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Re-Imagining the Developmental State in the Digital Era: A Normative Political-Economic Inquiry

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Abstract. In recent years, the rapid development of digital technologies such as artificial intelligence, big data, and platform economies has profoundly changed global production structures and governance models. This article re-examines the concept of a developing country in the digital age and emphasises how digitalisation can reshape the political and economic pattern of state-led development. By integrating normative political theory and digital political economy literature, this article points out that the traditional development-oriented national model based on industrialisation, export orientation and bureaucratic coordination must evolve to cope with the governance problems of data, algorithms and digital infrastructure. The study identified three key changes: from industrial policy to ecosystem coordination, from physical infrastructure to data governance, and from bureaucracy to an adaptive regulatory framework. Cases from Estonia, South Korea and India illustrate different methods of digital governance and show how countries can safeguard democratic accountability while promoting innovation. The research results show that the reconceived developed countries should act as "digital ecosystem enablers" and take into account fairness, transparency and ethical governance while promoting growth. This normative restructuring helps the policy debate to explore how emerging economies can achieve inclusive digital modernisation, while avoiding repeating the mistake of technology authoritarianism.

Keywords: Developmental state, digital economy, governance, data policy, political economy

1. Introduction

The concept of a development-oriented country is historically closely related to the economic miracles of post-war Japan and East Asia, representing a powerful institutional model for coordinating economic transformation [1]. It emphasises the autonomy of the bureaucracy, the positioning of industrial goals and export-oriented growth. Its operation is based on the assumption that the state can actively guide market forces towards the national development goals [2].

The classic "development-oriented state" model appeared in the mid-20th century in response to laissez-faire liberalism and centrally planned socialism [3]. Its success depends on the state's ability to coordinate capital, technology and labour to achieve strategic industrial goals, and Japan's Ministry of Industry and other institutions reflect the efficiency of the bureaucracy [4]. Chamers

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Johnson's pioneering work defines a developing state as an institutional arrangement characterised by "planned rationality" and embedded autonomy [5].

In the 21st century, the global production network has changed from a purely material form to an information form. According to economic cooperation and the United Nations Conference on UNCTAD, more than 60% of cross-border trade today involves data-driven services, cloud infrastructure or algorithmic processing, rather than tangible goods [6,7]. This shift challenges the traditional boundaries between industrial policy and information policy. As governments strive to ensure digital sovereignty, issues such as who owns and controls data, how the country regulates algorithms, and how to ensure fair competition in platform-dominated markets have also arisen.

Subsequent analysis extended this framework to South Korea, Taiwan, China and Singapore, showing how the disciplined bureaucracy and long-term investment vision have promoted rapid industrial catch-up. However, globalisation and financial liberalisation have weakened these structural advantages. The post-industrial economy is becoming more and more invisible, globalised and data driven. Production networks are scattered across borders, and key assets - knowledge, algorithms and user data - are often controlled by multinational platform companies.

Therefore, the coordination capacity of developing countries must shift from the industrial sector to the digital ecosystem. This conceptual repositioning requires new regulatory wisdom: data management, algorithm transparency and digital inclusiveness. These capabilities define "digital development countries", that is, entities that can coordinate innovation while adhering to normative commitments such as equality and responsibility.

Therefore, this article raises the question: in the digital age, how to reconceive a developing country to maintain its relevance and normative legitimacy? The analysis adopts theoretical and normative methods, drawing on the comparative insights of political economy, data governance and innovation research. The study does not provide new empirical data but reinterprets the institutional logic of developing countries to build a new conceptual framework that integrates digital sovereignty, data ethics and inclusive governance.

2. The digital turn in political economy and normative reconstruction of the developmental state

Digital capitalism has created a new accumulation model with data extraction, algorithm control and platform mediation as the core [8]. These mechanisms are very different from industrial capitalism in terms of scale and speed, creating a new governance dilemma for the nation-state.

First of all, value creation now relies on data control rather than physical production. Companies such as Google, Amazon or Tencent obtain rents through data aggregation, exacerbating the global asymmetric pattern. Secondly, regulatory sovereignty has been weakened, and it is difficult for national jurisdictions to enforce data and competition regulations across borders.

Traditional industrial tools such as tariffs or credit distribution cannot cope with these digital dynamics. Developing countries must turn to a platform governance model and seek a balance between innovation and public accountability. For example, public data infrastructure can ensure that key data sets remain open and interoperable and prevent privatisation and monopoly.

The comparative experience of developed economies confirms these trends. The European Union's Digital Market Act and the General Data Protection Regulation show how democratic countries can control platform hegemony through rule governance. In contrast, the United States mainly relies on anti-monopoly litigation and market-led innovation models, while China adopts a nationalist data governance system that emphasises sovereignty and monitoring.

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This "digital shift" has reshaped the role of the country - no longer a producer, but a platform coordinator. The country's development functions shift to market structure construction, the formulation of ethical standards, and the promotion of inclusive participation in the digital value chain.

The re-conceived developing countries must go beyond the old logic of "taking sides" and turn to shaping the digital ecosystem [9]. This requires the cultivation of three institutional capabilities. The government must master professional capabilities in the fields of algorithmic audit, privacy protection and network security to manage the power asymmetry inherent in digital capitalism. Public digital infrastructure - the state should ensure open standards, fair broadband access and a national data governance framework. Global collaboration - International coordination through World Trade Organization (WTO), Economic Cooperation Organization (ECO) and other platforms is the key to preventing digital protectionism and technological colonialism.

The new development-oriented country has thus transformed into a "mission-oriented digital country", integrating innovation with social goals. Its supervision focuses on the way of innovation rather than the scale of innovation. At the normative level, its legitimacy depends on whether ethical design, transparency and accountability mechanisms can be embedded in the digital governance system.

In addition, this transformation also means a change in culture and bureaucracy. Public institutions need to recruit interdisciplinary talents integrating economics, data science and ethics. Civil servants should not only receive algorithm interpretation training but also have the ability to predict their social impact. Similarly, the legislative framework must evolve to ensure the interpretability of algorithms, the right to participate and digital literacy. Without these soft powers, investment in hard infrastructure may only exacerbate existing inequalities.

3. Illustrative cases and policy implications

In order to further verify the theoretical applicability of digital development countries, this chapter selects three representative countries, Estonia, South Korea and India, as analysis cases. These countries have significant differences in political systems, economic structures and technical foundations, but they all show new forms of national capacity and public governance in digital transformation. By comparing their practical experience in digital identity systems, artificial intelligence industry policies and digital public infrastructure, people can more clearly understand the multiple roles of the country in the digital age - both the promoter of innovation and the guardian of social equity and data security. This chapter aims to reveal the institutional logic behind these experiences and provide empirical support and comparative perspective for subsequent challenges and policy revelations.

Estonia has shown a streamlined, efficient and interoperable governance model that integrates the transparent mechanism of digital identity authentication, electronic governance and blockchain empowerment. By giving priority to the implementation of citizen-centred service design, it proves how small countries can improve efficiency and trust without relying on authority control. However, the scalability of the Estonian model is highly dependent on network security resilience and international partnerships.

South Korea has expanded the traditional development logic through the task-driven digital industry policy. National initiatives such as the Digital New Deal and the artificial intelligence research and development strategy institutionalise the national coordination mechanism of the innovation ecosystem. The South Korean case shows that state intervention is still compatible with democratic accountability as long as the transparency mechanism and competition neutrality are

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maintained.Through open budget, social participation and transparent regulation, South Korea has achieved both state-led industrial upgrading and democratic accountability in the "New Digital Policy" and "National Artificial Intelligence (AI) Strategy", demonstrating that state intervention can still be compatible with democratic supervision under institutional transparency and competitive neutrality.

Indian experience has redefined the inclusiveness of the digital age. Aadhaar biometric identification system and unified payment interface (UPI) represent an ambitious effort to integrate citizens into the digital economy. These infrastructures promote both financial inclusion and private innovation. However, the Indian case has also exposed the risk of data abuse and monitoring, highlighting the importance of strong privacy laws.

Through comparative analysis of cases in different countries, it can be found that there are several policy directions worth learning from in the process of building a digital development-oriented country.

First of all, the regulatory sandbox system has found a balance between "encouraging innovation" and "strengthening supervision". The government can test the risk performance of new technologies within a controllable range, so that enterprises can carry out institutional innovation more boldly under the premise of ensuring safety and compliance. Secondly, the public data trust mechanism has become an important means to ensure that data services benefit society. By establishing a data hosting system managed by the government or independent institutions, the country can strike a balance between "protecting privacy" and "promoting scientific research", so that data can truly become a resource for social innovation and public governance. Third, the open-source obligation policy not only promotes innovation but also avoids problems such as technology monopoly and "supplier lock-in". The government requires the adoption of an open-source framework in information system procurement and digital infrastructure construction, which not only improves transparency, but also enhances the technological autonomy of the public sector. Finally, international digital cooperation is seen as an important way to reduce dependence on a single technology system. The digital governance cooperation framework promoted by international organisations such as the Organisation for Economic Cooperation and Development (OECD) and the WTO help to promote cross-border data circulation, standard recognition and technology sharing.

At the practical level, the applicability of these policy tools will vary depending on the institutional environment of each country. For example, the British Financial Conduct Authority (FCA) took the lead in piloting the "regulatory sandbox" model in the field of financial technology, and later Singapore and Australia also extended this practice to a wider range of digital policies. The "Public Data Trust" project piloted by the European Commission and Canada shows how the government can support scientific research and innovation while protecting sensitive data. At the same time, the open-source obligation clause has gradually become a standard requirement for the procurement of information systems by governments, which not only improves transparency, but also reduces technical dependence and risks.

4. Critical challenges and policy implications

In the digital era, developing countries face multiple profound challenges in the process of promoting economic transformation and social governance. These challenges come not only from the technical structure itself, but also from the redistribution of power at the political, economic and ethical levels. In general, it can be summarised into three main types of risks: the rise of technological authority, the widening of the global digital divide, and the continuous expansion of

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environmental and labour issues. On the basis of analysing these risks, this article further puts forward the core policy inspiration and strategic path of national governance in the digital age.

4.1. Risks of technical authority and algorithmic governance

With the wide application of big data, artificial intelligence and cloud computing, the country's regulatory capacity in the digital field has been significantly enhanced, but at the same time, there is also a risk of excessive power expansion. Some countries have strengthened data centralisation and social monitoring in the name of "data security" or "national sovereignty", forming the so-called "technical authority". This model may improve administrative efficiency in the short term but weakens citizens' privacy rights and social trust in the long term. According to the statistics of the OECD, more than 60% of countries around the world are promoting data sovereignty legislation in 2023, but about one-third of these policies lack a transparent accountability mechanism, which shows that the phenomenon of "control in the name of security" is spreading.

In addition, the opacity of algorithmic decision-making exacerbates the governance problems. Algorithms are not only a product of technology, but also the coding result of political will and social prejudice. When countries introduce algorithmic decision-making in public services such as taxation, credit and employment, the lack of an independent review mechanism may lead to "systemic discrimination" and data abuse. In this regard, developing countries need to establish a algorithm audit and ethical supervision system to prevent technical power from replacing legal power and ensure the legitimacy and fairness of digital governance.

4.2. Global digital divide and inequality of value capture

The globalisation of the digital economy has not brought about universal benefit sharing, but in many cases, it has deepened the gap between the north and the south. Developed countries master core technologies, platforms and data centres, while emerging economies are mostly in the links of data production and low-end digital labour. For example, the 2023 Digital Economy Report of the United Nations Conference on Trade and Development (UNCTAD) pointed out that eight of the world's top ten Internet companies are from the United States and two are from China, and their market capitalisation accounts for more than 70% of the global Internet industry. This means that data and algorithm dividends are mainly captured by a few multinationals and developed countries.

This structural imbalance not only weakens the policy autonomy of developing countries but also limits their ability to achieve industrial development through digitalisation. To realise inclusive digital development, countries should promote the balance between digital tax reform and cross-border data sharing rules under WTO e-commerce negotiation and OECD digital governance framework. At the same time, the South-South cooperation mechanism can serve as a channel for mutual assistance between emerging economies to reduce over-reliance on the technology systems of northern countries and achieve a more equal global digital order through open standards, knowledge sharing and regional cloud infrastructure construction.

4.3. Environmental and labour issues: The sustainable dilemma of digital development

Digitalisation is not a costless transformation. According to the International Labour Organisation (ILO) and the International Energy Agency (IEA), the energy consumption of global data centres accounted for about 4% of total electricity demand in 2022 and is growing at a rate of 7% per year. Without the transformation of green energy, digital infrastructure may become a new source of

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carbon emissions. At the same time, the instability of "gig work" in the digital platform economy is increasingly prominent. Algorithm-driven task allocation makes workers in a state of high dependence, with prominent problems such as wage fluctuations and lack of social security.

This shows that the mission of digital development countries should not be limited to promoting innovation and growth but must also coordinate environmental governance and labour security. Green data centre, circular economy technology, and platform labour supervision framework should become important directions for future policy design. Only under the premise of realising ecological sustainability and social justice can the development of the digital economy have true legitimacy and long-term competitiveness.

4.4. Policy enlightenment and governance framework

In the face of the above challenges, the development strategy of the 21st century should follow three core principles: transparency, inclusiveness and flexibility.

Transparency requires the government to maintain information openness in data use, algorithm design and public procurement, and strengthen public supervision. Inclusiveness means that the digital participation rights of disadvantaged groups, local economies and small and medium-sized enterprises should be taken into account in digital policies. Flexibility means that the policy system needs to have the ability to dynamically adjust to cope with the rapidly changing technical environment.

In terms of specific governance tools, this paper proposes four mechanisms. First, about the regulatory Sandbox: Test new technology policies in a controlled environment to balance innovation and risk; Secondly, about the Mission-driven R&D: Through national strategic investment, guide artificial intelligence, green technology and other directions to serve social goals. Thirdly is the Open-Source Obligation. Ensuring the openness and transparency of public technology projects and reducing monopoly and supplier dependence; Finally, about the Public Data Trust: Data is regarded as a social public asset and managed by independent institutions to promote scientific research and social innovation. In addition, the coordination of multilateral and regional cooperation mechanisms should be promoted. Through WTO digital trade negotiations, OECD digital governance guidelines and South-South cooperation platforms, countries can reach consensus on cross-border data flow, tax fairness and technical ethical standards, so as to reduce digital imbalances and technical barriers [10].

Generally speaking, the normative legitimacy of digital development countries will depend on whether they can find a balance between innovation-driven and civil rights: not only to avoid expanding control in the name of security, but also to improve social welfare through institutional innovation. This is not only the task of technological governance, but also the core proposition of national modernisation in the new era.

5. Conclusion

From the perspective of normative political economy, this article explores the theoretical restructuring of developing countries under the background of the digital era. Through the review of the classical development state model and the analysis of the digital political and economic structure, the study points out that in the process of transforming the global economy from industrial capitalism to digital capitalism, the functions and legitimacy of the state face fundamental challenges. The traditional institutional mechanism that relies on industrial coordination and export orientation is difficult to cope with the new accumulation logic with data, algorithms and platforms

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as the core. To maintain economic competitiveness and social inclusiveness in the digital age, countries must redefine their governance logic and development goals.

The reconceived "digital development countries" no longer carry out industrial intervention in the way of "choosing winners" but realise long-term institutional innovation by shaping the digital ecosystem. The core task of the country is to build a safe, open and inclusive digital infrastructure, develop new public capabilities such as algorithm supervision and data governance, and guide technological innovation to serve social welfare with the normative principles of transparency, responsibility and fairness. Such a "mission-oriented digital state" not only inherits the tradition of developing countries attaching importance to public planning but also overcomes its limitations in the information age.

At the practical level, this article reveals the diversified path of digital governance under different political systems through the comparative analysis of Estonia, South Korea and India. The small country model (such as Estonia) shows how "lightweight governance" can achieve efficient services with high transparency and citizen participation; developed industrial economies (such as South Korea) prove that countries' strategic investment in the AI and data industries can still go hand in hand with democratic accountability; and emerging economies (such as India) highlight the digital public base. Facilities play an important role in promoting social inclusion and market revitalisation. Together, these experiences show that digitalisation does not mean the exit of the national role, but the redefinition of national capacity and public responsibility.

At a deeper level, the rise of digital development countries has also challenged the traditional dualistic logic of "country-market". The essence of digital governance is a "process of co-construction of the system", which requires the joint participation of the state, enterprises and civil society. In the future, national governance should no longer be just a "supervisor" or "arbitrator", but should become a "designer and maintainer of the institutional platform". This collaborative governance logic provides a new value framework for the global digital order in the 21st century - emphasising openness, inclusiveness and sustainability.

Future research can be further deepened in three directions: first, evaluate the performance of digital policies in different countries in combination with empirical data; second, explore the long-term impact of emerging technologies such as artificial intelligence and blockchain on national capabilities and civil rights; third, pay attention to how the global southern countries can explore under the premise of not copying technological authority. The inclusive path of digital development. In general, the development-oriented state in the digital age is not the continuation of the heritage of the industrial era, but the core issue of modern political economy - it determines whether technological change can truly translate into social progress and human well-being.

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