

Research on the Value Creation of Hangzhou Robam Appliances' Digital Transformation

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Abstract

This project will study the path and effectiveness of Hangzhou Robames, who are among the top performers in the Chinese kitchen appliance industry in terms of market share, production scale, product type, and sales area, in driving value creation through digital transformation. Multiple analytical research methods will be used to systematically explore innovative ideas and paths for enterprise digital transformation and value creation, and provide practical significance and reference experience for enterprise digital transformation and value creation. Promote the digital transformation of enterprises, assist government departments in further improving enterprise digital management policies, continuously promote the development of data elements, and build a digital China.

Keywords

Digitization, Value Creation, Digital Economy

1. Introduction

1.1. Research background and significance

1.1.1. Research background

According to the 14th Five Year Plan for the Development of Digital Economy, the added value of China's core digital economy industries accounted for 7.8% of the gross domestic product (GDP) in 2020. It is expected that by 2025, this proportion will further increase to 10%. The 2022 government report regards the development of the digital economy as a very important direction, emphasizing the need to improve the overall layout of building a digital China. Digital technologies such as cloud computing and big data have brought new changes and driving mechanisms to the business development models of traditional enterprises. In addition, digital transformation is also a method for traditional enterprises to upgrade their industries, increase profits, and enhance competitiveness. The 20th National Congress of the Communist Party of China pointed out to accelerate the development of the digital economy and promote the deep integration of the digital economy and the real economy. Obviously, digitization is a new driving force for reconstructing economic growth models, optimizing social governance structures, and promoting high-quality economic and social governance development.

The development of the digital economy has promoted the digitalization process in the field of home appliances. Affected by the COVID-19 epidemic and the national real estate regulation, the market position of China's home appliance industry is still rising, but the growth rate is slowing down. Therefore, our country's power industry has begun to integrate digital technology into modern industries. Many home appliance manufacturers consider digital transformation as a new method for creating value for their businesses. Digital transformation is becoming an important way to improve the overall digital level of the home appliance industry and overcome development bottlenecks.

As a representative of a large kitchen appliance company, Robam Electric began its digital journey in 2016. However, in recent years, due to the marketing environment, factors such as household appliances and home purchases, as well as the difficulty of developing the entire kitchen appliance industry, the development of appliances has become a marketing bottleneck for the rapid development of the country's main business. Robam Home Appliances is facing a new wave of bottlenecks in the development of the kitchen appliance industry, and has urgently chosen the path of digital transformation to achieve the company's growth. The research on the digitalization path and performance of Bosch terminals is representative in the industry, and its results may become a benchmark for digitalization in other home appliance enterprises.

1.1.2. Research significance

1.1.2.1.Theoretical significance

Helps to enrich the literature research on the digital transformation of enterprises in the economic field. This study takes Robam Electric as an example to explore its transformation and value creation, providing literature reference for other enterprises' digital transformation.

Helps to expand research on factors influencing value creation. Studying the role of digital intelligence integration in promoting enterprise development can help companies better cope with the challenges of the digital economy and the "dual carbon" goals.

1.1.2.2.Practical significance

Provide experience and reference for the digital transformation of enterprises. Analyze the current problems of the Robam's electrical appliances and provide feasible suggestions. The digitization transformation of the Robam's electrical appliances has provided experience and reference for traditional manufacturing enterprises, reducing trial and error costs.

Provide decision-making basis for government and other regulatory departments to formulate policies. Against the backdrop of global advocacy for green development, the transformation of Robam Electric Appliances helps companies achieve sustainable development by developing energy-saving and environmentally friendly products, responding to the country's "dual carbon" strategic goals, and meeting consumers' pursuit of a healthy lifestyle. Assist in improving digital management and promoting the construction of a digital China.

1.1.3. Possible innovation points

Robam Electric, as a well-known kitchen appliance brand, and compared with previous literature, the possible innovations of this article are as follows:

1.1.3.1.Smart Home Integration

With the development of IoT technology, Robam Electric can deeply integrate its products with smart home systems to achieve interconnectivity between devices. Users can remotely control and monitor the operation status of kitchen appliances through smartphones or voice assistants, enhancing the user experience.

1.1.3.2.Green environmental protection technology

Under the promotion of the "dual carbon" goal, Robam Electric may develop more energy-efficient products, adopt environmentally friendly materials and production processes, reduce energy consumption and environmental pollution, and meet the market's demand for green products.

1.1.3.3.Healthy Cooking Solutions

Healthy eating is increasingly receiving attention from consumers. Robam Electric can develop kitchen appliances with healthy cooking functions, such as steam cooking, low-temperature slow cooking, etc., to help users better preserve the nutrition of food.

Firstly, in the context of the digital economy, there has been a wealth of research on enterprise digitization. It was not until 2015 when the country issued relevant policies that digital transformation began to enter the attention of scholars, and the related research is still

relatively incomplete. This article conducts a single case analysis on digital transformation to study the relationship between enterprise digital transformation and value creation; Furthermore, by reviewing relevant literature on digitalization, it can be found that there are relatively few case studies on digitalization at present. This article takes Robam Electric as the research object and conducts in-depth analysis on the digitalization transformation path of Robam Electric, exploring the relationship between digitalization transformation and enterprise value creation. This not only enriches the relevant literature research, but also helps enterprises to better develop their digitalization transformation.

1.2. Literature Review

Qi Yudong et al. pointed out that digitization is the integration of digitalization and intelligence, which promotes the transformation and development of enterprises through the form and logic of "digital+intelligence" (2022). Chen Chouyong and Xu Jinghan (2022) analyzed the relevant factors of digital transformation in manufacturing enterprises and believed that changes in technology, organization, and management are conducive to helping enterprises build a personalized evaluation index system for digital transformation capabilities. Wang Zhuli believes that "intelligence" in digitalization not only refers to artificial intelligence, but also includes human intelligence (i.e. natural intelligence), which is the combination of human intelligence and wit (2024). Chen Juan, Sun Xiaoqiang, and others believe that "number" in the concept of digitization represents numbers, emphasizing the network, technology, data, and other aspects of informatization; 'Intelligence' represents intelligence, emphasizing intelligent devices (2024).

The digital transformation requires enterprises to re optimize and combine internal resources through digital technology, achieve full utilization of resources, and form effective competitiveness (Berman and JSaul, 2012). In the new round of technological revolution and industrial transformation, digitization and intelligence have become important driving forces for industrial transformation and upgrading, important levers for green and low-carbon development, and key supports for building competitive advantages (Zhang Mei, Sun Ye et al., 2024).

There is relatively little research on the path of enterprise digital transformation in existing literature, and manufacturing enterprises lack extensive experience in digital transformation [3]. Therefore, this project takes Robam Electric as the case study object, focusing on the digital transformation and value creation of Robam Electric, which has a certain reference value for other enterprises to carry out digital transformation in the future.

1.3. Research ideas

This paper starts from the current situation of digital transformation, based on industry background and market, transformation strategy and path planning, case studies and best practices, to study the digital transformation of domestic enterprises. It further transitions to summarizing and analyzing data and information related to the digital transformation and value creation of Robam appliances, studying the reasons, paths and value creation of digital transformation. On the basis of clarifying the transformation goals, possible transformation paths are studied, including product innovation, market expansion, business model adjustment, etc. At the same time, analyze the challenges that may be encountered during the transformation process, such as technical difficulties, brand reshaping, organizational restructuring, etc., and propose corresponding response strategies.

2. Conceptual Definition and Theoretical Basis

2.1. Definition of Concept

2.1.1. Digital transformation

The digital transformation is a complex and multidimensional concept that involves the use of new generation digital and intelligent technologies by enterprises to transform the entire domain, scenario, and chain, aiming to drive the transformation and reshaping of enterprise management and business process scenarios.

Currently, scholars both domestically and internationally have a relatively unified understanding of digitization, with the mainstream view being the organic combination of digitization and intelligence. Chen Guoqing believes that digitalization is based on digitization, highlighting the standardized governance of data and the intelligent design of algorithms. Its empowering role in industries is reflected in the construction of new scenarios and the reshaping of value systems. Digitization is the integration of digitization and intelligence, driving the transformation and development of enterprises through the form and logic of "digital+intelligence". The term 'intelligence' in digitalization not only refers to artificial intelligence, but also includes human intelligence (i.e. natural intelligence), which is a combination of human intelligence and wit. Some scholars also believe that the "number" in the concept of digitization represents digits, emphasizing the network, technology, data, and other aspects of informatization; 'Intelligence' represents intelligence, emphasizing intelligent devices. At present, the prominent feature of "digitalization" is the realization of "Internet of Things". With the development of digital technology, the connotation of "digitalization" is constantly expanding.

2.1.2. Value creation

2.1.2.1. The connotation of value creation

Value creation refers to the entire process in which a company provides customers with the products or services they need through the interaction of various production factors. The value of an enterprise depends not only on the types and quantities of production factors, but also on the combination of production factors. The value creation of an enterprise refers to the integration of resources to drive innovation in its products, services, and processes, thereby meeting the needs of multiple stakeholders. (Chen Minghui et al., 2023) Enterprises generate value beyond existing products through innovation in products and services. The value-added path of value creation has shifted from consumer behavior dynamics to service provider behavior dynamics, placing innovation in products and services at the core of adding value to enterprises through free services. Its core lies in meeting the needs of the target customers.

2.1.2.1. The Connection between Digital Transformation and Enterprise Value Creation

The dual source capability of data and intelligence is the empowerment of dual capabilities for enterprises in the process of digital empowerment brought about by the digital revolution. It is a necessary key capability for the development of enterprises. Digitization leads to the integration of upstream and downstream value chain products with factor markets, reduces transaction costs, improves total factor productivity, and thus facilitates the dual circulation. The new generation of intelligent technology is used as a means to build the basic digital infrastructure of enterprises, triggering comprehensive changes in technology, business, management, etc., mobilizing the initiative of enterprise management from the inside out, and building a strong competitive advantage. Digitization brings tangible benefits to the transformation results and industry development, which inevitably involves the technological upgrading of the entire organization, business process reconstruction, and changes in corporate culture. This effectively promotes the optimization of internal organizational structure, improves management efficiency and cost and expense control, assists in the

enhancement of enterprise value, and achieves value creation for the enterprise. (Wang Haimeng, 2023)

2.2. Theoretical basis

2.2.1. Value chain theory

The theory of process reengineering was first advocated by two outstanding American scholars, Michael Hammer and James Champy, and by the 1990s, it had gradually established an influential theoretical framework in the field of management. This theory abandons the traditional function oriented departmental division model of enterprises, and instead focuses on the profound transformation and comprehensive reconstruction of the core operational processes of enterprises, with business processes as the center, to redraw and optimize the blueprint of enterprise management. The core goal of this transformation is to significantly improve the operational efficiency of enterprises and ensure that management processes closely align with the needs of actual production operations.

2.2.2. Process reengineering theory

The process reengineering theory, first proposed by two American scholars, Michael Hammer and James Champy, has developed into an important theoretical system that deeply influenced the management community by the 1990s. This theory abandons the traditional model of dividing departments according to functions in enterprise management, and instead focuses on the thorough reconstruction of the core operational processes of the enterprise, with business processes as the core, to re plan and design enterprise management processes. This move aims to significantly improve the operational efficiency of enterprises and more closely align with the actual production process requirements. Through process reengineering, enterprises can allocate resources more effectively, optimize the layout of various processes, and make them more reasonable. At the same time, this theory emphasizes that enterprises should focus on key business processes that improve customer satisfaction, comprehensively reshape operational processes from a global perspective, and strive to achieve the optimal state of the entire process.

2.2.3. Contingency theory

The contingency theory is developed on the basis of dynamic capability theory. Incorporate core elements such as path analysis, examination of internal and external environments, enhancement of organizational capabilities, and striving for a competitive advantage into its framework. The contingency theory holds that the internal elements and external environmental conditions of each organization are different, so there are no principles or methods applicable to any situation in management activities. Effective management requires managers to flexibly adjust strategies based on specific situations to achieve optimal management results.

3. Analysis of the Background of Robam Electrical's Digital Transformation

3.1. Analysis of the Necessity of Robam Electrical's Digital Transformation

With the increasing diversification and personalization of consumer demands, traditional kitchen appliances are no longer able to meet market demand. Consumers no longer only focus on the basic functions of products, but also pay more attention to features such as intelligence, convenience, energy conservation, and environmental protection. Through digital transformation, we aim to launch more high-quality and intelligent products that meet consumer needs, in order to gain a competitive edge in the market.

Currently, the new generation of information technologies represented by AI, big data, cloud computing, and the Internet of Things are rapidly developing, providing strong technical

support for the digital transformation of the manufacturing industry. The application of these technologies enables enterprises to achieve precise control over the production process, efficient collaboration in the supply chain, and rapid response to market demand.

Traditional manufacturing enterprises often face problems such as low production efficiency, high costs, and inventory backlog. The digital transformation can be achieved by introducing automated and intelligent production equipment, optimizing production processes, and realizing the automation and intelligence of the production process; By constructing a digital supply chain system, the transparency and synergy of the supply chain can be improved, and inventory and logistics costs can be reduced; Through an intelligent management system, optimize resource allocation and improve management efficiency. All of these will help the Robam improve operational efficiency, reduce costs, and enhance profitability.

3.2. Feasibility Analysis of Robam Electrical's Digital Transformation

As a leader in the Chinese kitchen appliance industry, Robam Electric's digital transformation is not only a positive response to market trends, but also a key measure for enterprises to achieve sustainable development and enhance core competitiveness.

3.2.1. Solid technical foundation

Robam Electric has accumulated rich experience in information technology application during its long-term development, including but not limited to the application of management systems such as ERP and CRM, laying a solid foundation for digital transformation. The company has already established a certain layout in the field of intelligent manufacturing, and has achieved initial automation and intelligence of the production process by introducing advanced automated production lines, intelligent robots, and other equipment. This provides strong technical support for further promoting the digital transformation, such as building unmanned factories and realizing intelligent manufacturing systems.

3.2.2. Policy support and resource guarantee

The national and local governments attach great importance to the digital transformation of the manufacturing industry and have introduced a series of supportive policies, including fiscal subsidies, tax incentives, financing support, etc. As a leading enterprise in the industry, Robam Electric is more likely to receive policy support and resource allocation, providing strong support for the digital transformation.

3.2.3. Organizational structure and talent reserve

In order to promote the digital transformation, Robam Electric has already made or is currently making adaptive adjustments to its organizational structure, establishing a dedicated digital transformation department or team to coordinate the company's internal digital transformation work. This helps ensure the smooth progress and effective implementation of the transformation work. The company also has strong talent reserves, with a group of professional talents familiar with fields such as information technology, intelligent manufacturing, and the Internet of Things.

4. Analysis of the Path of Robam Electrical's Digital Transformation

4.1. Systematic organizational structure

From the perspective of organizational structure, digitization is the foundation of enterprise digital transformation. In the process of promoting digital transformation, enterprises leverage digital, networked, and intelligent technologies to achieve a phased improvement in their internal digital operation capabilities and industrial collaborative operation capabilities. Through changes and optimizations in flat structure, networked collaboration, distributed work, data-driven decision-making, flexibility and adaptability, and customer orientation,

enterprises can build more efficient, flexible, and adaptable organizational structures to better adapt to the development and changes of the digital age.

4.1.1. Financial digitization drives the digitization of the entire value chain

Financial digitization driving the digitization of the entire value chain is one of the important trends in the current digital transformation of enterprises. Financial digitization is not only limited to internal changes within the finance department, but also a key force driving the comprehensive digitization of the entire enterprise value chain. It uses advanced technologies such as data technology, intelligent algorithms, and artificial intelligence to achieve automated processing, intelligent analysis, and real-time sharing of financial data, thereby improving financial work efficiency and decision support capabilities, and achieving deep mining and analysis of financial data. During this process, financial digitization not only optimized the functions of the finance department, but also provided more comprehensive, accurate, and timely data support for enterprises, laying the foundation for the digitization of the entire value chain. More importantly, financial intelligence not only focuses on financial data itself, but also provides insights into the business operations and market trends of enterprises through the analysis of financial data, providing direction and impetus for the digital transformation of the entire value chain of enterprises. (Qin Ningxuan et al., 2024)

4.1.2. Comprehensive budget and cost optimization

4.1.2.1. Comprehensive budget

Financial digitization comprehensive budgeting refers to the integration of advanced digital technology and intelligent tools to prepare, execute, monitor, and evaluate the comprehensive budget of an enterprise, achieving comprehensive digitization and intelligence of budget management.

Financial digitization and comprehensive budgeting are centered around data, which provides scientific basis for budget preparation by collecting, integrating, and analyzing massive amounts of internal and external data of the enterprise. These data include but are not limited to historical financial data, market trend data, business operation data, etc. And carry out intelligent decision-making, using technologies such as artificial intelligence and big data to deeply mine and analyze budget data, discover potential cost saving opportunities and risk points, and provide intelligent support for enterprise decision-making. By building a real-time monitoring system, the budget execution status can be dynamically tracked and monitored. Once deviations or abnormal situations are detected, timely adjustments and optimizations can be made to ensure the smooth achievement of budget goals. It also emphasizes the deep integration of finance and business, by breaking down departmental barriers, achieving seamless integration of financial data and business data, and improving the comprehensiveness and accuracy of budget management.

4.1.2.2. Cost and expense optimization

Financial digitization utilizes technologies such as big data and artificial intelligence to achieve automated collection, processing, and analysis of cost data. Through the integration of ERP (Enterprise Resource Planning), MES (Manufacturing Execution System) and other systems, enterprises can obtain real-time cost data for various links such as production, procurement, and sales, and conduct multidimensional and in-depth analysis. This automated processing not only improves the accuracy and timeliness of data, but also reduces manual intervention and errors, providing a solid foundation for cost optimization. It can also achieve precise cost accounting and control. It supports data collection and analysis based on all cost factors, and can perform cost accounting according to different dimensions (such as process, furnace seat, billet shape, steel grade, etc.). By constructing a digital model for total factor cost accounting, enterprises can accurately identify opportunities for cost reduction and achieve refined cost control. For example, through the MES system, data collection and analysis of implicit costs such

as revision, scrap judgment, and finishing processing can be conducted, allowing enterprises to promptly identify and control these implicit costs and optimize the product manufacturing process. In addition, automation and intelligence have reduced manual operations and repetitive work, lowering labor costs.

4.2. Digitalization of product development

From the perspective of research and development, with the deepening of digital transformation, intelligent technologies such as artificial intelligence have become a key part of digital transformation. By establishing an innovation driven development model, developing key core technologies, continuously innovating products, improving product performance, and effectively promoting the digital integration and transformation of the manufacturing industry.

4.2.1. Research and development achievements of intelligent products

4.2.1.1. Intelligent product series

Robam Electric has launched the ROKI intelligent cooking assistant, which further enhances interaction with consumers by optimizing user experience. This intelligent user experience upgrade enables ROKI to more accurately meet the diverse needs of users and enhance the brand's market influence. We have also developed the digital kitchen appliance brand ROKI, which not only focuses on the intelligence of a single product, but also aims to build a comprehensive digital kitchen ecosystem. The company has launched the ROKI kitchen appliance brand with digitalization as its core, and through innovative products such as "Creator i1", has deeply integrated digital concepts into all aspects of product design and functional development. These products not only address consumers' actual pain points during the cooking process, but also enhance their cooking interest and experience through digital means. In addition, the ROKI digital kitchen appliance i7 series has also been extended. As a representative of diversified products, the ROKI digital kitchen appliance i7 series showcases Robam Electric's profound strength in the field of intelligent kitchens. Through voice commands, users can easily start the range hood, select recipes, control the heat, and achieve a fully intelligent cooking experience.

4.2.1.2. Digital Production and Management

Robam Electric has created a nine day central digital platform for production management. As the central nerve of the Robam's "future factory", the Jiutian Central Digital Platform takes users as the center and data as the drive, integrates manufacturing, users and products, and realizes the system integration of industrial Internet and consumer Internet. Robam Electric has also established an intelligent manufacturing production base with a high level of automation. The base has widely used equipment such as robotic arms, AGV cars, and visual automatic inspection, achieving intelligent and automated production processes. At the same time, all data are connected to the industrial Internet digital platform, providing comprehensive and real-time data support for production management.

4.3. Intelligent manufacturing factory

From the perspective of production and manufacturing, on May 19, 2015, the State Council issued the "Made in China 2025", which pointed out that intelligent manufacturing based on information physical systems and other intelligent equipment, intelligent factories, etc. is leading the transformation of manufacturing methods, and intelligent terminal products such as smart home appliances are constantly expanding into new areas of manufacturing.

4.3.1. Establish an intelligent factory

The intelligent transformation process of Robam Electric can be roughly divided into three stages:

Initial trial phase (2010-2015):

Robam Electric has put into operation and built the industry's first digital intelligent manufacturing base, pushing its main products to a leading position in the market through system transformation. This stage mainly solved the problems of traditional employment models and initially achieved automation and digitization of production lines.

Comprehensive upgrade phase (2015-2020):

With an investment of nearly 500 million yuan, we have built a digital "future factory" covering an area of 50000 square meters, achieving a comprehensive upgrade of digital intelligent manufacturing. The factory has extensively applied automation and intelligent technologies, such as unmanned forklifts, intelligent lifting tracks, etc., achieving a mechanized, unmanned, and automated production mode. At this stage, Robam Electric was also selected as a pilot demonstration project for intelligent manufacturing by the Ministry of Industry and Information Technology, demonstrating its pioneering position in the field of intelligent manufacturing.

Deepening development stage (2020 present):

Further upgrade the intelligent equipment on the production line and release a new generation of digital kitchen appliances. Through the digital kitchen appliance "AI" cooking assistant, personalized cooking scene solutions such as remote control, voice activation, and touch screen control can be achieved. We have built a nine day central digital platform to promote the development of digital cooking chain, enhance user experience and cooking creativity.

A large number of automated equipment, such as robotic arms and AGV carts, have been installed in its factory to achieve automated operations on the production line. By controlling the operation of the robotic arm and AGV car through system instructions, precise control and efficient collaboration of the production process have been achieved. And a digital management system has been built, such as CRM, ERP, MES and other information systems, to achieve the capture and transparency of factory underlying data. By analyzing data, improve the yield rate and overall operational management efficiency, and achieve data-driven business management. Advanced technologies such as 5G, edge computing, visual inspection and object model are also used to improve the real-time and stability of data acquisition. Real time simulation and prediction of the production process through digital twin technology, anticipating potential issues in advance and taking measures to solve them.

4.3.2. Fully intelligent logistics management

Robam Electric has the largest and most intelligent logistics storage and transmission comprehensive three-dimensional warehouse in the domestic home appliance industry, which can support intelligent warehousing and distribution with a production capacity of 8 million units, saving about 60% of inventory space. This intelligent warehousing and logistics center adopts the advanced TIMMS3.0 integrated material management system to achieve efficient inbound and outbound of goods. In the case of low workload, the center can achieve a flow rate of 90 pallets in and out of the warehouse per hour, and its design capacity can even reach a daily capacity of 20000 pieces of goods in and out of the warehouse.

In the loading process, Robam Electric has introduced various loading equipment such as clamp type forklifts and belt conveyors. Clamp type forklifts have greatly improved the loading efficiency of large cargo, reducing the previous 9 people/hour to 4 people/hour, significantly improving the loading efficiency of large cargo and reducing the labor intensity of operators. In the process of preparing the product, an automatic palletizing system was adopted, which consists of 5 robotic arms (palletizing robots) and can complete different forms of palletizing for different products. For example, some pallets only store products of the same model, while others are mixed models. These robots can efficiently complete the palletizing of goods, improve warehousing efficiency and automation level of warehousing operations. Internally, the system is equipped with circular shuttle cars and aisle stackers. The system assigns tasks

based on the busy workload of each circular shuttle. After receiving the shelving instruction, the circular shuttle sends the palletized goods to the automated three-dimensional warehouse loading port, and then the aisle stacker crane delivers the goods to the designated storage location. These automated devices work together to achieve rapid warehousing and outbound of goods.

4.4. Precision service system

In terms of production services, we provide intelligent services such as tracking, scheduling, and optimization control of productive service processes. In terms of cloud services, we provide integrated and shared services for the entire society's manufacturing and service capabilities. In terms of community-based intelligent manufacturing services, we provide seamless social and collaborative production among multiple enterprises, as well as intelligent product operation and maintenance services.

Robam Electric actively adopts intelligent marketing tools in the marketing process, such as intelligent recommendation systems, intelligent customer service systems, etc. Intelligent recommendation systems can recommend personalized products and services to consumers based on their purchase history and browsing behavior, improving conversion rates and user satisfaction. Not only that, Robam Electric also actively expands its digital marketing channels, including social media, e-commerce platforms, official websites, etc. The company utilizes these channels to establish direct contact with consumers for brand promotion, product promotion, and customer service. At the same time, Robam Electric also focuses on the integration of online and offline channels, providing consumers with a more convenient and comprehensive shopping experience through O2O mode.

5. Analysis of Value Creation in the Digital Transformation of Hangzhou Robam Appliances

5.1. Optimizing and improving organizational structure to create value

5.1.1. Improve enterprise management

5.1.1.1. Digital R&D module

The digital R&D module is an important component of the Jiutian Central Digital Platform, which relies on multidisciplinary simulation tools, collaborative design management platform (PLM), testing management platform (LIMS), and process planning platform (CAPP) to achieve online and data-driven product development processes. Through this module, Robam Electric can efficiently and collaboratively complete simulation analysis, model design, BOM design and process design, which greatly improves the research and development efficiency and data security. At the same time, the module also achieves data connectivity with ERP, MES, IMS and other systems, enabling seamless integration of design, production, marketing services and other links, thus achieving zero distance between the market and research and development.

5.1.1.2. Intelligent manufacturing module

The intelligent manufacturing module is the key to achieving production automation and intelligence for Robam Electric. Through the establishment of "unmanned factory" and the integration of industrial Internet, edge computing, data algorithms and other new infrastructure, Robam Appliance has realized the intelligent interconnection of people and equipment driven by data. This module not only improves production efficiency and product quality, but also significantly reduces production costs and operating costs. For example, through the implementation of intelligent scheduling and delivery, intelligent distribution, intelligent quality control and other functions, Robam Electric's production efficiency has increased by 45%, product quality has improved to 99%, production cycle has been shortened

by 48%, production costs have been reduced by 21%, and operating costs have been reduced by 15%.

5.1.1.3.Digital Marketing and Service Module

The digital marketing and service module is an important means for Robam Electric to achieve precise marketing and enhance customer experience. By building a distribution platform and CRM system, Robam Electric can gain real-time insights into sales status and utilize technologies such as big data and VR to promote online business and achieve precise marketing. In the service aspect, Robam Electric ensures customer experience through online transparency of the entire business process, with an annual user satisfaction rate of 99%.

The different digital modules of the "Nine Heavens Central Digital Platform" carry specific functions. The platform utilizes big data and artificial intelligence technology to conduct in-depth analysis and optimization of production processes. By identifying bottleneck links and waste points, proposing improvement suggestions, and helping enterprises achieve lean production processes. At the same time, by accurately predicting resource demand, achieving rational allocation and efficient utilization of resources, and reducing production costs.

The Jiutian Central Digital Platform also has the function of real-time monitoring of product quality. By collecting and analyzing quality data during the production process, potential quality issues can be identified in a timely manner and corrective measures can be taken. This helps companies improve product quality and enhance market competitiveness. At the same time, by accurately grasping customer needs and market trends, enterprises can develop new products and provide high-quality services more precisely, enhancing customer satisfaction and loyalty.

5.1.2. Reduce enterprise expenses

Robam Electric has undergone a digital transformation by establishing a digital management committee, forming an operations management department, promoting system integration and data governance to optimize the organizational structure. In the process of the Robam's electrical transformation, the core link to reduce enterprise costs and create value lies in the optimization and improvement of organizational structure. This improvement not only enhances the operational efficiency of the enterprise, but also directly reflects in the significant decrease of key financial indicators - management fee rate and period expense rate.

5.1.2.1.Management fee reduction

The introduction of digital management tools such as ERP (Enterprise Resource Planning), CRM (Customer Relationship Management) and other systems enables management to grasp the real-time operational status of the enterprise and respond quickly to market changes. This not only shortens the decision-making cycle, but also reduces decision-making errors caused by information asymmetry, thereby lowering management costs. At the same time, the application of automated office systems, such as electronic approval processes and online meetings, significantly reduces the use of paper documents and the time cost of personnel commuting, further improving management efficiency. Traditional enterprises often suffer from problems such as excessive management hierarchy and poor information transmission. Robam Electric has optimized its organizational structure and reduced management levels, making decision-making more rapid and direct. Meanwhile, through intelligent recruitment and performance evaluation systems, precise allocation and efficient utilization of human resources have been achieved, avoiding talent waste and redundant costs.

5.1.2.2.Decreased expense rate during the period

Robam Electric has achieved close collaboration and information sharing among suppliers, manufacturers, logistics providers, and other links by building a digital supply chain management system. This not only improves the transparency and responsiveness of the supply chain, but also reduces inventory costs and logistics expenses. Meanwhile, by

conducting digital evaluation and management of suppliers, enterprises can choose partners with higher cost-effectiveness, further reducing procurement costs. The application of digital intelligent manufacturing systems enables Robam Electric to achieve automation and intelligence in the production process. Through intelligent devices, IoT technology, and other means, enterprises can monitor production progress, equipment status, and quality data in real time, and adjust production plans and resource allocation in a timely manner. This not only improves production efficiency and quality stability, but also reduces energy consumption and material loss costs during the production process. In the digital age, Robam Electric has achieved precise marketing and personalized services by utilizing big data analysis and artificial intelligence technology to gain a deep understanding of consumer needs and behavior habits. At the same time, by expanding online channels and empowering offline stores through digital transformation, the enterprise has built an omnichannel marketing and service system, further enhancing its market competitiveness.

5.2. Developing digitalization to create value drivers

5.2.1. Smart kitchen appliances lead the industry

Robam Electric has chosen to embark on the path of digital transformation with multiple considerations, and its transformation goals are multidimensional and far-reaching. This article provides an in-depth analysis of the company's profit and loss statement data, systematically comparing the performance of Robam Electric before and after its digital transformation, in order to comprehensively evaluate its transformation effectiveness.

Despite the overall downturn in the industry, Robam Electric still holds a leading position in the kitchen appliance brand in the first half of 2024. According to an offline report by Auvview, the retail sales and market share of the Robam brand range hood are 31.9% and 26.1%, respectively; The retail sales and market share of the Robam's gas stove are 31.3% and 22.9%, respectively; According to the online report from Ove, the retail sales and market share of the Robam brand kitchen appliance package are 27.0% and 20.9%, respectively; All are ranked first in the industry. As the absolute main source of revenue, in the first half of 2024, Robam Electric's range hood and gas stove products accounted for 47.76% and 1.169 billion yuan respectively, accounting for 47.76% and 24.72% of the total revenue.

Between 2015 and 2021, Robam Electric's revenue showed a continuous upward trend, which to some extent reflects its stable operation, solid business foundation, and steady increase in market share. However, relying solely on revenue growth as a single indicator is difficult to comprehensively evaluate the actual effectiveness of the digital transformation launched in 2016. Therefore, this article conducts an in-depth analysis of the revenue growth rate to analyze in more detail the specific impact of the digital transformation path on enterprise performance. Since 2016, Robam Electric has introduced a digital network management system to strengthen internal management efficiency and drive rapid business growth, especially in the following two years, achieving high-speed revenue growth. However, since 2018, the company has faced multiple challenges, including the impact of the rise of e-commerce on the traditional marketing model, the impact of the real estate purchase restriction policy on related industries, and the sudden impact of the COVID-19 in 2020, which together led to a slowdown in revenue growth for three consecutive years. Faced with difficulties, Robam Electric quickly adjusted its digital transformation strategy, increased investment between 2018 and 2020, promoted the Cloud Store 2.0 project, actively embraced e-commerce trends, and invested heavily to establish Zhejiang Chuchu Weilai Technology Co., Ltd. in 2020, focusing on innovation in artificial intelligence supply chain software and digital marketing services. These two measures effectively reversed the situation of weak revenue growth. By 2021, through the implementation of digital marketing strategies, Robam Electric's revenue has achieved a

significant increase of 24.84%, marking its successful breakthrough of growth bottlenecks and return to a high growth track.

5.2.2. Remarkable achievements in digital intelligence research and development

Patent acquisition status

The steady development of Robam Electric is due to its digital transformation, which has clearly chosen a specialized vertical cultivation route in terms of technological innovation. According to data, as of June 2024, Robam Electric has authorized a total of 5064 patents, with a year-on-year increase of 36.25% in patent applications in the first half of the year, including a 27.45% increase in soft copyright patents. Accumulated participation in 155 standard development projects, including leading the development of 42 projects, including 2 international standard proposals and 4 national standards. Moreover, as early as 2015, Robam Electric began to layout in the fields of AI and digitalization, taking the lead in building a digital intelligent manufacturing base and achieving the landing of unmanned factories in 2020.

Achievement of R&D awards

In 2018, Robam Electric's range hood 5610 won the iF Design Award, and the central range hood won the "2018 China Intelligent Manufacturing Golden Great Wall Award - Excellent Independent Research and Development Product" award, as well as the highest honor of the 2018 China Home Appliance Rock Award, the "Rock Solid Award".

In 2021, Robam Electric's range hood 8235S won the AWE2021 "Aipulan Gold Award" and the German IF Design Award. The Creator series also won the "2021 China High end Home Appliance and Consumer Electronics Red Top Award" and was awarded the 8235S Intelligent Star Award Cup by the Zhejiang Gas Appliance and Kitchenware Kitchen Appliance Industry Association.

In 2022, Robam Electric's project "Research and Industrialization of Key Technologies for Double chamber Double suction Intelligent Control High suction Range Hood" won the first prize of Science and Technology Progress Award of China Light Industry Federation.

In 2023, Robam Electric's digital kitchen appliance i7 won the "Kitchen Appliance Set - Overall Kitchen Appliance Red Top Award".

In 2024, Robam Electric's digital kitchen stove steaming and baking all-in-one machine iH1 won the Aipulan Gold Award, and the high-performance integrated stove black crystal steel 9ZC23 won the Aipulan Design Award.

5.3. Smart manufacturing ensures value creation

Smart manufacturing significantly improves production efficiency through specific methods such as automated production, real-time monitoring and data analysis, intelligent decision support, and process optimization and standardization. Robam Electric has achieved significant results through a series of process optimization measures, not only improving product quality to new heights, but also achieving a leap in production efficiency of 45%, shortening product development cycles by 48%, and reducing production and operating costs by 21% and 15% respectively.

According to the 2023 financial report of Robam Electric, the company achieved a total operating revenue of 11.202 billion yuan, a year-on-year increase of 9.06%. The net profit attributable to shareholders of the listed company was 1.733 billion yuan, a year-on-year increase of 10.20%, with a basic earnings per share of 1.83 yuan. According to AVC data, the omni channel retail sales of China's home appliance market (excluding 3C) increased by 3.6% from January to December 2023. Among them, the retail sales of China's kitchen and bathroom market (including cigarettes, stoves, electric heating, combustion heating, disinfection, washing, embedded, clean, and integrated stoves) reached 166.9 billion yuan, a year-on-year increase of 5.3%. Among them, the total scale of essential goods categories (cigarettes, stoves, electric

heating, and combustion heating) was 99.8 billion yuan, an increase of 6.5% year-on-year; The total scale of product categories (consumer, washing, embedding, net) is 42.3 billion yuan, an increase of 8.6% year-on-year; The total scale of integrated stoves was 24.9 billion yuan, a year-on-year decrease of 4.0%. Robam Electric's performance growth rate is significantly better than the industry average.

Regarding the future development of the industry, analysis suggests that China's external market environment is gradually returning to the right track and consumption is recovering, but the speed of recovery in the home appliance market lags behind overall consumption. The real estate market is exhausted, the driving force for new population growth is insufficient, consumer confidence remains low, and residents' consumption ability is limited. Coupled with industry factors such as high ownership of China's home appliance market, the scale of the domestic home appliance retail market has reached its peak. In the existing market, the kitchen appliance market is highly likely to maintain its current slight growth trend in the coming years, but there is still room for exploration in emerging categories. In this situation, finding increments from the stock will become the main theme for a period of time in the future. From the perspective of product categories, Robam Electric maintains a leading market share in various categories and the market concentration continues to increase. Online, Robam Electric's range hood package, kitchen appliance package, and range hood have market shares of 32.86%, 31.47%, and 17.95%, respectively, ranking first in the industry; Offline, Robam Electric's range hood, gas stove, and embedded steaming and baking machine share are 30.97%, 30.02%, and 31.45%, respectively, ranking first in the industry.

Among them, as the main business of Robam Electric Appliances, in 2023, with the advantages of product strength and marketing power, Robam Electric Appliances' revenue from range hoods and gas stoves will steadily increase. In terms of range hoods, revenue increased by 10.13% year-on-year. According to data from OviCloud, all styles of Robam Electric contributed to growth, with a significant increase in ultra-thin models. The overall price structure remained stable and shifted towards the high-end market, demonstrating a clear advantage in the high-end segmented market; From the perspective of development trends, with the new generation of users such as Generation Z taking charge, the ultra-thin form that combines aesthetics and spatial attributes has become a key upgrade point for products. As the pioneer and industry leader of the new ultra-thin form of range hood, data shows that Robam Electric CXW-260-5009S ranks first in the offline ultra-thin low suction market retail sales. It can be considered that Robam Electric will continue to maintain its advantage in the future range hood market competition. In terms of gas stoves, according to data from Aowei Cloud Network, despite the overall market showing a decline in volume and an increase in revenue, Robam Electric's gas stoves achieved stable growth, with a year-on-year increase of 8.71% in revenue. From the perspective of product structure, as the overall market structure shifts towards the mid to high end and mid to high end products gradually become the main force, Robam Electric's online brand share of 1700 yuan+ has grown rapidly, leading its peers. It can be foreseen that it will occupy more initiative in future competition. In terms of emerging categories, Robam Electric's new product category is accelerating its growth. In terms of integrated stoves, according to data from Aowei Cloud Network, the integrated stove market is under overall pressure in 2023, with a cumulative retail sales of 24.9 billion yuan, a year-on-year decline of 4.0%; The cumulative retail volume was 2.78 million units, a year-on-year decrease of 4.2%, showing a situation of both quantity and value decline. In this situation, Robam Electric has achieved significant growth in the KA&TOP channel by expanding new channels, with a year-on-year increase of 22.28% and 24.27% in KA&TOP channel share, respectively, occupying an absolute advantage in the first and second markets. In terms of products, as a latecomer, Robam Electric's integrated stove has successfully achieved a "curve overtaking", with "large cavity" and "high performance" continuing to lead the industry development, and significant growth in the high-

end offline market. Among them, in the price range of 10000+, Robam Electric's integrated stove share has increased by 16.64% year-on-year.

5.4. Accurate service drives value acquisition

5.4.1. Smart services have received continuous praise

In recent years, Robam Electric has created the industry's first "unmanned factory" and released the first set of "digital kitchen appliances" and "AI" cooking assistants. "Food God" is another milestone initiative in practicing the construction of new quality productivity. Compared to the hardware tool attributes of traditional kitchen appliances, the AI cooking big model "Food God" is more like a cooking partner who communicates with the user's heart. It observes the temperature, time, lighting, sound, and smell in the cooking world, perceives the user's role, identity, emotions, and actions, and matches the user's personalized data with the big model data to plan the most suitable overall cooking solution for each user. It not only tells the user how to cook, but also mobilizes all devices and collaborates with the cook to make dishes; Not only does it lower the threshold for cooking, but it also stimulates the joy of culinary creation; Different from the current global cooking models, the "God of Food" not only serves as a functional aid, but also encompasses everything related to cooking, including physiology, psychology, philosophy, aesthetics, cultural history, and human relationships. This is an emotional and anthropomorphic model.

Robam Electric has always been highly recognized for its after-sales service. According to reports, Robam Electric has won honors such as "National Best After sales Satisfaction Brand for Range Hood" and "National Top 10 After sales Service Units" multiple times. Robam Electric has established a comprehensive after-sales service system. This includes extensive service network coverage, standardized service processes, professional service personnel training, and continuous service quality supervision. Robam Electric has established a huge service network nationwide, allowing users to enjoy convenient services no matter where they are; From user repair to problem resolution, every step has strict standards and processes to ensure the professionalism and efficiency of the service; Robam Electric pays attention to the professional competence and skill improvement of service personnel, regularly conducts training and assessments to ensure that they can provide high-quality services; Through various methods such as user feedback and internal audits, we continuously monitor and improve service quality to ensure its stability and enhancement.

5.4.2. Intelligent marketing to reduce inventory

During the period from 2000 to 2011, the Chinese home appliance industry benefited from the rapid growth of the domestic economy, the acceleration of urbanization, and the booming development of the real estate industry, achieving rapid expansion. However, as the Chinese economy shifted towards a high-quality and stable growth stage after 2011, home appliance companies generally faced the challenge of inventory backlog. In this context, Robam Electric, as a leader in the industry, has not been spared from the increase in inventory pressure, especially under its traditional sales model, where the problems of low inventory turnover and accounts receivable turnover are becoming increasingly prominent. The main reason is that home appliance companies adopt dealer buyout sales. Once the manufacturer completes the shipment, it can be recognized as operating income. However, the sales model of Robam Electric Appliances is implemented through consignment, which means that the goods still belong to the enterprise's inventory account after being shipped, and can only be included in accounts receivable if the goods are successfully sold. This results in lower inventory turnover and accounts receivable turnover. Therefore, Robam Electric is facing the development problem of inventory backlog. Robam Electric has introduced an intelligent warehousing system to address this issue, achieving automation and intelligence of warehousing operations through IoT technology and automation equipment. The intelligent warehousing system can also seamlessly

integrate with the supply chain management system, achieving real-time sharing and synchronized updates of inventory information, further improving the accuracy of inventory management.

6. Research conclusions and recommendations

6.1. Research Conclusion

The digital transformation of Robam Electric is an important strategy for adapting to market changes and enhancing the competitiveness of the enterprise. Through product intelligence, production automation and intelligence, supply chain digitization, marketing and service digitization, and the construction of a digital management platform, the company has not only achieved innovation in business models and optimization of operational efficiency, but also provided users with more intelligent and personalized products and services.

In the production and manufacturing process, Robam Electric is comprehensively promoting digital transformation and upgrading. By applying digital technology, product quality has been improved to 99%, production efficiency has been increased by 45%, product development cycle has been shortened by 48%, production costs have been reduced by 21%, and operating costs have been reduced by 15%. The digital production management model ensures high-quality and efficient output of products, giving the company an advantage in market competition.

In the era of digital wave sweeping, Robam Electric is steadily moving towards a more brilliant future with its forward-looking strategic vision and solid technological strength. We have reason to believe that Robam Electric will continue to lead the development of the kitchen appliance industry and contribute more to people's better lives.

6.2. Suggestions from the perspective of enterprises

In the current market environment, digitization is a new driving force for reconstructing China's economic growth mode, optimizing social governance structure, and promoting high-quality development of economic and social governance forms. As a traditional home appliance manufacturing enterprise, the transformation and upgrading of Robam Electric is the key to enhancing competitiveness.

Robam Electric can achieve a magnificent transformation through green innovation, including the use of environmentally friendly materials, energy-saving technologies, and circular economy models. Research has shown that the green transformation process of manufacturing enterprises can be divided into three stages: traditional development period, green transformation period, and green transformation period. The transformation models and strategies at the same stage are different.

Continuously invest in research and development to promote product innovation, especially in smart home and IoT technology. Technological innovation can help businesses develop new growth points and meet consumers' demand for smart kitchen appliances.

6.3. Policy recommendations from the perspective of government regulation

As a leader in digital solutions for urban catering fumes, Robam Electric's digital transformation not only promotes the development of the enterprise itself, but also has a profound impact on the entire industry and society. Government regulation is essential.

6.3.1. Improve the policy and regulatory system

The government should strengthen the formulation and implementation of standards related to digital transformation, ensure that enterprises follow unified technical standards and norms during the transformation process, and improve transformation efficiency and quality. Especially in terms of data security, privacy protection, system interoperability, etc., the

government should establish strict standards and regulations to safeguard the legitimate rights and interests of enterprises and social stability.

6.3.2. Strengthen cooperation between the government and enterprises

The government should take the initiative to establish cooperation mechanisms with enterprises to jointly promote the digital transformation. The government should encourage and support enterprises to carry out demonstration projects for digital transformation, and promote the overall level of digitalization in the industry through the leading and driving role of demonstration projects. The government can provide financial, technological, and policy support for demonstration projects to ensure their smooth implementation and significant results.

6.3.3. Strengthen supervision and services

The government should strengthen the supervision of markets related to digital transformation to prevent unfair competition and illegal activities. By establishing a sound market supervision mechanism, we can safeguard the legitimate rights and interests of enterprises and consumers, maintain market order and fair competition. At the same time, provide high-quality public services for enterprises, including data sharing, technical support, talent training, etc.

6.3.4. Guide enterprises to strengthen independent innovation

The government should encourage enterprises to strengthen technological innovation and research and development investment, and cultivate independent innovation capabilities. By establishing innovation funds and providing research and development subsidies, we support enterprises in developing and applying new technologies, products, and models. At the same time, the government can establish an innovation reward mechanism to commend and reward enterprises that have achieved significant results in digital transformation.

The government should promote cooperation and exchange between enterprises, universities, and research institutions, and promote the deep integration of industry, academia, and research. By jointly building R&D centers and cultivating talents, we can achieve resource sharing and complementary advantages, and enhance the technological innovation and achievement transformation capabilities of enterprises.

6.4. Reference and inspiration for other enterprises

6.4.1. Clarify the motivation and goals for transformation

When enterprises undergo digital transformation, they should clarify the motivation and goals of the transformation, be guided by market demand and consumer demand, and develop a scientific and reasonable transformation strategy.

6.4.2. Increase investment in technological innovation

Technological innovation is the core driving force for the digital transformation of enterprises. Enterprises should increase investment in cutting-edge technologies such as AI, big data, and the Internet of Things to promote the intelligent upgrading of products and services.

6.4.3. Build a digital management system

Enterprises should establish a comprehensive digital management system, integrate digital resources from various links such as research and development, production, supply chain, and marketing, and achieve efficient collaboration and data sharing within the enterprise.

6.4.4. Emphasize customer experience and service

In the process of digital transformation, enterprises should focus on improving customer experience and service quality. Realize zero distance contact with consumers through digital means and provide more convenient and efficient customer service.

6.4.5. Continuous optimization and iteration

The digital transformation is a continuous process, and enterprises need to continuously optimize and iterate their digital products and solutions to adapt to market changes and changes in consumer demand.

6.4.6. Deepen ecological cooperation and open innovation

Ecological cooperation: In the process of digital transformation, enterprises should not fight alone. By establishing close ecological cooperation relationships with industry partners, technology providers, research institutions, etc., we can jointly explore new business models and solutions to accelerate the transformation process. Through ecological cooperation, enterprises can obtain more resources and technical support, reducing transformation risks.

Open innovation: Enterprises should maintain an open mindset and actively seek innovation cooperation with external parties. Attract innovative forces from around the world to participate in the digital transformation of enterprises through crowdsourcing, challenge competitions, collaborative research and development, and other means. This open innovation model helps companies quickly acquire new technologies, ideas, and applications, promoting sustained innovation.

6.4.7. Emphasize safety and compliance

In the process of digital transformation, data security is an issue that enterprises must attach great importance to. Enterprises should establish a sound data security management system to ensure the security and privacy of user data and enterprise data. Prevent data leakage and loss through encryption technology, access control, data backup, and other measures. At the same time, enterprises must comply with relevant laws, regulations, and industry standards. Strengthen compliance awareness, establish a sound risk assessment mechanism, ensure that enterprises do not cross legal red lines during the transformation process, and maintain the reputation and image of the enterprise.

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