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Research Article

Evaluation of Digital Transformation Maturity of Small and Medium-Sized Entrepreneurial Enterprises Based on Multicriteria Framework

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This paper firstly constructs a set of digital maturity evaluation system for small and medium-sized enterprises based on the maturity model theory and adopts the AHP-DEMATEL evaluation method to evaluate the digital maturity of small and medium-sized enterprises. The four dimensions of digital strategy, operational technology, cultural organization capabilities, and ecosystem explore the impact mechanism of digitalization on enterprise product transformation capabilities. This research fully combines theory with practice and effectively makes up for the lack of digital theory research of small- and medium-sized enterprises.

1. Introduction

Digital transformation is conducive to enhancing the comprehensive competitiveness of small and medium-sized enterprises. Compared with large enterprises, small and medium-sized enterprises generally have problems such as small scale, weak anti-risk ability, insufficient self-owned funds, and social financing difficulties. On the one hand, giving full-play to the accurate measurement and control capabilities of digital technology is conducive to reducing losses, optimizing processes, and thus reducing enterprise costs. On the other hand, digital transformation can help small and medium-sized enterprises cope with the challenges brought about by small scale. When facing the changing production and operation environment, they can achieve flexible response through flexible production, CRM system, etc. At the same time, the digital transformation brings more external digital resources to small and medium-sized enterprises, helps small and medium-sized enterprises obtain more help and experience in collaborative research and development, supply chain connection, management capacity-building, enterprise value promotion, and other aspects, and further strengthens their core competitiveness. Small and medium-sized enterprises are the new force of national economic and social development, contributing more than 50% of the national tax revenue, more than 60% of GDP, more than 70% of technological innovation, and more than 80% of urban employment. The large number and wide range of small, medium, and microenterprises are the important foundation for stabilizing the economy, the main support for stabilizing employment, and the key link to improve the stability and competitiveness of the industrial supply chain.

For small and medium-sized enterprises, digitalization helps enterprises to improve production efficiency and enhance their innovation capabilities; for the government, manufacturing digitalization is the only way for the country to accelerate the construction of a manufacturing power and develop advanced manufacturing [1]. However, the digitalization of the manufacturing industry started relatively late. On the one hand, enterprises often do not have a clear understanding of digitalization. The positioning, status, and development path of their own digitalization level are unclear, and there is a lack of systematic digitalization methodology and typical cases of digital transformation in the industry to guide. On implementation, on the other hand, enterprises also lack the necessary cognition about the significance of digitalization to the development of enterprises, especially the internal mechanism of digitalization affecting the ability of enterprises to transform and upgrade [2]. These problems make many small and medium-sized enterprises lack the motivation to implement digitalization. Even if they reluctantly carry out digitalization construction work, they often face the result of getting twice the result with half the effort. Based on the above research background, this paper believes that establishing a set of effective digital maturity evaluation tools for small and medium-sized enterprises, evaluating and researching the digitalization level of small and medium-sized enterprises, and conducting research on the impact mechanism of digitalization on enterprise transformation capabilities. Both satisfying the urgent demands of small and medium-sized enterprises to improve their digitalization level can also help the government to better understand the current status of enterprise digitalization level and improve the efficiency of government guidance and support for enterprise development [3].

This research will first construct a set of digital maturity evaluation system of small and medium-sized enterprises and use it to evaluate the digital maturity of small and medium-sized enterprises. Capability and product transformation cost control capability, as the result factors that digitalization affects enterprise product transformation capability, explores the impact mechanism of digitalization on enterprise product transformation capability from four dimensions: digital strategy, operational technology, cultural organization capability, and ecosystem. By constructing a digital maturity evaluation model for small and medium-sized enterprises, on the one hand, it complements the existing theoretical research on maturity models. The selection and optimization of methods have been reasoned and explained in detail, which can be said to provide certain theoretical support and expansion for the research on enterprise digitalization [4]. By exploring the impact mechanism of digitalization on enterprise product transformation capabilities, on the one hand, it supplements the current academic research on the mechanism of digitalization affecting enterprise transformation. The key factors expand the application of product space theory to a certain extent and provide new ideas for similar research.

This paper combines theory with practice. Based on the multicriteria theory, this paper constructs a maturity evaluation model for the digitalization of small and medium-sized enterprises and makes a preliminary evaluation on the digitalization status of small and medium-sized enterprises. A tool to explore the impact of SME digitalization on enterprise product transformation capability. The innovative contribution of this research lies in the full combination of theory and practice, which effectively makes up for the lack of digital theory research of small and medium-sized enterprises and the disconnection between theory and practical application and learn from relevant research institutions.

2. Related Work

With the continuous emergence of various digitalization-related technologies and products, its impact on the manufacturing industry has become more and more profound, and the concept of digital factory has begun to appear in some small and medium-sized enterprises. Nambisan et al. put forward the concept of "digital factory." He believes that a digital factory is a computerized representation of a real factory. By establishing a digital factory in a computer that is virtually parallel to the real factory, it can help small and medium-sized enterprises to accelerate the introduction of new products, reduce costs, and improve production [5]. Huang and Qihai pointed out that the digital factory mainly provides an integrated method that can improve the product and production process, and the key technology is its simulation optimization ability [6]. Mojtaba et al. mentioned that digital capability refers to the ability of enterprises to use digital technology to shorten the distance with customers, empower employees, and change internal processes, and mentioned that digital transformation requires top-down leadership push [7]. Malgina proposed that digitization is the use of digital technology to change business models and provide new opportunities for revenue and value creation, and digitization is the process of enterprises transforming from traditional models to digital business models [8]. Banai et al. further define digitalization as the process of using digital technologies to improve or disrupt traditional business models, business processes, and products and services [9]. Olejniczak and Debicka put forward the concept of "full digitalization," that is, "enterprises use information technology to promote business model innovation, improve customer experience and operational efficiency, and have a potential impact on traditional industry patterns" [10]. Huang proposed that the digital transformation strategy should focus on three main areas, one is the new customer experience: by providing each customer with a seamless omni-channel experience, improving products and services, and deepening customer loyalty; the second is innovative business mode, collect value data through the connection between devices, transform business models, streamline operations, and improve the sensitivity to respond to market changes; the third is to improve employees' innovation ability, and through digital tools enable employees to achieve better information, connectivity, and more active, dedicated to work, and more flexible to handle work [11]. Zuperkiene proposed that the digital transformation of small and medium-sized enterprises mainly includes two aspects, one is to realize automatic management and the other is to differentiate competition. This requires companies to restructure their business, create new data-driven models, and deliver better experiences, services, and products, thereby facilitating the realization of the three goals of digital transformation: improving operational efficiency and enhancing customer and employee engagement [12]. Key digital means include big data analytics, cloud computing, IoT, mobility, and social [13]. Gm A pointed out that the digital age has three main characteristics: intelligence, networking, and big data, and expounded the impact of the three characteristics on the green development of enterprises. The impact is mainly reflected in process optimization, configuration optimization, information dissemination, knowledge acquisition, and scientific decision-making in six aspects [14].

Antonenko et al. pointed out that the paths and methods of digital transformation corresponding to different types of manufacturing are also different. The common point is to use digital transformation to provide consumers with new functions and upgrade elements of smart devices [15].

It can be seen from the digital transformation schemes given by scholars in various related fields that digital transformation is not limited to the application of digital technology, but is also a cultural and organizational change. For a successful digital transformation, while considering the digitization of enterprise operational capabilities, it must also consider the digitization of strategy, culture, organization, capabilities, and the digitization of interaction areas such as the ecosystem.

3. Multi-Criteria Framework of Enterprise Evaluation Index Based on Information Uncertainty

In the process of dealing with such multi-criteria decision-making problems with ambiguity and uncertain information, decision makers need to provide two types of decision-making information: one is the attribute weight selected in this paper to study the evaluated scheme and the selected. The preference information of decision makers for different schemes and different attributes is usually difficult to know exactly. Some scholars use subjective judgment to determine attribute weight coefficient and expert preference information. There is a lack of verification of the conclusions reached by using objective methods to determine this information. Therefore, the research results cannot be well combined with the actual situation for analysis. The conclusions drawn from the objective method to determine this information will be closer to the actual situation; the other type is the judgment value of each attribute under each scheme, that is, the attribute value, which is also the focus of this paper [16]. Due to the limitation of a series of objective conditions such as the complexity and ambiguity of objective things, it is difficult for this paper to obtain accurate quantitative data to describe real problems when dealing with such decision-making problems, which also determines that the data obtained in this paper are qualitative data with ambiguity. The ambiguity of these two aspects of information determines the ambiguity in the research process of multi-criteria decision-making problems [17]. This paper constructs a mathematical model to solve the multicriteria problem as shown in the following equation:

$$\begin{aligned} &\min Z = \widetilde{C}X, \\ &x \in X = \left\{x | \widetilde{A}x < \text{and} \widetilde{b}x \geq \widetilde{0} = (0,0,0,0)\right\}. \end{aligned} \tag{1}$$

In this linear programming model, $\widetilde{A}$ represents a constraint matrix, and $\widetilde{C}$ represents a matrix composed of multiple objective functions. Traditional multiobjective linear programming models are often used to solve some objective functions related to limited resource supply and demand in optimization decision problem. However, in real life, many optimization problems often have certain conflicts and inconsistencies between their objective functions. Therefore, the method of hierarchically solving the objective functions must be used to solve this kind of multiobjective decision-making. Therefore, the hierarchical sequence method is widely used [18]. This paper describes the hierarchical optimization problem as shown in the following equation:

$$\operatorname{lex} \max_{w \in W} \{f_1(w), f_2(w), \ldots, f_r(w)\}. \tag{2}$$

The basic idea of the hierarchical sequence method is to give a sequence of objective functions according to their importance, which are the most important objective and the secondary objective. According to the given sequence of importance objective functions, the most important objective, that is, the first objective $f_1(w)$ is solved for its optimal solution under the constraints of $w \in W$, and an optimal solution set w is obtained. Until the optimal solution of the r objective is obtained. Figure 1 shows the solution framework.

The evaluation index system of enterprise construction standards must be established on the basis of feasible and guaranteed data collection channels, and at the same time, it must be ensured that the selected indicators can scientifically reflect the characteristics of the enterprise and can be calculated, analyzed, and quantified [19]. The selection of evaluation indicators must be based on existing operational management practices, and its low-cost availability must be fully considered. The data required for the evaluation indicators are easy to collect; the indicator system should be simple and complex, and the evaluation methods are simple, clear, and easy to operate; each evaluation indicator, its corresponding calculation method, and various data must be standardized. The indicator system framework is as follows as shown in Figure 2.

In the sub-indicator system of economic benefits, it mainly considers the production capacity and business performance of the enterprise; in the sub-indicator system of resource conservation, it mainly examines whether the enterprise has resource conservation goals, and inspection systems, as well as the resource conservation management that the enterprise has implemented. The construction and other aspects of the system; in the environmental level sub-index system, the construction and treatment of industrial waste water, industrial waste gas, industrial waste residue, solid waste, plant environmental layout, and greening degree are mainly investigated. In the indicator system, it mainly examines the situation of the enterprise in solving the local employment situation and the salary level of employees.

This paper mainly obtains the scores of each employee and surrounding residents on the various indicators of the enterprise through surveys as well as the basic information of all participants [20]. In the process of processing the collected data, the fuzzy multi-criteria decision-making method based on trapezoidal fuzzy numbers and the fuzzy multi-criteria decision-making method based on triangular fuzzy proposed in this paper are mainly used for evaluation research. The comprehensive ranking of the enterprise under

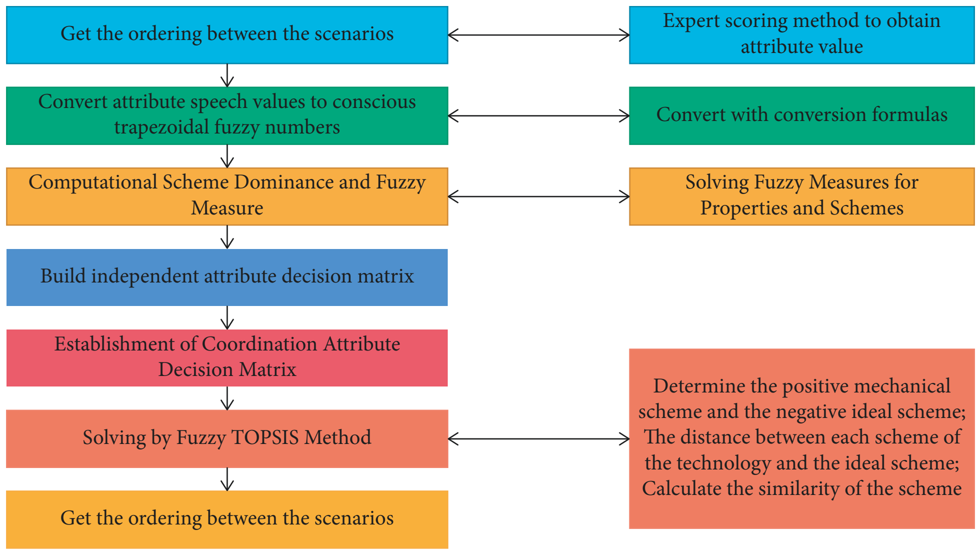

Figure 1: Solution framework diagram.

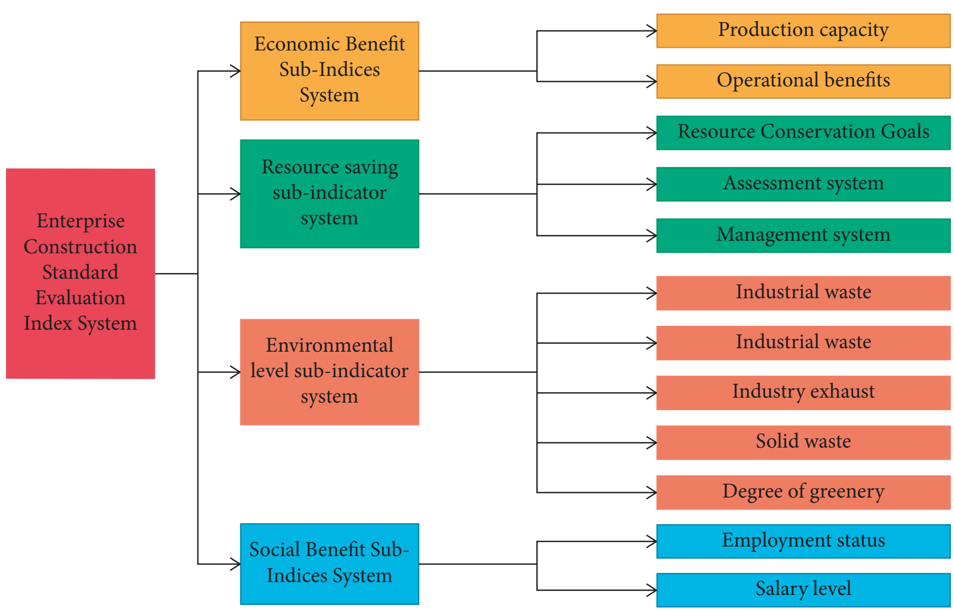

Figure 2: The framework of the evaluation index system of enterprise construction standards.

the given four attribute indicators and the final results are compared and explained.

The specific solution steps are shown in Figure 3.

Small, medium, and micro enterprises are the main body to attract employment. Promoting the development of small, medium, and micro enterprises is conducive to improving the quality of employment. At present, China's employment support policies for small, medium, and micro enterprises, especially small and micro enterprises, have been strengthened year by year. The small, medium-sized, and micro enterprises that attract and promote employment are provided with tax relief policies. Enterprises employ key groups of employment assistance such as people with employment difficulties. In addition, there are supportive policies for enterprise financing and enterprise upgrading. Select employees of industrial enterprises, administrative and technical personnel, and residents around the enterprise for evaluation and scoring, collect the scoring values of the enterprises to be obtained under the given index system, obtain valid questionnaires, and classify them according to certain regions and industries. Sort out and get the comprehensive scoring value of similar enterprises in each region; establish a decision matrix, and according to the transformation standard between the expert scoring language value and the fuzzy number, and get the decision matrix based on the fuzzy number for each scheme. Criterion decision-making method, respectively, calculates the index weight value of the survey object and the weight value of the ideal scheme and then calculates the distance difference between each scheme and the ideal scheme according to the distance formula of fuzzy

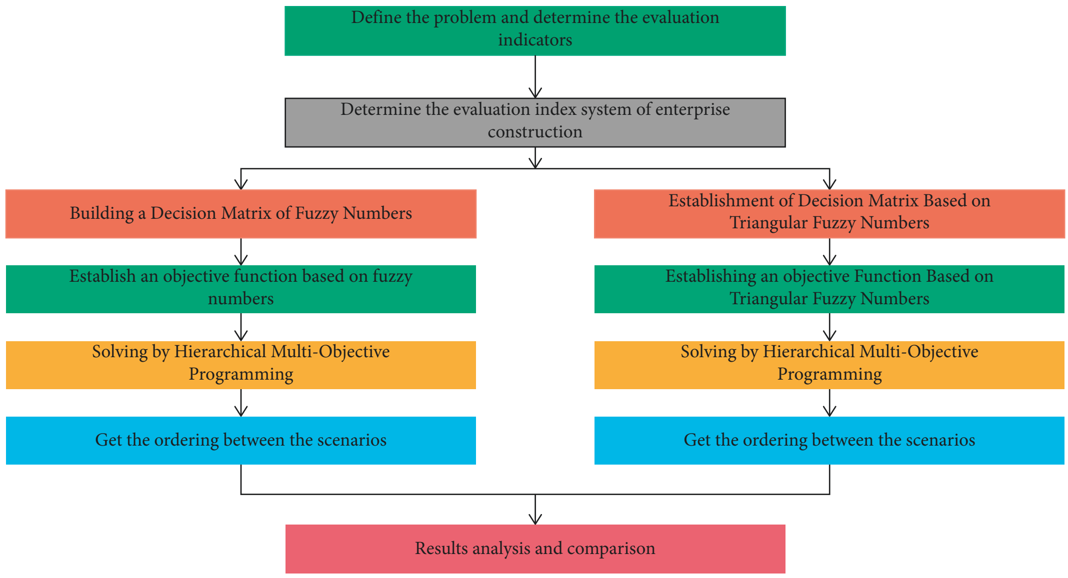

Figure 3: Flowchart of enterprise construction standard evaluation decision-making.

numbers, according to the smaller the distance difference, the better the scheme. According to the principle of superiority, the ranking between the evaluated schemes is obtained and the results calculated by the two methods are compared and explained, and finally the conclusion of this chapter is drawn [21].

4. Analysis of the Digital Maturity Model of Small and Medium-Sized Entrepreneurial Enterprises

4.1. Product Space Theory and Its Extension Theory. By studying the distribution structure of product space network, we can reveal the transformation process of export documents of different countries. The theory holds that the product itself contains not only the production factor information used by a country in the manufacturing process but also other broader factor information, such as R&D and design, marketing management, and intellectual property, that is to say, the product is the comprehensive embodiment of a country's factor endowment information. Product characteristics have an important impact on trade patterns and economic growth. The evolution of national comparative advantage is closely related to the structural characteristics of product space. By studying the document characteristics of product space, we can find the evolution path of national comparative advantage, which will then affect the trade model and future economic development. From the perspective of product space structure, this theory explores the key factors that determine the optimal jump distance when an enterprise jumps from the original product to produce a new product. The product space theory holds that the distance between any two products is unequal in space and the size of the distance is related to the similarity of the capacity required to produce the two products. The more similar the capabilities required to produce the two products, the smaller the distance between the two products, the easier the product jump is; conversely, the greater the difference in the capabilities required to produce the two products, the greater the distance between the two products, the more difficult the product jump is to achieve. The product space theory can be expressed by the HK model.

Assuming that there is an enterprise that produces product A in the market, the revenue of product A is P_A, and at the same time, there is a product B with higher revenue P_B in the market. If the company chooses to jump, it can obtain additional revenue P_{B-A}, which is the same as the jump. The distance is proportional to δ as shown in the following equation:

$$\begin{aligned} P_{B-A} &= P_B - P_A, \\ &= f\delta. \end{aligned} \tag{3}$$

At the same time, the enterprise also bears the jump cost (or transition cost) C. It can be proved that the jump cost is proportional to the square of the jump distance as shown in the following equation:

$$C = \frac{c\delta^2}{2}. \tag{4}$$

Therefore, the company can obtain a profit through product jumping as the following equation:

$$\delta^* = \frac{f}{c}. \tag{5}$$

It is further assumed that there are homogeneous companies with overlapping eras in the market and each company can survive for two consecutive periods. At this time, for a company that survives for two periods, the total profit after two jumps is the following equation:

$$\Pi = f\delta_1 - \frac{1}{2}c\delta_1^2 + f\delta_2 - \frac{1}{2}c\left(\delta_2 - \delta_1\right)^2. \tag{6}$$

According to the profit maximization strategy, the optimal jump distance of each period of the enterprise is

Table 1: Evaluation model of digital maturity of SMEs.

First-level indicator	Secondary indicators	Three-level indicator
Strategy (A)	Relevance to business strategy (A1)	Relevance to business strategy (A11)
	Oriented to a long-term digital strategy (A2)	Oriented to a long-term digital strategy (A21)
	Focus on realizing customer value (A3)	Focus on realizing customer value (A31)
Transportation technology (B)	R&D (B1)	Rapid R&D (B11)
		Customized (B12)
	Procurement (B2)	Expenditure visualization (B21)
		Collaborative advanced platform (B22)
		Procure to pay process (B23)
		Procurement performance management (B24)
	Manufacturing (B3)	Resource/process effectiveness (B31)
		Production quality management (B32)
		Workforce efficiency (B33)
		Asset utilization (B34)
	Supply chain (B4)	Supply chain strategy (B41)
		Supply chain planning (B42)
		Physical logistics (B43)
		Supply chain performance management (B44)
		Order management (B45)
		Supply chain collaboration (B46)
	Marketing (B5)	Marketing management strategy (B51)
		Market analysis (B52)
		Digital marketing management (B53)
		Customer experience (B54)
Cultural organizational competence (C)	Culture (C1)	Risk appetite (C11)
		Test and learn (C12)
		Speed/agility (C13)
	Organization (C2)	Roles and responsibilities (C21)
		Talent and leadership (C22)
		Governance mechanisms/digital KPIs (C23)
		Organizational science for decision-making (C24)
	Ability (C3)	Data-driven decision-making (C31)
		Organizational process automation (C32)
		IT system support (C33)
Ecosphere (D)	Internal collaboration (D1)	Internal collaboration (D11)
	External resilience (D2)	External resilience (D21)

determined. It can be seen that the optimal jump distance when the company conducts product jump or transformation is actually determined by the company's survival period, the company's jump profit coefficient, and the product jump cost coefficient.

4.2. Descriptive Statistical Analysis of Survey Data Samples. Based on the five basic principles, this paper firstly constructs the digital maturity evaluation model of SMEs as shown in Table 1. In order to facilitate the distinction, this paper names the first-level indicators as dimensions, the second-level indicators as classes, and the third-level indicators as domains, and marks each indicator with its corresponding symbol for subsequent analysis [22].

4.3. Reliability and Validity Analysis. Reliability index: the reliability of the response scale refers to the measurement of whether the results are consistent when a certain thing is repeatedly measured by using a measurement tool or the same index [06]. Cronbach's Alpha value is usually used to reflect. If the Cronbach's Alpha value of the scale is greater than 0.7, it can be considered that the reliability of the scale and the items is high; if the Cronbach's Alpha value of the scale is between 0.5 and 0.7, it can be considered that the reliability of the scale and the items is average. The Cronbach's Alpha value of the table is less than 0.5, it can be considered that the reliability of the scale and the items is low, and it is necessary to consider resetting the scale. In this study, SPSS 25.0 was used to calculate the total Cronbach's Alpha value of the questionnaire as shown in Figure 4. Figure 5 shows the Cronbach Alpha values in different fields.

The total Cronbach's Alpha value is 0.964 and greater than 0.7, and then the reliability coefficients corresponding to the indicators at all levels are calculated. The analysis shows that the Cronbach's Alpha value of all indicators exceeds 0.5 and most of the Cronbach's Alpha values are greater than 0.7, indicating that the reliability indicators are reasonable and the reliability is acceptable. Therefore, the questionnaire has ideal reliability.

4.4. Construct Validity. Construct validity refers to the degree of integration between the measurement questionnaire and the theoretical or conceptual framework on which

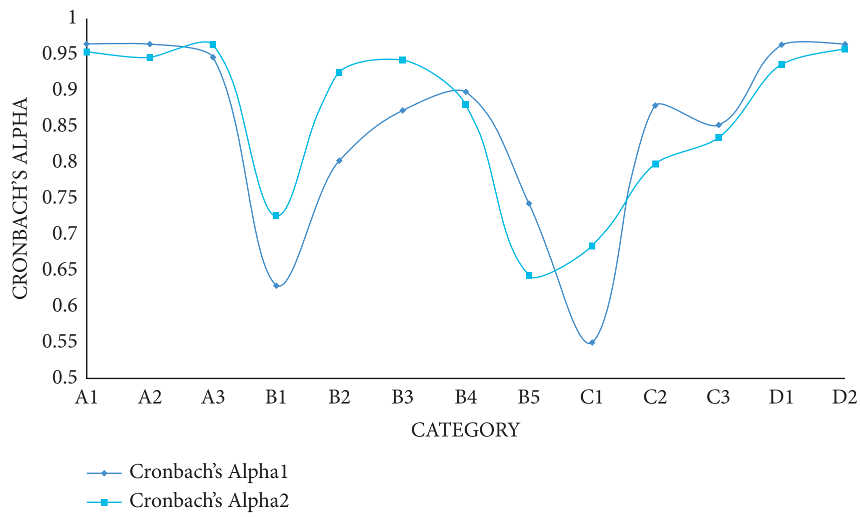

Figure 4: Cronbach's Alpha values for different categories.

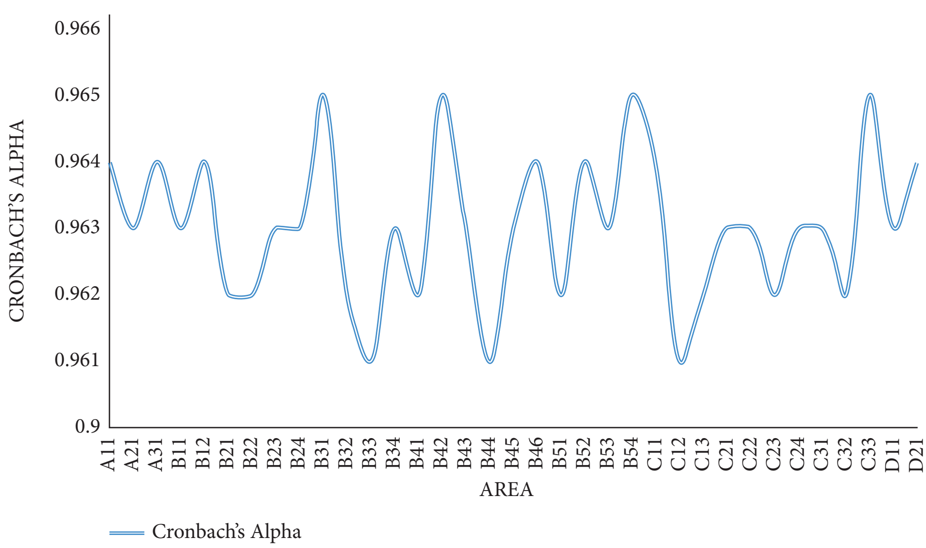

Figure 5: Cronbach's Alpha values in different domains.

it is based and mainly reflects whether the questionnaire can be used to measure the abstract concepts studied. Construct validity is usually assessed using factor analysis. Factor analysis is to transform and process the original variables into a small number of strong factors, use the strong factors to explain the observable variables to the greatest extent, and then reveal the relationship between the original variables and factor variables. This is a kind of dimensionality reduction analytical method. Before doing factor analysis, KMO-Bartlett is usually used to test the correlation between variables, so as to analyze whether the sample data is suitable for factor analysis. Under the premise that the Bartlett sphericity test value is less than 0.001, the closer the KMO value is to 1, the more suitable the sample data is for factor analysis. In factor analysis, each index has a high loading value on a common factor, and the cumulative variance contribution rate of all common factors is at least 40%, so that the structural validity of the questionnaire can be considered to be good. Figures 6 and 7 show the factor load after the maximum variance orthogonal rotation. The rotated factor loading matrix of each variable was obtained after factor analysis of the survey data with SPSS 25.0.

The KMO-Bartlett test was performed by SPSS 25.0, the KMO value of the sample was 0.958 and the Bartlett sphericity test value was 0.000, indicating that the sample data was suitable for factor analysis. Figure 6 shows that a total of 4 common factors were extracted in this study, and their cumulative variance contribution rate was 61.148%, which was higher than 40%.

The core step of the AHP-DEMATEL method is to combine the AHP combination weight W of each domain and the centrality of each domain calculated by the DEMATEL method to calculate the comprehensive influence degree of each domain, that is, the combination of each domain obtained based on the AHP-DEMATEL method. For the weight of each domain combination, see Figure 8.

After the orthogonal rotation with the maximum variance, the factor loading matrix of each index is obtained. It is

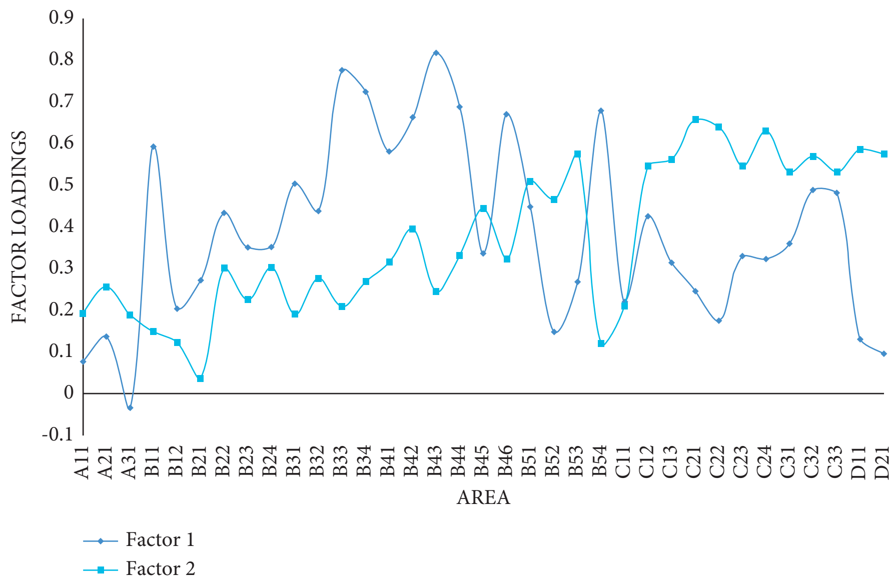

Figure 6: Factor loadings after orthogonal rotation with maximum variance.

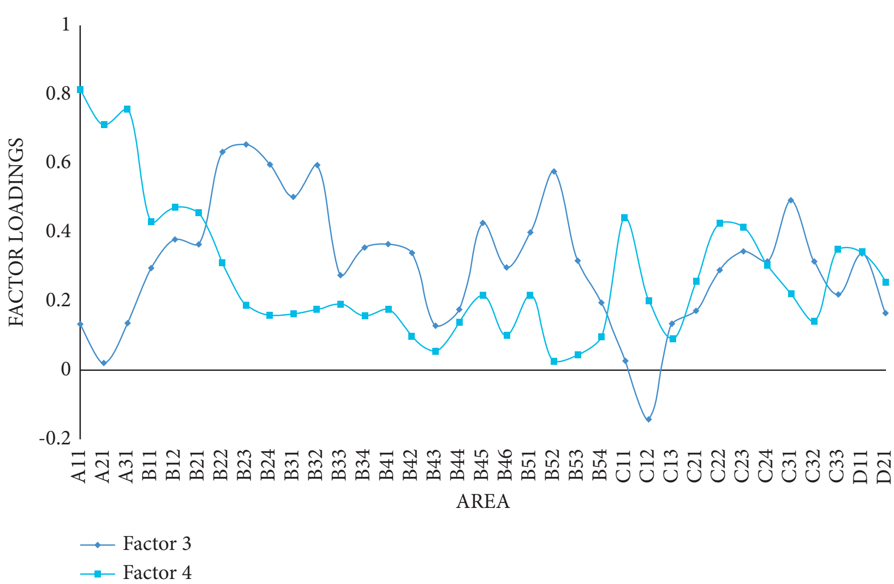

Figure 7: Factor loadings after orthogonal rotation with maximum variance.

generally considered that the standard threshold of the factor loading value is 0.4. For high loading values, the value is between 0.442 and 0.817, while the loading values on other common factors are lower. Therefore, it can be considered that this questionnaire has good construct validity.

4.5. Calculation of Digital Maturity Score. The top five centralities are internal collaboration (D11), organizational scientific decision-making (C24), organizational process automation (C32), data-driven decision-making (C31), and IT system support (C33). The size of the centrality reflects the degree of influence of this factor on the improvement of the digital capability of an enterprise, and an indicator with a higher centrality is an important reason for driving the improvement of the digital capability. Among them, internal collaboration is an important guarantee for the implementation of digitalization in the whole process of the enterprise. Organizational scientific decision-making and data-driven decision-making are the guidelines for the implementation of digitalization initiatives. Organizational process automation and IT system support are the prerequisites and foundations for the successful implementation of digitalization initiatives. The weight of each domain combination is shown in Figure 9.

The top five reasons are IT system support (C33), organizational process automation (C32, 0.890), talent and leadership (C22), long-term digital strategy orientation (A21), and customer value-focused (A31). This is because a complete IT system, correct digital strategy, and excellent digital talents are the foundation to ensure the successful implementation of

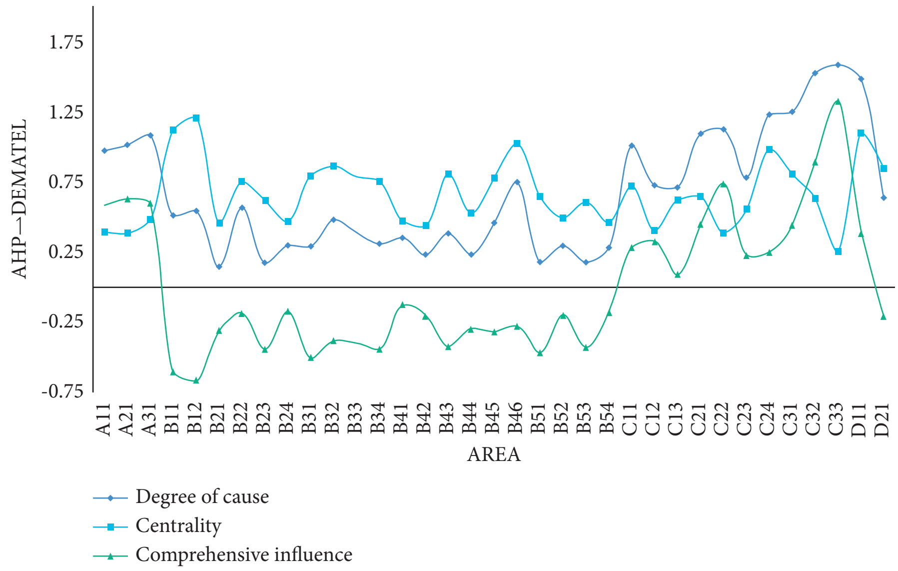

Figure 8: Values of causality, centrality, and comprehensive influence.

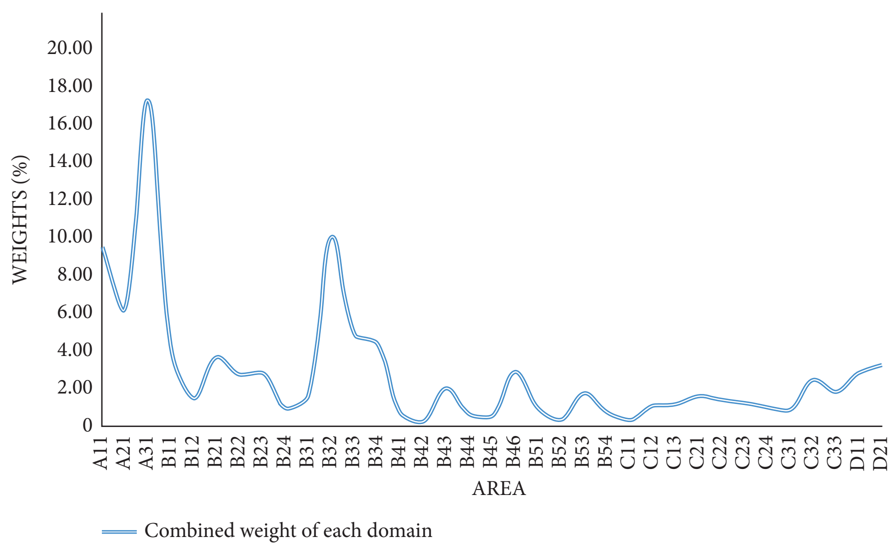

Figure 9: Combined weights of each domain.

digitalization. The top three outcome factors are customer customization (B12), rapid R&D (B11), and resource/process efficiency (B31). The outcome factor often plays a mediating role, and the cause factor promotes the development of the outcome factor to promote the improvement of digital capabilities. Customer customization, rapid R&D, and the improvement of resource/process efficiency all need to be supported by a number of other factors. At the same time, the improvement of these three indicators can directly affect the digital capabilities of enterprises.

Taking domain A11 as an example, the comprehensive score value of each domain can be obtained according to the following equation:

$$S_{11} = \frac{\sum_{i=1}^{k} (s_i * g_i)}{\sum_{i=1}^{k} g_i}. \quad (7)$$

Similarly, the combined score of each domain can be obtained as shown in Figure 10.

The top five in terms of comprehensive influence are the realization of customer value (A31), production quality management (B32), relevance to business strategy (A11), long-term digital strategy orientation (A21), and labor efficiency (B33). Indicators with high comprehensive influence are the core influencing factors to promote the improvement of digital capabilities of enterprises. Among them, the realization of customer value as the center, the correlation with business strategy, and the long-term digital strategy as the guide determine the degree of emphasis and direction of improvement on digitalization. Production quality management and labor efficiency are the key factors that determine the degree of digitalization in the production and manufacturing process of enterprises. Implement digital

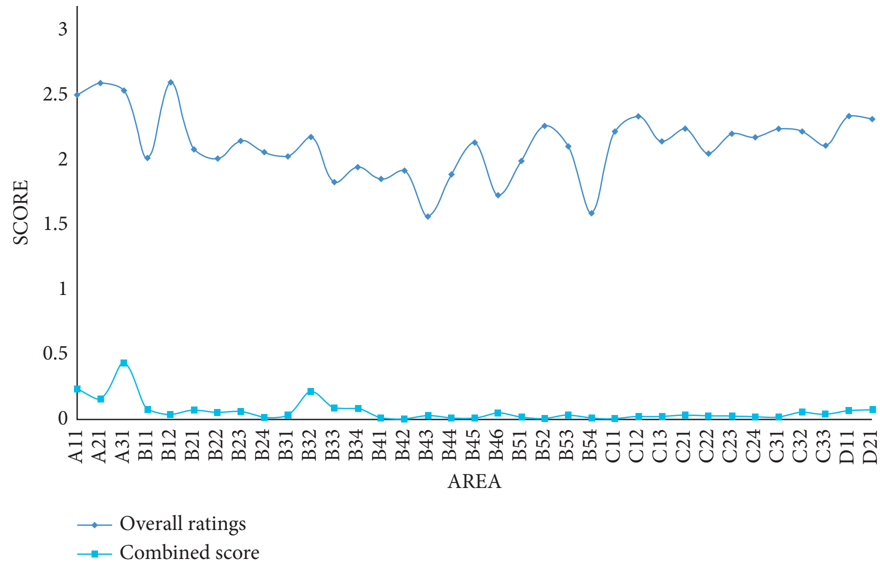

Figure 10: Comprehensive score and combined score of each indicator.

tools to make information more accessible throughout the organization. Communicate with digital transformation leaders (digital or non-digital transformation leaders, who are part of the transformation) to obtain transformation support. Revise Standard operating procedures to incorporate new digital technologies. Establish a clear change scenario for digital transformation description and cases of changes taking place. And the digitization of manufacturing processes is a top priority for small and medium-sized enterprises.

To sum up, it can be seen that the distribution of the weights of the indicators in this model is relatively reasonable, which further proves the reliability and validity of this model and also indirectly proves that the results obtained by this study are more authentic and credible.

5. Conclusions

Based on the maturity model theory and the multi-principle framework theory model, this research constructs an evaluation model of the digital maturity of small and medium-sized enterprises and an exploration model of the impact mechanism of digitalization of small and medium-sized enterprises on enterprise product transformation capabilities. Based on large sample data, a variety of statistical software and methods are used to conduct empirical research on the model. Based on the principles of scientificity, completeness, independence, objectivity, and operability, and on the basis of the relevant evaluation research on the digital maturity of small and medium-sized enterprises by international scholars, a three-level index system including dimension, category, and the domain is constructed. A model for evaluating the digital maturity of small and medium-sized enterprises based on the digital maturity evaluation model and the extended product space theoretical model and synthesizing relevant research results at home and abroad, a hypothetical model of the impact of digitalization of small and medium-sized enterprises on the enterprise's product transformation capability is constructed, and the corresponding questionnaire design and survey implementation are carried out. The obtained data were tested for reliability and validity. The digital maturity of SMEs was evaluated. The results found that the comprehensive score of digital maturity of small and medium-sized enterprises was 2.219, and the digital maturity level of small and medium-sized enterprises can be judged as "digital transformers." It can be said that small and medium-sized enterprises have achieved certain achievements in digital transformation and upgrading, but the overall level of digitalization is still to be further improved.

In addition, this study also conducts a comparative analysis of the digital maturity of SMEs in different regions and different industry types. When studying the impact of digitization of small and medium-sized enterprises on the product transformation capabilities of enterprises, because the organizational capabilities of digital culture cover a wide range of fields, it may have both positive and negative effects on the cost control capabilities of enterprise product transformation and offset each other. Future research can consider exploring the impact mechanism of the further refined digital field on the product transformation capability of enterprises so as to deepen the understanding of this mechanism [23, 24].

Data Availability

The data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares no conflicts of interest or personal relationships that could have appeared to influence the work reported in this paper.

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