

Difficulties and Solutions of Digital Transformation of Small and Medium-sized Enterprises in the Era of Digital Economy

-- Take Hangzhou, Zhejiang Province as Example

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Abstract: The digital economy has promoted the transformation and upgrading of real enterprises. As an important group of innovation, entrepreneurship and employment, the digital transformation of small and medium-sized enterprises is imperative in order to achieve better survival and development. Taking small and medium-sized enterprises in Hangzhou, Zhejiang Province, China, as the research object, a questionnaire survey was conducted on the current situation and problems of their digital transformation. The survey questions include 30 questions, such as the recognition of digital transformation, the willingness of digital transformation, the planning of digital transformation, the performance of digital transformation, existing problems and suggestions, and were analyzed. The survey results show that there are many problems in the digital transformation of small and medium-sized enterprises, such as insufficient awareness, weak foundation, financial difficulties, lack of talents and so on. Based on the above problems, the four dimensional integration path of strategy, technology, process and organization is put forward from the enterprise level; From the perspective of the government, this paper puts forward countermeasures and suggestions such as precise implementation of policies, improvement of finance, strengthening cognition, introducing and educating talents, setting up benchmarks and building ecology, so as to promote the innovation driven and digital transformation development of small and medium-sized enterprises.

Keywords: Digital economy, Small and medium-sized enterprises, Digital transformation.

1. Introduction

With the promotion and application of digital technologies such as artificial intelligence, block chain, cloud computing and big data, China's digital economy has developed rapidly. According to the white paper on the development of China's digital economy issued by the Chinese Academy of information and communications technology, China's digital economy will reach 39.2 trillion yuan in 2020, accounting for 38.6% of GDP, and the digital economy has effectively supported economic and social development. The Chinese government has made it clear that it wants to promote the deep integration of the Internet, big data, artificial intelligence and the real economy. The 2020 government work report proposes to continue to introduce support policies to create new advantages of the digital economy. Industrial digitalization and digital industrialization will be the main theme of China's economic development. The implementation of these policies has greatly promoted the digital transformation and upgrading of enterprises. A survey of more than 100 enterprises implementing digital transformation by Boston Consulting Company found that from 2002-2016, the procedural business efficiency of these enterprises in business process, decision-making approval, business communication and other aspects increased by 50% to 350%. In the era of digital economy, digital transformation is the only way for enterprises to survive and sustainable development, and it is imperative for enterprises to carry out digital transformation. By the end of 2019, the number of small and medium-sized enterprises in China had exceeded 30 million, according to

the Ministry of industry and information technology. Small and medium-sized enterprises are the group with the largest number, the most active innovation and entrepreneurship and the strongest employability in China. The government has introduced many policies to help the development of small and medium-sized enterprises.

2. Literature Review

At present, the research on digital transformation has attracted much attention from scholars around the world. Digital transformation is the innovative process of enterprises using digital technology. By reshaping their vision, strategy, organizational structure, process, ability and culture, To adapt to a highly changing digital environment"Digital transformation not only helps enterprises to achieve close cooperation between digital technology and different businesses, improve operational efficiency, but also improves the market position and influence of enterprises by improving product or service quality and consumer satisfaction; enterprises carry out digital transformation, and then achieve performance improvement goals through cost reduction, efficiency improvement and innovation pathsBurdened by the high fixed costs of participating in the value chain and lacking core technologies, small and medium-sized enterprises can easily be locked in the low end of digital based production networks as their participation in the value chain deepens. Therefore, small and medium-sized enterprises should choose transformative breakthroughs to achieve survival and sustainable development through digital transformation.

To sum up, the existing research has carried out relevant discussions on the concept connotation, role and influencing factors of digital transformation of small and medium-sized enterprises, and the existing research results provide reference value for this study. However, there are relatively few studies on the digital transformation of small and medium-sized enterprises, especially in combination with surveys. In view of the importance of small and medium-sized enterprises in the development of China's digital economy, this paper explores the problem of digital transformation of small and medium-sized enterprises in Hangzhou, and provides solutions for the digital transformation of small and medium-sized enterprises.

3. Data Sources and Sample Composition

3.1. Data Sources

This paper takes small and medium-sized enterprises in Hangzhou, Zhejiang Province, as the research object, and uses the questionnaire survey method to investigate the digital transformation of small and medium-sized enterprises in Hangzhou. Based on previous research results and the actual operation of small and medium-sized enterprises, a total of 30 questions were designed. Among them, five questions involve the characteristics of the investigated personnel, such as gender, education, tenure, position level and position, and six questions involve the background of the enterprise, such as the nature of the enterprise, its industry, personnel size, annual income and operating time; Six questions involve enterprises' awareness of digitalization; The 13 questions involve the current situation and problems of enterprise digital transformation. Due to the impact of the covid-19 epidemic, the questionnaire adopts the form of online questionnaire, which is distributed to M.B.A. students who are studying in Zhejiang Business University and conducting electronic questionnaire surveys on them. According to the previous understanding, some MBA students are small and medium-sized enterprises from Hangzhou, and most of them are senior, middle and grass-roots managers of enterprises, so they have a certain understanding of the basic situation of enterprise operation. This survey adopts the way of submitting questionnaires online, and collects effective questionnaires from 200 managers of small and medium-sized enterprises in different industries, ensuring that the data can objectively and truly reflect the digital transformation of small and medium-sized enterprises.

3.2. Sample Composition

Basic characteristics of the respondents. The composition of 200 samples in this survey is shown in Table 1. Survey data show that 81% of the respondents participating in the questionnaire have bachelor's degree or above, and the educational level of the respondents is generally high. About the working time of the survey objects in the enterprise, nearly half of the survey objects have worked in their own enterprises for more than five years; 14% of the respondents worked in their own enterprises for 3-5 years, which also shows that they are basically familiar with the relevant situation of their research. The distribution of survey data at various job levels is relatively balanced, with enterprise managers accounting for 70.5%. Generally speaking, the more managers understand the digital economy, the better,

with a certain degree of persuasion. The survey objects are distributed in all positions of the enterprise, covering R & D, production, sales and marketing, procurement, supply chain, operation, personnel administration and finance. Overall, the respondents are highly representative, which also verifies that the survey data have high coverage and representativeness, which has a certain understanding of the digital transformation of small and medium-sized enterprises.

Table 1. Basic characteristics of the surveyed

name	category	number	Proportion
Gender	male	86	43%
	female	114	57%
educational background	Specialist	38	19%
	undergraduate course	100	50 percent;
	master	61	30.5%
	doctor	1	0.5%
Tenure	Year VI	15	7.5%
	1-3 years	60	30%
	3-5 years	28	14%
	>5 years	97	48.5%
Job level	Top management	30	15%
	middle managers	60	30%
post	Grass-roots managers	51	25.5%
	Ordinary employees	59	29.5%
	R & D personnel	11	5.5%
	Production personnel	7	3.5%
	Purchasing staff	7	3.5%
	Operators	26	13%
	Marketing and sales	35	17.5%
	Supply chain personnel	6	3%
	Personnel / Administration	31	15.5%
	Financial officer	56	28%
other	21	10.5%	

3.3. Basic Characteristics of Sample Enterprises

The composition of 200 sample enterprises in this survey is shown in Table 2. From the perspective of sample structure, most of the respondents were private enterprises, followed by state-owned enterprises, and the proportion of foreign-funded enterprises, joint ventures and others was basically the same. The survey results show that the surveyed enterprises are widely distributed in the industry, of which 43% belong to the manufacturing industry, accounting for a large proportion. Combined with the scale of personnel and annual income, it is basically small and medium-sized enterprises. On the issue of the operation time of the research enterprises so far, 57% of the total research enterprises have been operating for more than 10 years, and 21% of the total research enterprises have been operating for 6-10 years 5%, enterprises with operation time of 3-6 years accounted for 15% of the total survey, and enterprises with operation time of less than 3 years accounted for 6.5% of the total survey. The survey shows that the enterprises in the mature stage account for 35.5% of the total number of enterprises in the survey; Enterprises in the growth period accounted for 35% of the total number of surveys; Enterprises in the transition period accounted for 22.5% of the total number of surveys; Start-ups accounted for 7 percent of the total.

Table 2. Basic characteristics of sample enterprises

name	category	number	Proportion	name	category	number	Proportion
nature	Foreign-owned enterprise	19	9.5%	personnel scale	Less than 10	9	4.5%
	Joint venture	16	8%		10-100 people	72	36%
	state-owned enterprises	40	20%		101-300 people	29	14.5%
	private enterprise	107	53.5%		>300	90	45%
	other	18	9%	annual income	[1 million]	14	7%
industry	Internet / it / Electronics / Communications	18	9%		100-500 ten thousand	30	15%
	real estate	3	1.5%		500-1000 ten thousand	14	7%
	Finance	15	7.5%		>10 million	142	71%
	Construction	8	4%	operate time	Less than 3 years	13	6.5%
	Manufacturing	86	43%		3-6year	30	15%
	Agriculture, forestry, animal husbandry and fishery	1	0.5%		6-10 year	43	21.5%
	Wholesale / retail / trade	16	8%		>10 years	114	57%
	professional services	17	8.5%	develop stage	Start-up	14	7%
	Culture / sports / Entertainment	2	1%		Growth period	70	35%
	Transportation / warehousing / Logistics	9	4.5%		mature period	71	35.5%
	Energy / env / minerals	3	1.5%		Transition	45	22.5%
	Education and training / Research	8	4%				
	Life services	14	7%				

4. Current Situation of Digital Transformation of Small and Medium-sized Enterprises

4.1. Sample Analysis of Small and Medium-sized Enterprises' Awareness of Digital Transformation

How well companies know about digitalization. Enterprises' understanding of digitalization is mainly to investigate the situation that enterprises can upgrade their business and management through the application of digital technologies such as information technology, Internet and artificial intelligence. The survey results show that 15% of the total surveys have a deep understanding of digitalization, 27.5% of the total surveys have a comprehensive understanding of digitalization, and 44% of the total surveys have a simple understanding of digitalization. 5%, 13% of the total survey did not know about digitalization. Overall, the understanding of digitalization of the surveyed enterprises is still at a general level.

4.2. Views of Enterprises on The Importance of Digital Transformation

Those who believe that they are very important to enterprises account for 25.5% of the total number of surveys, those who believe that they are important to enterprises account for 26% of the total number of surveys, those who believe that they are more important to enterprises account for 40% of the total number of surveys, and those who believe that they are not important to enterprises account for only 8.5% of the total number of surveys. Generally speaking, the vast majority of enterprises believe that the digital transformation of enterprises is important to the development of enterprises.

4.3. Willingness of Enterprises to Digital Transformation

The survey on the willingness of enterprises to carry out digital transformation shows that 14.5% of the total surveys are carried out by enterprises to carry out comprehensive reform of digital transformation, 50.5% are inclined to carry out gradual reform of digital transformation, 29% are in the wait-and-see period of digital transformation, and 6% are not willing to carry out digital transformation.

4.4. The Current Stage of Enterprise Digitalization Process

About the current stage of the digital process of enterprises, 31% of the total number of enterprises surveyed have not yet carried out digital transformation; Enterprises have just entered the digital transformation, and 31% of the total number of surveys are still in the embryonic stage; Enterprises have entered the growth stage of digital enterprises, accounting for 26.5% of the total number of surveys; The digital process of enterprises has been highly improved and continuously innovated, accounting for 10% of the total number of surveys. The results show that most small and medium-sized enterprises have not yet carried out digital transformation or are only in the embryonic stage.

4.5. Enterprises Formulate Plans or Strategies for Digital Transformation

As for whether enterprises have formulated plans or strategies for digital transformation, the survey shows that 15.5% of them have completed and clearly and reasonably formulated plans or strategies for digital transformation; 17% of the surveyed enterprises have completed, but they have vaguely formulated plans or strategies for digital transformation; 31.5% of the surveyed enterprises are in the process of formulating plans or strategies for digital

transformation; Thirty six percent of the companies surveyed had no plans or strategies for digital transformation.

5. Suggestions on Digital Transformation of Small and Medium-sized Enterprises

5.1. The Main Factors Hindering the Digital Construction of Enterprises

Of those surveyed, 53 percent said they lacked professionals; 51% of the respondents believed that the investment cost was too high and the special funds were insufficient; 21% of the respondents believed that they did not understand digital technology and lacked digital training; 21% of the respondents believed that their ability was not enough and lacked the conditions for digital implementation; 15.5% of the respondents believed that there was a lack of access to technology; 15.5% of the respondents believed that the leadership did not pay enough attention; 1.5% of respondents believed there was a lack of government support; 13.5% of the respondents believed that there was no clear and specific implementation plan; 7.5% of the respondents believed that local IT service providers and providers were lacking; 8% of the respondents believed they were worried about data security; 10.5% answered other factors. Generally speaking, most enterprises believe that the main factors hindering digital construction are lack of professionals, high investment costs and lack of special funds.

5.2. The Problems That Enterprises Need to Solve in The Future Digital Construction

There are 625% of the respondents believed that the system integration was not enough; 38% of the respondents believed that the professional consultation of informatization was insufficient; 30.5% of the respondents believed that the lack of application software; 28.5% of the respondents believed that the lack of basic equipment; 27.5% of respondents believed that the lack of funds; 16.5% of the respondents believed that the service quality of local IT service providers was not enough; 12% of the respondents believed that the leadership did not pay enough attention; 8.5 percent chose something else. Generally speaking, most enterprises believe that the future digital construction needs to solve the problems of system integration, insufficient information professional consultation, lack of application software and so on.

5.3. The Government Can Support Aspects of Enterprise Digitalization

At present, enterprises hope that the government can support the digital construction of enterprises, including 625% of enterprises hope that the government can provide support in terms of policy support; 46.5% of enterprises hope that the government can provide support in professional training; 37.5% of enterprises hope that the government can provide support in the strategy of talent introduction; 35.5 percent wanted financial support from the government; 35% of enterprises hope that the government can provide support in the construction of digital collaboration platforms upstream and downstream of the industrial chain. 95 percent want the government

5.4. Support Can Be Provided in Technology Assisted R & D

9.5% of enterprises hope that the government can provide support in introducing excellent service providers.

To sum up, the government plays a great role in the digital construction of enterprises, and most enterprises hope that the government will support enterprises in policy support, talent introduction and financial support.

6. Epilogue

Digital transformation path of small and medium-sized enterprises

Generally speaking, the integration process of small and medium-sized enterprises and digital economy is accelerating, some small and medium-sized enterprises have entered the stage of digital transformation, and a number of excellent typical cases of small and medium-sized enterprises have emerged. However, the integration of small and medium-sized enterprises and digital economy has not yet reached the stage of deep integration, and there are still some problems to be solved urgently. Supporting the digital transformation of small and medium-sized enterprises, formulating supporting policies and creating a good business environment are the momentum to strengthen the digital transformation of small and medium-sized enterprises. Based on the current development situation of small and medium-sized enterprises and the above problems, the following countermeasures and suggestions are put forward from the government level.

6.1. Precise Implementation of Policies to Increase Policy Support for Digital Transformation

Active guidance and strong support for small and medium-sized enterprises are one of the indispensable powerful driving forces to promote their transformation and upgrading. First, according to the types and characteristics of small and medium-sized enterprises, we should introduce a highly targeted, operational and accurate guidance and support policy system. We will implement classified policies for small and medium-sized enterprises in different industries, fields and scales, and guide and support them in batches and in an orderly manner. Highlight key industries, especially information industry, high-tech industry, manufacturing small and medium-sized enterprises, etc. Secondly, we should further improve the application standards of digital technology industry, establish unified, comprehensive, open and integrated industry leading standards and norms, and standardize the management of digital technology related industries, so as to provide a good and orderly external environment for the digital transformation of small and medium-sized enterprises. Effectively optimize the business environment, and promote the benign interaction and value creation between large, medium-sized enterprises and mature enterprises through technology incubation and industrial park construction. The three is to ensure data security and strengthen data protection. Introduce normative policy documents requiring cloud service institutions to ensure the system security of public databases and public cloud systems Ensure data integrity, authenticity and real-time. Strengthen the protection of all kinds of patents, R & D achievements, trade secrets, public privacy and other data information

6.2. Innovate the Financial System and Alleviate the Dilemma of Digital Transformation

Establish a special fund to support the digital transformation of small and medium-sized enterprises to help solve the problem of insufficient funds for some small and medium-sized enterprises. Focus on supporting the construction of intelligent equipment, digital production process, networked production mode, cloud platform and "double innovation" platform for small and medium-sized enterprises. Support eligible public service platforms for small and medium-sized enterprises to provide special services for intelligent transformation through subsidies, purchase of products and services, incentives and other means. Use the cloud policy of enterprises to increase financial support for the transformation and upgrading of logarithm intellectualization. We will further develop and expand preferential tax policies such as VAT deduction scope for small and medium-sized enterprises in the process of production and operation, support small and medium-sized enterprises to accelerate intelligent transformation, and enhance the competitiveness of product market economy. Streamline the application and approval process for small and medium-sized enterprises. Operate according to the market-oriented model, give full play to the leverage effect of fiscal funds, and leverage social capital to invest in small and medium-sized enterprises in key industrial areas.

6.3. Improve the Awareness of Digitalization and Strengthen the Introduction and Education of Talents

We should strengthen the training of digital thinking and skills for managers of small and medium-sized enterprises and enhance their digital awareness. Through the digital technology talent training base jointly built by the government, enterprises and schools, we will continue to develop and enrich the digital talent reserve. We should strengthen vocational education, actively train applied talents, promote digital universal education, and enhance the digital literacy of the whole people.

6.4. Establish Digital Benchmarking Enterprises and Cultivate "Specialization, Specialty and Innovation"

We will support the development of innovative small and medium-sized enterprises in various start-up and growth periods, and focus on cultivating small and medium-sized enterprises with strong innovation ability, distinct product characteristics and great growth potential. Encourage small and medium-sized enterprises to carry out multi-level industry university research cooperation, actively introduce innovation teams, and strengthen the organic combination of digital concept innovation, digital management mode innovation and business model innovation.

6.5. Build A Digital Economic Ecosystem and Improve Public Services

Actively build an industrial public service system that

provides it empowerment, organizational empowerment and management empowerment for small and medium-sized enterprises, including technological innovation and technology financial service network platform, standard, inspection, test data platform and resource docking and promotion service platform.

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