



The Impact of Technology-Driven Business Model Innovation on Corporate Performance: a Case Study of JD.com in the Digital Economy Era

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Abstract. In the era of the digital economy, technology-driven innovation has become the core engine of the business model innovation for enterprises. This article uses JD.com as a case study to systematically analyze the mechanisms through which technology-driven business model innovation affects enterprise performance. The research finds that JD.com has significantly improved both its financial and non-financial performance through technology empowerment strategies such as upgrading smart supply chains and building instant retail ecosystems. In terms of financial performance, gross profit margins and net profit margins have continued to grow, inventory turnover efficiency has been significantly optimized, and technological investments have had a notable positive impact on revenue growth. On the non-financial side, the market share in instant retail has increased substantially, and user repurchase rates and activity levels have significantly enhanced. The study further reveals the dynamic coupling relationship between technological iteration and business model evolution, indicating that technological innovation drives performance growth through pathways such as optimizing supply chain efficiency, responding to immediate demand, and constructing ecological closed loops. This article validates the effectiveness of technology-driven business models in the context of the digital economy, providing practical insights for enterprise strategic transformation and supplementing micro-empirical evidence for related theoretical research.

Keywords: Digital Economy, Technology-driven, Business Model Innovation, Corporate Performance

1 Introduction

In the digital economy era, the efficient circulation of data elements, the deep integration of platform economy, and the rapid iteration of intelligent technologies are reshaping the global business ecosystem. According to the China Digital Economy Development Research Report (2024), the scale of China's digital economy has exceeded 50 trillion yuan, accounting for 42.8% of the GDP [1]. Technology-driven innovation has become the core engine for business model innovation in enterprises.

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Especially in the e-commerce sector, the digital reconstruction of consumer scenarios and the intelligent upgrade of the supply chain are forcing companies to transform from a single transaction model to an ecological and service-oriented model. As a benchmark enterprise in China's e-commerce industry, JD.com's growth trajectory is deeply intertwined with the wave of the digital economy. From its early single model of self-operated e-commerce to its current ecological layout relying on intelligent supply chains, instant retail (such as "Hourly Delivery"), and omni-channel traffic operations, its transformation practices have confirmed the importance and foundational role of Internet technology in business model innovation.

Currently, the academic community has conducted certain explorations into the relationship between business model innovation and corporate performance. Li Wen proposed through a literature review that the impact pathways of business model innovation are multidimensional and need to be analyzed in combination with the specific characteristics of different industries [2]. Huo Qianqian and Chen Wei pointed out that omni-channel business model innovation can indirectly enhance corporate operating performance by improving market value and profitability [3]. Fu Haolin and Yang Wenchao, focusing on retail enterprises, emphasized that the innovation of online sales models has a significant impact on performance stability [4]. Lu Shan further extended the research perspective to the context of "Internet Plus" and found that the integration of technology and business models is the key driver of performance growth [5]. However, the existing research predominantly focuses on macro-level frameworks or cross-sectional data and falls short in exploring the micro-mechanisms of innovative practices among leading enterprises. Moreover, despite the extensive investigation into the relationship between business model innovation and corporate performance, the specific mechanisms through which technology-driven business models operate under the digital economy context still need to be refined. Therefore, this paper aims to fill the research gap through the case of JD.com.

This paper will take JD.com as a case study, focusing closely on the characteristics of the digital economy and the logic of technology-driven innovation to systematically analyze the pathways through which business model innovation impacts corporate performance. The research will integrate both financial indicators (such as gross margin and current ratio) and non-financial indicators (such as Operational Efficiency and Customer Stickiness) to quantify the contributions of technology-enabled innovation models, such as intelligent supply chains and instant retail, to corporate performance. It will also reveal the dynamic coupling relationship between technological iteration and the evolution of business models. Through this research, this paper aims to provide valuable references and suggestions for corporate strategic formulation and contribute new insights to the research field of the relationship between business model innovation and corporate performance.

2 Analysis of JD.com's Business Model Innovation Journey

2.1 Key Stages and Characteristics of JD.com's Innovation

JD.com's innovation trajectory comprises four stages, each driven by technological advancement and market demand, reflecting a quintessential digital transformation path.

Transition from Offline Retail to E-commerce Platform (2004–2007). Initially an offline electronics retailer, JD.com pivoted to e-commerce as China's internet penetration surpassed 15% in 2007 [6]. Amid widespread distrust in B2C platforms due to counterfeit goods, JD.com adopted a "Genuine Products at Low Prices" strategy. Technological initiatives, such as a product traceability system and "Cash on Delivery", built consumer trust, translating into market dominance.

Self-built Logistics and Supply Chain Integration (2008–2015). Intensifying competition necessitated faster delivery. JD.com invested in logistics infrastructure, achieving nationwide warehouse networking via ERP systems (2008) and cold chain logistics (2012). By 2015, 85% of self-operated orders were delivered within 24 hours, supported by 5,367 distribution stations [7].

Intelligent Supply Chain Upgrading Driven by Technology (2016–2020). Driven by the development of the digital economy and artificial intelligence, JD.com has entered the "technology-empowered business model" phase, focusing on market demand trends. China's retail market is gradually shifting from a supply-driven model to a consumption-driven model. Consumers are now placing a series of personalized demands on product experiences. The early era of standard demands based on "price + functionality + quality" is gradually evolving into a 2.0 era of personalized demands [8]. Meanwhile, focusing on the domestic situation, there is still a significant gap in the digital service needs of small and medium-sized enterprise [9].

To address the demand side, JD.com has utilized AI algorithms to build a user profiling system, which has effectively enhanced the precision of SKU recommendations and driven the growth of high-value-added category sales. At the same time, through the "front store, back warehouse" model, JD.com has dynamically adjusted inventory distribution and restructured the supply chain, further reducing inventory turnover days to 30 days. Furthermore, JD.com has opened up its logistics and data services to third-party merchants, forming a dual-driven ecological closed loop of "retail + services," thereby increasing the proportion of non-self-operated businesses.

In this phase, JD.com has empowered its operations with AI technology, creating a "zero-inventory production" model through intelligent forecasting. This has, in turn, pushed suppliers to adopt flexible supply chains, forming an ecological-level interaction of "technology-demand-industry collaboration."

Omni-channel and Instant Retail Ecosystem Construction(2021–Present). In the post-pandemic era, "instantaneous demand" has experienced explosive growth. In 2023, the scale of instant retail in China reached 650 billion yuan, a year-on-year increase of 28.89%, and it is expected to exceed 2 trillion yuan by 2030 [10]. With the spiral evolution of technology and demand, JD.com launched instant retail centered on the "Hourly Purchase" service, marking its business model's entry into the stage of comprehensive integration.

The surge in community group buying orders has prompted JD.com to develop a Location-Based Services (LBS) algorithm to achieve precise inventory matching within a 5-kilometer radius, reducing the order-picking time from 30 minutes to 8 minutes. On the other hand, by taking a stake in Dada Nexus, JD.com has built a network of "instant delivery + localized warehousing," further perfecting the technological support system for "Hourly Purchase."

2.2 Driving Factors of JD.com's Business Model Innovation

The driving forces behind JD.com's business model innovation stem from a multidimensional set of factors, including technological iteration, changes in market demand, competitive pressures, and policy guidance. The following is a systematic analysis of these core driving factors, combined with specific practices and literature references.

Technological Enablers: AI and Digitalization. JD.com has always regarded technology as the core engine of its business model innovation. Its intelligent supply chain system uses big data to predict consumer demand and dynamically optimize inventory distribution (such as the "front store, back warehouse" model), significantly improving inventory turnover efficiency within 30 days. Meanwhile, instant retail services (such as "Hourly Purchase") rely on Location-Based Services (LBS) and AI algorithms to achieve "30-minute delivery," meeting consumers' needs for immediacy [11]. In 2025, JD.com further deepened the integration of AI technology and the supply chain, driving intelligent upgrades in production efficiency and user reach. The continuous iteration of technology has not only optimized internal efficiency but also given rise to new business models such as "Retail as a Service" (RaaS), opening its logistics and data capabilities to third parties and forming an ecological closed loop.

Market Demand: Shifting Consumer Behavior. Based on the literature review, the driving forces behind e-commerce business model innovation all center around the "consumer," which aligns with the core user-centric mindset of the Internet age [12]. Changes in market demand are one of the direct driving forces for JD.com's innovation. With the rise of new retail, consumers have set higher standards for the shopping experience. The importance of shopping convenience, personalization, and sustainable consumption has prompted JD.com to launch "Hourly Purchase," an instant retail service, to meet market demands.

Competitive Pressure: Omni-channel and Traffic Competition. The fierce competition in the e-commerce industry has, to some extent, prompted JD.com to constantly break through traditional models. Pinduoduo, relying on the deep barriers of the lower-tier market and a low-price strategy, has gained an advantage in the fields of agricultural products and low-priced goods through the "direct connection from production areas + social sharing" model. Social e-commerce platforms represented by TikTok Shop, through algorithmic recommendations and content marketing, reach precise users with influencer marketing and short videos, driving the explosion of immediate consumption scenarios. Facing a diversified and differentiated e-commerce competition landscape, how to leverage technological empowerment to drive model innovation is pushing JD.com to constantly reinvent itself.

Policy Support: Government Collaboration and Sustainability. The policy environment provides an important impetus for Jingdong's innovation. The national "14th Five-Year Plan" clearly proposes to accelerate the development of digitalization and build a digital China [13]. As a representative enterprise of the digital economy, Jingdong empowers its supply chain, logistics, and retail business through digital technology, and promotes the transformation of its business model to intelligence and digitalization. Meanwhile, based on the general trend of green development, the government encourages enterprises to promote the green and digital transformation of the upstream and downstream of the industrial chain through industrial alliances and collaborative innovation. Jingdong Logistics promotes the transformation of the green supply chain model through the establishment of the "Green Stream Eco-Alliance" and the "Jingdong Cloud Box Green Recycling Container Eco-Alliance", corresponding to the call of national policies.

3 Impact of JD.com's Business Model Innovation on Corporate Performance

3.1 Financial Performance

Technology-Driven Business Models Significantly Enhance JD.com's Profitability. Based on the annual report data of JD.com Group from 2020 to 2024, JD.com's gross margin increased from 15.1% [14] to 15.86% [11], and the non-GAAP net profit margin rose from 2.25% [14] to 4.12% [11]. This improvement prominently reflects the qualitative change in operational efficiency brought about by technological investment, with the core driving force being the continuous optimization of intelligent supply chain technology.

By dynamically adjusting inventory distribution through AI algorithms, JD.com has significantly reduced operational losses. According to the data published in JD.com's financial reports, in 2020, JD.com's operating costs were 636.7 billion yuan, with an initial inventory balance of 57.932 billion yuan and a year-end inventory balance of 58.933 billion yuan, resulting in an inventory turnover rate of approximately 10.90% [14]. In 2024, JD.com's operating costs reached 975 billion yuan, with an

initial inventory balance of 68.058 billion yuan and a year-end inventory balance of 68.058 billion yuan, and the inventory turnover rate increased to 12.39% [11]. The precise decision-making empowered by technology has significantly reduced operational losses.

Simultaneously, the "Retail-as-a-Service" (RaaS) model has established a second growth curve through open logistics and data capabilities. In 2024, service revenues contributed by this model accounted for 21% of total revenue, with the technical services segment emerging as the primary profit engine at a 45% gross margin [11]. This structural upgrade has not only diversified revenue streams but also achieved quantum improvement in profit quality through high-value-added digital services - the service business contributes disproportionately more to overall profits than its revenue share would suggest, fully validating the commercial value of technological capability monetization.

Liquidity. Despite sustained increases in technology, R&D, and logistics infrastructure investments, JD.com maintained a stable current ratio between 1.3 and 1.6 [14,15]. This financial resilience originates from its diversified revenue structure and cash flow optimization. In 2024, JD Logistics reported annual net revenues of RMB 182.837 billion, with logistics and related service revenues reaching RMB 140.701 billion, of which over 70% was derived from external customers [15]. The stable cash flow generated by logistics services effectively mitigated short-term pressures from technological investments.

Operational Efficiency. The supply chain modernization initiatives have driven substantial improvements in JD.com's operational efficiency throughout the reporting period. The deepened implementation of the "front-store-back-warehouse" model (integrated retail-warehouse system) and AI-powered forecasting systems reduced inventory turnover days from 35.55 days in 2020 [14] to 29.65 days in 2024 [11]. Simultaneously, dynamic regional demand matching significantly enhanced inventory distribution accuracy and merchandise turnover rates, demonstrating continuous strengthening of omni-channel coordination capabilities.

3.2 Analysis of Non-Financial Performance

R&D Investment and Ecosystem Collaboration. JD.com's business model iteration is driven by technology as the core engine. Its R&D investment and patent achievements are the underlying capabilities that support the implementation of innovations such as intelligent supply chain and instant retail.

The Q4 and full-year 2024 performance report explicitly mentioned that as of the end of 2024, JD.com's cumulative R&D investment had reached nearly 140 billion yuan, with a single-year R&D investment of 17 billion yuan in 2024. The focus was on areas such as artificial intelligence (AI), large models, intelligent supply chain, and robotic technologies [11].

The investment and accumulation of technology have not only optimized operational efficiency (e.g., reducing inventory turnover days to 29.65 days) but also created an ecosystem synergy through an open platform (RaaS model). This has established a closed loop of "technology output → ecosystem collaboration → diversified revenue," driving the diversification of the revenue structure and ultimately enhancing the company's risk resistance and long-term performance.

Operational Efficiency and Customer Stickiness. Focusing on the supply chain segment, JD Logistics business model is supported by a core framework of intelligent warehousing networks, global logistics infrastructure, and digital technologies (such as 5G, AI, and IoT), covering the entire process of warehousing, transportation, and delivery. According to the 2023 ESG report of JD Group, JD has shortened delivery cycles through technological optimization (e.g., the "next-day delivery" service), achieving a 20% increase in order fulfillment rates and an 18% improvement in reverse logistics turnover efficiency, with a significant enhancement in customer stickiness [15].

Green Supply Chain and Low-Carbon Transition. To keep pace with the trend of green and sustainable development, JD actively promotes the transformation and upgrading of a green and low-carbon supply chain. By the end of 2023, JD Logistics had 8,290 of its own new energy vehicles, which effectively reduced fuel costs (saving 74,000 tons of diesel per year) [15]. The use of photovoltaic power generation reduced energy expenditure. Meanwhile, it attracted ESG-oriented customers (such as the cooperation with IKEA on the hydrogen fuel transportation project) and expanded high value-added markets. According to the report, the total installed capacity of rooftop photovoltaic power in 17 Asia No.1 intelligent industrial parks was 114.48 megawatts, and the procurement volume of photovoltaic green electricity in 2023 was 47,344.4 megawatts, reducing carbon emissions by 27,000 tons [15].

Secondly, JD actively promotes the "Green Flow Plan," reducing secondary packaging by over 800 million items and reusing recyclable thermal boxes 716,500 times per year. Packaging costs have been reduced (the X series of cardboard boxes have cut carbon emissions by 1,719 tons) [15].

Social Responsibility and Rural Revitalization. JD Logistics builds a social trust network and enhances its business resilience through a "Responsible Supply Chain." During the 2023 floods in Beijing-Tianjin-Hebei region and the earthquake in Gansu, it activated emergency responses and mobilized over 100,000 items of supplies. Its disaster preparedness has enhanced brand credibility, promoted long-term cooperation between the government and enterprises, and strengthened the stability of the supply chain network.

On the other hand, JD actively responds to the "Rural Revitalization" initiative. Its rural logistics network covers nearly 90% of the counties nationwide, with a 30.2% year-on-year increase in the volume of agricultural product express orders [15]. The penetration and layout in the Lower-tier markets not only brings in new users and

reduces the loss rate of agricultural products, but also provides more employment opportunities and sales channels for rural areas. This reflects JD's willingness to take on social responsibilities and promotes the process of "Common Prosperity" in China.

4 Conclusion

This study confirms that JD's technology driven business model innovation significantly improves corporate performance. In terms of finance, the company achieved a 3.9% increase in gross profit margin and an average annual compound growth rate of 26% in revenue; The optimization of non-financial indicators(such as a 15.9%reduction in carbon emission intensity and a 20%increase in order fulfillment rate)directly drives the improvement of operational efficiency, the upgrading of customer structure, and the growth of long-term value, thereby validating the business logic that "responsibility is competitiveness.. This achievement stems from the synergistic effect of technological innovation and business models, manifested in the optimization of supply chain systems, the improvement of immediate demand response capabilities, and the construction of open ecosystems.

In future development, JD.com needs to focus on promoting three strategic directions: continuously deepening the application of technologies such as artificial intelligence, the Internet of Things, and blockchain to enhance supply chain agility; Based on big data analysis, improve user profiles and implement precise operational strategies; Strengthen the layout of instant retail infrastructure, optimize the local warehousing network and partner collaboration mechanism. With the development of generative artificial intelligence and digital twin technology, autonomous supply chain systems and metaverse shopping scenarios may reshape the industry performance evaluation system. JD's transformation practice provides valuable reference paradigms for the digital transformation of the retail industry, but companies still need to make adaptive adjustments based on industry characteristics when drawing on it.

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