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Original Paper

A study of the Performance of Haier Smart under Digital Transformation

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Abstract

In recent years, the digital boom has continued to hit, and global scientific and technological innovation has been unprecedentedly intensive and active. On the cusp of this 5G trend, emerging technologies such as artificial intelligence, cloud sharing, and big data are emerging in an endless stream, constantly impacting traditional technologies and the real economy. The fourth industrial revolution has quietly penetrated into every corner of society. Both people's lives and the economic environment have been unprecedentedly affected. As an important pillar industry in the national economic construction, how to meet the digital transformation, seize the opportunity of digital transformation, enhance product value, and create new quality productivity has become particularly important.

This paper takes digital transformation as the starting point, explores the motivation and path of Haier's digital transformation in the past ten years, and evaluates its performance. The study found that Haier Smart Home's digital transformation has improved the long-term performance of enterprises; the first enlightenment is to accelerate the transformation and upgrading and improve the degree of digital attention ; second, adhere to innovation-driven, enhance digital R & D sales; third, create a digital platform to enhance the user's personalized experience. It is expected that the research in this paper can provide some reference for the digital transformation of other household appliance enterprises and bring some help to the digitization of China's household appliance manufacturing industry.

Keywords

Digital Transformation Corporate performance Haier Smart Home

1. Background and Significance of the Study

1.1 Research Background

Accompanied by the renewal of digital information technology, digital economy has gradually become a strong driving force for China's economy to move towards high-quality development. The "14th Five-Year Plan" discusses the importance of stimulating the potential of data elements and accelerating the construction of digital networks. With the government's strong focus on and support for digital strategy, entrepreneurs must realise the importance of investing more resources in digital transformation and using digitalisation to transform and upgrade their businesses to improve their competitiveness. As a result, more and more enterprises are implementing digital transformation to meet the challenges of industrial change brought about by big data, intelligence, and the Internet of Things.

Manufacturing industry as an important pillar industry in the construction of the national economy, how to adapt to the external economic situation, to achieve digital transformation is of great significance, the digital economy into the traditional manufacturing industry is the key to digital transformation and upgrading. This paper selects Haier Smart Home as the research object, firstly, taking into account that Haier Smart Home has always been the leader of the traditional home appliance industry, as early as 2005, began to prepare for the digital transformation, and then opened the networked strategy in 2012, formally entered the road of digital transformation, a long time span, transformation and reform of the depth of China's home appliance industry is the benchmark enterprise for the digital transformation of home appliance industry. Secondly, Haier Smart Home was listed on China's A-share market as early as 1993, and disclosed specific digital transformation measures in its annual report, and the financial data can be accessed in a complete and coherent manner. By studying the digital transformation process of Haier Smart Home, we can visually see the changes in the performance of the enterprise during the period of digital transformation, which is of great significance to other enterprises in the industry.

1.2 Research Significance

Currently, most of the research on digital transformation adopts empirical research methods, however, there is relatively little literature on in-depth analyses of individual enterprise cases. The limitation of this research method is that it is difficult to fully reveal the specific practices and details of the digital transformation process. In this paper, Haier Smart Home is selected as a case study to deeply analyse the impact of its digital transformation on enterprise performance. Through the study of specific cases, it reveals the strategies and measures adopted by Haier Smart Home in the process of digital transformation and the role of these initiatives in improving its business performance.

At the same time, Haier Smart Home's digital transformation is typical and representative, and its successful cases are of great significance for the digital transformation of the home appliance manufacturing industry as well as the entire manufacturing industry. Studying Haier Smart Home's successful experience not only helps to understand the implementation path and key factors of digital transformation, but also provides feasible strategic suggestions for other enterprises.

2. Digital Transformation Literature Review

2.1 Connotation of Digital Transformation

Zhou, Liu, Xin et al. (2022) argued that digital transformation is a dynamic process, emphasising the key application of digital technology in it. They explored the relationship between digital transformation and informatisation, digitisation as well as intelligence, pointing out that digital transformation is not only an upgrade of technological applications, but also a profound change in business models and management styles. Zeng et al. (2021) suggest that digital transformation is a comprehensive change in production, operation, and value proposition of enterprises. The transformation not only involves the updating of the technological level, but also covers the comprehensive adjustment of the enterprise's business processes and organisational structure, aiming to improve the overall operational efficiency and market competitiveness. According to Xiao (2017), enterprise digital transformation is a strategic upgrade that covers the core links of the value chain. This transformation involves product research and development, intelligent manufacturing and marketing management, and aims to enhance the innovation ability and market responsiveness of enterprises through the comprehensive application of digital technology. Jiang and Liu (2022) point out that the digital transformation of enterprises can significantly enhance their core competitiveness, especially their ability to cope with market risks. They emphasise that through digital means, firms are able to respond more flexibly to market changes, thus occupying a favourable position in a highly competitive market environment.

2.2 Motivation of Digital Transformation

A study by Demary et al. (2021) shows that the development of information technology has played a major driving role in facilitating the digital transformation of retail companies. They point out that information technology has not only changed the traditional retail model, but also brought more growth opportunities for retail companies. Specifically, information technology has driven digital transformation in the retail industry by improving operational efficiency, enhancing customer experience, and expanding market channels in various ways. Hess et al.'s (2016) study found that top-down promotion by management is an important driver of successful digital transformation in companies. They emphasised that active participation and strong support from the leadership is crucial in developing and implementing a digital transformation strategy. Management ensured that digital transformation was carried out smoothly within the organisation by setting clear goals, providing the necessary resources and guiding the change process.A study by Lederer et al. (2017) noted that the company's strategic transformation was a key factor in facilitating the company's digital transformation, and that employee support for the digital strategy also played a crucial role. The study shows that when a company develops and implements a digital transformation strategy, it not only needs to plan comprehensively at the strategic level, but also must gain the understanding and support of all employees. The active participation and cooperation of employees helps to create a unified will for change and common goals within the organisation, thus ensuring the success of digital transformation.

Some domestic scholars, Xiao and Qi (2019), also pointed out that the transformation of enterprises is affected by both the external environment and internal changes. In order to achieve digital transformation and upgrading, enterprises need to comprehensively consider internal and external factors and make corresponding strategic adjustments. Specifically, the external environment includes market competition, technological advances and policy changes, etc., while internal changes involve the transformation of organisational structure, management mode and corporate culture. Only on the basis of comprehensively analysing and adapting to these factors can an enterprise successfully achieve digital transformation. According to Zhang (2020), the core objective of financial digitisation is to enhance data connectivity and collaboration, thereby increasing the value of data and improving the efficiency of financial shared services. By implementing financial digitisation, companies can achieve seamless integration and real-time sharing of financial data, which not only optimises the financial management process, but also supports more accurate decision-making and resource allocation. Cai and Liu et al. (2020) found through a case study of Tianhong that under the trend of consumption upgrading, the user value proposition has shifted from purely functional needs to a greater focus on emotional experience. Personal experience has become the new standard, and the main body of value creation has shifted from the traditional enterprise-led model to the enterprise-customer co-led model. This shift reflects the active role that customers play in the value creation process and emphasises the importance of customer experience and emotional connection. Chen (2021) found through an empirical study that institutional pressure at the regional level plays a significant role in facilitating the digital transformation of enterprises. The study suggests that local governments and regulators have created an environment conducive to digital transformation through the formulation and implementation of relevant policies and regulations, thereby promoting innovation and change in technology application and management models.

2.3 Impact of Digital Transformation on Business Performance

According to Hu (2020), digital transformation has a significant effect on business performance. Through the introduction of digital technologies, firms are able to optimise their operational processes and improve productivity, which leads to a significant increase in performance. According to Qi and Cai (2019), digital transformation not only enhances the data acquisition and analysis capabilities of enterprises, but also improves their innovativeness, which in turn significantly improves their performance. Through digitalisation, firms are able to access market and customer information more accurately and drive innovation and decision-making through data analysis, thereby improving overall performance. Lin and Lv (2019) pointed out that digital transformation changes the organisational structure and strategic layout of enterprises through the application of digital technology, optimises the value chain, and ultimately improves enterprise performance. The application of digital technology not only promotes the optimisation of internal processes, but also improves the market competitiveness and responsiveness of enterprises at the strategic level. Yang's (2018) study found that enterprises that implemented the "Internet +" strategy increased their earnings per share by 31% and return on assets by

24%, which effectively promoted the improvement of corporate performance. This suggests that the "Internet+" strategy significantly enhances the profitability and asset utilisation efficiency of enterprises through the integration of Internet technology and traditional business, thereby promoting the overall improvement of enterprise performance.

3. Haier Smart Home Digital Transformation Case Introduction

3.1 Basic Information of Haier Smart Home

(Haier Smart Home), founded in 1984 and headquartered in Qingdao, Shandong Province, formerly known as Qingdao Haier Company Limited, is a leading global manufacturer and solution provider of home appliances and consumer electronics products. Haier Smart Home's business covers a wide range of areas including home appliances and smart home. Its main home appliances include: refrigerators, washing machines, air conditioners, water heaters and kitchen appliances, etc. For smart home, it mainly focuses on interconnecting home appliances through the Internet of Things (IoT) and smart technologies to provide intelligent home solutions. Haier Smart Home is a pioneer and benchmark enterprise in digital transformation. As early as 2005, Haier Smart Home began to prepare for digital transformation and launched its networking strategy in 2012, successfully realising the transformation from traditional home appliance manufacturing to intelligent and networked manufacturing by constructing connected factories and intelligent manufacturing systems. After years of development, Haier Smart has become a leading global home appliance company with major brands such as Leader, Casarte, Haier, AQUA, Fisher & Paykel, Candy, and GE Appliances. In terms of influence, it is ranked among the world's top 500 companies in Fortune, has been honoured as the world's most appreciated company, and is located in the leading position in the home appliance industry.

3.2 Haier Smart Digital Transformation Motivation

3.2.1 Policy support

In 2015, China put forward the "Made in China 2025" plan for the first time, which explicitly proposed to realise the digital and intelligent transformation and upgrading of the manufacturing industry, enhance the core competitiveness and innovation capacity of China's manufacturing industry, and realise the transformation from a large manufacturing country to a strong manufacturing country. The "14th Five-Year Plan" also explicitly proposes to welcome the digital era, activate the potential of data elements, promote the construction of a strong network country, welcome the digital era, fully tap and activate the potential of data, promote the construction of the digital economy, digital society and digital government, and promote the comprehensive change of production, life and governance with digital transformation, so as to enhance the comprehensive competitiveness of the country. the comprehensive competitiveness of the country. The Qingdao Municipal Government, where Haier Smart is located, has also issued the Implementing Opinions on Supporting the Development of Digital Economy, which supports the digital transformation needs of enterprises in a number of ways, including access to and utilisation of data resources, construction of digital infrastructure, and security

of land for enterprises. At the same time, it provides a full range of policy support in terms of talent cultivation, incentive policies and enterprise development to help enterprises improve their operational efficiency and market competitiveness through digital technology.

In the era of digital economy, promoting the deep integration and development of the digital economy and the real economy is the way to achieve sustained and stable growth of China's economy. Through the extensive application of digital technology, traditional industries will gain new development momentum and competitive advantages. As a leader in the home appliance industry, Haier Smart Home actively promotes digital transformation, improves product value-added and user experience by building an intelligent manufacturing and smart home ecosystem, and achieves continuous innovation and competitiveness enhancement of the enterprise.

3.2.2 Market Competition Drive

Accompanied by the rapid development of a new generation of information technology, digital, networked and intelligent technologies are fully penetrating into various fields such as manufacturing, energy, transportation, healthcare and education. The application of these technologies not only improves the efficiency and quality of various industries, but also promotes comprehensive innovation and change in the industry. New modes and formats such as smart manufacturing, smart energy, driverless and smart classrooms are gradually becoming the dominant force for development. By integrating advanced technologies and innovative concepts, these emerging fields have reshaped the operation and business models of traditional industries, and become an important driver of economic growth. In today's market environment, the competitors of enterprises are not only limited to traditional industrial enterprises, but also include technology-based emerging companies and digital giants. Such a competitive landscape drives companies to continuously upgrade their technological capabilities and level of innovation in order to maintain a competitive edge.

3.2.3 User Demand

In today's home appliance manufacturing industry, which is gradually moving towards intelligence, users are paying more and more attention to product performance, appearance design and after-sales service experience. This change in demand requires companies not only to provide high-quality products, but also to ensure that the user in the purchase and use of the process to obtain quality service. In the face of such challenges and opportunities, the home appliance industry needs to shift from the traditional "manufacturing" mode to the "smart manufacturing" mode, and realise the interconnection of online and offline data. Haier Smart Home a has set up a professional team with the user as the core, and built a comprehensive digital platform to improve product development and service capabilities. Through digital transformation, Haier Smart Home is committed to improving user experience and meeting users' changing needs. By developing high-end, personalised products and optimising the whole process of service from production to after-sales, it has created a win-win brand ecosystem. Such upgrades not only enhance the added value of products, but also strengthen the brand's market competitiveness.

3.2.4 Cost Reduction and Efficiency Improvement

In the digital era, companies must enhance their competitiveness by reducing costs and improving efficiency in the face of the current competitive market environment. Haier Smart Home faced many challenges before its digital transformation. Its complex organisational structure and lack of refinement and standardisation in its management style led to poor collaboration between departments and low overall management efficiency. This not only hindered the rapid development of the enterprise, but also limited its competitiveness in the market. The lack of management refinement and poor departmental collaboration leads to wasted resources and delayed decision-making, which affects the overall performance of the enterprise.

4. Analysis of Financial Performance in the Context of Digitalisation of Haier Smart Home

4.1 Solvency Analysis

Table 1. Key Solvency Indicators of Haier Smart Home 2016-2023

Year / Indicators	2016	2017	2018	2019	2020	2021	2022	2023
Current ratio	0.946	1.149	1.177	1.052	1.044	0.990	1.099	1.105
Quick ratio	0.739	0.869	0.898	0.756	0.775	0.671	0.749	0.776
Equity ratio	2.493	2.240	2.024	1.884	1.987	1.682	1.490	1.392
Gearing ratio	0.714	0.691	0.669	0.653	0.665	0.627	0.598	0.582

The current ratio fluctuated between 2016 and 2023, increasing from 0.946 in 2016 to 1.149 in 2017, and then gradually increasing to 1.177 in 2018. it then declined in 2019 and 2020 to 1.052 and 1.044, respectively. it declined slightly to 0.990 in 2021, but then increased to 1.099 and 1.105 in 2022 and 2023 rebounded to 1.099 and 1.105, respectively. the quick ratio had an overall trend similar to the current ratio between 2016 and 2023, rising from 0.739 in 2016 to 0.869 in 2017 and reaching 0.898 in 2018. it then declined in 2019 and 2020 to 0.756 and 0.775, respectively. 2021 declined to 0.671 in 2021, but rebounded to 0.749 and 0.776 in 2022 and 2023, respectively.The current ratio generally showed an upward trend, indicating that the company's short-term solvency is improving, especially when it reaches more than 1.1 in 2022 and 2023, which suggests that the company's current assets have been able to cover its current liabilities. Haier Smart Home has optimised inventory management through digital transformation, achieving precise inventory control, reducing inventory backlog and capital consumption, increasing the proportion of current assets and improving short-term solvency.

The equity ratio has been declining year by year, from 2.493 in 2016 to 1.392 in 2023, indicating that the company is gradually reducing debt and relatively increasing equity. This change can be attributed to the company's active repayment of debt and increase in shareholders' equity. The reason for the

decline in the equity ratio is that Haier Smart Home has introduced more capital investment to support technology upgrades and innovations during the digital transformation process, mainly from shareholders' equity rather than debt, thereby reducing the equity ratio. The debt-to-asset ratio has been declining year by year, from 0.714 in 2016 to 0.582 in 2023. The continuous decline in the debt-to-asset ratio reflects the gradual decline in the company's debt ratio and the improvement in net worth. A lower debt-to-asset ratio helps reduce financial risks and improve the company's financial health.

Haier Smart's digital transformation has significantly improved the company's operating efficiency and market competitiveness, and optimized financial management and asset structure. These improvements have not only improved the company's profitability and cash flow, but also effectively reduced the company's debt ratio and financial risks, and the debt repayment ability indicators have been significantly improved. Digital transformation has improved the overall financial health of Haier Smart Home, making it more resilient and more adaptable to market changes and competitive pressures.

4.2 Operational Capability Analysis

Table 2. Key Operating Capacity Indicators of Haier Smart Home 2016-2023

Year / Indicators	2016	2017	2018	2019	2020	2021	2022	2023
Receivable turnover	9.722	12.794	17.574	18.225	13.165	15.553	15.302	12.898
Inventory turnover	5.390	5.110	5.816	4.990	5.008	3.925	4.025	4.530
Total asset turnover	0.907	1.051	1.100	1.071	1.031	1.046	1.033	1.032

The accounts receivable turnover ratio increased year-on-year from 9.722 in 2016 to a peak of 17.574 in 2018. it further rose to 18.225 in 2019, before declining, to 13.165 in 2020, rebounding to 15.553 in 2021, and 15.302 and 12.898 in 2022 and 2023, respectively. during the digital transformation process , Haier Smart introduced a Customer Relationship Management (CRM) system to optimise customer credit management through data analysis, accelerating the collection of accounts receivable and improving the accounts receivable turnover ratio.

The inventory turnover ratio fluctuated from 5.390 in 2016 to 5.816 in 2018,, before declining to 4.990 in 2019, rising slightly to 5.008 in 2020 but dropping to 3.925 in 2021. 4.025 and 4.530 in 2022 and 2023, respectively. Haier Smart Home, through its digital transformation, optimised its warehousing and logistics management systems, enabling accurate inventory control and efficient distribution. These measures improved inventory turnover in the early years. However, in 2020, the home appliance industry was severely impacted by the generally weak economic development efforts, which led to a decline in the turnover ratio due to fluctuations in market demand.

Total asset turnover remained relatively stable between 2016 and 2023, rising from 0.907 in 2016 to

1.051 in 2017 and reaching 1.100 in 2018. 1.071 and 1.031 in 2019 and 2020, respectively, before recovering slightly to 1.046 in 2021, and to 1.033 and 1.032. Through comprehensive digital management, Haier Smart Home has become more efficient in asset utilisation and resource allocation, and the total asset turnover ratio has remained stable, reflecting the Company's efficient utilisation of resources and optimisation of its business model in the course of digital transformation.

Overall, Haier Smart Home's overall operational efficiency and asset utilisation have been effectively improved through digital transformation. These improvements have not only enhanced the Company's competitiveness in the market, but also laid a solid foundation for sustainable development in the future

4.3 Profitability Analysis

Table 3. Key Profitability Indicators of Haier Smart Home 2016-2023

Year / Indicators	2016	2017	2018	2019	2020	2021	2022	2023
Return on assets	0.068	0.079	0.075	0.083	0.072	0.076	0.074	0.080
Net profit margin on total assets	0.051	0.060	0.059	0.066	0.056	0.061	0.062	0.066
Return on net assets	0.178	0.194	0.177	0.190	0.166	0.163	0.156	0.158

The return on assets gradually increased from 0.068 in 2016 to 0.083 in 2019, then fell to 0.072 in 2020, but rebounded to 0.076 in 2021, 0.074 in 2022, and 0.080 in 2023. The year-on-year growth of total assets decreased from 0.051 in 2016 to 0.066 in 2019. It fell to 0.056 in 2020, but rose again to 0.061 in 2021, 0.062 in 2022, and 0.066 in 2023.

Haier Smart Home has transformed digitally, innovated products and services, launched more intelligent and value-added products, and improved its market competitiveness and customer satisfaction. At the same time, digital transformation has enabled Haier Smart Home to increase its reliance on data in decision-making, optimize business processes and resource allocation, and improve operational efficiency and overall profitability.

Overall, Haier Smart Home's digital transformation has had a significant positive impact on profitability. By improving operational efficiency, introducing intelligent products and services, and using data to drive decision-making, the company has made significant progress in return on assets and return on assets. Although ROE fluctuates in the short term, it remains at a high level overall, reflecting the effectiveness of the company's long-term optimization of capital structure and investment. Digital transformation has enhanced Haier Smart Home's market competitiveness and sustainable development capabilities.

4.4 Development Capacity Analysis

Table 4. Key Development Capacity Indicators of Haier Smart Home 2016-2023

Indicators \ Year	2016	2017	2018	2019	2020	2021	2022	2023
Fixed asset growth rate	0.845	0.030	0.007	0.218	-0.013	0.067	0.217	0.090
rate of capital accumulation	0.158	0.241	0.152	0.165	0.048	0.190	0.165	0.118
Net profit growth rate	0.885	0.062	0.025	-0.788	-0.250	0.008	-0.187	-0.178

The growth rate of fixed assets peaked at 0.845 in 2016 before declining significantly in 2017 and 2018 to 0.030 and 0.007, respectively. it rebounded to 0.218 in 2019, declined slightly to -0.013 in 2020, and then rose again to 0.067 in 2021, reaching 0.217 in 2022 and 0.090 in 2023. Analysing the reasons for this, 2016 was mainly characterised by the successful acquisition of GEA to support the digital transformation and the upgrading of production facilities. In the following years, the company's investments in fixed assets stabilised, reflecting the gradual improvement of the digital infrastructure.

The capital accumulation rate remained at a high level between 2016 and 2019, at 0.158, 0.241, 0.152 and 0.165, respectively. it declined in 2020, at 0.048, but rebounded to 0.190 in 2021, and 0.165 and 0.118 in 2022 and 2023, respectively. the fluctuations in the capital accumulation rate reflect the different stages of the Company's strategic adjustments to capital investment. in 2017, Haier Intelligence made large-scale digital investment thereby having a high capital accumulation rate, while it declined in 2020 due to the epidemic shock, followed by a rebound in 2021 and relative stability in the following two years, Haier Intelligence continued to make capital investment in digital transformation and market expansion, maintaining a high capital accumulation rate to support the company's long-term strategic goals .

Net profit growth rate increased significantly to 0.885 in 2016 but fluctuated sharply in the following years. 0.062 and 0.025 in 2017 and 2018, respectively, declined sharply to -0.788 in 2019, -0.250 in 2020, recovered slightly to 0.008 in 2021, but -0.187 in 2022 and - 0.178. Haier Zhijia is facing fierce market competition and rapidly changing market demand in the process of digital transformation, and these factors may have affected the stable growth of profit. However, although the net profit growth rate is still negative in 2022 and 2023, it has improved from the previous years, indicating that the company has made some progress in addressing the challenges and adjusting its strategy.

5. Conclusions and Recommendations

5.1 Conclusion

Haier Smart Home's digital transformation has significantly improved its overall operational efficiency, market competitiveness and financial health. Although the company faces short-term financial fluctuations, various financial indicators show a positive development trend due to the optimization of asset management, the improvement of product and service quality, and the flexible adjustment of capital investment strategies. Digital transformation has enhanced Haier Smart Home's market competitiveness and sustainable development capabilities, making it more adaptable and capable of adapting to future market conditions.

5.2 Recommendations

5.2.1 Continue to Invest in Digital Infrastructure

The company has invested heavily in digital transformation, but continued investment in the latest digital technologies and infrastructure is essential to maintain its competitive advantage. Further application of technologies such as cloud computing, artificial intelligence, and the Internet of Things will improve operational efficiency, customer experience, and market responsiveness.

5.2.2 Optimize Supply Chain Management

Further optimization of supply chain management, especially from the perspective of inventory and logistics, can improve inventory turnover, reduce inventory delays and logistics costs. Deploying more advanced supply chain management systems to provide real-time monitoring and intelligent planning will ensure the flexibility and responsiveness of the supply chain.

5.2.3 Improve Innovation Capabilities

Increase investment in R&D and innovation, and encourage continuous upgrading and diversification of products and services. In particular, smart home innovation will improve market competitiveness and provide more integrated and intelligent home solutions through cross-border cooperation and ecosystem construction.

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