Path and Performance of Digital Transformation of Specialized, Refined, Distinctive and Innovative Enterprises

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Abstract. The world is currently experiencing a rapid development of the digital economy. Digital transformation has become a key focus of long-term strategic deployment for enterprises, in order to adapt to the demands of the digital age, enhance operational efficiency, strengthen core competitiveness, and achieve sustainable development goals. In the rapidly changing market environment, digital transformation is not only an inevitable choice for Specialized, refined, distinctive and innovative enterprises (SRDI enterprises), but also as a key strategy for long-term sustainability. Therefore, how to effectively promote digital transformation and achieve optimal performance has become a central issue in the strategic planning of SRDI enterprises, attracting widespread attention at both the national and social levels. This study adopts the case analysis method to deeply explore the digital transformation path and performance of Jinpan Smart Technology, a representative SRDI enterprise, and concludes that digital transformation significantly has a significant positive effect on the performance of SRDI enterprises. Not only does this study enrich academic research on the digital transformation of SRDI enterprises, but it also provides theoretical foundations and reference value for the digital transformation practice of SRDI enterprises through the case of Jinpan Smart Technology.

Keywords: Digital Transformation; SRDI Enterprises; Path; Enterprise Performance.

1. Introduction

In recent years, the rapid development of the digital economy and the continuous deepening of international trade have marked the arrival of the era of digitization. In the increasingly fierce market competition and innovation-driven development prospects, digital transformation has become an inevitable choice for enterprises to adapt to the digital economy. The emergence and widespread application of cutting-edge technologies such as cloud computing and big data analysis have prompted enterprises to improve operational efficiency, optimize industrial structures, strengthen innovation capabilities, thereby expanding competitive advantages and market size. Digital transformation not only profoundly impacts enterprises themselves but also plays a significant role in promoting high-quality development of the national economy[1].

As a key force in promoting innovation, facilitating employment and improving people's livelihoods, SMEs play an irreplaceable role in the national economy and social stability. Since the concept of SRDI was first proposed in 2011 and the launch of the SRDI Little Giant Enterprise Program in 2018, SMEs have consistently pursued SRDI as their strategic goals. Faced with the rapidly changing market environment, digital transformation is essential for SRDI enterprises to innovate and upgrade. Especially after the outbreak of the COVID-19, the economy of all industries generally declined, the market continued to be depressed, and the demand for digital transformation increased significantly[2]. Moreover, as the digitalization process continues to deepen, the imbalance among enterprises of different sizes has become increasingly prominent, which greatly hinders the implementation of the digital transformation strategy of SRDI enterprises and restricts their development potential. In the promotion of digital transformation, SRDI enterprises may encounter technical hurdles, high costs, and risk challenges. Therefore, how to effectively implement digital transformation and achieve good performance has become the focus for the planning and deployment of SRDI enterprises.

2. Literature Review

2.1. Research on the Path of Digital Transformation

Exploring the effective path for enterprises to implement digital transformation not only provides theoretical support for enterprises that have not yet carried out digital transformation, but also points out the direction of transformation and feasible implementation measures for them.

The digital transformation path of enterprises is closely related to the adjustment of business models, business processes, and organizational structures[3]. Given its profound impact and high investment costs, digital transformation is viewed as a comprehensive, top-down reform process[4]. In the context of the digital economy, the ways to achieve digital transformation of industrial enterprises include building and utilizing multilateral digital platforms, developing new digital products and personalized services, and conducting intensive intellectual property exchanges[5]. Additionally, the integration of digital technologies and business models is also considered the optimal strategy for digital transformation[6]. The digital transformation of traditional enterprises can be divided into three stages: planning digital development, applying digital technologies, and managing digital assets[7]. Through empirical analysis of survey data from 98 SMEs in southern Germany, the study revealed that dynamic capabilities accelerate SMEs' digital transformation by promoting both digital leadership and digital culture dimensions[8].

2.2. Research on the Influencing Factors of Enterprise Performance

Enterprise performance is of great significance for enterprises to evaluate the financial condition and operating results at a specific moment or period of time, and is also a key basis for enterprises to make reasonable and scientific decisions.

Some scholars point out that enterprise performance is influenced by external factors. Specifically, industry environmental management systems have a positive effect on enterprise performance[9]. Through empirical analysis of data from Chinese manufacturing enterprises, it was revealed that tax incentives and government subsidies play a positive role in promoting enterprise performance, with innovation serving as a mediating variable[10]. Meanwhile, some scholars find that enterprise performance is also influenced by internal factors. There exists a positive correlation between entrepreneurial characteristics and SMEs' performance, with five variables including innovation performance mediating this relationship[11]. From the perspective of executive compensation, the compensation structure of executives helps enhance enterprise performance[12]. Based on data from 207 Chinese manufacturing enterprises, the research results indicate a positive correlation between human resource management and organizational structure and enterprise performance, with corporate culture acting as a moderating factor[13]. Additionally, other scholars combine internal and external influencing factors to analyze SMEs' performance, identifying information technology, market environment, learning capacity, behavioral patterns, and regulatory policies as key factors affecting SMEs' performance[14].

3. Case Analysis

3.1. Overview of Jinpan Smart Technology

Founded in 1997, Jinpan Smart Technology is a national high-tech enterprise integrating R&D, production, sales, and services. It has not only established four research and manufacturing bases in Haikou, Wuhan, Shanghai, and Guilin, but also set up branches in the United States and Hong Kong. Since its establishment, Jinpan Smart Technology has always adhered to the business philosophy and practiced the corporate mission. It was awarded the title of SRDI Little Giant Enterprise in 2020. In 2021, Jinpan Smart Technology publicly issued A-shares on the Shanghai Stock Exchange.

To implement national policies and adhere to ESG principles, Jinpan Smart Technology focuses on promoting the integration of informatization and industrialization as well as digital transformation,

thereby enhancing its ability to create value for customers and strengthening its core competitiveness. Jinpan Smart Technology was selected as an excellent case of digital transformation for Chinese listed companies in 2023 and 2024.Over the years, Jinpan Smart Technology has persistently driven innovation in technology, management, and production models to propel its growth and lead industry advancements. Its products and services have the characteristics of high quality and high performance, and have been widely used in multiple industries such as rail transit, marine engineering, and infrastructure. In addition to being popular in the domestic market, these products and services are also exported to 87 countries and regions across 6 continents.

3.2. Digital Transformation Path of Jinpan Smart Technology

3.2.1 Digitization of Production Process

(1)Build Digital Factory and Output Digital Solutions

Jinpan Smart Technology relies on its professional team in the digital field to deeply integrate cutting-edge technology with traditional manufacturing technology. By 2024, it has established seven digital factories, achieving automation of production lines, logistics, information flow, as well as simulation of product design and production processes. With the implementation of digital factories, Jinpan Smart Technology has revolutionized the traditional manufacturing model, achieving a comprehensive digital manufacturing model transformation from product sales, design, production, delivery to after-sales service. It has further optimized the production process, significantly boosted overall productivity and efficiency, driving sustained business growth and strengthening core competitive advantages. While promoting its own digital transformation, Jinpan Smart Technology also commercializes comprehensive digital solutions, assisting other enterprises in digital transformation, achieving win-win cooperation, and empowering the development of digital transformation in the industry.

(2)Build a Digital Quality Platform and Optimize the Quality Management System

Jinpan Smart Technology is dedicated to exploring and innovating in cutting-edge technological fields, integrating high-end technologies into its business. Based on these advanced technologies, it has built a digital quality platform, implemented the “123+N” digital quality management model, and promoted industrial digital transformation. Through this platform, Jinpan Smart Technology creates traceability tree diagrams for products, simplifies information tracking processes, and quickly solves quality problems. The platform also features a key performance analysis model for quality, associated with MES to automatically collect data, deliver quality performance data, charts, and warning information, thereby improving data accuracy and decision-making scientificity. In addition, Jinpan Smart Technology has optimized its quality management system, improved its institutional processes, and ensured product quality. Furthermore, it implements a product recall system, strictly adhering to inspection and testing procedures to improve product quality and customer satisfaction.

3.2.2 Digitization of Organizational Management

(1)Develop HRMS and Implement Strategic Human Resource Management

Jinpan Smart Technology has developed HRMS on its ERP platform, combining HCM and SF models. This system integrates multiple functional modules such as organizational management, personnel administration, and attendance tracking, effectively promoting information sharing and collaborative management, and significantly enhancing human resource management efficiency. By embedding human resource knowledge and processes into the system, Jinpan Smart Technology has achieved a dual improvement in management level and efficiency. It continuously focuses on the operation and management of human capital, achieving a transformation from traditional human resource basic management to human capital appreciation, as well as an innovation from talent management to business value creation.Jinpan Smart Technology has implemented a long-term equity incentive mechanism and differentiated compensation management system to stimulate employee potential, attract and retain outstanding talent. It also prioritizes the allocation of talent

resources in strategic emerging industries, selecting and cultivating outstanding professionals to promote enterprise performance and organizational transformation.

(2)Strengthen Training and Attach Importance to Talent Construction

During the initial stage of digital transformation, most employees face adaptation challenges, leading to a decline in work efficiency and a slowdown in transformation process. In response, Jinpan Smart Technology regularly conducts professional training for employees to enhance professional skills, deepen understanding of transformation concepts, and promote the application of digital tools. At the same time, it attaches great importance to the cultivation of management cadres to promote enterprises to adapt to market changes and achieve strategic goals. Jinpan Smart Technology highly concerns the construction of talent team, formulates qualification level standards for different job categories, and adopts targeted talent development and training strategies based on this. It offers dual-track career paths combining management and professional development for employees to stimulate creativity and inject momentum into digital transformation. Additionally, Jinpan Smart Technology strengthens the cultivation of talents in the fields of AI, and cooperates with external institutions to carry out training activities related to intelligent manufacturing, in order to deepen digital transformation.

3.2.3 Digitization of Technological innovation

(1)Improve Innovation System and Increase R&D Investment

Jinpan Smart Technology adheres to the concept of creating value through technological innovation and continuously upgrades product innovation and intelligent manufacturing technologies. It has improved its innovation system and established multiple research institutes. To stimulate innovation vitality, It revised its reward system and increased the intensity of rewards. It also updated the regulations on innovation management by adding evaluation rules and scoring criteria to ensure the fairness and transparency of the evaluation process. After implementing the digital transformation strategy, Jinpan Smart Technology has increased R&D investment and actively cultivated R&D talents. By collaborations with universities and research institutions, It has formed a highly collaborative interdisciplinary R&D team. Keeping pace with technological trends, It optimizes product designs, accelerates new product development and new technology adoption, thereby reducing costs, shortening product cycles, improving production efficiency, meeting customer needs, and consolidating market position.

(2)Pursue Green and Low-carbon Development and Promote Sustainable Development

In recent years, Jinpan Smart Technology has steadfastly pursued a green and low-carbon development path, actively implementing the dual carbon policy to achieve sustainable development. It has made remarkable progress in the field of green and low-carbon, successfully building four-zero carbon factories and utilizing its independently developed energy management system to achieve efficient integration and optimized allocation of resources. In the process of product design, It integrates environmental protection concepts, selects eco-friendly materials, optimizes production processes, and uses energy-efficient equipment and green manufacturing technology to produce green products, effectively reducing energy consumption and emissions. For recycling, It collaborates with professional institutions to develop comprehensive recycling plans and adopts differentiated treatment methods for different materials, reducing environmental pollution, saving energy costs, and optimizing energy utilization efficiency. It is also vigorously expanding the renewable energy business, using clean energy to provide customers with eco-friendly products and services, and then comprehensively laying out digital and intelligent manufacturing, promoting the digital transformation path of sustainable development.

3.2.4 Digitization of Customer Service

(1)Build CRMS and Establish a Whole-process Service System

Jinpan Smart Technology insists to providing customized and personalized services and has formulated rules and regulations to standardize service standards. Guided by customer needs, it applies digital technologies to customer service, creates CRMS, and forms an iron triangle team

consisting of account managers, technical solution experts, and delivery experts to provide customers with comprehensive pre-sale, in-sale, and after-sale services. Through its CRMS, it has achieved one-stop management of the entire process, reducing costs and improving efficiency. At the same time, Jinpan Smart Technology utilizes digital channels for product promotion and sales to expand market share. In addition, It organizes digital training for after-sale service to equip employees with proficiency in digital tools, thereby boosting work efficiency and customer satisfaction.

(2)Use Advanced Technologies to Ensure Customer Information Security

With the advancement of technology and digital transformation, enterprises are increasingly relying on information technology. A large amount of business data and customer information are transmitted through networks, which may lead to cybersecurity risks such as customer information leakage and abuse. Therefore, ensuring information security has become a crucial task for enterprises in driving digital transformation. Jinpan Smart Technology employs technical measures including HTTPS encrypted transmission, AccessToken authentication, and network firewalls to protect customer privacy and prevent data leakage. This enhances customer trust, establishes long-term stable customer relationships, and facilitates enterprise digital transformation. Meanwhile, It implements account authorization and hierarchical management in the use of enterprise system software to strengthen the protection of customer information and prevent information leakage. Additionally, Jinpan Smart Technology regularly organizes data security training to enhance employees' awareness and skills in data security.

3.2.5 Data Assetization

In the context of digital transformation, data assets have become a key element of corporate core competitiveness, which not only promote the formation of new quality productivity, but also drive the integration of scientific and technological innovation resources. Jinpan Smart Technology excavates the data value generated by digital manufacturing, and constructs a data standard system to systematically organize data and improve the data governance, storage and analysis platform. It cooperates with external professional institutions to verify and identify data resources and form five core data assets. According to the relevant regulations of the finance department, Jinpan Smart Technology recorded the new data assets into the table and listed them in Fujian Big Data Trading Center, which shows that it has entered the stage of transforming data elements into data assets. It also obtained DCMM Level 3 certification, signaling a new stage in the field of data management and providing important support for its digital transformation and sustainable development. After that, It will continue to adhere to the data-driven concept, deepen its engagement in data asset, promote "AI+" initiatives, and contribute to the digital transformation of the industry.

3.3. Digital Transformation Performance of Jinpan Smart Technology

Jinpan Smart Technology launched its comprehensive digital transformation strategy in 2019, and the transformation effect is increasingly prominent. Therefore, this study regards 2019 as the key time for the digital transformation of Jinpan Smart Technology. Based on its digital transformation path, this study selects multi-dimensional performance indicators to evaluate its digital transformation performance.

3.3.1 Performance Evaluation Based on Financial Indicators

For the performance evaluation based on financial indicators, this study selects the financial data of Jinpan Smart Technology from 2018 to 2024, and analyzes the changes in enterprise performance before and after its digital transformation from four dimensions of profitability, solvency, operating capacity and development capability.

(1)Profitability

According to the data in Table 1, the net profit margin of Jinpan Smart Technology in 2020 reached 9.57%, reflecting the good results achieved by enterprises in cost control and income growth in the early stage of transformation. However, the net profit margin declined in 2021 and 2022 due to the rising prices of bulk commodities like non-ferrous metals, the impact of overseas epidemic on export

freight, and the implementation of the restricted stock incentive plan. Nevertheless, with the application of digital technologies and the increase of digital factories, the net profit margin rebounded to 7.53% in 2023 and further rose to 8.27% in 2024, demonstrating significant improvement in enterprise profitability as the transformation deepened. Meanwhile, Jinpan Smart Technology experienced slight declines in return on assets and return on equity from 2019 to 2021, which was mainly due to the increase in asset investments during the transformation process that failed to immediately boost net profits. As the transformation progressed, the optimization effect of digital tools on various links has gradually become prominent, and the operation efficiency and profitability have been improved.

It can be seen that since the full implementation of digital transformation in 2019, the net profit margin, return on assets and return on equity of Jinpan Smart Technology have fluctuated slightly. While experiencing short-term declines due to external factors, it has started to rise since 2023. This fully proves that digital transformation can effectively enhance the profitability of enterprises and significantly strengthen competitive advantage in the industry.

Table 1. Comparison of Profitability of Jinpan Smart Technology

	2018	2019	2020	2021	2022	2023	2024
Net Profit Margin	9.00%	9.34%	9.57%	7.13%	5.97%	7.53%	8.27%
Return on Assets	6.61%	6.60%	6.34%	5.01%	4.41%	6.28%	6.29%
Return on Equity	13.60%	12.66%	12.47%	10.29%	10.86%	16.45%	14.51%

(2)Solvency

According to the data in Table 2, the current ratio of Jinpan Smart Technology remained relatively stable between 1.64 and 1.78, with little fluctuations. The current ratio demonstrated a gradual annual decline from 2019 to 2023, though the decrease was modest. It rebounded to 1.73 in 2024, reflecting that the solvency has been improved in the process of continuous promotion of digital transformation. The change trend of the quick ratio is similar to that of the current ratio, fluctuating between 1.12 and 1.21. While showing a slight annual decrease from 2019 to 2021, it increased steadily from 2021 to 2024 and exceeded the level of 2018, indicating that the solvency of Jinpan Smart Technology has been improved. The asset-liability ratio showed a significant upward trend from 2020 to 2022 due to the increase of debt financing, but it has declined since 2023, demonstrating that the financial risk was controlled to a certain extent.

Overall, after implementing digital transformation, the solvency of Jinpan Smart Technology showed relatively stable fluctuations in current ratio and quick ratio. However, the change range of asset-liability ratio was obvious, showing a dynamic change from a slight decline to a significant rise and then to a sharp decrease.

Table 2. Comparison of Solvency of Jinpan Smart Technology

	2018	2019	2020	2021	2022	2023	2024
Asset-liability Ratio	47.84%	46.45%	51.19%	54.25%	61.51%	61.35%	53.76%
Current Ratio	1.76	1.78	1.71	1.70	1.67	1.64	1.73
Quick Ratio	1.20	1.19	1.12	1.13	1.16	1.17	1.21

(3)Operating Capacity

Table 3 data shows that the inventory turnover ratio of Jinpan Smart Technology decreased from 2.06 times in 2018 to 1.87 times in 2020. This decline occurred during the initial phase of digital transformation, as optimizing production processes and inventory management required time to adapt, potentially leading to the problem of inventory overstock or poor turnover. Additionally, the large balance of issued goods, the long acceptance cycle of some equipment and the expansion of business scale all led to the increase of inventory. However, since 2021, due to the effective application of digital technologies and refined inventory management, the inventory turnover ratio has improved significantly. The accounts receivable turnover ratio dropped from 3.01 times in 2018 to 2.60 times

in 2020, mainly due to COVID-19 impacting customer payment speeds and increasing the balance of accounts receivable. It increased in 2021 and 2022, because Jinpan Smart Technology enhanced the collection efficiency by monitoring accounts receivable and reminding overdue accounts through digital systems. Although it decreased slightly in 2023 and 2024, the overall accounts receivable management ability has been improved and maintained at a high level. The change trend of total asset turnover ratio is consistent with that of inventory turnover ratio. In 2019 and 2020, the increase in digital transformation investment led to the increase of asset scale, while the new assets failed to give full play to benefits in time, resulting in the decline of total asset turnover ratio. The total asset turnover ratio rebounded from 2021 to 2023, reflecting that Jinpan Smart Technology can make more effective use of digital transformation to optimize asset allocation, improve asset utilization efficiency and speed up asset turnover.

In general, the indicators of Jinpan Smart Technology fluctuated in the early stage of the comprehensive digital transformation. However, from 2021, these indicators began to rise and gradually exceeded the level before the transformation, indicating that digital transformation has a positive impact on improving operating capacity.

Table 3. Comparison of Operating Capacity of Jinpan Smart Technology

	2018	2019	2020	2021	2022	2023	2024
Inventory Turnover Ratio	2.06	1.99	1.87	2.04	2.40	2.98	2.71
Accounts Receivable Turnover Ratio	3.01	2.66	2.60	3.12	3.21	3.00	2.60
Total Asset Turnover Ratio	0.73	0.71	0.66	0.70	0.74	0.83	0.76

(4)Development Capability

Table 4 reflects that the revenue growth rate of Jinpan Smart Technology showed a downward trend before its digital transformation, primarily attributed to factors such as domestic economic downturn, intensified industry competition, and production capacity saturation. In response, Jinpan Smart Technology launched a comprehensive digital transformation strategy in 2019, applying digital technologies to build digital platforms and smart factories to enhance its competitiveness. In 2020, Haikou digital factory was officially put into operation, significantly boosting per capita output value. With the subsequent completion of six factories, its production capacity was further enhanced. Due to the release of new production capacity and the growth of customer demand, the production and sales volume have both increased, driving substantial revenue growth. Consequently, the revenue growth rate of Jinpan Smart Technology improved in 2020, with a significant increase in 2021, jumping from 7.95% to 36.32%, and reaching a peak of 43.69% in 2022. Regarding net profit growth rate, although it declined in 2019, the net profit growth rate has improved with the deepening of digital transformation. Despite challenges from the rise in the price of bulk materials and the increase in overseas freight limited it in 2021, technological innovation and digital applications drove net profit growth rate to increase from 1.31% to 20.74% in 2022 and reach 78.15% in 2023. While both revenue and net profit growth rates declined slightly in 2024, they remained positive, indicating continuous growth.

To sum up, the digital transformation of Jinpan Smart Technology has a significant positive effect on the improvement of its development capability.

Table 4. Comparison of Development Capability of Jinpan Smart Technology

	2018	2019	2020	2021	2022	2023	2024
Revenue Growth Rate	8.67%	2.69%	7.95%	36.32%	43.69%	40.50%	3.50%
Net profit Growth Rate	214.55%	8.86%	10.29%	1.31%	20.74%	78.15%	13.82%

3.3.2 Performance Evaluation Based on Non-financial Indicators

For the performance evaluation based on non-financial indicators, this study collects relevant data according to the digital transformation path, and explores the performance changes of Jinpan Smart

Technology before and after digital transformation from three aspects of innovative research and development, green development and market expansion.

(1)Innovative Research and Development

With the promotion of digital transformation, Jinpan Smart Technology has significantly increased its investment in innovative research and development, mainly reflected in the increase in the number of R&D personnel and the amount of R&D investment. From the perspective of R&D investment, since the full implementation of digital transformation in 2019, the amount of R&D investment has surged from 95,954,700 in 2018 to 355,625,807 in 2024, providing strong financial support for enhancing innovative capability. Meanwhile, the proportion of R&D investment in operating revenue rose from 4.39% in 2018 to 5.15% in 2024, indicating that Jinpan Smart Technology paid more attention to the role of R&D in promoting business development, so as to consolidate the advantages of technological innovation. Regarding R&D personnel, the number expanded from 300 in 2018 to 408 in 2024, accounting for 17.60% in 2024. This provided solid human talent support for boosting innovation capability and helped Jinpan Smart Technology make a breakthrough in performance improvement.

Table 5. R&D Investment Intensity of Jinpan Smart Technology

	2018	2019	2020	2021	2022	2023	2024
Amount of R&D Investment (yuan)	95,954,700	101,460,900	111,905,300	157,580,847	247,138,364	351,076,772	355,625,807
Proportion of R&D Investment in Operating Revenue (%)	4.39	4.52	4.62	4.77	5.21	5.27	5.15
Number of R&D Personnel (person)	300	301	305	320	340	394	408
Proportion of R&D Personnel (%)	16.29	17.16	16.70	16.14	16.62	17.85	17.60

Given that Jinpan Smart Technology only published the cumulative number of patents since 2020 in its annual report, this study selects the period from 2020 to 2024 for comparative analysis. The total number of patents increased steadily from 169 in 2020 to 284 in 2024, reflecting that digital transformation has promoted the continuous emergence of innovative achievements and the significant improvement of R&D capability. The number of invention patents grew from 11 in 2020 to 41 in 2024, with their proportion rising from 6.51% to 14.44%. This indicates that after implementing digital transformation, Jinpan Smart Technology has prioritized the depth and quality of technological innovation and focused on developing core technologies with high technical content and innovation, which contributes to long-term growth and competitiveness enhancement. Although the requirements of utility model patents are lower than those of invention patents in terms of creativity and technical level, they are of great practical value. The proportion of such patents of Jinpan Smart Technology is large and growing continuously, which shows that digital transformation can effectively combine technological innovation with practical application and enhance economic benefits by improving products. In contrast, the number of design patents changes slightly, and the proportion is also low. Based on the above analysis, as digital transformation deepens, the innovative research and development capability has been enhanced, and the core competitiveness and technological advantages have been improved.

Table 6. Patents of Jinpan Smart Technology

	2020	2021	2022	2023	2024
Number of Patents	169	189	231	250	284
Number of Invention Patents	11	15	18	36	41
Number of Utility Model Patents	152	167	204	206	235
Number of Design Patents	6	7	9	8	8

(2)Green Development

Due to incomplete data disclosure, this study only presents the green and low-carbon performance of Jinpan Smart Technology from 2021 to 2024. The greenhouse gas emissions decreased from 16,415 in 2021 to 4,749.29 in 2024, while the emission intensity dropped from 0.0497 in 2021 to 0.0007 in 2024. These figures demonstrate remarkable achievements in implementing the dual carbon policy and a significant enhancement in the green development capability. This stems from its commitment to sustainable development principles, adoption of advanced technologies for intelligent transformation and eco-friendly factory construction. Although the total energy consumption showed a gradual annual increase, the energy consumption intensity declined significantly from 0.0100 in 2021 to 0.0082 in 2024, reaching the advanced level of the industry. During digital transformation, Jinpan Smart Technology has continuously improved the intelligent manufacturing processes, developed the integrated energy management systems, and realized the intelligent monitoring and data evaluation of energy consumption through digital means, which improved the efficiency of the energy system and further strengthened the green and low-carbon development ability. In addition, Jinpan Smart Technology has won many honorary titles such as green factory and zero-carbon factory, and it has been recognized as an excellent practice case of sustainable development. In general, digital transformation has effectively promoted energy conservation, emission reduction and sustainable development, and improved the green development capability.

Table 7. Green and Low-carbon Performance of Jinpan Smart Technology

	2021	2022	2023	2024
Greenhouse Gas Emissions (Ton of CO_2 Equivalent)	16,415.00	16,041.00	8,773.00	4,749.29
Greenhouse Gas Emission Intensity (Ton of CO_2 Equivalent Per 10,000 yuan of Income)	0.0497	0.0338	0.0131	0.0070
Total Energy Consumption (Ton of Standard Coal)	4,570.00	4,921.00	5,522.70	5,686.95
Energy Consumption Intensity (Ton of Standard Coal Per 10,000 yuan of Income)	0.0100	0.0104	0.0083	0.0082

(3)Market Expansion

Due to the lack of some data, this study collects customer satisfaction and product quality certification data of Jinpan Smart Technology from 2021 to 2024, and analyzes their dynamic change trends to evaluate the impact of digital transformation on market expansion ability. The customer satisfaction was 98.17% in 2021, slightly decreased to 95.96% in 2022, rebounded to 98.03% in 2023, and further increased to 98.26% in 2024. Although there were slight fluctuations, the customer satisfaction consistently remained above 95%, which reflected that through digital strategies, Jinpan Smart Technology maintained high customer satisfaction and brand reputation. In terms of product quality certifications, the number increased from 242 in 2021 to 355 in 2024, demonstrating the rigorous quality control and emphasis on quality improvement through digital transformation. Jinpan Smart Technology has established a digital quality platform, optimized its quality management system, and ensured that products meet more standard certification,thereby expanding market share and improving enterprise performance. It can be seen that after the full implementation of digital transformation, Jinpan Smart Technology's market expansion ability has performed well in terms of customer satisfaction and product quality certification.

Table 8. Market Expansion of Jinpan Smart Technology

	2021	2022	2023	2024
Customer Satisfaction	98.17%	95.96%	98.03%	98.26%
Product Quality Certification	242	242	306	355

4. Conclusions and Implications

4.1. Conclusions

With the continuous development and wide application of cutting-edge technologies, digital economy has become the key driving force to promote the high-quality development of the national economy. The deep integration of digital economy and traditional economy not only enhances production efficiency but also drives industrial transformation and upgrading. By taking Jinpan Smart Technology as a case study to explore the path and performance of digital transformation of SRDI enterprises. The study draws the following conclusions:

Digital transformation has a significant positive impact on the performance improvement of SRDI enterprises. Jinpan Smart Technology has adopted diversified digital transformation paths and significantly enhanced enterprise performance through these measures. Firstly, in production process, it has successfully built multiple digital factories and provided digital solutions, realizing cost reduction and efficiency improvement, thereby promoting the growth of enterprise performance. Secondly, in organizational management, it has established HRMS that facilitates information sharing and collaborative management, improving management efficiency and scientific decision-making. Simultaneously, it has paid attention to the digital training of employees to lay a solid talent foundation for the improvement of enterprise performance. Furthermore, in technological innovation, it has improved the innovation system, increased R&D investment, and utilized digital platforms to achieve energy conservation, emission reduction, and cost optimization. Additionally, in customer service, it provides more convenient and personalized services through CRMS, which significantly improves customer satisfaction and loyalty. Finally, it emphasizes data asset utilization, makes efficient use of data elements to unleashing data potential, and strengthens data asset management, so as to consolidate competitive advantages in the digital economy and improve enterprise performance.

4.2. Implications

In view of the case study of digital transformation of Jinpan Smart Technology, this study provides reference for other SRDI enterprises.

First, increase innovation investment and enhance R&D capabilities. During the digital transformation process, SRDI enterprises should pay attention to R&D innovation and increase the exploration of new products and technologies, so as to achieve technological breakthroughs and product differentiation. They also should build a development-oriented R&D system, establish a professional R&D team, and set up an innovation review mechanism to stimulate the innovation enthusiasm of R&D personnel. In addition, they should strengthen cooperation with external R&D institutions to form core technologies, attract and retain talents, thereby accelerating the digital transformation process.

Second, optimize customer service and expand market share. Due to the small scale and limited resources, SRDI enterprises are often in a disadvantageous position in the market competition. Therefore, SRDI enterprises must prioritize service quality, strengthen relationship management, and provide personalized products and services through digital platforms to meet the diversified needs of customers. By enhancing brand recognition and influence, they can effectively expand market share and promote digital transformation.

Third, unlock data value and strengthen digital training. In order to improve data quality and utilization efficiency, SRDI enterprises should establish the concept of data-driven development, regard data as the core resource, and transform data elements into enterprise assets. At the same time, SRDI enterprises should focus on the construction of talent team, build a perfect talent development management system, and promote the integrated development of talents. Additionally, regular training and education should be carried out to improve the digital thinking and ability of employees, driving the digital transformation and upgrading of enterprises.

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