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STRUCTURAL EVOLUTION OF GLOBAL VALUE CHAINS IN THE ERA OF INTELLIGENT TRANSFORMATION

Abstract

The paper explores the structural evolution of global value chains (GVCs) in the era of intelligent transformation driven by artificial intelligence, big data, and digital platforms. It argues that intelligentization has shifted GVCs from linear, hierarchical production systems toward adaptive, data-driven, and platform-based networks. The study develops a triadic analytical framework integrating technology, organization, and governance dimensions to explain this evolution. By comparing China's platform-driven model and Central Asia's digital integration pathway, the research highlights how regional diversity shapes the global restructuring process. The findings indicate that technological capability, institutional readiness, and policy coordination jointly determine the pace of intelligent GVC integration. The paper further proposes a multi-level policy synergy framework linking national, regional, and global governance for sustainable digital globalization. Overall, the study contributes to understanding GVC 4.0 as a new paradigm of algorithmic coordination and intelligent value creation.

Keywords: global value chains, intelligent transformation, platform governance, digital economy, policy synergy.

CHAPTER 1. INTRODUCTION

1.1 Background and Research Motivation

In recent years, the global economy has entered an era of intelligent transformation driven by artificial intelligence (AI), big data, cloud computing, and the Internet of Things (IoT). These technologies have not only redefined production efficiency and business models but also reshaped the structural logic of global value chains (GVCs). Traditional international production networks - once characterized by hierarchical, vertically fragmented manufacturing systems - are now evolving into decentralized, data-driven, and platform-oriented ecosystems [1]. This paradigm shift implies that the global division of labor is no longer determined merely by comparative advantages or cost efficiency but increasingly by technological capability, data governance, and algorithmic coordination [2].

The concept of GVCs, originally popularized by Gereffi and colleagues, has undergone several theoretical iterations - from GVC 1.0 (manufacturing fragmentation) to GVC 2.0 (knowledge-intensive modularization), and now toward GVC 3.0, or even GVC 4.0, characterized

by intelligent interconnectivity and adaptive collaboration [3]. The diffusion of Industry 4.0 technologies, such as robotics and digital platforms, has blurred the traditional boundaries between production and services, headquarters and subsidiaries, and even producers and consumers [4]. The resulting structural evolution calls for a renewed theoretical interpretation of how global production networks reorganize under intelligent transformation.

1.2 Research Significance and Theoretical Gaps

Despite a growing body of literature on digital transformation, existing research still exhibits three key gaps.

First, much of the empirical literature focuses on the technological upgrading or trade effects of AI and digitalization, while neglecting the structural dimension - that is, how intelligent transformation fundamentally alters the configuration and governance of GVCs [5].

Second, previous GVC research frameworks remain largely linear and hierarchical, assuming clear upstream and downstream relationships. However, under the intelligent paradigm, value creation is increasingly networked, iterative, and symbiotic, necessitating a shift toward complex adaptive systems theory [6].

Third, the governance dimension of GVCs has transformed dramatically. The rise of platform-based coordination mechanisms (e.g., Amazon, Alibaba, Foxconn Industrial Internet) implies that governance is now embedded within digital infrastructures, making traditional “lead-firm–supplier” models insufficient [7].

Theoretically, this study aims to bridge these gaps by developing an analytical framework that links technological transformation to GVC structural evolution through three interconnected dimensions - technology, organization, and governance. It also explores how intelligent transformation redefines the spatial distribution, value creation logic, and power structure within global production systems [8].

1.3 Research Objectives, Methodology, and Structure

The purpose of this paper is to reveal the structural evolution logic of global value chains under intelligent transformation and to identify the mechanisms through which emerging technologies reshape production, distribution, and governance at a global scale. The study adopts a theoretical and trend analysis approach rather than an econometric one, combining:

- literature synthesis: integrating recent developments in GVC theory, Industry 4.0, and platform economics [1] [3];
- comparative analysis: examining global trends and regional variations, particularly between developed economies and emerging digital economies such as China and Central Asia [9];
- structural modeling: constructing an analytical framework that interprets GVC evolution from a “technology–organization–governance” triadic perspective (to be visualized in Figure 1 in the next chapter).

The rest of this paper is organized as follows: Chapter 2 introduces the theoretical foundations and analytical framework of GVC structural evolution. Chapter 3 explains the structural logic of GVC evolution and its mechanisms of intelligent transformation. Chapter 4 analyzes global trends and regional variations, emphasizing China’s platform-based upgrading and Central Asia’s digital integration. Finally, Chapter 5 concludes with theoretical reflections and policy implications for future global production governance.

Through this structure, the paper seeks to contribute to both theory and practice: theoretically, by redefining GVC evolution under the intelligent paradigm; and practically, by providing insights into how countries and firms can strategically reposition themselves within the emerging intelligent global economy [10].

CHAPTER 2. THEORETICAL FOUNDATIONS AND ANALYTICAL FRAMEWORK

2.1 Evolution of Global Value Chain Theories: From GVC 1.0 to GVC 3.0

The study of global value chains (GVCs) has evolved through several paradigmatic stages.

GVC 1.0 emerged in the late twentieth century, emphasizing production fragmentation and the internationalization of manufacturing activities. In this phase, firms in advanced economies offshored labor-intensive production to developing countries, while retaining high-value segments such as design, branding, and marketing [1]. The core analytical focus was vertical specialization, where comparative advantage and cost minimization determined the global division of labor.

GVC 2.0 unfolded in the early 2000s with the rise of knowledge-intensive and modular production. As innovation and design capabilities diffused globally, coordination within value chains became increasingly modular, allowing for flexible linkages between suppliers and lead firms. Governance models - ranging from market-based to relational and hierarchical - became a central topic of inquiry, reflecting different degrees of coordination complexity and knowledge exchange [3].

In the current GVC 3.0 stage, the diffusion of digital and intelligent technologies - including AI, robotics, additive manufacturing, and IoT - has fundamentally transformed both the structure and dynamics of GVCs [2] [4]. These technologies are driving a shift from linear, fragmented chains toward intelligent, adaptive, and ecosystem-based networks. Production is no longer confined to sequential stages but operates through real-time data integration, cross-border digital platforms, and collaborative innovation systems [5]. This phase represents the emergence of a self-organizing global production system capable of continuously optimizing efficiency through algorithmic learning and platform governance.

2.2 Theoretical Foundations of Intelligent Transformation

The structural evolution of GVCs under intelligent transformation can be understood through three interrelated theoretical perspectives.

(1) Technological Paradigm Shift Theory.

Following Freeman and Perez (1988), technological revolutions are accompanied by new techno-economic paradigms that redefine production organization, industrial linkages, and economic growth trajectories. The intelligent transformation represents a new paradigm where data replaces labor as the central production factor, and algorithms replace management hierarchy as the coordinating mechanism [6].

(2) Evolutionary and Complexity Economics.

From an evolutionary perspective, GVCs are complex adaptive systems whose structures emerge from continuous interactions among firms, institutions, and technologies. Intelligent transformation accelerates these adaptive processes, creating path-dependent yet non-linear structural evolution [7]. Feedback mechanisms - enabled by data analytics and AI - enhance the system's self-organization capacity, leading to dynamic equilibrium rather than static comparative advantage.

(3) Platform and Data Governance Theories.

The emergence of platform ecosystems (e.g., Amazon, Alibaba, Siemens MindSphere) has introduced a new form of governance architecture within GVCs [8]. Platform owners act as coordinators of multi-sided markets, controlling data flows, standards, and interfaces that link producers, consumers, and service providers. Governance thus shifts from ownership-based control to infrastructure-based orchestration, giving rise to a new global hierarchy built on data governance power rather than asset possession [7] [9].

2.3 Analytical Framework: The “Technology–Organization–Governance” Triadic Model

To capture the structural transformation of GVCs under intelligent transformation, this study constructs a triadic analytical model encompassing technology, organization, and governance dimensions [1] [5] [8].

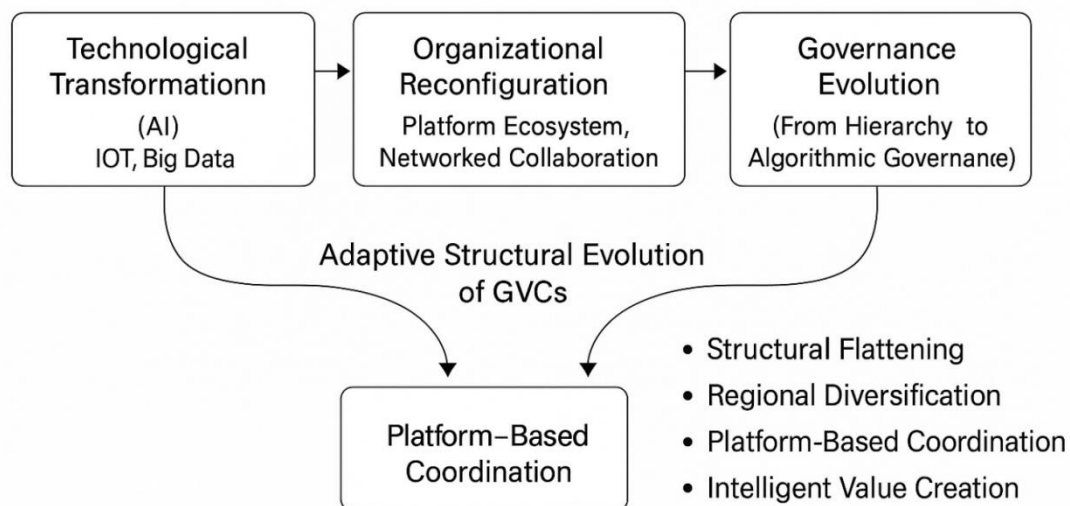
● **Technological Dimension:** Refers to the integration of digital and intelligent technologies (AI, robotics, big data) into production and logistics. Technological diffusion drives the automation and decentralization of production nodes, enabling real-time information sharing and predictive coordination [2].

● **Organizational Dimension:** Reflects how production networks evolve from linear chains to collaborative ecosystems. Enterprises increasingly rely on digital platforms to co-create value, blurring the boundaries between suppliers and users. This redefines traditional notions of firm boundaries and industrial organization [6] [8].

● **Governance Dimension:** Concerns the mechanisms through which coordination, control, and value appropriation are achieved within intelligent networks. Governance transitions from lead-firm-dominated hierarchies to platform-mediated cooperation, where standards, data rights, and algorithms become the primary tools of governance [4] [9] [10].

These three dimensions are mutually reinforcing: technological change enables new organizational forms, while new governance structures institutionalize and diffuse those technological paradigms. The intelligent transformation thus represents not only a technological revolution but also a systemic reconfiguration of how value is created, distributed, and captured in the global economy.

Figure 1. Analytical framework of global value chain structural evolution under intelligent transformation



2.4 SUMMARY

This chapter establishes the theoretical basis for understanding the intelligent transformation of GVCs. It demonstrates that global production systems have evolved from linear and hierarchical chains to complex adaptive networks characterized by technological convergence, organizational collaboration, and algorithmic governance. The following chapter will apply this framework to explain the structural logic and mechanisms of GVC evolution, focusing on how intelligent transformation shapes value creation and global production distribution.

CHAPTER 3. STRUCTURAL LOGIC OF GLOBAL VALUE CHAIN EVOLUTION

3.1 Drivers of Intelligent Transformation in GVC Evolution

The intelligent transformation of the global economy has fundamentally altered how value is created, distributed, and governed across nations. The driving forces behind this transformation can be summarized in three interconnected dimensions: technological, organizational, and institutional [1][3].

(1) Technological Drivers.

AI, robotics, and data analytics have reshaped the global production process by introducing predictive coordination and automation at scale [2]. The result is a structural flattening of value chains - reducing the number of intermediary layers between design, production, and delivery. Smart factories, digital twins, and real-time logistics systems enable a continuous data loop that synchronizes production nodes across borders, converting what was once a sequential process into a simultaneous network [4].

(2) Organizational Drivers.

Intelligent transformation has changed how firms organize and interact within GVCs. The traditional “hub-and-spoke” structure of lead-firm control has evolved into a platform-based ecosystem where multiple actors (suppliers, customers, developers, regulators) co-create value [5]. The rise of platform intermediaries such as Amazon, Alibaba, and Foxconn Industrial Internet illustrates how digital infrastructures integrate manufacturing and services under a unified governance logic [7].

(3) Institutional and Policy Drivers.

Governments are increasingly influencing GVC restructuring through digital industrial policies, data governance standards, and cybersecurity regulations. Initiatives such as China’s “Digital Silk Road,” the EU’s “Data Act,” and OECD digital trade frameworks demonstrate that data sovereignty and algorithmic standards are emerging as new competitive dimensions in global trade [9] [10].

These three drivers form a mutually reinforcing system: technological advances enable organizational innovation, while policy and governance frameworks institutionalize these new forms of production and coordination.

3.2 From Vertical Fragmentation to Intelligent Distribution

The structural evolution of GVCs can be viewed as a shift from vertical fragmentation to intelligent distribution [1] [6].

In traditional GVCs, production tasks were divided along a vertical hierarchy of inputs and outputs. Under intelligent transformation, this hierarchy is replaced by horizontal and multi-layered interaction networks.

(1) Flattening of Production Layers.

Digital connectivity reduces the distance between producers and consumers. Firms employ data analytics to anticipate demand and adjust production dynamically, shortening supply chains and enabling localized manufacturing [4] [8].

(2).Decentralization of Decision-Making.

AI systems now support decentralized decision-making through distributed data architectures and blockchain-based traceability systems. Decision rights are shifting from headquarters to digital nodes, fostering a polycentric governance pattern [7].

(3).Knowledge, Algorithm, and Data Flows.

Unlike traditional material and capital flows, GVC 3.0 relies on intangible circulations - knowledge flow (innovation sharing), algorithm flow (decision automation), and data flow (real-time coordination). These three intangible flows form a new hierarchy of value creation, redefining comparative advantage from cost-based to information-based competition [5] [6].

3.3 Governance Transformation: From Hierarchy to Algorithmic Coordination

Intelligent transformation also reconfigures GVC governance structures. Governance is increasingly exercised through digital infrastructures rather than ownership control [2] [9].

(1).From Lead-Firm Control to Platform Coordination.

Traditional lead-firm dominance (e.g., Apple–Foxconn) is being replaced by platform-mediated collaboration, where the platform orchestrates transactions, standards, and data sharing among multiple actors [3] [8]. Platforms thus act as “algorithmic governors” that allocate tasks, monitor performance, and enforce rules automatically through code.

(2).Rise of Algorithmic Power.

Algorithms have become new governance instruments that determine who gains access, visibility, and value within the network [4] [10]. As production data flows into centralized AI systems, governance shifts toward predictive control, allowing platforms to manage uncertainty dynamically.

(3).Towards Self-Adaptive Governance.

The convergence of data and AI gives rise to self-adaptive governance systems, capable of learning and recalibrating coordination rules in real time. This creates what can be termed an “algorithmic institutionalism,” where governance authority emerges not from human hierarchy but from computational logic embedded in digital networks [6].

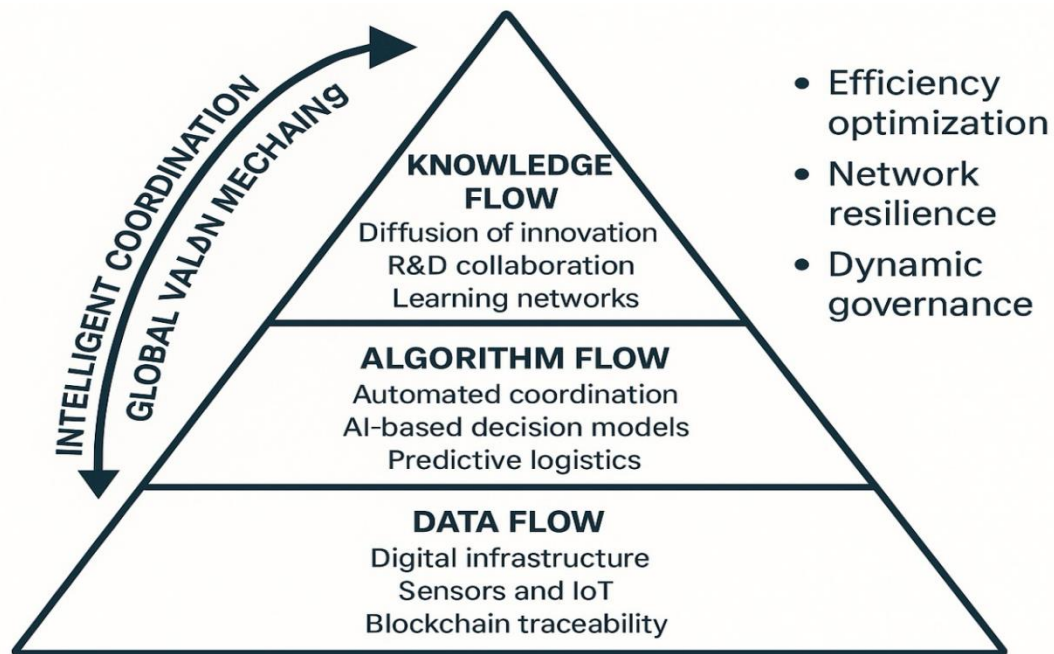
3.4 Structural Outcomes of Intelligent GVC Evolution

The intelligent transformation of GVCs generates a set of structural outcomes observable across multiple industries and regions [7] [9]:

- **Structural Flattening:** Supply chains are becoming shorter and more integrated through digital coordination mechanisms.
- **Regional Diversification:** The risk of over-concentration drives firms to adopt multi-regional supply configurations, blending reshoring with digital outsourcing.
- **Platform-Based Coordination:** Production, innovation, and logistics converge around platform ecosystems, enhancing scalability and network efficiency.
- **Intelligent Value Creation:** Data and algorithms emerge as core production factors, generating new forms of value beyond traditional manufacturing output.

These transformations imply that global production networks are entering a reflexive phase of evolution, where digital connectivity, data intelligence, and governance algorithms co-evolve to define the new architecture of the world economy.

Figure 2. Hierarchical System of Knowledge Flow, Algorithm Flow, and Data Flow in Intelligent GVCs



3.5 SUMMARY

This chapter elucidates the mechanistic logic of GVC evolution under intelligent transformation. Technological advancement drives decentralization, platformization, and data-driven governance, while new flows of knowledge, algorithms, and data reshape global production hierarchies. The next chapter will extend this logic to empirical and regional dimensions - examining global trends and regional variations in GVC restructuring across developed and emerging economies.

CHAPTER 4. GLOBAL TRENDS AND REGIONAL VARIATIONS

4.1 Global Transformation Trends in GVCs under Intelligentization

The global economy is undergoing a systemic restructuring as digital technologies diffuse across production and trade networks. Intelligent transformation—driven by artificial intelligence, data analytics, and automation—has accelerated three core trends in the global value chain (GVC) landscape: re-regionalization, platformization, and datafication [1] [3].

(1) Re-regionalization of Global Production.

After decades of hyper-globalization, global value chains are becoming more regionally concentrated. Firms in advanced economies increasingly pursue near-shoring and friend-shoring strategies to balance efficiency with resilience. Digital manufacturing technologies and logistics automation enable production to be distributed flexibly across regional hubs while maintaining global coordination [4] [6].

(2) Platformization and Ecosystem Competition.

The rise of digital platforms marks a structural departure from the traditional lead-firm model. Platforms act as transactional infrastructures that mediate between producers and consumers, aggregating data and orchestrating algorithmic coordination [5] [7]. Platform ecosystems such as Amazon, Alibaba, and Siemens MindSphere create new forms of global production networks in which firms compete not through ownership of assets but through control of interfaces and data standards [8].

(3) Datafication of Trade and Value Creation.

Data has become both a production input and a traded asset. Cross-border data flows now exceed global trade in goods by volume and value contribution [2]. The integration of AI and data

analytics into trade systems facilitates intelligent supply-chain management, predictive demand forecasting, and risk control. These developments redefine value creation from physical output to informational coordination, signaling the transition from GVC 3.0 to an emerging GVC 4.0 paradigm [1] [9].

4.2 Regional Differentiation in Intelligent GVC Integration

While intelligent transformation is global in scope, its structural manifestations vary significantly across regions, reflecting differences in technological capability, institutional readiness, and policy orientation [3] [9]. Two cases - China and Central Asia - illustrate contrasting yet complementary pathways toward intelligent GVC integration.

(1) China: From Manufacturing Power to Platform-Driven Value Chains

China represents the most advanced case of intelligent GVC integration among emerging economies. Building upon its manufacturing capacity, China has moved up the value chain through AI-empowered industrial upgrading and platform-based trade systems.

- **Technological Capability:** China's national AI strategy, smart manufacturing initiatives, and data infrastructure projects have fostered a robust ecosystem that links industrial clusters with global digital networks [2] [4].

- **Organizational Transformation:** Local governments in Beijing, Shanghai, and Shenzhen have implemented industrial internet and cross-border e-commerce policies, promoting ecosystem-oriented governance [7].

- **Global Linkages:** Through the Belt and Road Initiative and "Digital Silk Road," China is exporting digital infrastructure, standards, and platforms, extending its value-chain integration influence to partner economies [9] [10].

China's intelligent GVC evolution thus exemplifies a transition from production-driven to platform-driven globalization, characterized by strong state guidance, policy coordination, and rapid technological diffusion.

(2) Central Asia: From Resource Dependence to Digital Integration

In contrast, Central Asian economies - including Kazakhstan, Uzbekistan, and Azerbaijan - are at an earlier stage of intelligent value-chain development. Historically dependent on natural resource exports, these economies now face the challenge of embedding themselves into digital global networks.

- **Technological Constraints:** Limited digital infrastructure and data governance frameworks constrain their participation in knowledge- and algorithm-intensive segments of the GVC [5][8].

- **Policy Transformation:** Recent policy initiatives, such as Azerbaijan's AI Strategy Implementation Plan 2025, indicate a shift toward integrating AI and digital trade into national development agendas.

- **Strategic Opportunities:** By aligning with China's "Digital Silk Road" and leveraging regional connectivity, Central Asia can serve as a digital corridor between Asia and Europe, participating in higher-value segments through data exchange and logistics intelligence [6][9].

Thus, while China is the technological leader, Central Asia is evolving as a strategic bridge - its progress contingent on digital capacity building, institutional harmonization, and regional cooperation mechanisms.

4.3 Comparative Structural Features of Intelligent Value Chains

A comparative analysis between China and Central Asia reveals divergent structural characteristics of intelligent GVC integration (Table 1).

Table 1

A comparative analysis between China and Central Asia in Different Dimension

Dimension	China	Central Asia
Technological Infrastructure	Advanced AI, IoT, and digital platforms integrated across industries	Developing digital and AI infrastructure, focused on logistics and e-government
Governance Mode	Platform-based, data-driven governance with policy-industry synergy	Policy-driven digitalization, limited private platform ecosystems
GVC Position	Upstream innovation and platform coordination	Midstream logistics and digital service connectivity
Integration Strategy	Exporting digital standards via Digital Silk Road	Aligning with regional platforms for digital trade participation
Structural Outlook	Towards autonomous, algorithmic coordination (GVC 4.0)	Transitioning to intelligent coordination (GVC 2.5–3.0)

This contrast highlights that technological endowment and policy maturity determine the pace and pattern of intelligent GVC evolution. China’s model emphasizes technological sovereignty and ecosystem governance, whereas Central Asia’s strategy focuses on connectivity and capability upgrading. The two are increasingly complementary, forming an emerging digital symbiosis across the Belt and Road region.

4.4 Emerging Global Paradigm: Toward GVC 4.0

The intelligent transformation of GVCs signals a movement toward GVC 4.0, characterized by three structural attributes [1] [6] [9]:

1. **Intelligent Autonomy:** Production and logistics systems operate through real-time sensing and adaptive learning, reducing dependence on manual control.
2. **Algorithmic Coordination:** AI replaces traditional managerial hierarchies, ensuring continuous optimization across global nodes.
3. **Ecological Integration:** Cross-sectoral data sharing and platform interconnection blur the boundaries between manufacturing, services, and digital trade.

In this paradigm, global competitiveness is defined by the capacity to manage and govern flows of data, knowledge, and algorithms rather than the mere control of production assets. Intelligent GVCs thus represent not just a new industrial configuration, but a redefinition of the global economic order.

4.5 SUMMARY

This chapter demonstrates that the intelligent transformation of global value chains exhibits both universal and region-specific dynamics. Globally, GVCs are shifting toward data-driven, platform-based, and regionally networked configurations. Regionally, China’s leadership in intelligent GVC integration contrasts with Central Asia’s gradual digital adaptation.

CHAPTER 5. CONCLUSION AND POLICY IMPLICATIONS

5.1 Major Findings

This study has explored how intelligent transformation - driven by artificial intelligence, big data, and digital platforms - reconfigures the structure and governance of global value chains (GVCs). Building on the theoretical framework developed in Chapters 2 and 3, the analysis reveals

that GVC evolution is no longer a simple linear process of industrial upgrading but a dynamic, feedback-driven transformation system [1 2]. Three key findings can be highlighted:

(1) From Fragmentation to Intelligent Coordination.

Intelligent technologies have transformed GVCs from vertically fragmented structures into adaptive networks characterized by continuous data feedback, algorithmic decision-making, and decentralized control. This evolution represents a structural departure from traditional cost-driven globalization toward information-driven coordination [3] [4].

(2) From Ownership to Governance through Data and Algorithms.

In the intelligent era, the source of competitive advantage shifts from physical asset control to the ability to govern flows of data, knowledge, and algorithms. Platforms serve as both technological and institutional infrastructures that determine who accesses information and how value is distributed across networks [5] [8].

(3).From Global Dependence to Regional Symbiosis.

Intelligent GVCs are increasingly characterized by regional differentiation and strategic interdependence. As shown in Chapter 4, China's platform-driven leadership and Central Asia's digital adaptation create a multi-polar production network in which digital standards, cross-border platforms, and data corridors form the backbone of a new regional integration order [6] [9] [10].

Together, these findings suggest that intelligent transformation is not merely a technological trend but a systemic evolution of global production governance, fundamentally redefining the logic of value creation and international competitiveness.

5.2 Theoretical Contributions

This research contributes to the literature on global value chains and intelligent transformation in several dimensions:

(1).Conceptual Innovation.

It extends GVC theory from the traditional “production–trade” paradigm to a technology–organization–governance triadic model [2] [5]. This model captures how technological innovation interacts with organizational reconfiguration and governance restructuring in shaping global production systems.

(2).Analytical Integration.

By integrating insights from evolutionary economics, platform theory, and complex systems analysis, the study develops a holistic view of GVC evolution as a self-organizing adaptive system capable of continuous learning and structural renewal [3] [6] [7].

(3).Regional Interpretation.

The comparative examination of China and Central Asia enriches the global debate on technological diffusion and regional upgrading, offering a concrete illustration of how intelligent transformation unfolds unevenly yet interdependently across regions [8][9].

These theoretical contributions provide a foundation for further research on GVC 4.0—the next phase of globalization where algorithms, data, and digital governance shape economic hierarchies and institutional architectures.

5.3 Policy Implications

The intelligent transformation of GVCs raises profound implications for governments, enterprises, and international organizations. Three levels of policy action are essential:

(1) National Level – Building Intelligent Industrial Ecosystems

Countries must cultivate digital infrastructure, innovation capacity, and human capital to embed themselves into intelligent GVCs. For emerging economies, policy priority should focus on

establishing open data frameworks, digital-trade logistics, and AI governance standards that attract platform investment [6] [9].

China’s experience demonstrates that coordinated industrial and digital policy can accelerate structural upgrading when supported by state-guided innovation systems and regional experimentation [2] [4].

(2) Regional Level – Enhancing Digital Connectivity and Standard Alignment

Regional integration mechanisms - such as the Belt and Road Digital Silk Road—should foster interoperability of platforms, data standards, and cybersecurity regulations. Cooperation between China and Central Asia shows that policy synchronization enhances regional participation in digital value chains while mitigating technological inequality [8] [10].

(3) Global Level – Establishing Inclusive Digital Governance

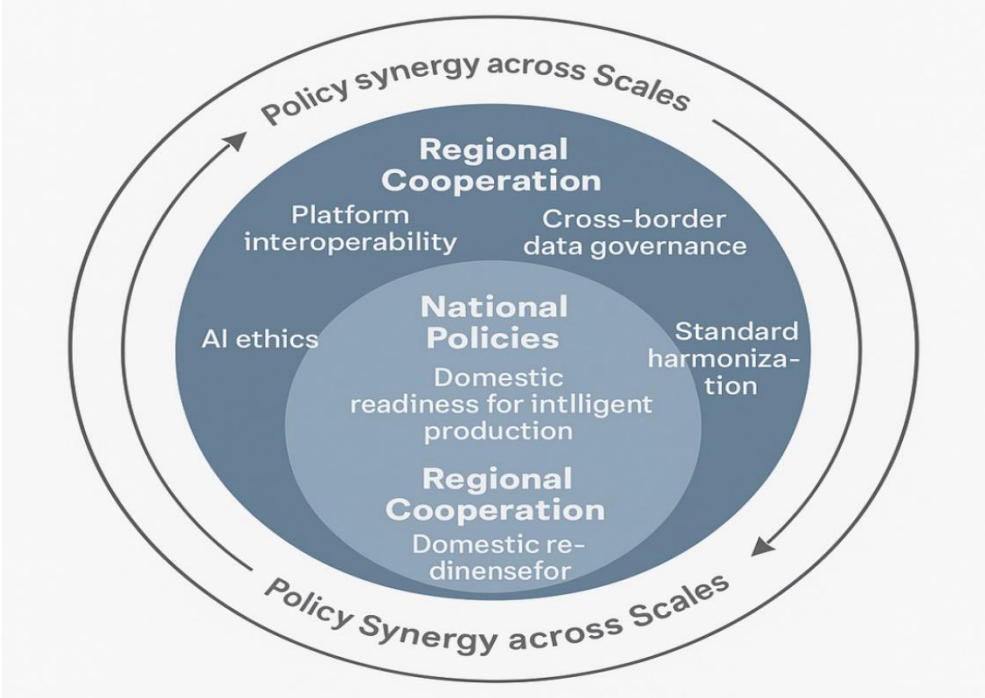
International institutions (e.g., WTO, OECD, UNCTAD) should promote global frameworks for data sharing, cross-border algorithm ethics, and digital taxation. The aim is to prevent the fragmentation of global cyberspace into incompatible data blocs and ensure that intelligent transformation benefits all economies equitably [1] [7].

This requires multilateral consensus on algorithm transparency, data-flow governance, and AI ethics in trade and production.

In conclusion, the intelligent transformation of global value chains marks a structural inflection point in the world economy. As data and algorithms become new factors of production, and platforms become the new arenas of governance, the traditional logic of comparative advantage is giving way to one of computational advantage.

The future of globalization will be defined not by the flow of goods alone, but by the governance of knowledge, data, and intelligence. The challenge for policymakers is to ensure that this transformation enhances inclusivity, transparency, and sustainability - thus enabling a more balanced and intelligent global economy [1] [10].

Figure 3. Policy Synergy Framework for Global Intelligent Value Chains



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Ağıllı transformasiya dövründə qlobal dəyər zəncirlərinin struktural təkamülü

Xülasə

Məqalə süni intellekt, böyük məlumatlar və rəqəmsal platformalar tərəfindən idarə olunan ağıllı transformasiya dövründə qlobal dəyər zəncirlərinin (GVC) struktur təkamülünü araşdırır. Ağıllılaşmanın GVC-ləri xətti və iyerarxik istehsal sistemlərindən adaptiv, məlumatlara əsaslanan və platforma yönümlü şəbəkələrə çevirdiyi iddia olunur. Tədqiqat bu təkamülü izah etmək üçün texnologiya, təşkilatı və idarəetmə ölçülərini birləşdirən triadik analitik çərçivə təqdim edir.

Çin-in platforma əsaslı modeli ilə Mərkəzi Asiyanın rəqəmsal integrasiya trayektoriyasını müqayisə etməklə, tədqiqat regional müxtəlifliyin qlobal yenidənqurma prosesini necə formalaşdırdığını vurğulayır. Nəticələr göstərir ki, texnoloji imkanlar, institusional hazırlıq və siyasət əlaqələndirilməsi ağıllı GVC integrasiyasının sürətini müəyyən edir. Məqalə həmçinin dayanıqlı rəqəmsal qloballaşma üçün milli, regional və qlobal idarəetməni əlaqələndirən çoxsəviyyəli siyasət sinerjisi çərçivəsini təklif edir. Ümumilikdə, tədqiqat GVC 4.0-ı alqoritmik əlaqələndirmə və ağıllı dəyər yaradılmasının yeni paradigması kimi təqdim edir.

Açar sözlər: *qlobal dəyər zəncirləri, ağıllı transformasiya, platforma idarəetməsi, rəqəmsal iqtisadiyyat, siyasət sinerjisi.*