

Research on the impact of digital transformation on enterprise operation capability—Take Walmart as an example

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ABSTRACT

This paper takes Walmart as an example to explore the impact of digital transformation on enterprise operational capabilities. Through literature review and case analysis, the paper first analyzes the mechanism of digital transformation's impact on enterprise operational capabilities from the perspectives of resource-based theory, transaction cost theory, and value chain theory. Subsequently, the paper examines Walmart's digital transformation practices in detail, analyzing its digital initiatives in supply chain management, e-commerce, customer data mining, payment systems, and logistics distribution. The research results indicate that digital transformation has significantly improved Walmart's asset management capabilities, debt-paying ability, and profitability, enhancing the company's market competitiveness. However, digital transformation also introduces new operational risks, such as system operation risks, data security risks, and personnel quality risks. Finally, the paper proposes relevant policy recommendations, suggesting that enterprises should strengthen risk assessment and management while advancing digital transformation to address the challenges it brings.

KEYWORDS

Digital Transformation; Enterprise Operational Capability; Walmart; Supply Chain Management; E-commerce; Data Security; Risk Management

1 Introduction

With the development of technologies such as the Internet of Things, artificial intelligence and big data, digital transformation has become a key means for enterprises to enhance their competitiveness and achieve sustainable development. The world's major economies have actively introduced policies to support enterprises in implementing digital transformation, such as the United States launching the National Artificial Intelligence Initiative, the European Union implementing the Digital Europe Plan, and China's 14th Five-Year Plan (2021-2025) making digital transformation one of its core strategies to raise the level of digitalization in various industries. Enterprises around the world have begun to implement digital transformation, using digital means to optimize business processes, reshape organizational structures, and improve operations and management. As a leader in the global retail industry, Walmart has effectively improved its operation and management capabilities through a series of forward-looking digital means to successfully respond to rapid changes in the market and diversified development of consumer demands. The case of Walmart's digital transformation is of great value for analyzing the impact of digital transformation on the operation capability of enterprises.

This paper uses the case of Walmart's digital transformation to analyze the impact of digital transformation on Walmart's operational capability, as well as the new risks and problems brought by digital transformation to enterprise operations, and puts forward relevant policy suggestions.

2 Literature Review

2.1 Digital Transformation

Digital transformation is a hot topic in current academic circles and practice, but there is no consensus on the definition of digital transformation. Berman & Bell (2018), based on a technological perspective, argues that digital transformation is the process of reconstructing business processes, products and services, and business models through digital technologies (such as cloud computing, AI, and Internet of Things). Matt et al. (2015), based on a strategic perspective, emphasize that digital transformation is the systematic integration of digital technologies at the strategic level of an organization to achieve fundamental changes in competitiveness and value creation. Vial (2019) proposes that digital transformation is a complex system restructuring process with interwoven technological, organizational, social and cultural factors from the perspective of socio-technical system. Lv Tie (2019) believes that digital transformation is an all-round, multi-angle and whole-chain transformation through digital technology. Wu Jiang et al. (2021) believe that digital transformation is a complete redefinition of its business, redefining the capabilities of organizational activities, processes, business models and people.

2.2 Business operation capability

Enterprise operation capability refers to the comprehensive ability of an enterprise to maximize input and output, ensure sustainable profit and market competitiveness through resource allocation optimization, process efficiency improvement and risk control. It is the core index to measure the effective use of resources and achieve business objectives of an enterprise. Generally speaking, the indicators of enterprise operation ability mainly include asset management efficiency indicators (such as inventory turnover rate, accounts receivable turnover rate, current asset turnover rate, fixed asset turnover rate, total asset turnover rate), debt paying ability indicators (such as current ratio, quick ratio, asset-liability ratio) and profitability indicators (such as operating income growth rate, net interest rate).

2.3 Mechanism of the impact of digital transformation on enterprises' operating capacity

The Resource-Based View (RBV) posits that an enterprise comprises diverse resources, each contributing uniquely to its competitiveness. With advancements in information technology, data has emerged as a crucial strategic asset for gaining competitive advantage. As Amazon founder Jeff Bezos said, "Data is the new oil. It's the new fuel that will drive future economic growth." Digital transformation can enable enterprises to obtain the key resource of data, help enterprises to achieve fine management, and through big data analysis, in-depth exploration of the value behind the data, to achieve accurate sales, accurate pricing, accurate inventory management, improve enterprise operation capabilities, increase enterprise heterogeneity and market competitiveness. For example, by analyzing sales data, customer feedback and other information, retail enterprises can timely adjust inventory and marketing strategies, avoid the occurrence of slow sales and stock shortages, improve the efficiency and flexibility of business operations, and reduce operational risks.

Transaction Cost Theory. According to the transaction cost theory, market transactions need to pay costs, including the cost of searching the transaction object, negotiating the cost of reaching an agreement, signing the contract and supervising the implementation of the cost, including the money, time, energy and physical strength paid by people to complete a transaction. Enterprise digital transformation can use digital technology to simplify information transmission and processes, reduce the transaction costs between enterprises and customers and suppliers, and improve the operation efficiency of enterprises. For example, retail enterprises develop e-commerce and carry out online channel sales, which can save a lot of costs compared with physical store sales. In the past, enterprises may need a lot of manpower to manually record data and check accounts, but through the introduction of advanced information systems and automation technology, these tedious work can be completed quickly and accurately by computers.

Value Chain Theory. According to the value chain theory, the business activities of enterprises are divided into main activities and supporting activities. The basic activities include production operations, external logistics, marketing and sales, etc., while the supporting activities include procurement, technology development, human resource management, etc. These different but interrelated business activities work together to form a dynamic process of value creation, that is, the value chain. In the implementation of digital transformation, enterprises can optimize their main activities and support activities by using technological means, so as to improve their operational efficiency, reduce costs and create new value. For example, in terms of key activities, enterprises can optimize supply chain management through the Internet of Things, big data and artificial intelligence, realize real-time inventory monitoring, demand forecasting and automated procurement, and improve the efficiency of supply chain management. The use of digital technology to optimize logistics and distribution can reduce transportation costs. In terms of supporting activities, building a digital procurement platform to optimize supplier management can improve procurement efficiency and transparency. Building an integrated online and offline service system can enable enterprises to provide customers with more convenient and personalized services. Through big data analysis, enterprises can more accurately understand customer needs and provide customized products and services, thus creating new value.

3 Walmart's digital transformation practices

Walmart is the world's largest chain retailer and has repeatedly topped the Fortune Global 500 list. Walmart's digital transformation can be traced back to the 1980s, from the early informatization to the current AI, big data and blockchain applications, Walmart has always been at the forefront of the retail industry, especially in the outbreak of COVID-19 in 2020, Walmart has accelerated its digital transformation. Walmart's digital transformation mainly focuses on supply chain and inventory management, e-commerce and omnichannel retail, technological innovation and data-driven, payment and customer experience, logistics and distribution.

3.1 Digitalization of supply chain and inventory management

Walmart is actively promoting the digital transformation of supply chain and inventory management to improve the

efficiency of procurement, inventory, shelves and tally. For example, Walmart has developed and promoted the Retail Link system, which shares sales and inventory data with suppliers, so that suppliers can understand the sales status of goods in real time, optimize production and distribution, and reduce inventory overruns and stock shortages. It has introduced automated robots and AI technology in warehouses and stores to improve efficiency by using robots to sort, move and pack goods. Real-time inventory monitoring through the Internet of Things and RFID technology, and the use of drones to manage warehouses, has shortened the inventory count cycle from the past monthly to daily. The introduction of shelf-scanning robots (Auto-S), which are twice as efficient and three times faster than humans in looking at shelves.

3.2 E-commerce and omnichannel retail

Walmart is actively promoting e-commerce and omnichannel retail to achieve integration of online and offline channels. In 2000, Walmart officially launched Walmart.com, its e-commerce platform. In 2007, it launched the "order online, pick up in-store" service, which started the omnichannel retail experiment. Later, it launched "Order Online, Pick up at the roadside", in which the shop assistant delivered the goods to the car after the customer placed the order online. In 2016, Walmart acquired e-commerce platform Jet.com for \$3.3 billion, using Jet.com's technology and team to boost Walmart.com's competitiveness. The Walmart mobile app offers features such as product search, online ordering, in-store navigation and more. Walmart is also launching localized e-commerce platforms in several countries. By merging online and offline, Walmart has become a leader in omnichannel retail.

3.3 Mining the value of customer data

Walmart actively mines the value of customer consumption data and provides personalized services. Walmart has established the world's largest retail data warehouse to store and analyze massive sales, inventory and customer data. Through historical data analysis, it can optimize inventory management and demand forecasting, identify sales trends, formulate precise marketing and promotion strategies, and improve operational efficiency. It uses AI and machine learning technology to optimize pricing, inventory and personalized recommendations to provide customers with customized product recommendations and enhance the shopping experience. Integrated voice shopping function with support for intelligent assistants such as Google Assistant, allowing customers to search for products and place orders through voice commands. Through these digital technologies, Walmart has improved operational efficiency and customer experience.

3.4 Digitalization of consumer payments

Walmart is actively promoting digital payment applications to improve payment convenience and the overall shopping experience for customers. For example, it launched its own mobile payment application Walmart Pay, which allows customers to complete payment by scanning the QR code on their mobile phones without carrying cash or credit cards, improving the payment convenience and shortening the payment time. Self-service payment devices are widely deployed in stores, where customers can scan products and complete payment by themselves, reducing queuing time. Walmart also supports contactless payment methods such as Apple Pay.

3.5 Digitization of logistics delivery

Walmart uses big data and AI technology to optimize distribution routes and logistics networks, and selects the best routes through intelligent algorithms to reduce distribution time and logistics costs. It keeps track of the location of every truck at all times through the global satellite positioning system to improve operational efficiency. Introduce automated robots and AI technology in warehouses to automatically sort and move goods to improve efficiency. Through these digital measures, Walmart not only improves logistics efficiency and delivery service quality, but also reduces costs and enhances customer satisfaction.

4 Analysis of the impact of digital transformation on Walmart's operational capability

4.1 Asset management capability

The overall asset turnover rate has increased, and the efficiency of asset use has been improved. The turnover ratio of current assets, fixed assets and total assets is the ratio of sales income to the average total current assets, total fixed assets and total assets respectively, reflecting the use efficiency of current assets (cash, inventory, etc.), fixed assets (such as plant) and total assets respectively. In the five years from 2019 to 2024, Walmart's current assets turnover, fixed assets

turnover and total assets turnover all showed an upward trend, rising from 8.40, 4.81 and 2.41 in 2019 to 8.43, 6.07 and 2.59 in 2024, respectively. This indicates that as Walmart promotes the digital transformation of supply chain management, e-commerce and logistics distribution, the efficiency of the use of current assets, fixed assets and total assets has been improved.

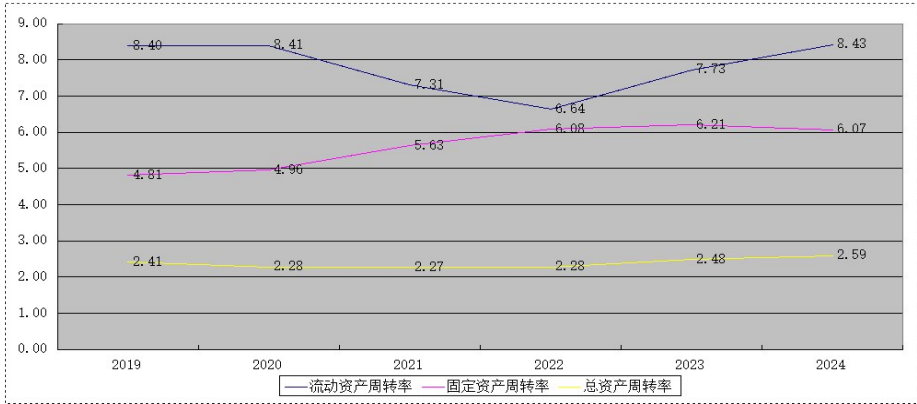


Figure 1 Walmart inventory turnover rate, 2019-2024

Inventory turnover showed a rising trend, and the efficiency of inventory management increased. Inventory turnover rate is an important indicator to measure the efficiency of inventory management. The higher the inventory turnover rate, the higher the efficiency of inventory management and the lower the risk of inventory overhang. During the five years from 2019 to 2024, Walmart's annual inventory turnover fluctuated somewhat, but on the whole showed an upward trend, rising from 8.75 in 2019 to 8.79 in 2024, indicating that as Walmart vigorously promotes the digital transformation of supply chain and inventory management, its inventory management efficiency has increased.

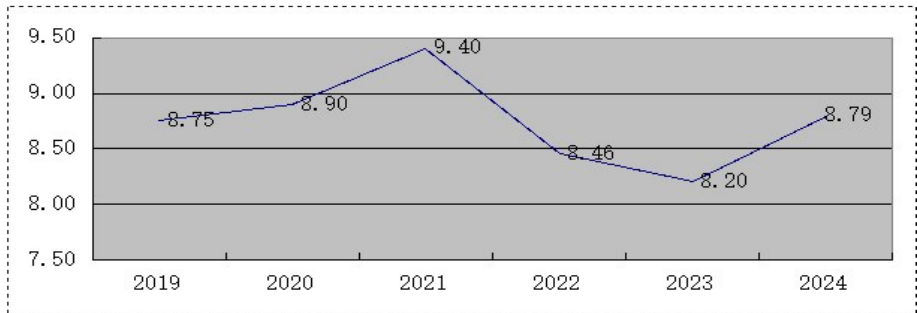


Figure 2 Walmart inventory turnover rate, 2019-2024

The accounts receivable turnover rate has decreased, indicating a need for improved management. The accounts receivable turnover ratio, which compares sales revenue to the average accounts receivable balance, measures how quickly an enterprise recovers its receivables. A higher ratio signifies stronger collection capabilities. From 2019 to 2024, Walmart's accounts receivable turnover rate declined annually, from 85.79 in 2019 to 76.83 in 2024. This suggests that digital transformation has not enhanced Walmart's accounts receivable management efficiency, necessitating further actions to strengthen it.

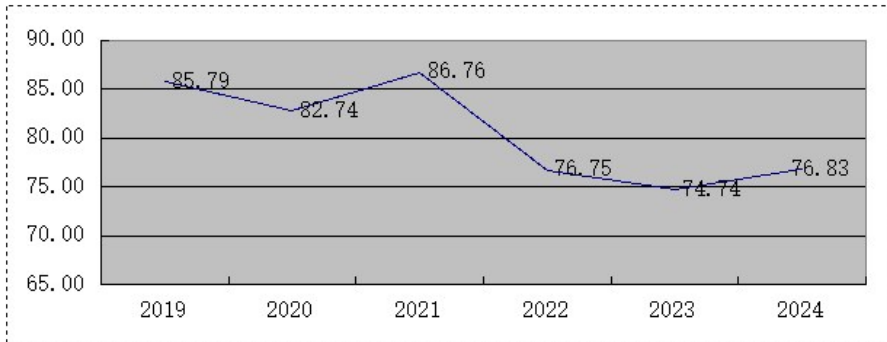


Figure 3 Walmart's accounts receivable turnover rate from 2019 to 2024

4.2 Debt Servicing Capacity

The current ratio and quick ratio rise, and the short-term solvency is enhanced. The current ratio and quick ratio are important indicators to measure the short-term solvency. The higher the ratio, the stronger the short-term solvency. From 2019 to 2024, Walmart's current ratio and quick ratio showed an overall increasing trend. The current ratio increased from 0.8 in 2019 to 0.83 in 2024, and the quick ratio increased from 0.23 in 2019 to 0.24 in 2024. This indicates that with the digital transformation, Walmart's short-term debt repayment ability has been improved.

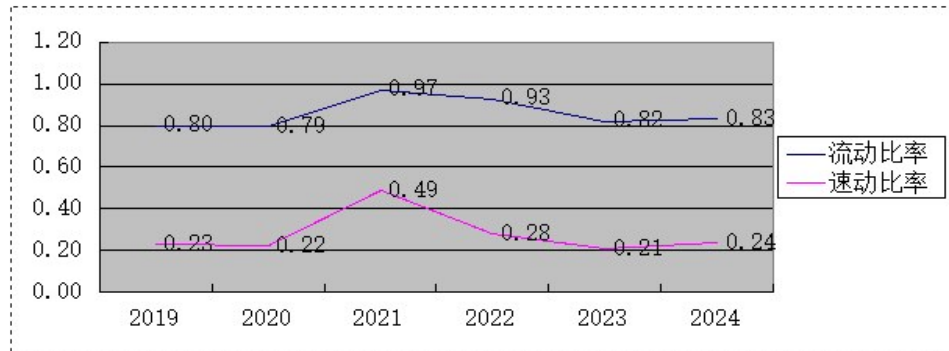


Figure 4 Current ratio and quick ratio of Walmart from 2019 to 2024

The asset-to-liability ratio decreases and the company's financial risk decreases. The asset-liability ratio is the ratio of total liabilities to total assets, reflecting the financial risk of an enterprise. The higher the ratio, the greater the financial risk. From 2019 to 2024, Walmart's asset-liability ratio showed an overall downward trend, from 0.55 in 2019 to 0.51 in 2024. This indicates that with the digital transformation, Walmart's debt repayment ability is improved, and its financial risk is reduced.

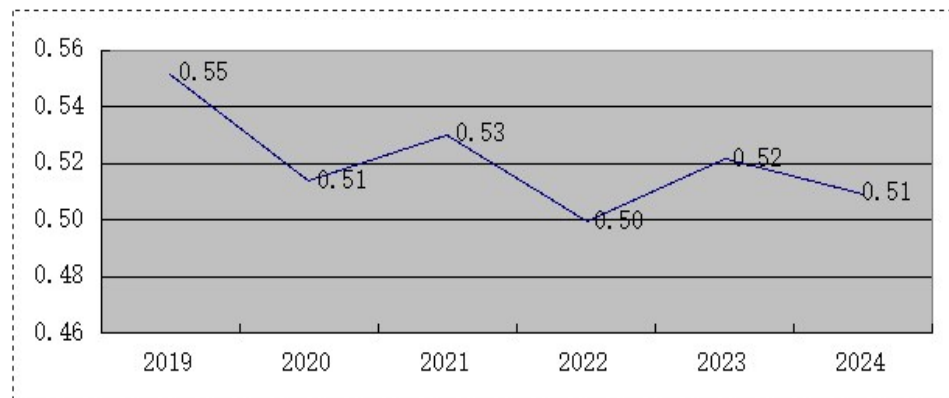


Figure 5 Walmart's asset-liability ratio from 2019 to 2024

4.3 Profitability

Annual operating income has been growing, and the growth rate is rising. The growth rate of operating income reflects the change of the company's operating performance and is an important indicator to measure the company's development level and growth status. From 2019 to 2024, Walmart's annual operating income maintained stable growth, and the annual operating income growth rate showed an upward trend, from 2.81% in 2019 to 6.03% in 2024.

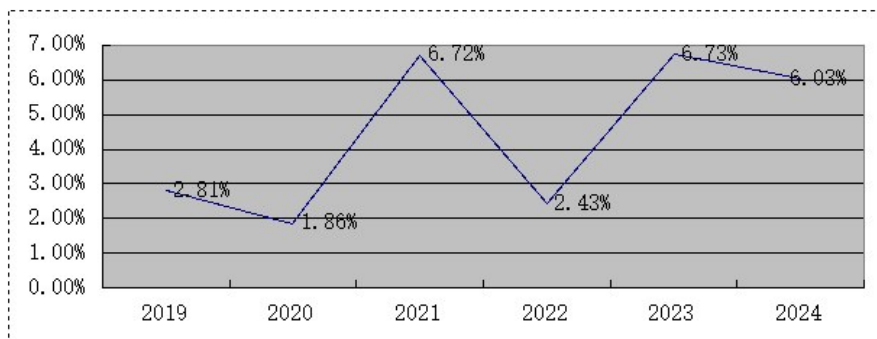


Figure 6 Growth rate of Walmart's operating income from 2019 to 2024

Annual net margin growth and enhanced profitability. Since 2019, Walmart's annual net profit rate has shown an increasing trend, rising from 1.41% in 2019 to 2.53% in 2024, indicating that with the digital transformation of enterprises, Walmart's profitability has been increasing.

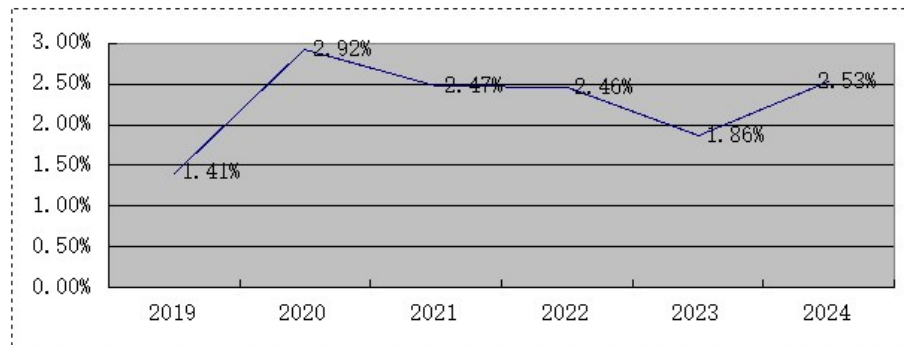


Figure 7 Walmart's net profit rate in 2019-2024

5 New risks arising from digital transformation

Digital transformation not only improves the operation capability of enterprises, but also brings new risks to the operation management of enterprises. They mainly include: first, system operation risk. The stable operation of enterprise digital systems such as Walmart's supply chain information system, e-commerce system and other electronic systems depends on highly reliable IT infrastructure, including servers, networks and cloud services, etc. Hardware failure, network attacks or system vulnerabilities may cause system operation interruption and bring business operation risks. Second, data security risks. Data is a core asset of digital transformation, but data quality issues often plague enterprises and can lead to bad decisions. At the same time, in the process of digital transformation, the collection, storage, use and sharing of data has become more complicated, and problems such as data security breaches and compliant use of data may arise. Third, operational risks. The digital literacy of enterprise employees is uneven, and some employees may lack understanding and mastery of digital technologies and tools, and it is difficult to adapt to the changes in working methods brought about by digital transformation, resulting in operational risks and affecting work efficiency. Fourthly, business risks.

6 Conclusions and enlightenments

This paper examines the impact of digital transformation on enterprise operational capability through literature review and case study methods. Initially, it explores the influence mechanism using resource-based theory, transaction cost theory, and value chain theory. Subsequently, it analyzes Walmart's digital transformation to assess its effect on operational capability. Key findings indicate that digital transformation enhances asset management, debt-paying ability, profitability, and overall competitiveness. However, it also introduces new operational risks such as system operation, data security, and personnel quality risks. Therefore, businesses should proactively embrace digital transformation to improve operational management and market competitiveness while strengthening risk assessment and management to better respond to potential challenges.

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