standard-setting and ethical deliberations, can help embed pluralistic perspectives in global AI norms [33]. Third, knowledge sharing and global digital commons, through equitable data-sharing frameworks, regional cloud infrastructure, and multilateral digital partnerships, can mitigate risks of data colonialism and technological concentration, enabling more distributed and balanced innovation [34].

Translating these priorities into practice requires actionable policies that emphasize mutual benefit rather than competition. This paper proposes six interlinked policy directions:

(1) Global Capability-Building Partnerships: Establish joint AI and digital training programs, research consortia, and innovation exchanges between Northern and Southern institutions to enhance collective knowledge and skills.
(2) Open and Inclusive AI Ecosystems—Co-develop open and multilingual AI tools that reflect diverse cultural contexts, supporting both innovation and inclusivity [35].
(3) Sustainable Digital Infrastructure—Invest in regional data centers and cloud systems co-financed by development banks, governments, and private actors to improve digital access and resilience.
(4) Shared Ethical and Regulatory Standards—Promote global participation in AI governance bodies to ensure that ethical frameworks are transparent, accountable, and representative of varied socioeconomic contexts.
(5) Triangular and South–North–South Cooperation—Foster platforms that connect ASEAN, African, Latin American, and OECD economies to coordinate research, trade, and innovation policies toward inclusive development [16].
(6) The establishment of an international compute governance architecture. Drawing on precedents from nuclear non-proliferation and climate agreements, such an architecture could include multilateral compute-sharing arrangements, reporting requirements for large-scale training runs, and equitable allocation mechanisms that prevent the Global South from being excluded from frontier AI capabilities [3,18,19].

Together, these principles and policy actions form a Global Cooperative Framework for Inclusive AI Development—a model of shared responsibility and distributed innovation. By embedding cooperation, ethics, and equitable access into AI governance, this framework seeks to transform technological advancement into a catalyst for collective prosperity and sustainable global welfare.

4.3. Consequences of Fragmented or Absent Cooperation

The absence of international cooperation in AI development would exacerbate global inequality, technological dependency, and economic fragmentation. Without coordinated frameworks for knowledge transfer, the Global South could become locked into a subordinate position in global value chains, serving primarily as data providers or low-value digital labor sources while the Global North captures most of the gains from AI-driven productivity growth. Such asymmetric outcomes could mirror or even deepen historical patterns of technological dependency, leading to what scholars have termed algorithmic and data colonialism [36]. The economic costs of such fragmentation are substantial: duplicated infrastructure investments, incompatible regulatory regimes, and a lack of compute interoperability would prevent efficient allocation of computational resources across borders, significantly reducing potential AI-driven productivity gains globally [4,17]. The absence of shared AI safety standards would further compound these costs, as countries racing independently to develop frontier capabilities face heightened risks of misalignment and accidents that could erode public trust worldwide. From an economic perspective, the lack of shared governance would amplify coordination failures and reduce global efficiency. For the Global North, rising inequality and exclusion could undermine the stability of global markets, weaken supply chain resilience, and limit the diffusion of innovation. A fragmented AI landscape could also heighten geopolitical tensions, erode trust in cross-border data flows, and create inefficiencies that slow collective progress on global challenges such as climate change, health security, and digital governance. From an economic perspective, the lack of shared governance would therefore not only amplify coordination failures but also reduce global welfare and the potential for inclusive, sustainable growth.

5. Conclusions

The global diffusion of AI, and the potential transition from ANI to AGI, presents an inflection point for shared human development. The challenge is not competition between North and South but coordination toward inclusive technological progress. The service economy, as a dynamic and interconnected space, provides fertile ground for collaboration that combines Northern technological frontiers with Southern human capital and cultural innovation.

This paper contributes to emerging debates in technological change and development economics by proposing a partnership-centered model of AI governance and capability building, with particular attention to the role of compute governance as both a material constraint and a policy lever. AI can become not only a source of disruption but also a driver of collective advancement, provided that both North and South invest in human-centered innovation, fair digital ecosystems, and the institutional infrastructure—from shared compute facilities to multilateral governance bodies—required to sustain equitable progress over the long term.

Author Contributions

T.T.P.: conceptualization, writing—original draft, funding acquisition; J.C.: writing—review and editing, formal analysis. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

Use of AI and AI-Assisted Technologies

No AI tools were utilized for this paper.

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