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Digital Dependency and Structural Power: A Political Economy Reading of Technology

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Abstract

This article examines how digital infrastructure has become a new space of power within the global economy. Using a political economy approach inspired by Susan Strange's idea of structural power, it explains that digitalisation often repeats the old pattern of inequality between developed and developing countries. The study combines qualitative analysis of international policy documents with quantitative evidence on global investment and technology flows. It looks at major digital programmes such as China's Digital Silk Road, the European Union's Global Gateway, and the G-7 Partnership for Global Infrastructure and Investment, and compares them with similar regional projects led by emerging economies. Case studies from Kenya, Indonesia, Brazil, and Nigeria show that while digital networks bring innovation and faster growth, they can also deepen economic and regulatory dependence on foreign actors. This study finds that the core problem is not access to technology, but the concentration of power over data, capital, and technical standards. The paper argues that countries in the Global South can only convert connectivity into real development if they strengthen regional cooperation, insist on transparent contractual terms, and invest in domestic research capacity and skilled labour. These measures would allow technology to serve sovereignty instead of reinforcing dependence so that countries in the Global South can use technology to strengthen their sovereignty and achieve genuine development.

Keywords: Digital Economy, Global South, Structural Power, Political Economy, Dependency, Sovereignty

1. Introduction

It is true that almost every aspect of our lives is practically influenced by digital technology, from administration and education, communication and business. For countries in the Global South, new digital networks represent a long-awaited opportunity to catch up with the industrial and technological progress of the more advanced economies. Governments are investing in internet connection, mobile networks, and data centers, in hopes that digitalisation will cause a reduction in poverty and inequality and unemployment as well as promote innovation. Yet behind these positive aspirations lie complex questions about control, ownership, and inequality.

Infrastructure is rarely just technological; it is also political and economic. It determines who sets the terms of access, who supplies the technology, and who stores the data generated by millions of users. Digital infrastructure thus links the development goals of the Global South to the strategic calculations of global powers. Scholars of international political economy remind us that technical systems always carry the interests and values of those who design and finance them (Strange, 1988; Foster & Azmeh, 2020) [10, 5].

Over the last decade, a global race for digital influence has developed between major economies. China's Digital Silk Road has expanded rapidly, providing affordable technology and financing for telecommunication networks and "smart city" systems.

By contrast, the European Union and the United States have launched alternative initiatives such as the Global Gateway and the Partnership for Global Infrastructure and Investment, which promote transparency, sustainability, and data security. Each project seeks to improve its connection while promoting its own standards of operation and geopolitical interests.

For countries seeking investment, this competition presents both opportunities and new challenges. Governments of Africa, Asia and Latin America can now choose whom to work with among several options, however, their choices are often influenced by current financial commitments, diplomatic affiliations, or domestic political interests (Van der Spuy, 2021) [13]. The increasing options to select from does not necessarily translate to equal bargaining power. Instead, the conditions attached

to financing, technology transfer, and data management may create new layers of dependency, even as they address urgent development needs.

This tension is the central theme of this study. Using a political economy approach, this article shows how digital infrastructure reflects the structure of the global economy, where financial capital and innovation are still concentrated in a few states and corporations. The argument is that the condition under which technology is used reflects global economic hierarchy rather than technology itself causes inequality (Strange, 1988 [10]; Mearsheimer, 2001). The same networks that provide access to education and markets can also incorporate developing societies into systems of ownership and surveillance controlled elsewhere.

At the same time, the study recognises that many countries in the Global South use this competition creatively. By negotiating with different partners and adopting mixed technology strategies, they can extract resources, expertise, and leverage from both East and West. It is important to note that as a result, we can agree that digital cooperation has a dual nature**:** it can have the potential to reinforce dependency, and simultaneously widen policy space and stimulate innovation.

The fundamental question addressed here is how countries in the Global South, that is developing countries in Africa, Asia and Latin America can benefit from global digital investments without losing the ability to determine their own technological future. Can partnerships driven by powerful states still produce balanced outcomes? To what extent can local regulation and regional cooperation offset new forms of dependency?

The article proceeds in six sections. The next section presents the political economy framework used to interpret the relationship between technology and power. The third section examines the global digital projects that are shaping international cooperation. The fourth section goes on to analyze examples from Africa, Southeast Asia, and Latin America. The fifth section talks about the implications for sovereignty and sustainable development, and conclusively, the sixth section lays out the policy recommendations for strengthening digital autonomy in an increasingly connected global system.

2. Theoretical Framework: The Political Economy of Digital Infrastructure

According to the political economy approach digital transformations are seen as part of a broader global structure of production, commerce, and finance. It emphasises that economic and technological change does not occur in a vacuum but reflects the interests of particular states, corporations, and social classes (Strange, 1988) [10]. For developing countries, this means that access to technology is shaped by the existing distribution of power and by the established rules of the international economic order.

For a long time, dependency theorists like Raul Presbisch has explained the concept of capitalism by dividing the international system into two, the core states made up of countries in Europe and North America, also known as the Global North and the Peripheral states, made up of countries in Africa, Asian and Latin America, collectively known as the Global South. The peripheral economies remain reliant on the industrial centres for manufactured goods and capital. In today's world, that dependence often takes a digital form. The Global South exports data, raw materials for electronics, and consumer markets, while importing hardware, software, and managerial expertise from the Global North (Foster & Azmeh, 2020) [5]. What used to be an exchange of commodities has transitioned into an exchange of information and technical standards.

Susan Strange's idea provides a useful background for understanding structural power. Structural power refers to the ability to shape or influence the system within which others operate: it could be production processes, financial or security arrangements or knowledge structures (Strange, 1988) [10]. This kind of power is best illustrated by the Control over digital infrastructure. States and firms that build and manage networks determine the cost and flow of information for everyone else.

In the political economy of technology, public and private power are deeply intertwined. Governments rely on multinational corporations to provide expertise and implement infrastructure projects, while corporations depend on state backing to access new markets and shield their operations from regulation. As a result business objectives and foreign policy combine to create a hybrid kind of influence where commercial goals merge with foreign policy. This dual logic of profit and diplomacy is demonstrated by Huawei's 5G contracts in Asia and Europe, Google's undersea cables around Africa and Microsoft's cloud partnerships with African governments.

Additionally, the political economy approach promotes a balanced assessment. It recognises that these projects can generate real benefits in employment, innovation, and connectivity. They provide routes to modernisation that might otherwise be inaccessible. Yet they also raise new strategic questions about how data is controlled, how revenue is distributed, and pay off long-term debt. As countries in the Global South get involved in the digital economy, the problem lies in making sure that contracts that appear to be technical but are inherently political should protect both national and regional interest of the country involved.

3. Global Digital Initiatives

The political economy of the digital era is visible in a handful of large programmes through which major powers expand both technology and influence. Each initiative offers developing regions investment and expertise but also embeds particular standards of governance, finance, and security that reflect its sponsors' interests.

3.1 China's Digital Silk Road

China's Digital Silk Road, formally introduced in 2015 as part of the Belt and Road Initiative, aims to connect partner countries through telecommunications networks, e-commerce, satellite systems, and cloud computing. It addresses real infrastructure shortages in the Global South and provides relatively affordable technology. Between 2015 and 2021, Chinese firms such as Huawei and ZTE installed the majority of Africa's broadband and 4G equipment (AidData, 2020) [2].

Chinese partnerships bring immediate benefits to African governments through concessional finance for large projects, speedy deployment, and local capacity training. In exchange, these Chinese investments lead to long-term dependencies around hardware maintenance, software updates, and cybersecurity. Data transit passing through Chinese-built networks also raises a question mark about

privacy and the extraterritorial reach of Chinese cybersecurity laws (Carmody, 2016) [4]. According to Van der Spuy (2021) [13] the dependency may be administrative rather than political, yet it still inhibits recipient countries' regulatory independence.

3.2 Western Alternatives and Re-Engagement

In response, Western actors have increased infrastructure diplomacy. In 2021, The European Union launched the Global Gateway investing 300 billion euros to transportation, energy, and digital projects designed to promote transparency and sustainable governance. The United States and G-7 followed with the Partnership for Global Infrastructure and Investment (PGII), which promises collaboration between governments and private investors to close the infrastructure gap.

These initiatives have so far, offered countries in Africa, Asia, and Latin America an alternative to Chinese loans and technology. Yet critics note that Western programmes often move slowly, require complex due-diligence procedures, and prioritise normative goals such as environmental or gender benchmarks that may not fit local realities (Foster & Azmeh, 2020) [5]. The outcome is that developing states welcome these funds but still rely heavily on faster, flexible arrangements from Asian providers.

3.3 Emerging Regional Models

Beyond China and Western powers, several middle-income and regional players are shaping digital infrastructure. India has begun promoting its "Digital Public Infrastructure" model abroad, offering open-source payment and identification systems adaptable to low-income countries. Singapore and South Korea export regulatory know-how in cybersecurity and data governance, while Gulf States invest heavily in African data centers. These South-South interactions diversify partnerships and demonstrate that digital cooperation need not always reproduce North-South dependency, although the scale of non-Western finance remains modest compared to China or the EU (Carmody, 2016) [4].

3.4 Implications for the Global South

Taken together, these programmes reveal both opportunity and constraint. They provide much-needed investments and create digital capacity across the developing world. However, each initiative extends a particular set of technical standards and legal concepts that shape global data governance. Governments in the Global South must consequently face the challenge of choosing between competing offers, weigh financial costs, political alignment and strategic risks. Their goal is to manage these relationships in such a way that digital connectedness translates to sustainable development in the national interest rather than further trapping the country's economy into a cycle of dependence.

4. Regional Case Studies

To understand how digital partnerships influence the Global South, it helps to examine a few representative examples. The cases of Kenya, Nigeria, Indonesia, and Brazil show different ways that developing states have gained from, yet also managed, technology dependence.

4.1 Kenya: Connectivity, Growth, and New Vulnerabilities

Kenya is widely recognized as one of Africa's most connected economies. Most of her infrastructures were financed through Chinese loans. Notable mentions are the National Optic Fibre Backbone and the expansion of mobile broadband. Huawei built large sections of the 4G network and now assists in trials for 5G technology. These partnerships have improved service coverage and reduced connectivity costs, supporting mobile-money innovations such as M-Pesa.

Kenya also relies on a small number of vendors which makes data security and market concentration risky. In 2017, When the government launched its Safe Cities surveillance system, critics were worried that contracts awarded to Chinese firms would grant more control over how data is stored in urban centres. Van der Spuy's research in (2021) [13] shows that although Kenya benefits from lower prices and speedy deployment, the lack of transparency in technology agreement and the long-term cost of maintenance makes things unclear. Kenya's experience demonstrates that digital infrastructure can create economic advancement, but it can also make people more vulnerable from a state of underdevelopment to a state of overdependence.

4.2 Indonesia: Balancing Between East and West

Indonesia is a key player in the Asian digital economy because it is the fourth most populous country in the world. Its government promotes diversification and welcomes investment from both China and the West. Chinese firms specialized on hardware and construction for network towers, while American and European firms dominate software services, cloud computing, and fintech.This dual participation provides Indonesia with alternatives to choose from and leverage, while also exposing the limits of regulation. This challenge led to the creation of The Personal Data Protection Law (2022) in response to the dominance of foreign digital corporations. Indonesian policymakers promote what is called "technological pluralism" which means collaborating with both the Chinese and the West but maintaining national control of their data. Such a balancing strategy reflects both pragmatism and risk. Political-economy analysts note that developing middle powers like Indonesia may avoid one-sided dependence by mixing partnerships, but they still sit within a hierarchy shaped by capital, patents, and intellectual property (Foster & Azmeh, 2020) [5].

4.3 Brazil: Regional Leadership and Strategic Autonomy

Brazil has become Latin America's leading advocate for "digital sovereignty." Its extensive fibre-optic network was originally built through contracts with U.S. and European companies, but after revelations about global surveillance programmes in 2013, the government began investing heavily in home-grown research and South-South cooperation. Partnerships with China have since expanded satellites and e-commerce platforms, while agreements with the EU include joint commitments on data protection.

Brazil's hybrid approach has made it both a client and a competitor of global digital powers. On one hand, it benefits from diversified sources of investment; on the other, it

maintains indigenous expertise through a network of state universities and research institutes. For Scholars like Carmody (2016) [4] Brazil's policy as an example of moderate realism since it acknowledges the role of global interdependence while maintaining regional autonomy in strategic sectors.

4.4 Nigeria: Digital Ambition and Structural Constraints

The promise and tension of Africa's digital development is encapsulated in Nigeria's experience. Since the 2010s, public investment in internet expansion has increased significantly, and collaboration with companies like Google, Huawei, Meta, and ZTE have established Lagos as a Regional technology hub. The country's new National Broadband Plan (2020–2025) targets 90 percent coverage, using a mix of public funding and private capital.

However, the reliance on foreign hardware and cloud services has generated anxiety about security and local ownership of data. The construction of "smart" government systems by Chinese contractors has relaxed immediate capacity constraints but left long-term questions about who controls the generated information. Nigeria established its own Data Protection Bureau to strengthen regulatory control. However, weak technology foundation and fragmented legislative system has made sovereignty in technology difficult to achieve (Van der Spuy, 2021) [13].

Nigeria's startup ecosystem is also impacted by international competition. The majority of fintech companies are funded by Western venture capital, but infrastructure supply chains are dominated by Asian corporations. Innovation thrives, but ownership and strategic technologies remain external, which is dual dependency. Analysts such as Foster and Azmeh (2020) [5] describe Nigeria's case as an example of "integrated dependency," in which participation in global platforms raises GDP yet maintains asymmetrical control.

Nigeria demonstrates that digital progress in the Global South is not simply a story of empowerment. It is a negotiation between national ambition and global structure, where autonomy must be built through diversified partnerships, regional collaboration, and sustained domestic investment in research and human capital.

4.5 Comparative Insights

The four case studies show that developing countries are neither inherently empowered nor inherently dependent on digital infrastructure. The outcomes depend on how countries handle political alliances, legal frameworks and technological diversity.

Kenya highlights the vulnerabilities that arise when a few external actors handle technology supply. Indonesia serves as a lesson of both the advantages and the disadvantages of juggling multiple partners. Nigeria shows that digital transformation in the Global South is more of a negotiation between national interest and Global structure than a simple story of empowerment, Brazil reveals the potential for regional leadership through hybrid collaboration.

In each scenario, autonomy must be cultivated through a variety of partnerships, regional cooperation, and sustained domestic investment in research and human capital.

Across all four examples, a clear political-economy pattern emerges. Investment in digital infrastructure draws the peripheral states more deeply into global markets, yet critical decisions over intellectual property, production, and data governance continue to rest in the hands of third parties. In today's digital age, economic growth and dependency often advance together. The central task for policymakers is to secure the benefits of connectivity while ensuring domestic control over the systems that make it possible.

5. Implications for Sovereignty and Sustainable Development

The increasing interconnectedness of politics and technology has pushed digital sovereignty at the forefront of national development goals of all countries. For many states in the Global South, the question is no longer about whether to connect, but how to connect without giving up decision-making autonomy. Digital sovereignty does not imply isolation from global platforms; rather, it is the freedom to make technological decisions that are consistent with national interests and social values.

Economic sovereignty

The proliferation of foreign digital infrastructure has deep implications for fiscal and industrial policy. Although external funding accelerates growth, dependence on imported software, foreign cloud storage, and patented algorithms limits domestic value creation. Local firms often compete on uneven ground against transnational corporations that hold the intellectual property. Sustainable development therefore requires building skills, research capacity, and regulatory expertise at home. Digital economies that rely only on external inputs risk reproducing the same extractive patterns that once defined commodity dependence.

Social and environmental sustainability

Digital infrastructure changes not only economies but also the social and environmental fabrics of the Society. According to the World Bank, (2019, p. 51) [14] *"digital dividends are not automatic; they depend on analog complements in skills, institutions, and accountability."*

In other words, this growing interconnectedness can empower communities through online education, telemedicine, and entrepreneurship, However, they can also worsen inequality if access is limited to urban centres or when automated systems reinforce social bias. Sustainable digital transformation must therefore combine investment with access for everyone and a high level of digital literacy.

The environmental aspect is equally important. The Global E-Waste Monitor (2020) [6] noted that more than fifty million tonnes of electronic wastes are thrown away annually, and that figure is projected to drastically increase if nothing serious is done about it by the government. Similarly, the UN SDG Report (2022, p. 77) stresses that technology should *"advance human well-being within planetary boundaries."* Dealing with these challenges require regulation, innovation in green data infrastructure, and regional cooperation to manage e-waste responsibly.

These social and environmental factors have demonstrated that sovereignty in the digital age is not absolute, but obtained through negotiation.

6. Policy Recommendations: Toward Digital Autonomy and Inclusive Innovation

In order to turn this connectedness into genuine autonomy, governments and regional bodies can act on several levels.

1. Build endogenous capacity: Investing in education, research, and public-private innovation hubs is the first step towards long term independence. Expanding computer

science and engineering programmes, supporting scholarships for STEM programmes, funding national research centres and think tanks, as well as supporting start-ups will help create a domestic environment that adapts imported technology that will solve local needs. Governments should also encourage the use of open-source software, which reduces the dependency on proprietary systems and improves transparency.

2. Enhance regional collaboration: It is important to mention that no single developing country is powerful enough to address global inequalities on its own. Hence, they must unanimously utilize regional organizations like the African Union (AU), Association of South East Asian Nations (ASEAN), or Mercado Común del Sur" (MERCOSUR) to standardize data protection laws, coordinate cybersecurity responses, and bargain collectively for better terms and conditions with external investors. Additionally, a shared digital market also increases scale and bargaining power, which makes local production more feasible.

3. Diversify your technological partnerships: Countries in the Global South can do this by partnering with diverse countries from East, West, and South This allows them to learn from each other's mistakes and to leverage on lessons learnt for their own advantage. So, rather than choosing one partner out of several, governments can pursue pragmatic pluralism, which means selecting technologies based on their cost, quality, and how well they fit into the developmental goals of that country.

4. Regulate data governance and platform power: For both security and trust, there should be stringent data protection laws, independent oversight agencies, and regional accreditation standards. Governments should prioritize their citizens' digital rights first, and demand data portability clauses in all infrastructure contracts. At the same time, there should be a synergy between civil society and academia, this is to ensure accountability and informed policymaking.

5. Align digitalisation with sustainability goals: Technology strategies should also consider social inclusion, there should be equal access to all citizens, and promote environmental sustainability. There should be incentives for renewable energy use in data centers, recycling of electronic waste, and programmes targeting rural areas: this is so that digitalisation will promote human development rather than technological elitism.

7. Conclusion

The research shows that digital infrastructure is not merely a technological project but also a political and economic endeavour that reflects the global distribution of power. The experience of countries like Kenya, Indonesia, Brazil, and Nigeria demonstrates that the same networks that promise growth can reproduce dependency if they are not embedded in inclusive, context-sensitive policies.

Yet the picture is not one of inevitable subordination. Across the Global South, governments, entrepreneurs, and citizens have shown creativity in transforming external competition into local opportunity. They use digital diplomacy, multiple partners, and regional standardized practices to claim a measure of autonomy within an unequal system.

The path toward digital sovereignty will require perseverance, policy coherence, and social participation. When technology serves people rather than the reverse, connectivity becomes more than an economic metric; it becomes an expression of collective agency. In this sense, the future of the digital world will not be determined solely by those who own the cables and servers, but by those who find ways to use them for shared prosperity and human dignity.

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