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Research on the Impact of Digital Transformation on BYD's Financial Performance

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Abstract: This paper focuses on BYD Company and conducts an in-depth financial statement analysis by closely integrating its annual reports and financial indicators. On one hand, it meticulously sorts out the motivations for the company's digital transformation, comprehensively analyzes its financial performance, accurately identifies the problems existing in the process of digital transformation, and proposes targeted solutions to lay a solid foundation for the company's digital transformation. On the other hand, when analyzing the impact of digital transformation on financial performance, it emphasizes the use of BYD's financial data from 2019 to 2024. From the four dimensions of solvency, profitability, operation, and development capabilities, it systematically summarizes the company's financial status and operating results over the past six years. Through comprehensive and in-depth research, it aims to provide practical suggestions for BYD Company to optimize its digital transformation path and improve its development quality, helping the enterprise move forward steadily in the wave of digitalization.

Keywords: Financial performance; Digital transformation; BYD

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1. Introduction

With the continuous advancement of the digital economy wave, many automobile enterprises have adopted some transformation and upgrading strategies and actively carried out digital transformation to adapt to the constantly changing consumer market. Facing fierce market competition, BYD has actively introduced advanced means and continuously implemented a digital transformation strategy to optimize innovative technologies and improve operational efficiency, providing consumers with higher-quality products and services. However, digital transformation also faces enormous challenges. By analyzing the impact of BYD's digital transformation on its financial performance, we can not only discover the difficulties and challenges BYD faces in digital transformation but also provide useful transformation references for other automobile enterprises.

1.1. Introduction to BYD company

BYD Co., Ltd. (002594) was established on November 18, 1994, with its headquarters in Shenzhen, Guangdong Province. The company was listed on the Hong Kong Stock Exchange in 2002 (01211.HK) and on the Shenzhen Stock Exchange in 2011 (002594.SZ). It is a Fortune Global 500 company listed in both Hong Kong and Shenzhen, with business spanning four major industries: automobiles, electronics, new energy, and rail transit. From energy acquisition and storage to application, it comprehensively builds a zero-emission new energy overall solution and is committed to using technological innovation to help cool the Earth by 1°C. The main businesses of BYD Co., Ltd. include the automobile business mainly focused on new energy vehicles, mobile phone components and assembly business, and secondary rechargeable battery and photovoltaic business. Its main products are in the automobile business, mobile phone components and assembly business, secondary rechargeable batteries, and photovoltaic business.

2. Motivations for BYD's digital transformation

2.1. Complying with the trend of the digital economy and policy strategic guidance

Nowadays, the digital economy is developing rapidly, and digital transformation is permeating all fields of the economy and society with an unprecedented depth and breadth. Internet technology and data processing have become indispensable parts of enterprise development. Especially for the automobile industry, which relies on product innovation, digital transformation is not an optional item but an inevitable trend for enterprises to conform to industry development [1–3]. In the digital economy era, automobile enterprises must rely on digitalization for enterprise transformation and upgrading, continuously optimize products, accurately perceive the latest trends in the consumer market, and design products that meet the growing needs of consumers to gain a foothold in the market. At the same time, China's "dual carbon" goals are driving the rapid development of the new energy vehicle industry and also imposing higher requirements on enterprises' carbon footprint management and data security. As a leading enterprise in the new energy vehicle industry, BYD's transformation is not only a response to the requirements of green manufacturing under the "dual carbon" goals but also a strategic choice to receive policy resources, obtain R&D subsidies, and qualify for pilot projects.

2.2. Market evolution driven: Dual pressures of demand transformation and competitive restructuring

The shift in user demand from "functional satisfaction" to "co-created experiences" has become the core driving force for digital transformation. Consumers' perception of automobiles has evolved from "transportation tools" to "mobile intelligent terminals," with demands for functions such as OTA (Over-the-Air) upgrades, intelligent cockpits, and autonomous driving becoming new purchasing criteria. Industry research indicates that in 2023, the proportion of post-90s car buyers exceeded 30%. This demographic group exhibits a significantly stronger demand for digital interactions compared to traditional consumer groups, and most users hope to participate in customizing product configurations. To adapt to this change, BYD has built a CDP (Customer Data Platform) to integrate data from all channels, including online browsing, test drive feedback, and after-sales evaluations. As a result, the proportion of customized orders for the Tengshi N9 model increased from 18% in 2022 to 53% in 2024, enabling the company's transition from "manufacturing" to "manufacturing + services."

2.3. Achieving cost reduction and efficiency enhancement for enterprises

In the face of continuous market changes, enterprises must seek innovation to secure a chance of survival. If they continue to adhere to outdated practices, they will encounter significant development bottlenecks during their growth and will need to produce high-quality new products to tackle fierce market challenges [4–6]. With the expansion of its product matrix (including series such as Dynasty, Ocean, and Yangwang) and global production capacity, traditional management methods have become inadequate in handling the complexities of supply chain, production planning, quality control, inventory management, and other aspects. BYD has adopted digital simulation and virtual testing to shorten the new vehicle development cycle. It has advanced the construction of the industrial internet to enable real-time monitoring of production data and intelligent decision-making. Through an APP-based direct sales model, the company directly reaches users, collects vehicle usage data for product improvement and personalized service provision (such as precise after-sales service recommendations), and connects the entire "research-production-supply-sales-service" chain. Digitalization is an inevitable choice for achieving refined operations, cost reduction, and efficiency enhancement.

3. Financial performance analysis of BYD's digital transformation implementation

3.1. Solvency

This paper selected two indicators, the current ratio and the asset-liability ratio, to evaluate BYD's long-term and short-term solvency.

3.1.1. Current ratio

The current ratio is the ratio of current assets to current liabilities. Generally, a current ratio of around 2:1 is considered appropriate. The current ratio reflects whether a company's current assets have sufficient liquidity to meet debt repayment requirements before short-term debts mature. **Table 1** shows BYD's current ratio from 2019 to 2024.

Table 1. Current ratio

Year	Current ratio
2024	0.75
2023	0.67
2022	0.72
2021	0.97
2020	1.05
2019	0.99

Note: The data is sourced from the annual reports of BYD Company and the official website of iFinD.

From the perspective of financial indicators, it is generally considered that a current ratio around 2 is appropriate. BYD's current ratio from 2019 to 2024 shows an overall declining trend and remains below 2. This change indicates a significant weakening of the company's short-term solvency, with a risk of debt default. In 2020, the current ratio was 1.05, close to 1, suggesting that BYD's short-term solvency was acceptable that year, with current assets basically covering current liabilities. In 2024, the current ratio was 0.75, an increase

from 2023 but still at a low level, indicating that the short-term solvency remains concerning. Although BYD's revenue continued to grow in 2024, the accounts receivable turnover rate decreased year-on-year, the proportion of inventory was relatively high, and the scale of accounts payable was large, concentrating short-term debt repayment pressure on supply chain accounts.

3.1.2. Asset-liability ratio

The asset-liability ratio is an indicator reflecting a company's long-term solvency. A reasonable range for measuring long-term solvency is between 40% and 60%, and a ratio exceeding 70% indicates significant financial risk. The comparison of BYD's asset-liability ratios from 2019 to 2024 is shown in **Table 2**.

Table 2. Asset-liability ratio

Year	Asset-liability ratio (%)
2024	74.64
2023	77.86
2022	75.42
2021	64.76
2020	67.94
2019	68.00

BYD's asset-liability ratios from 2019 to 2024 were 68.00%, 67.94%, 64.76%, 75.42%, 77.86%, and 74.64%, respectively, showing a fluctuating trend. It is noteworthy that BYD's asset-liability ratios remained at a relatively high level from 2019 to 2024, mainly due to the large-scale capital investments required during the initial transformation period, which were mainly financed through debt. Although BYD's asset-liability ratio has improved after digital transformation, it remains at a high level, indicating that the company still needs to further optimize its operating pressure and credit risk.

3.2. Profitability

In this section, we evaluate the changes in BYD's profitability using the key indicator of return on equity (ROE). ROE is an important indicator for measuring the return on investment of a company's owner's equity. Generally, when a company's ROE reaches a high level, it indicates that the company has strong profitability using its own capital, reflecting an optimal operating performance. BYD's ROE from 2019 to 2024 is shown in **Table 3**.

Table 3. Return on equity

Year	Return on equity (%)
2024	26.05
2023	24.40
2022	16.14
2021	3.73
2020	7.43
2019	2.62

From the overall trend from 2019 to 2024, BYD's ROE shows a pattern of first increasing, then decreasing, and then rising sharply, reflecting that the company's profitability has experienced a strong recovery and continuous enhancement after hitting a low point in 2021 due to the impact of the epidemic. Through its own technological innovation, market expansion, and effective cost management measures, BYD has gradually widened the gap with some competitors in the new energy vehicle industry, continuously improving its profitability competitiveness and demonstrating strong development potential and a favorable profit outlook in the new energy vehicle sector.

3.3. Operational capability

This section evaluates asset utilization efficiency and operating performance by analyzing the inventory turnover rate.

3.3.1. Inventory turnover rate

The inventory turnover rate is an important indicator for measuring a company's operational capability, reflecting the speed of inventory turnover. A higher inventory turnover rate indicates faster inventory turnover, stronger sales capability, less working capital tied up in inventory, and higher capital utilization efficiency. BYD's inventory turnover rates from 2019 to 2024 are shown in **Table 4**.

Table 4. Inventory turnover rate

Year	Inventory turnover rate (%)
2024	6.15
2023	5.76
2022	5.75
2021	5.03
2020	4.43
2019	4.12

From the overall trend from 2019 to 2024, BYD's inventory turnover rate shows a continuous upward trend, from 4.12% in 2019 to 6.15% in 2024, fully reflecting the continuous enhancement of the company's operational capability. With the acceleration of inventory turnover speed, the company can more quickly realize the value conversion of inventory, reducing inventory storage costs and capital occupation costs, and improving the company's capital liquidity and overall operating efficiency. This also indicates that BYD's management level in production, sales, and other aspects is continuously improving, enabling it to better adapt to changes in market demand.

3.4. Development capability

This section selects the operating revenue growth rate as an indicator to examine the changes in BYD's growth capability before and after its digital transformation. The operating revenue growth rate is a key metric for measuring changes in a company's operating revenue. A higher growth rate indicates rapid growth in the company's operating revenue, a broad market outlook, and significant development potential. Data from 2020 to 2024 shows a comparison of BYD's operating revenue growth rates in **Table 5**.

Table 5. Operating revenue growth rate

Year	Operating revenue growth rate (%)
2024	29.02
2023	42.04
2022	96.20
2021	28.02
2020	22.59
2019	-1.78

From the overall trend from 2019 to 2024, BYD's operating revenue growth rate shows a pattern of rapid initial growth followed by a decline but still maintaining a relatively high level. The high growth rate in 2022 reflects BYD's strong development momentum and market competitiveness in the new energy vehicle industry, while the subsequent decline in growth rate is a normal phenomenon as the industry reaches a certain stage of development. Overall, BYD has achieved significant growth in operating revenue over these years, demonstrating strong development capability and notable achievements in market expansion and business growth. However, with intensifying industry competition and changes in the market environment, BYD needs to continuously engage in technological innovation, product upgrades, and market strategy adjustments to maintain a favorable development trend.

4. Challenges and issues faced by BYD company in digital transformation

Although BYD has actively promoted digital transformation in the new energy vehicle industry, it has encountered numerous difficulties and limiting factors during the process, mainly including rapid technological updates and integration challenges, where the new energy vehicle industry involves a wide range of technological fields, such as solar and wind energy, which are developing rapidly. Companies need to continuously invest in research and development to keep pace with technological updates, posing challenges in terms of technology selection and integration. The integration of advanced technologies such as the Internet of Things (IoT), big data, cloud computing, and artificial intelligence (AI) into existing business processes is difficult, requiring companies to possess strong technical capabilities and interdisciplinary talent. As digital transformation progresses, the volume of corporate data, including sensitive information such as customer details and technical parameters, increases significantly, making information security issues increasingly prominent. Companies need to establish a comprehensive information security management system [7].

Furthermore, the new energy vehicle industry is developing rapidly, leading to increasingly fierce market competition. Companies need to enhance their competitiveness through digital transformation, but this requires substantial capital investment, placing significant pressure on companies. Consumer demand for new energy products is becoming increasingly diversified, requiring companies to optimize their products and services through digital transformation to meet consumer needs [8]. The new energy vehicle industry has a long industrial chain involving multiple links, and corporate digital transformation requires collaboration with upstream and downstream enterprises in the chain to achieve digital upgrades across the entire chain. However, industrial chain collaboration faces numerous difficulties.

5. BYD's digital transformation strategies in the context of digital transformation

5.1. Addressing technological challenges through "dynamic iteration + secure and controllable" approaches

To address technological challenges, BYD should first establish a technology dynamic tracking and selection mechanism. This requires forming an interdisciplinary technology evaluation team that regularly (e.g., quarterly) monitors iteration trends in core technologies such as solar and wind energy, as well as digital technologies including IoT and AI. Based on enterprise business priorities, a "technology fit list" should be developed to guide implementation. Technologies with higher maturity levels (e.g., IoT monitoring for power stations) should be prioritized, whereas technologies still in the exploratory stage (e.g., AI predictive maintenance) should be validated through small-scale pilot projects to avoid blind investment.

BYD should advance technology integration in phases. Following the pathway of "single-point breakthrough, process integration, and full-chain collaboration," digital technologies should initially be applied to high-pain-point areas such as production equipment monitoring and user data analysis to accumulate implementation experience. Subsequently, integration can be expanded to the full research, production, and operation-and-maintenance chains. Collaboration with technology service providers is essential to customize integration solutions and reduce the technical difficulty of independent implementation.

Finally, BYD must build a comprehensive information security protection system. This entails establishing security safeguards across the entire data lifecycle, including collection, storage, transmission, and application, encrypting sensitive information such as customer data and technical parameters, and deploying real-time risk monitoring systems to mitigate emerging data security threats [9].

5.2. Responding to competition and industrial chain pressures through "resource integration + demand response" and collaborative industrial chain strategies

To address competitive pressures and enhance industrial chain collaboration, BYD should first leverage economies of scale and output digital capabilities. This involves offsetting costs through large-scale investments while simultaneously generating revenue by exporting digital solutions to partners across the industrial chain. Through digitalization, the company can more accurately match consumer demands by constructing a user demand data analysis platform capable of identifying customer preferences related to "range, intelligence, and personalized customization" [10].

In addition, BYD should promote digital collaboration across the industrial chain by taking the lead in establishing a unified digital platform that eliminates data barriers between upstream and downstream stakeholders, including raw material suppliers, production and manufacturing entities, and operation and maintenance service providers. Such a platform enables full-link visibility from "demand, production, and delivery," facilitating the sharing of production progress data with component suppliers, improving the prediction of supply chain risks, and significantly enhancing overall collaboration efficiency.

6. Conclusion

This study provides a comprehensive analysis of BYD's financial performance and the challenges and opportunities presented by its digital transformation. By examining data from 2019 to 2024 across solvency, profitability, operational capability, and development capacity, the findings show that digital transformation has brought both significant improvements and new pressures. While profitability, inventory turnover efficiency,

and revenue growth have strengthened notably, high asset-liability ratios and weakened short-term solvency reflect persistent financial risks during the transformation period. At the same time, BYD continues to confront difficulties such as rapid technological iteration, data security risks, intensified industry competition, and the complexity of industrial chain collaboration. In response, this paper proposes targeted digital transformation strategies from the perspectives of technological iteration, information security, consumer demand responsiveness, and industrial chain collaboration. These strategies aim to enhance BYD's ability to integrate digital technologies, strengthen its competitive resilience, and promote sustainable long-term development. Overall, effective digital transformation requires not only continuous investment in technology and talent but also coordinated improvement across management systems, supply chain collaboration, and user-centered service innovation. By adopting these approaches, BYD can further consolidate its leadership in the new energy vehicle sector, improve development quality, and achieve high-level digital competitiveness in the accelerating digital economy era.

Disclosure statement

The authors declare no conflict of interest.

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