The Path and Practice of Digital Transformation of Enterprise International Trade

-- Taking Haier Group as an Example

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Abstract

Under the influence of COVID-19, trade digitalization has been driving the transformation and upgrading of traditional trade modes, helping enterprises to expand trade channels, and making the production organization more networked and intelligent. Taking Haier Group as an example, this project explores the combination path of informatization, intellectualization and trade service by analyzing the background and situation of PEST enterprises, and establishes Porter's Five Forces model and Cobb-Douglas function to further analyze the practical feasibility and deficiencies after the digital transformation of international trade, so as to provide reference for the digital transformation of foreign trade enterprises in China.

Keywords

Digital Trade; Cobb-Douglas Production Function; Trade Digital Strategy; Route Optimization.

1. Introduction

As cloud computing, Internet of Things, big data, artificial intelligence, blockchain and other digital technologies are widely used in international trade, trade digitalization continues to drive the transformation and upgrading of traditional trade methods, presenting a new digital foreign trade model with the integration of cross-border goods trade and service trade chain. Under the influence of the global novel coronavirus pandemic, foreign market demand shrinks, domestic factories shut down, freight encountered obstacles, digital economy can enable the international trade activities of the transaction network, greatly reduce the transaction cost, through new technology, new ways to display products, online communication and trade, so how to digital transformation of foreign trade enterprises, has become a major problem. Taking Haier Group as an example, this survey aims to study the path and practice of digital transformation of international trade industry.

2. The Background and Situation of Haier Group Enterprises

2.1. Summary of Various Stages of Haier's Digital Development


Haier's strategic transformation and development requirements and the dual role of its own
innovation gene meet the customized needs of customers, build an interconnected factory system (mass customization), an interconnected factory platform, and a third-party professional furniture installation service platform (basic services), realize the connectivity of manufacturing business, give priority to the development of product innovation, and consolidate the manufacturing foundation.


The problems of low quality and low efficiency in domestic household industry are becoming increasingly prominent. The company actively creates value for customers by creating U+ smart life ecosystem (personalized customization), foreign exchange earning platform, U+ smart life 1.0/2.0 platform (value-added services), external interaction and collaboration, forming data precipitation to feed back into service business, giving priority to the development of service innovation. However, it still lags behind the value creation ability of product innovation. Taking the sales of household appliances as the entry point, it pays more attention to the sale of services.

2.1.3. The Third Stage: Accelerated Development Stage (2017-Present)

The global smart home market is growing, and scene customization is still in its initial stage in the overseas market. Users co-create and realize their self-value, create scene ecological construction (scene customization), "10+N" open innovation platform, COSMOPlat platform /U+ smart life 3.0/X.0 platform (integrated service), and integrate internal and external ecological systems. Provide intelligent integrated solutions, product innovation and service innovation develop simultaneously, the value creation ability of the two is equivalent, to replace the product with the scene, integrated sales, EVA greatly increased, digital benefit greatly increased.

2.2. PEST Analysis

2.2.1. Politics

(1) 2017.11 Guiding Opinions on Deepening the "Internet + Advanced Manufacturing Industry" to Develop the Internet of the Ministry of Industry promoted the combined development of the Internet and manufacturing industry

(2) 2018.7 Guide to Promote Enterprises’ Online Cloud Sales (2018-2020) strives to further optimize enterprises’ online cloud environment

(3) In 2020.5, Notice on Promoting the Comprehensive Development of the Mobile Internet of Things (iot) was issued to vigorously develop 5G

(4) Guiding Opinions on the Development of Big Data in the Yangtze River Industry in 2020.5 To build an industrial big data ecosystem

(5) Improve the innovation ability of manufacturing key technologies and lead the development of building materials industry to high quality

2.2.2. Economy

(1) With the development of digital economy, upstream suppliers have monopoly rights

(2) Social e-commerce retail obtains lower prices from upstream suppliers, which leads to increased costs and reduced profits. In order to realize cross-border trade, the state establishes a free trade zone service center and a cross-border trade service platform to promote the free flow of funds and flexible operation

(3) The 45th Five-Year Plan clearly puts forward the idea of “Accelerating digital development and building Digital China”.

(4) The integration of the development of the real economy and the digital economy into the development of the e-commerce platform, which expands the sales channels and faces a broader consumer group
2.2.3. Society

China has a large population and a large domestic market demand. For a big local enterprise like Haier, there are great development advantages. In addition, in recent years, people begin to yearn for high-quality home living environment, and pay great attention to the quality of goods and services. Haier is the brand of "environmental protection", "energy saving", "high quality" and "good after-sales service". In addition, Haier also took advantage of the Beijing Olympic Games and online media to have a great influence. This has also provided a good environment for Haier's rapid growth. In a word, only by constantly meeting the needs of consumers can it develop sustainably.

2.2.4. Technology

Due to the implementation of China’s strategy of rejuvenating the country through science and education, the implementation of the national talent power strategy, and the government attaches great importance to higher education, the domestic ability to cultivate talents is increasingly enhanced, the full cooperation between the company and colleges and the endless research results at home and abroad for the development of the company to provide technical security, driving the industry including the home appliance industry to flourish.

Under the pressure of international advanced technology and level, it is not easy for Haier to go abroad. Meanwhile, the domestic market is also affected. In this situation, Haier continues to innovate and has made great breakthroughs in energy saving, environmental protection and digitalization. Master five key technologies: green dual carbon, security and privacy and compliance, chip and operating system, AloT/ perception and interaction, data productivity.

3. The Combination Path of Digitalization and International Trade

3.1. Dynamic Monitoring of the Development Trend of International Trade in Household Appliances

In the digital age, the cost of information acquisition is relatively cheap, so mining the dividend of the information age is conducive to promoting the development of Haier's international trade. The advantages of digitization and informatization can effectively reduce monitoring costs, so the relevant departments of the enterprise can quickly grasp the development trend of international trade of household appliances with the help of the Internet, so as to meet the product needs of other countries with the help of the production advantages of the enterprise, and achieve a win-win situation for both parties and even multiple parties in the trade.[1]

3.2. The Precision of Domestic Production and Supply

Through the product display on the cross-border trading platform, the effective connection between the supply side and the demand side of household appliances can be realized, and the production capacity and inventory level of product manufacturers and the consumption requirements of suppliers can be positioned more accurately with the help of digital technology, thus making the manufacturing process of products more flexible. Select customers according to the information, improve the trade achievement rate, expand international trade business.

3.3. Visualization of Logistics Clearance Stage

By supporting diversified modes of transport such as sea, air, land and express, and combining with customer needs, suitable modes of transport and routes are recommended, so that the whole track can be seen after placing orders, to help customers convenient delivery. With the help of artificial intelligence and cloud technology one-stop customs declaration platform, it can save 60% of the customs clearance cost, greatly improve the accuracy, and promote the facilitation and intelligence of trade and customs clearance process. At the same time, with the use of blockchain technology and unified risk control platform, it can quickly verify the main
links of tax refund, so as to accelerate the process of tax refund.[4]

3.4. **High Efficiency in the Payment Settlement Stage**

Trade digitalization also relies on relevant trade platforms to build a cross-border supply chain service system for global payment and settlement, digital customs and logistics, and build a reliable, transparent and efficient global payment, computing and financial network through technological innovation. By relying on digital loan settlement, we can improve the level of financial risk control and security, simplify business processes, and greatly improve the quality and efficiency of our services to customers.[3]

4. **Development Prospect Analysis -- Based on Cobb-Douglas Production Function**

4.1. **Model Establishment**

Based on the Cobb-Douglas production function, the econometric model \( Q = AK^\alpha L^\beta e^\mu \) was established, where \( Q \) was the output, \( K \) was the capital input and \( L \) was the labor input. It was assumed that the technical level of \( A \) was unchanged, \( \alpha \) and \( \beta \) were the parameters, and \( \mu \) was the random disturbance term. Select the total digitalized R & D investment capital and the number of personnel, Haier’s operating revenue during 2015-2019, through Table 1, let the operating revenue represents \( Q \), the total digitalized R & D investment capital represents \( K \), and the number of R&D personnel represents \( L \), \( Q, K \), \( L \) pair relationship table, it can be seen that under the 5% confidence level, not only \( Q \) and \( L \), but also \( Q \) and \( K \) are strongly correlated. There is also a strong correlation between \( L \) and \( K \). For the estimation of this growth model, by taking the natural logarithm of both sides of the Corpullas model, we can get:

\[
\ln Q = \ln A + \alpha \ln K + \beta \ln L + \mu.
\]

<table>
<thead>
<tr>
<th>year</th>
<th>Haier operating Revenue (million Yuan)</th>
<th>Digital R&amp;D Investment (Million Yuan)</th>
<th>Number of R&amp;D personnel (People)</th>
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<tbody>
<tr>
<td>2013</td>
<td>86488</td>
<td>2093</td>
<td>9765</td>
</tr>
<tr>
<td>2014</td>
<td>88775</td>
<td>2400</td>
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<td>89748</td>
<td>2461</td>
<td>10097</td>
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<td>3249</td>
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<td>4510</td>
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<td>5105</td>
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<tr>
<td>2019</td>
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Data source: Haier Zhijia Annual Report

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<thead>
<tr>
<th></th>
<th>lnQ</th>
<th>lnK</th>
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<tr>
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<td>0.99083</td>
<td>0.91899</td>
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<tr>
<td>lnK</td>
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<td>1.0000</td>
<td>0.94741</td>
</tr>
<tr>
<td>lnL</td>
<td>0.91899</td>
<td>0.94741</td>
<td>1.0000</td>
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4.2. **Empirical Analysis**

OLS model was used for regression analysis of \( \ln K, \ln L \) (explanatory variable) and \( \ln Q \) (explained variable) respectively, and the results showed that the coefficient of determination \( R \) and the
adjusted coefficient of determination R2 were 0.985681 and 0.980908, respectively, indicating that the regression model had a very good fit for the samples.

![Data Regression Analysis](image)

Figure 1. Data regression analysis

The equation obtained by substituting the data is: \( \ln Q = 6.503734 + 0.925458 \ln K - 0.246997 \ln L \).

As can be seen from the equation, each increase of one unit of capital input K will increase 0.925458 units of output Q, that is, Haier Group's operating income increases with the increase of R&D capital input. Similarly, every unit increase in the number of R&D personnel will reduce 0.246997 unit output Q, that is, Haier Group's operating income decreases with the increase of R&D capital input. From \( \alpha + \beta < 1 \), it can be concluded that Haier Group's operating income presents a pattern of diminishing returns to scale, indicating that according to the existing technology, expanding the production scale to increase output is not worth the loss; that is, it is impossible to increase the total output by expanding the production scale. To develop digital economy and promote the development of intelligent information technology, we need to constantly optimize labor force, improve capital input and comprehensive technology level.

5. Problems in the Digital Transformation of International Trade -- Based on Porter's Five Forces Model

5.1. Threats from Potential Entrants

As for China's home appliance industry, due to the impact of large-scale market, the industry has low barriers to entry, so the possibility of potential competitors to enter is very low. However, the demand development potential of China's home appliance market is huge, which objectively guides more and more large companies to enter this industry. But the digital transformation makes the entry barrier of the industry enhanced, improve the requirements of potential entrants in the industry development, at the same time with the booming development of the home appliance industry has produced a number of market segments, thus improving the product differentiation, diversification although the entry threshold is lower, but the capital and technology constraints will lead to new entrants Xu Sheng cannot continue to develop. However, these requirements also provide development goals and directions for potential entrants to a certain extent, prompting them to better enter the industry and develop relatively quickly, seize market share, and pose a potential threat to enterprises.[5]
5.2. The Degree of Competition among Peers and Competitors

As the strongest competitor of Haier, Midea is already a digital and intelligence-driven technology group, with a digital-driven global value chain and flexible intelligent manufacturing capability. Obviously, Haier does not take the lead in digital transformation. Haier's digital transformation and breakthrough in trade will undoubtedly expand foreign markets and enhance its global competitiveness.

In addition, Gree, Samsung and Hisense are also Haier's competitors. The competition between Haier and Gree is mainly manifested in the field of air conditioning, while the competition between Haier and Samsung is mainly in the field of TV and refrigerator. In the face of the Internet wave of intelligent information, home appliance enterprises have embarked on the road of digital transformation, step by step, and constantly strengthen their own information development, so that the development speed of home appliance industry continues to accelerate, and the industry competitiveness is becoming increasingly fierce.

5.3. The Threat of Substitutes

In the era of big data, Haier has taken the lead in planning to build its various products into the concept of smart home. Haier has made innovations in the hardware of home appliances, and has launched plans to upgrade the ecosystem, involving seven fields of products including air, washing, water, food, safety, health and entertainment. It owns dozens of products such as refrigerators, air conditioners, washing machines, computers, clothes dryers, razors, weight scales, air purifiers, water purifiers, intelligent sweeping robots, mobile phones and so on. With the strengthening of environmental awareness and the development of intelligent information, energy saving and environmental protection smart household appliances have gradually become a market advantage. After the digital transformation in trade, Haier should grasp the technological development trend and market demand, and introduce substitutes at the right time, so as to expand the market penetration. Due to the diversification of Haier products and brand influence, the threat of other substitutes will be greatly reduced.

5.4. Bargaining Power of Buyers

With the digital transformation of Haier's trade and the acceleration of domestic and foreign trade, the bargaining power of buyers and suppliers determines the cost profit margin of the enterprise to a certain extent. While increasing the sales volume, the enterprise should ensure the higher cost profit margin and increase the accumulation of capital, so as to promote the further development of the enterprise. The bargaining power of buyers may induce price wars among enterprises. According to the data of Euromonitor2020, Haier's global market share of home appliances is the first in the world, reaching 16.5%. It has great brand influence and high customer dependence, so it has the main control over the price of products.

5.5. Bargaining Power of Suppliers

Suppliers can improve the cost profit margin of enterprises by raising the selling price of products or reducing the cost, so as to improve the competitiveness of enterprises in the industry. Haier's raw materials come from the global Top 500 suppliers. After the digital transformation, Haier has a wider selection of suppliers, more opportunities and advantages, so it has enough production capacity and potential to expand capacity, has a complete quality assurance and cooperation system, and has strong bargaining power in terms of price.

6. Conclusion: Suggestions and Path Optimization

6.1. Attach Importance to Talent Selection and Optimize Labor Force

When determining the future development direction of the enterprise, it is necessary to introduce talents to promote the development of the enterprise and train the employees in the
enterprise, so that they can better master the skills needed for the future development of the enterprise. In the digital transformation, it is necessary to choose the "right people" and pay attention to the selection of talents, which is more conducive to the transformation of the enterprise. The construction of the enterprise's digital talent echelon should include three aspects: digital management talents, digital professionals and digital application talents. Only by optimizing the labor force, improving the efficiency of R&D personnel, and the efficiency of production and sales personnel, can capital input be relatively improved and labor costs relatively reduced, thus increasing the profits of enterprises.

6.2. Improve the R&D Capital Input and Comprehensive Technology Level

The success of digital transformation cannot be separated from the support of technology. It is not enough to have technical talents. We should give technical talents certain support, export and shape the technology, bring profit points for the enterprise, and apply it to all aspects of the enterprise. Haier Group set up DTS (Digital Technology Service) in 2015, whose business contents include infrastructure, core system, operation and technological innovation. In today's Haier Group, cloud computing, big data, artificial intelligence and other new technologies can well help each functional department to transform, making it gradually grow into a digital enterprise with comprehensive transformation. Haier Group has ten research and development centers, 108 manufacturing plants and 66 marketing centers in the world. In 2017, the market revenue increased by 20%, and the overseas market revenue accounted for 40% of the global revenue. It can be seen that Haier Group attaches great importance to technology and has invested a lot of money and energy in technology research and development.

6.3. Strengthen the Digital Strategic Management of Trade

Strengthening digital trade strategy management is a crucial part of the development of enterprises' digital trade. Haier originally started in manufacturing and is famous for its home appliance brand. On the road of transformation, Haier takes this as the basis to connect to users from the product end, instead of changing from a single product to a smart life solution, nor from mass manufacturing to mass customization. Instead, it has found a development strategy suitable for Haier Group -- networking strategy (closed traditional enterprise organization t open ecological platform; The relationship with upstream and downstream from zero-sum game T benefit sharing), and promote the maker culture, encourage employees to use Haier resources internal entrepreneurship strategy. Forming a unified and complete digital trade management system is a solid foundation for enterprises to better develop digital trade.[2]

6.4. The Government Shall Formulate an Evaluation Index System for Innovation Capability

When an enterprise reaches a certain innovation standard, the government will provide a reward mechanism to the enterprise, encourage the enterprise to continue technological research and innovation, and strive to form a new situation of technological innovation for the market. At the same time, the market demand can promote the guiding mechanism of technological innovation, make the technological innovation work targeted, ordered, systematic and standardized, and then promote the continuous development of technological innovation of enterprises.

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