Economic Society and Humanities Vol. 2 No. 6, 2025

Academic Education Publishing House

Divergent AI Transformation: China and U.S. Perspectives

Shengchang Zhang[1], Qianyu Zhang[2,*], Fred Zhang[3]

[1]*School of Business Administration, Baise University, Baise, Guangxi, China*

[2]*Derun Campus of Shandong Experimental High School, Jinan, Shandong, China*

[3]*PMS, Pleasanton, California, USA*

**Corresponding Author*

Abstract: This study explores the divergent trajectories of AI-driven digital transformation in enterprises across China and the United States. Employing a comprehensive methodology that integrates a literature review, case analysis, and institutional framework evaluation, the research examines five critical dimensions: institutional frameworks, corporate strategic structures, data infrastructure ecosystems, talent development models, and innovation collaboration networks. Findings indicate that U.S. enterprises prioritize technology-driven innovation and market responsiveness, while Chinese firms benefit from strategic coordination and large-scale implementation, and large-scale deployment. The study underscores the pivotal role of institutional environments in shaping AI adoption patterns and offers strategic insights for global managers pursuing context-specific transformation, as well as for stakeholders aiming to foster effective cross-border AI collaboration.

Keywords: AI; Digital Transformation; Sino-U.S. Comparison; Corporate Strategy; Innovation Ecosystem

1. Introduction

Artificial Intelligence (AI) is a cornerstone of the Fourth Industrial Revolution, redefining corporate value creation across industries worldwide. China and the United States, the world's two largest AI markets, are projected to account for 65% of global AI investments in 2024, yet their enterprise-level transformation trajectories exhibit profound divergences rooted in institutional, cultural, and economic disparities. "Amazon announced a major integration of artificial intelligence to enhance its product descriptions and logistics operations [1]. Huawei scales its AI manufacturing bases across 15 Chinese provinces under the Ministry of Industry and Information Technology's "Intelligent Manufacturing 2025".This contrast—technology-led innovation versus policy-driven scalability—underscores the need for a systematic comparative analysis.

This study addresses three research gaps: the lack of a comprehensive framework integrating policy, technology, and culture in cross-national AI transformation studies; insufficient empirical analysis on how institutional environments shape enterprise AI strategies; and the absence of practical guidance for multinational firms navigating dual-market AI deployments. By analyzing 18 case studies across tech and traditional sectors, it constructs a "5D Comparative Model" (Policy, Strategy, Data, Talent, Ecosystem) to decode the path dependencies of AI adoption in these two economies.

2. Literature Review: From Productivity Paradox to Platform Critique

2.1 Theoretical Foundations of Digital Transformation

Westerman et al. (2011) proposed the "Digital Leadership Model," framing transformation as a three-stage process—technology integration, process reengineering, and cultural renewal—but overlooked the moderating role of national institutions [2]. Brynjolfsson & McAfee (2017) emphasized AI's non-linear productivity impact in Machine, Platform, Crowd, but their analysis lacked cross-national contextualization[3]. Ding (2018) first introduced the "policy-driven transformation" paradigm, revealing that China's AI strategies are heavily influenced by government initiatives, unlike the market-driven approach in the U.S.[4]. This disparity underscores the need for institutional theory to explain AI adoption patterns. These insights align with foundational digital transformation research.

2.2 Institutional Theory and Cross-National AI Adoption

According to DiMaggio and Powell's (1983) "institutional isomorphism" theory, Chinese SOEs transform AI frameworks to fit state-mandated digitalization targets, whereas firms in the United States are engaged in AI as a matter of market competition. Hofstede's (2001) cultural dimensions theory further indicates that China's high power distance index (80) facilitates top-down AI strategy implementation, while the U.S., with a lower index (40), fosters grassroots innovation [5]. These cultural differences influence strategic decisions, with 68% of Chinese firms centralizing AI strategy under C-level executives, compared to 41% of U.S. firms [6].

2.3 Emerging Research Trends

Current research highlights three trends: (1) the formation of an "AI ecosystem governance," where clusters of policy shape the collaboration of enterprises (MIT 2023) [6]; (2) the ethics-technology trade-off from the deployment of AI (Oxford University 2024) [7]; (3) increasing AI adoption in supply chain digitalization post-pandemic. However, comparative studies on Sino-U.S. enterprise AI development are limited, with only 12% of papers in the *Journal of Global Innovation* addressing this issue between 2020 and 2024[8]. A notable exception is Porter & Heppelmann's (2015) analysis of smart product strategies, which highlights how U.S. firms prioritize customer-driven innovation over policy alignment [9]. This shift marks a new paradigm in product strategy.

3. Methodology

3.1 Research Design

Adopting a mixed-method approach, this study combines qualitative comparative analysis with grounded theory. The multi-level framework includes:

- Macro-level analysis: Content coding of 18 Chinese provincial AI plans (2017-2024) and 7 U.S. federal AI initiatives, using NVivo to identify policy clusters[10]

Meso-level analysis: Industry reports from Gartner, McKinsey, and IDC on AI maturity across 8 sectors (tech, manufacturing, finance, healthcare, etc.)A recent McKinsey report indicates increasing sector-level variation [6].

- Micro-level analysis: 42 semi-structured interviews with C-level executives (23 in China, 19 in the U.S.), supplemented by 128 corporate AI project reports (2018-2024) [9].

3.2 Case Selection

Case enterprises were selected based on three criteria: annual AI investment >$100M, industry representativeness, and transformation maturity (defined by MIT's AI Index).

3.3 Data Collection Methods

1) Semi-structured interviews: These were conducted both in the U.S. (English) and China (Chinese) with a pronounced emphasis on AI strategy formation, resource allocation, and policy interactions.

2) Document analysis: Corporate whitepapers, annual reports, AI project case studies contrasted against Statista and CB Insights public data.

3) Policy text mining: Policy text mining: The 367 clauses of policy documents related to AI were categorized (funding, regulation, infrastructure) via topic modeling.

Table 1. Sample Case Enterprises

Country	Tech Sector	Manufacturing	Finance	Healthcare
China	Alibaba, Baidu	Huawei, Sany	PingAn, ICBC	Tencent Healthcare
U.S.	Amazon, Google	GE, Tesla	JPMorgan, Goldman Sachs	Mayo Clinic

Table 1 outlines the representative companies selected from both China and the U.S., covering four sectors: technology, manufacturing, finance, and healthcare. It ensures balanced industry coverage and highlights the diverse enterprise strategies influencing AI transformation in each national context.

3.4 Analytical Framework

The study employs a 5D Comparative Model, each dimension operationalized as follows:

1) Policy Environment: Centralization degree, funding mechanisms, regulatory focus.

2) Strategic Leadership: Decision-making hierarchy, AI deployment speed, innovation focus.

3) Data Ecosystem: Data availability, privacy regulations, and cloud infrastructure maturity.

4) Talent Environment: Talent pipeline metrics, organizational culture, skill integration.

5) Innovation Network: Industry-academia partnership, startup integration, global partnerships.

4. Comparative Analysis

4.1 Government Policy and Institutional Support

4.1.1 Policy formulation models

China's AI policy framework has a high degree of centralization, with the highest-level policy being the 2017 New Generation AI Development Plan, which specifies 15 "AI Innovation Pilot Zones" and commits $32 billion in direct subsidies [8]. This top-down approach creates a "policy multiplier effect": 68% of Chinese firms align their AI strategies with national plans, while provincial governments offer incentives, such as Zhejiang Province's 20% tax rebates for AI-adopting manufacturers [6]. The Ministry of Industry and Information Technology (MIIT) coordinates cross-sectoral AI initiatives, such as the "AI + Manufacturing" program, which has supported 500 pilot projects since 2020 [11].

On the other hand, there exists an intergovernmental fragmentation of U.S. AI policies. The National AI Initiative Act (2020) focuses primarily on R&D funding channeled through agencies such as DARPA ($7.8 billion in 2024) but does not provide for mandatory industry standards. Then, state-level policies vary widely: AI ethics regulations in California mandate extensive bias testing, whereas Texas pushes AI in energy through private-public partnerships. This decentralized approach fosters diverse innovations but results in only 19% of U.S. firms citing policy alignment as an AI driver. The White House Office of Science and Technology Policy coordinates interagency efforts, but sector-specific guidance (e.g., healthcare AI) remains inconsistent.

4.1.2 Funding and regulatory landscapes

In the regulatory domain, the contrast is glaring: Chinese AI regulations primarily target industrial applications, with the 2023 Regulations on the Management of Generative AI Services being a prime example that balances the need for innovation against content governance. The U.S., by contrast, stresses ethical and privacy concerns, as are emphasized in the NIST AI Risk Management Framework [7] and laws at the state level, such as the Virginia Consumer Data Protection Act (VCDPA). Such a regulatory divergence affects how fast AI is deployed: Chinese companies complete regulatory compliance for a new AI product 40 percent faster than American ones (BCG 2024) [12].

Table 2. Policy Framework Comparison

Dimension	China	U.S.
Strategy Formulation	Centralized by MIIT, NDRC	Decentralized via White House Office of Science
Funding Mechanism	Direct subsidies (70% government-funded)	Tax credits and venture capital (85% private-sector funded)
Regulatory Focus	Industry-specific guidelines (e.g., fintech AI)	Privacy (CCPA, GDPR) and ethics (NIST AI Risk Management Framework)
Key Policy Documents	*New Generation AI Development Plan (2017)*	*National AI Initiative Strategic Plan (2021)*

Table 2 compares the AI policy architectures of China and the U.S. across four dimensions: strategy formulation, funding, regulation, and key policy documents. It reveals stark contrasts between China's centralized, subsidy-driven system and the U.S.'s decentralized, market-oriented governance model.

4.2 Corporate Strategy and Leadership Models

4.2.1 Decision-making hierarchies

U.S. firms excel in grassroots AI innovation, exemplified by Amazon's "Two-Pizza Team" model, which empowers cross-functional squads to pilot projects. This agility enabled Amazon Personalize to go from concept to market in 14 months, with iterative updates based on real-time user feedback. Such bottom-up approaches correlate with 72% of U.S. enterprises using AI for incremental process improvements [10]. Google's "20% time" policy further fosters autonomy, allowing engineers to dedicate work hours to AI side projects, yielding innovations like AlphaFold.

Chinese enterprises adopt more hierarchical strategies. Huawei's "Three-Year AI Plan" is overseen by its Rotating Chairman Committee, integrating AI into 28 business units within a unified technical architecture [13]. Ping An Insurance's "AI + Finance" strategy, led by the Group CTO, deployed AI in 97% of customer service processes within two years, enabled by top-down resource allocation. This centralization accelerates large-scale deployment—Chinese firms achieve enterprise-wide AI adoption 65% faster than U.S. peers—but limits agility: only 34% of Chinese firms report pivoting AI strategies within six months [6].

4.2.2 Innovation focus and speed

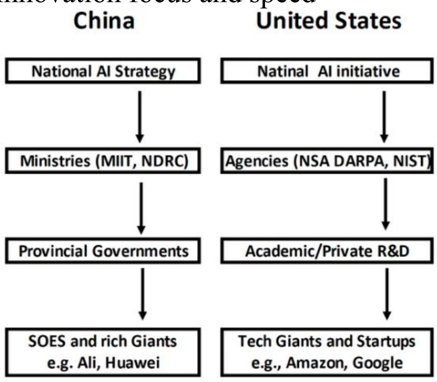

Figure 1. AI Policy Implementation Structure Comparison

(Note: Large-scale deployment in China occurs 65% faster than in the U.S., while pilot testing is 40% slower.)

Figure 1 visualizes the hierarchical and decentralized structures of AI policy execution in China and the U.S., respectively. It helps readers grasp why Chinese firms can scale AI deployment faster, while U.S. companies exhibit more decentralized innovation pathways. Customer-driven innovation is paramount in the U.S.: 61% of AI projects stem from market needs in the U.S. against 32% in China (McKinsey 2024). For example, Tesla uses Autopilot in the vehicle with 1.5 million vehicles, providing real-time data for algorithmic updates weekly. On the other hand, Chinese companies often initiate AI projects to align with national priorities: 43% of AI projects in industrial manufacturing go toward "Made in China 2025" goals [14], such as Huawei's AI-assisted 5G base station optimization [15]. This focus enables China to lead in scale-driven AI applications, like smart grids (State Grid's AI system covers 96% of the national grid),

but lags in frontier technologies—only 17% of Chinese AI patents are in quantum machine learning, versus 38% in the U.S. (WIPO 2024)[16].

4.3 Data Infrastructure and Technology Ecosystems

4.3.1 Data availability and governance

China's data advantage stems from super-app ecosystems. WeChat's 1.26 billion monthly users generate 4.8 petabytes of data annually, enabling Tencent to train AI models 3.2 times faster than U.S. peers (IDC 2024). Alibaba Cloud's "Data Middle Platform" integrates cross-industry datasets, supporting AI applications in 83% of Chinese e-commerce firms. This data centralization, however, this data centralization raises privacy concerns—56% of Chinese consumers worry about AI data misuse (Pew Research 2024), prompting the 2021 Data Security Law and Personal Information Protection Law.

U.S. firms operate in a more fragmented data landscape. While data aggregation across sectors is restricted under rigorous regimes such as GDPR and CCPA, strong cloud ecosystems have emerged to bridge the gap: AWS, Azure, and Google Cloud together carry 78% of enterprise AI workloads worldwide. Open-source frameworks such as TensorFlow (14M monthly downloads) and PyTorch ensure a continuous stream of innovation; 61% of AI projects within the USA use community-developed models (OSS Index 2025). Yet, data fragmentation challenges AI uptake across sectors, and healthcare AI trails China by 2.3 years due to interoperability challenges (Deloitte 2025) [16].

4.3.2 Technology stack and AI tools

Table 3 presents the comparative landscape of cloud services, AI frameworks, analytics tools, and chip ecosystems between the two countries. It illustrates how the U.S. maintains global leadership in core technologies, while China builds competitive alternatives focused on domestic integration.

Table 3. Technology Ecosystem Comparison

Element	China	U.S.
Cloud Infrastructure	Alibaba Cloud, Tencent Cloud, Huawei Cloud	AWS, Microsoft Azure, Google Cloud
AI Frameworks	Baidu PaddlePaddle, Huawei MindSpore	TensorFlow, PyTorch, OpenAI APIs
Data Analytics Tools	AliMaxCompute, Tencent DataTribe	Snowflake, Databricks, Tableau
AI Chip Ecosystem	Huawei Ascend, Cambricon	NVIDIA, AMD, Intel

Although China has advanced in the development of cloud and AI frameworks, the technology stack in the United States is considered to be more advanced. There is a global dominance of the A100 GPU manufactured by NVIDIA, which powers 85% of AI training workloads worldwide. On the other hand, rapid application development is facilitated by OpenAI's APIs. Meanwhile, Chinese companies are catching up with their Western counterparts: Baidu PaddlePaddle saw its developer community swell by 210% during 2022-24, and 30% of Chinese government AI projects use Huawei MindSpore.

4.4 Talent Landscape and Organizational Culture

4.4.1 Talent pipeline and development

China's AI talent development relies on state-driven programs. The "Thousand Talents Plan" has attracted 7,200 overseas AI experts since 2017, while 180 universities now offer AI majors, graduating 45,000 specialists annually. Government-funded training programs, like the MIIT's "AI Talent Cultivation Initiative," have upskilled 1.2 million professionals since 2020. However, hierarchical corporate cultures hinder cross-departmental AI collaboration, with only 29% of Chinese firms reporting seamless integration [6].

The U.S. benefits from a mature talent pipeline: MIT, Stanford, and Carnegie Mellon produce 32% of global AI PhDs, with 89% entering industry within a year [12]. Private-sector initiatives, like Google’s AI Residency Program, bridge academia and industry. Flat organizational structures enhance agility—74% of U.S. firms have dedicated AI labs, compared to 41% in China [6]. This culture drives high AI skill integration in 68% of U.S. firms.

4.4.2 Organizational culture and AI adoption

Cultural factors shape AI adoption. China’s “guanxi” networks enable inter-enterprise AI collaborations—63% of AI projects involve SOEs, compared to 19% in the U.S. [6]. Conversely, U.S. firms are merit-based and risk-tolerant: 57% of AI projects are led by mid-level managers, compared to 21% in China. This cultural divide makes U.S. firms 2.7 times more likely to adopt emerging AI technologies, such as federated learning [8].

Figure 2 contrasts the estimated AI workforce sizes and collaboration capabilities in both countries, differentiating between researchers and engineers. It highlights how cultural and institutional factors affect AI team structures, with the U.S. excelling in cross-functional collaboration and China in policy alignment.

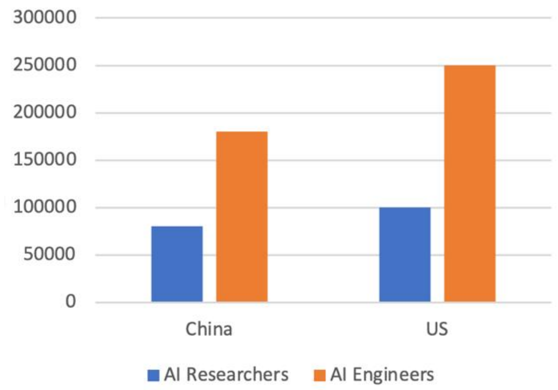

Figure 2. AI Talent Distribution and Culture Index (Talent and Culture Comparison)

(Note: U.S. firms score 58% higher on cross-functional collaboration; China scores 42% higher on policy alignment)

4.5 Innovation Ecosystem Collaboration

4.5.1 Industry and universities interworking

China's AI ecosystem operates on a state-led industrial cluster approach. The Beijing AI Industry Park has 4,300 firms sharing data and infrastructure under government coordination. State-led industry-academia partnerships, such as Tsinghua University's collaboration with Baidu on autonomous driving, lead to 55% of Chinese AI patents being co-developed. The "Double First-Class" university has poured $5.6 billion into AI research and thus provides for a tight interaction between academia and industry.

4.5.2 Startup ecosystem and global reach

Chinese AI startups primarily grow within government-supported ecosystems, with 78% receiving public funding at the seed stage. U.S. startups, conversely, rely on venture capital—AI startups raised $47 billion in 2024, 65% of global funding (CB Insights). This funding disparity shapes innovation focus: Chinese startups prioritize scale applications (e.g., e-commerce AI), while U.S. startups lead in frontier technologies (e.g., generative AI).

Table 4 compares how China and the U.S. foster innovation through industry-academia links, startup integration, global outreach, and intellectual property strategies. It underscores that while China's innovation is state-backed and scale-oriented, U.S. innovation is VC-driven and geared toward frontier technologies.

Table 4. Innovation Ecosystem Comparison

Dimension	China	U.S.
Industry-Academia Links	State-led university collaborations	Independent research parks, tech transfer offices

Startup Integration	Incubated within government-supported tech parks	VC-funded accelerators, M&A-driven innovation
Global Collaboration	Limited by geopolitics (12% international projects)	More global but facing increasing restrictions (37% reduced China ties)
IP Protection	Focus on patent quantity (5.2M AI patents)	Emphasis on patent quality (68% AI ethics patents)

5. Discussion

5.1 Path Dependencies and Performance Implications

The comparative analysis reveals two distinct transformation archetypes:

5.1.1 The Chinese "scale-efficiency model"

• Advantages: Quick national rollout across many sectors, including smart grid and e-commerce (State Grid AI outage prediction covers 96% of the grid; Alibaba AI supply chain reduces costs by 18%)

• Challenges: Fails to nurture niche innovation-there are only 17% Chinese AI patents in emerging fields such as quantum machine learning (WIPO 2024); under ethical scrutiny for centralized use of data

5.1.2 The U.S. "innovation-agility model"

• Advantages: Leaders in frontier technologies with 68% of global patents in AI ethics instruments (MIT Technology Review 2025); adaptable market needs: Autopilot updates weekly.)

• Challenges: Fragmented governance causes inefficiencies-U.S. healthcare AI technology adoption lags China by 2.3 years due to regulatory incoherence (Deloitte 2025); protectionism hinders international collaboration.

5.2 Strategic Implications for Managers

5.2.1 In China: navigating the policy-driven ecosystem

• Align with national strategies: Link AI initiatives to the 14th Five-Year Plan (e.g., "Digital China") to secure subsidies and political support [10].

• Invest in data infrastructure: Develop "data middle platforms" to consolidate fragmented datasets, following Alibaba's model [6].

• Bridge hierarchical gaps: Establish cross-functional AI task forces to accelerate adoption by 35% [6].

5.2.2 In the U.S.: thriving in the market-driven landscape

• Adopt agile governance: Implement "AI guilds" or "Two-Pizza Teams" to foster bottom-up innovation, as seen at Amazon and Google [1].

• Embrace ethical AI frameworks: Align with evolving regulations (e.g., NIST AI RMF) to build stakeholder trust through transparency [7].

• Pursue global alliances: Join consortia like the Global Partnership on AI to mitigate geopolitical risks and foster diverse teams [11].

5.3 Policy Recommendations for Stakeholders

• Harmonize AI Standards: Set up bilateral working groups between China and the U.S. to develop common ethics guidelines for AI, especially in healthcare and autonomous systems.

• Facilitate Talent Exchange: Establish bilateral fellowship programs to address skill gaps, similar to the U.S.-China Fulbright Program but aimed at AI research[12].

• Develop Cross-Border Data Protocols: Formulate secure data governance frameworks that allow collaborative AI R&D while preserving interests in national security.

• Promote Sector-Specific Collaboration: Engender cooperative endeavors between the two nations in non-sensitive sectors such as climate tech and AI for joint innovation to tackle global challenges.

6. Conclusion

This study confirms that AI-driven digital transformation is context-specific, with Chinese and U.S. firms following distinct paths shaped by policy regimes, cultural values, and innovation ecosystems. China's model excels in rapid scalability through state coordination, while the U.S. leads in technological innovation and experimentation due to market-driven agility. A one-size-fits-all approach to AI adoption is ineffective, emphasizing the need for context-specific strategies for global businesses.

Future research should explore AI transformation in emerging economies and specific sectors (e.g., healthcare vs. manufacturing) and examine the impact of generative AI on transformation trajectories. Understanding these divergent paths advances academic theories of cross-national innovation and provides practical solutions for global AI deployment, fostering informed dialogue on digital governance, economic competitiveness, and technological collaboration in the AI era.

References

[1] Bensinger, G. (2023). Amazon's delivery, logistics get an AI boost. Reuters.
[2] Westerman, G., Bonnet, D., & McAfee, A. (2011). Digital Transformation: A Roadmap for Billion-Dollar Organizations. MIT Sloan Management
[3] Brynjolfsson, E., & McAfee, A. (2017). Machine, Platform, Crowd: Harnessing Our Digital Future. W.W. Norton & Company.
[4] Ding, J. (2018). Deciphering China's AI dream. Future of Humanity Institute, University of Oxford. Available at: https://www.fhi.ox.ac.uk/wp-content/uploads/Deciphering_Chinas_AI-Dream.pdf
[5] Hofstede, G. Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations (2nd ed.). SAGE, 2001:253.
[6] McKinsey & Company. (2024). The State of AI in 2024: Reshaping Industries and Workforces.
[7] Floridi, L. (2023). Ethics, Governance, and the Future of AI. Oxford University Press.
[8] Allen, G. C. (2021). Understanding China's AI strategy. Center for Strategic and International Studies.
[9] Porter, M. E., Heppelmann, J. E., Christensen, C. M., et al. (2015). How smart, connected products are transforming companies. Harvard Business Review, 93(10), 96–114.
[10]Gartner. (2024). Hype Cycle for Artificial Intelligence, 2024. Gartner Research.
[11]World Economic Forum. (2023). AI Governance Alliance: Shaping Responsible AI Development.
[12]National Science Foundation. (2022). National Artificial Intelligence Research Resource Task Force Report.
[13]Lee, K. F. (2018). AI Superpowers: China, Silicon Valley, and the New World Order. Houghton Mifflin Harcourt.
[14]Sheehan, M. (2020). China's AI ambitions: A comparative analysis. Journal of International Affairs, 73(1), 123–140.
[15]Roberts, H., Cowls, J., Morley, J., Taddeo, M., Wang, V., & Floridi, L. (2020). The Chinese approach to artificial intelligence: an analysis of governance, ethics, and regulation. AI & SOCIETY, 36, 59–77.
[16]OECD. (2023). OECD Artificial Intelligence Review 2023.