



The Impact of Digital Transformation on Enterprise Performance

—A Case Study of TCL Zhonghuan

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Abstract. The development of the digital economy is driving profound changes in the mode of production, lifestyle and governance, and has become a key force in reorganizing global factor resources, reshaping the global economic structure, and changing the global competition landscape. As a high-tech enterprise, TCL Zhonghuan fully demonstrates its outstanding achievements in digital transformation and driving the digital construction of the industrial chain. Using case analysis method, this paper takes TCL Zhonghuan as the research object, firstly introduces relevant concepts, secondly introduces the enterprise profile, introduces the motivation for TCL Zhonghuan to implement digital transformation, focuses on analyzing the financial data of TCL Zhonghuan from 2016 to 2022 in vertical dimension, and explores the impact of digital transformation on enterprise performance. It is found that digital transformation can improve the growth ability and operation ability of enterprises, which can help enterprises develop better. Finally, it puts forward some suggestions on digital transformation, and provides reference for other enterprises to implement digital transformation.

Keywords: Digital economy; Digital transformation; Business performance; High-tech enterprises.

1 Introduction

At present, China's digital economy has entered a stage of rapid development, with the digital transformation of traditional industries accelerating, digital economic infrastructure achieving leapfrog progress, and new business forms and models developing vigorously.

The state of digital transformation:

(1) Digitalization also provides productivity improvements, cost reductions, and innovations that also “influence” DT (Hess et al., 2016)^[1]

(2) With the further development of the digital economy, prior literature broadened its research on digitalization to microcosmic enterprises (Jiang, Du, & Chen, 2022)^[2]

and the using the data from the enterprises, we can do some empirical research on the impact of digital technology for firm performance.

(3)Promoting technological innovation, human capital, operational capacity, and investment efficiency through DT can improve the productivity of Chinese enterprises. Other studies have shown that the productivity gains achieved by DT can lead to higher profitability (Jiang, Du, 2022)^[3].

In this context, TCL Zhonghuan, as a veteran silicon wafer company, is selected as a typical case of digital transformation of listed companies in 2023. Therefore, this paper takes TCL Zhonghuan as an object, makes a vertical comparison of financial data from 2016 to 2022, studies the impact of digital transformation on corporate performance, and provides ideas and suggestions for other companies to implement digital transformation.

2 The Concept of Digital Transformation

As a new enterprise development model, digitization is of great significance to the development of economy and society(Yongzhang Peng, 2022)^[4]. Digital transformation is a high-level transformation based on digital transformation and digital upgrade, which further touches on the company's core business, aims to build a new business model, and develops digital technology and support capabilities to build a dynamic digital business model. One of the most significant benefits of digitization is that it facilitates direct communication between businesses and customers, allowing businesses to collect customer feedback on products in a more convenient and cost-effective way(Gao, D, 2023)^[5].

3 The Company Profile

Tianjin Zhonghuan Semiconductor Co., Ltd. was established in 1999, formerly known as Tianjin No. 3 Semiconductor Device Factory established in 1969, completed the shareholding system transformation in 2004, and was listed on the Shenzhen Stock Exchange in April 2007, with the stock abbreviation of "Zhonghuan Shares" and the code of 002129. It is a high-tech enterprise that produces and operates semiconductor materials and semiconductor integrated circuits and devices.

The company's main business covers the research and development, production and sales of semiconductor silicon wafers, semiconductor power and rectifier devices, conductor photovoltaic monocrystalline silicon wafers, photovoltaic cells and modules. At the same time, the company is also involved in the manufacturing, processing, wholesale, retail of electronic instruments, equipment and components, as well as housing rental and other businesses.

4 The Drivers of Digital Transformation in Enterprises

(1) Policy support: The digital economy is an important development direction in China, and enterprises need to follow the trend to promote transformation, create innovative value, and achieve long-term development.(T.et al,2023)^[6].

(2) Improve product quality: Digital transformation can improve product quality. Digital technology can achieve precise control and real-time monitoring, reduce errors and defects in the production process, and improve product quality and stability.

(3) Intensified competition in the industry: With the rapid development of the new energy industry, the competition is becoming increasingly fierce. In order to maintain market competitiveness, TCL Zhonghuan needs to continuously strengthen technological innovation and improve production efficiency. Digital transformation can help companies achieve faster and more efficient production and management, improve market responsiveness, and enhance competitiveness.

5 The Process of Digital Transformation of Enterprises

In 2014, TCL Electronics put forward the business strategy of intelligent manufacturing, intelligent supply chain based on retail drive, and digital transformation of new retail. In 2018, Zhonghuan started the construction of the smart factory - Tianjin Huanzhi Factory, and the factory was officially put into operation in 2020, and has reached the standard of smart factory.

In 2021, TCL Zhonghuan was launched through ERP and integrated with BG/BU through more than 230 interfaces, realizing the integration of industry and finance and the integration of three streams. In 2022, benefiting from the global "double carbon" trend, the photovoltaic new energy industry has ushered in a period of rapid development.

In 2023, the list of "Typical Cases of Digital Transformation of Listed Companies in 2023" organized and selected by the China Association of Listed Companies was released, and TCL Zhonghuan's "Solar level Large size G12 monocrystalline silicon material Smart factory supply chain collaborative Management Project" won the outstanding case of industrial chain construction. In 2024, TCL Zhonghuan added the concept of "Industry 4.0".

6 Analysis of Enterprise Performance under Digital Transformation

When conducting digital transformation, other enterprises can refer to TCL Zhonghuan's experience in digital transformation. In this chapter, a comparison should be made between the years when digital transformation is not implemented and the years when digital transformation is implemented. Therefore, the financial data of seven years from 2016 to 2022 is selected to analyze the impact of digital transformation on enterprise performance.

6.1 Analysis of Growth Ability

In analyzing the growth ability of TCL Zhonghuan, two indicators of total operating income and year-on-year growth of total operating income are selected.

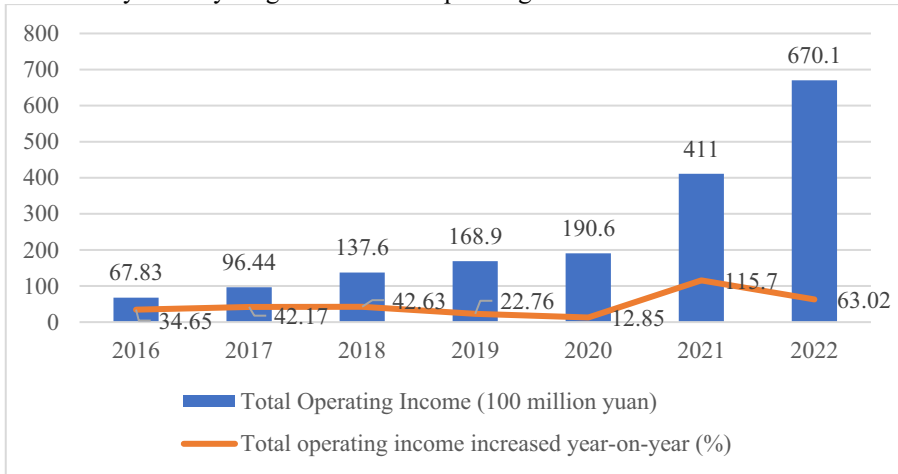


Fig. 1. TCL Zhonghuan Growth Capability Indicators from 2016 to 2022

As can be seen from Figure 1, the total operating income of TCL Zhonghuan presents a continuous upward trend, and the increase rate from 2021 to 2022 is greater than that from 2016 to 2020. In 2018, the total revenue exceeded 10 billion, because the implementation of 10GW diamond wire-cut ultra-thin silicon wafer project in Jiangsu has been completed, and it has fully entered the production increase and volume operation period. The total revenue growth rate in 2021 is as high as 115.7%, mainly in the new energy photovoltaic business segment to achieve 38.448 billion yuan of operating income, in the photovoltaic silicon business, Ningxia Yinchuan 50GW (G12) solar level monocrystal silicon material smart factory in January 17, 2022, the first G12 single crystal successfully off the line. In 2022, in the face of the external environmental impact of the Russia-Ukraine conflict, the energy crisis, global inflation and other emergencies, as well as the shortage of supply chains in the industry caused raw material prices to rise, photovoltaic thanks to its green, economic, manufacturable characteristics, still achieve rapid growth against the trend, the global photovoltaic new installed capacity is expected to reach 260GW, a record high.

6.2 Profitability Analysis

The profitability analysis of enterprises is to look at the relative ratio of input and output, and choose the year-on-year growth rate of net profit margin and the year-on-year growth rate of operating income to reflect profitability (Ying Liu, 2023)^[7].

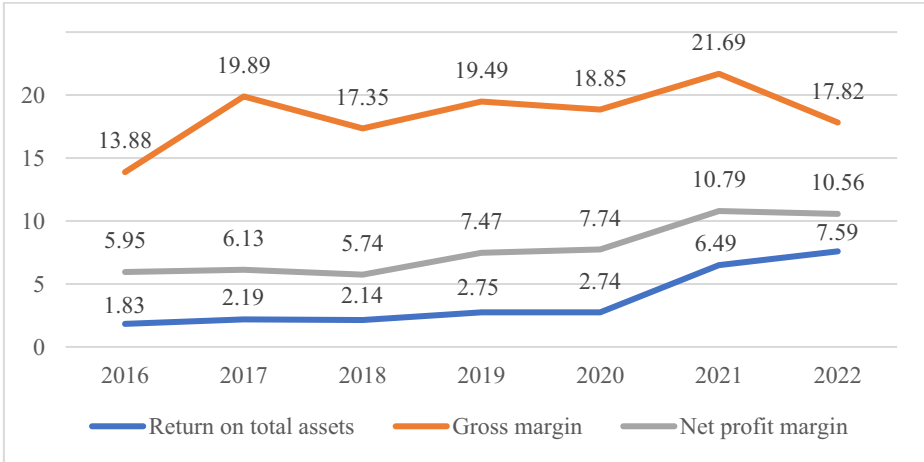


Fig. 2. TCL Zhonghuan Profitability Indicators from 2016 to 2022

As can be seen from Figure 2, the net interest rate and return on total assets of TCL Zhonghuan show a steady upward trend, while the gross profit rate of TCL Zhonghuan fluctuates somewhat during this period, but the overall trend is on the rise, with an obvious upward trend in 2017 and 2021. TCL Zhonghuan 's gross profit margin increased from 13.88 in 2016 to 19.89, due to the company's new energy materials industry capacity improvement, while further exploring the market and expanding sales scale. TCL Zhonghuan underwent a transformation in 2017, transforming from the previous diversified operation into a professional operation. This transformation enabled the company to focus more on its core business and improve operating efficiency, which in turn improved gross margin. At the beginning of digital transformation, the cost of creating hardware, core software, and human resources equipment will significantly increase the value of the enterprise in the short term, thereby reducing the financial performance of the enterprise(Yonghong,L, 2023) [8]. The net interest rate rose steadily, and the rise was more obvious in 2021 and 2022. TCL Zhonghuan, with its deep accumulation in the semiconductor field, continued to promote technological innovation, which not only enriched the company's product line, but also opened up new market space for it, and led to the sustained growth of sales performance.

6.3 Solvency Analysis

The solvency analysis selects the index of short-term solvency, current ratio and quick ratio. Long-term solvency indicator equity ratio.

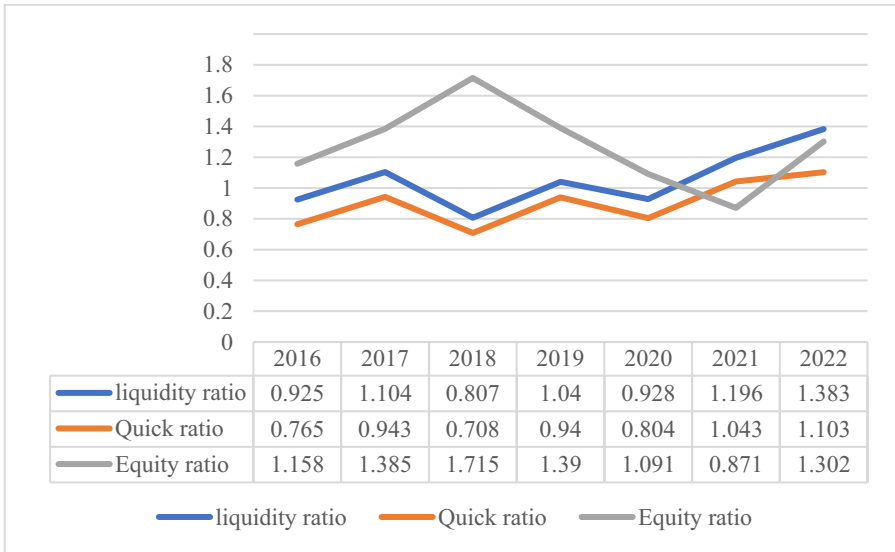


Fig. 3. TCL Zhonghuan's solvency indicators from 2016 to 2022

As can be seen from Figure 3, the rising trend of TCL's Zhonghuan current ratio and quick ratio is basically the same, and the equity ratio shows a trend of first rising, then decreasing and then rising. The reason for the decrease in the current ratio and quick ratio in 2018 was that TCL Zhonghuan further expanded the sales and production scale of semiconductor device products in the process of digital transformation, resulting in a decrease in current assets, resulting in a decrease in the current ratio and quick ratio. The increase in the current ratio and quick ratio in 2021 is obviously due to the cumulative shipments of semiconductor polishing and epitaxial sheets of the company in 2021, which increased the global market share to 2.7%, and the rapid growth of production and sales scale. The highest equity ratio in 2018, which led to the weakening of the long-term debt repayment ability of the enterprise, was due to the increase in the equity ratio caused by the issuance of shares to acquire assets in order to acquire Guodian Photovoltaic Electronics in 2018. From 2019 to 2021, the equity ratio gradually declined, indicating that after the digital transformation, the long-term solvency of enterprises gradually became stronger.

6.4 Analysis of Operational Capacity

The operating capacity was analyzed by selecting three indicators: return on total assets, inventory turnover and accounts receivable turnover.

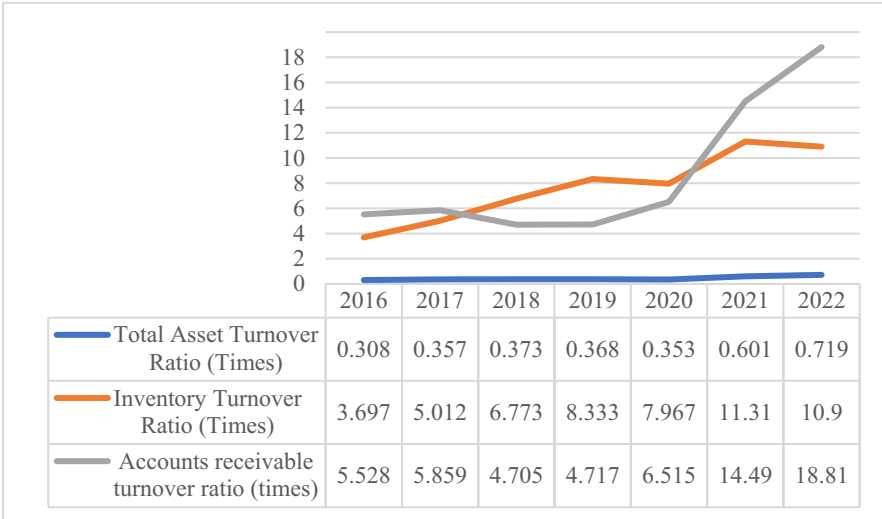


Fig. 4. Operational capacity indicators from 2016 to 2022

As can be seen from Figure 4, the total asset turnover rate of TCL Zhonghuan from 2016 to 2022 is relatively stable, the inventory turnover rate has a downward trend in 2020 and 2022, and the accounts receivable turnover rate has an obvious upward trend after 2020. In 2018, the total asset turnover rate showed a slight downward trend, and in the digital transformation, the completion of the company's silicon monocrystalline material industrialization project for solar cells in 2018 and the acquisition of Guodian Photovoltaic led to an increase in fixed assets, resulting in a decrease in the company's asset utilization rate. In the process of implementing digitalization in 2018, the inventory turnover rate exceeded 6.5 for the first time, and the inventory turnover rate continued to rise to 8.3 in 2019 and then decreased to 7.96 in 2020, due to the poor prosperity of the photovoltaic industry during the project acquisition promoted by TCL Technology Group at the end of 2019. The accounts receivable turnover ratio fluctuated from 2016 to 2022, but rose sharply to 14.49 in 2021, indicating that the company's collection speed is fast, the average collection period is short, the bad debt loss is small, and the solvency is strengthened.

7 Recommendations

In order to further deepen the digital transformation and improve the enterprise performance of TCL Zhonghuan, the following suggestions are put forward:

(1)Deepening industrial chain cooperation: In the original value chain, the data transmission efficiency between the upper, middle and lower links is too low, which greatly hinders the long-term sustainable development of enterprises. In the digital era, the traditional value chain no longer adapts to the development needs of the industry (Yihe Guo,2023) ^[9].

(2)Digitalization is tied to the enterprise: The method of completing digitalization and enterprise resources can enhance the existing digital resource base of enterprises, enrich and utilize new digital resources, and improve the degree of digitalization. It has access to digital resources, can mobilize business innovation, and coordinates the allocation of digital resources between different departments.(Zhong et al,2023)^[10].

(3)Establish a shareable digital platform: Relevant enterprises can refer to the digital transformation experience of TCL Zhonghuan or the digital transformation experience of other leading enterprises in the industry to share data and information related to digital transformation within the industry, integrate high-quality resources between enterprises, help improve the success rate of digital transformation of manufacturing enterprises, and improve the transformation efficiency of enterprises(Yuqi Liu, 2024)^[11].

8 Conclusions

Through the digital transformation implemented by TCL Zhonghuan as the research content, this paper explores the impact of enterprise digital transformation on enterprise performance. It is found that in the first two years of the implementation of digital transformation, TCL Zhonghuan performed well in various financial indicators. In the later period, the company increased investment in digital transformation, purchased equipment required for transformation, expanded scale and mergers and acquisitions, and individual financial indicators began to show a weak trend, and the long-term solvency declined. After the implementation of digital transformation, the financial indicators of growth ability, operation ability and profitability of TCL Zhonghuan are getting better and better. So in the long run, digital transformation can improve the profitability of enterprises and operational capacity, help enterprises better manage costs, reduce costs, promote the level of net profit, enhance the growth ability of enterprises.

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