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THE IMPACT OF DIGITAL TRANSFORMATION ON ENTERPRISE PERFORMANCE - DATA FROM HIGH-TECH ENTERPRISES IN THE YANGTZE RIVER DELTA REGION

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Abstract

Due to the existence of the "digital paradox", the mechanism and results of enterprise Digital transformation have been a hot topic of discussion among scholars in recent years. This article is based on the background of the integrated development of the Yangtze River Delta in China, with high-tech enterprises in the Yangtze River Delta as the research object, and collects sample data on Digital transformation and performance development of 375 enterprises. Based on Structural Equation Modeling (SEM), path relationships were constructed. The research results indicate that Digital transformation of enterprises has a significant positive impact on Enterprise performance through the comprehensive effects of value chain digitization, business process digitization, product and service digitization, and digital technology application. Meanwhile, Digital transformation of enterprises also has a significant positive impact on business model innovation, green innovation, and entrepreneurial spirit. Among them, green innovation and entrepreneurial spirit have a significant positive impact on Enterprise performance, while business model innovation has no significant impact on Enterprise performance. Further exploration can lead to the conclusion that green innovation and entrepreneurial spirit have a significant mediating effect between Digital transformation and Enterprise performance, while business model innovation has no mediating effect.

Keywords: Digital Transformation; Business Model Innovation, Green Innovation, Entrepreneurial Spirit; Enterprise Performance.

1. INTRODUCTION

The digital economy born from the Fourth Industrial Revolution has become a new driving force for global economic growth. According to data from the International Monetary Fund (IMF), the global digital economy has grown approximately 15 times in the past decade. This indicates that the digital economy is increasingly becoming an important driving force for global economic expansion. China's 14th Five Year Plan and the Third Plenary Session of the 20th Central Committee of the Communist Party of China have clearly put forward the intention of accelerating the development of the digital economy, promoting the transformation and progress of production technology through digitization, and effectively implementing the strategy of innovation leading development. According to the "Research Report on the Development of China's Digital Economy (2024)" released by the China Academy of Information and Communications Technology, the scale of China's digital economy will reach 53.9 trillion yuan in 2023, accounting for 42.8% of GDP. The digital economy has become a key force driving stable growth and transformation.

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As a key element of economic progress, enterprises have become a new driving force for economic development in the digital economy era through Digital transformation. The uncertainty of economic policies, as an important external objective factor, has a positive driving effect on the Digital transformation of enterprises. Under the uncertainty of economic policies, enterprises will actively embrace Digital transformation (Yangzhen et al., 2023).

Digital transformation relies on emerging technologies such as big data, artificial intelligence, blockchain, and cloud computing, which have had a profound impact on economic growth models and have become a trending research topic. Scholars have conducted qualitative and quantitative research on the potential economic consequences of Digital transformation, and the research results are divided into positive or negative impacts of Digital transformation. Some scholars hold an optimistic attitude towards Digital transformation. At the macro level, Rosário et al. (2023) compare the digital economy with sustainable development and argue that digital technology is beneficial for developing sustainable technology solutions, smart cities, sustainable urbanization, and sustainable consumption.

But what attracts our attention is whether the digitalization of enterprises at the micro level allows all enterprises to enjoy the digital dividend? Ekata (2012) proposed the so-called 'IT paradox' after examining the Digital transformation performance of Nigerian banks. In addition, industrial robots empowered by digital technology will also lead to more employee unemployment and lower labor income distribution (Acemoglu and Restrepo, 2020).

This process raises two fundamental research questions: how does Digital transformation affect Enterprise performance? What is the level of impact of Digital transformation on Enterprise performance? In order to address the research questions raised in this study, this article focuses on the relevant theories of the digital economy, selects high-tech enterprises in the Yangtze River Delta region of China as research objects, collects 375 research samples, introduces three mediating variables, and uses structural equation modeling (SEM) to explore the relationship between Digital transformation and Enterprise performance, and determine the impact mechanism and level of Digital transformation on Enterprise performance.

2. LITERATURE REVIEW

2.1 The Relationship between Digital transformation and Enterprise performance

From the focus of scholars' research, it is more about expressing the positive impact of Digital transformation on Enterprise performance, because intuitively, the more intelligent brought about by digitization can greatly improve work efficiency while also reducing the subjective physical work of employees. At the macro level, research has shown that digital technology and platforms can overcome geographical limitations, reduce the "digital divide", promote the optimization of economic geography, promote inclusive growth and high-quality economic development (Zhang Xun et al., 2019).

From a micro perspective, data has become an important factor of production, and the integration of digital technology and traditional business of enterprises can help enhance their ability to cope with market fluctuations. Digital, intelligent, and automated production methods

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can improve operational efficiency, cash flow, and return on investment capital for enterprises (Mikalef and Pateli, 2017; Chen Yizao, 2023.). Based on this, this study proposes the following hypotheses:

H1: The Digital transformation of enterprises has a significant positive impact on Enterprise performance.

2.2 The Relationship between Digital transformation and Business Model Innovation

From a macro perspective, Digital technology has become a key driving force for business model innovation by establishing new organizational structures, cost mechanisms, value exchange mechanisms, and cross-border organizational forms (LI, 2020).From an internal organizational perspective, Digital transformation will to some extent trigger changes in organizational structure and processes, driving the emergence of new processes and structures that adapt to external environmental changes, thereby achieving business model innovation. Digital transformation requires new organizational forms as carriers, such as more agile and open connectivity mechanisms (DASILVA CM, 2018), to promote creative formation and thus drive value proposition innovation.

Liu Jie et al. (2023) found that Gree Electric's digital "perception ability acquisition ability reconstruction ability" has driven the innovative development of its business model. Yun Lexin et al. (2023) explored the use of resources from the "acquisition stability mobilization" stage of Digital transformation exploration, to the "accumulation enrichment coordination" stage of transformation progress, and finally to the "stripping exploration deployment" stage of transformation diversification, achieving value reconstruction and value logic transformation, and completing business model innovation. Zhang Zhengang et al. (2022) believe that Digital transformation is a process in which enterprises rely on digital technology to adapt to dynamic environmental changes, transform existing organizational structures, improve operational efficiency, and become competitive. Based on this, this study proposes the following hypotheses:

H2: The Digital transformation of enterprises has a significant positive impact on Business Model Innovation.

2.3 The Relationship between Business Model Innovation and Enterprise performance

In recent years, researchers have been exploring the mechanisms through which business model innovation affects Enterprise performance (Bouncken, et al., 2021). A study targeting leaders in both private enterprises and government public sectors indicates that companies with outstanding financial performance place twice as much emphasis on business model innovation compared to those with poor performance (Furrer, Schmidt, & Heidenreich, 2018). The positive correlation between business model innovation and Enterprise performance is evident in the transformation of existing strategic partnerships, adoption of more flexible processes, and cost-cutting measures, leading to increased customer base. Business model innovation, rooted in business strategy and related theories, is a key factor in achieving competitive advantage and sustainable growth while being a necessary condition for superior performance outcomes. It has become one of the top three areas of innovation for CEOs to enhance overall Enterprise

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performance. By innovating their business models, companies can gain enduring competitive advantages that are difficult to replicate, translating into sustained profitability (Bouwman, Nikou, & de Reuver, 2019). Novel business model innovations, as proposed by Wu Yanbo et al. (2023), play a partial mediating role between platform integration capabilities, platform restructuring capabilities, and the growth of nascent businesses. Based on this, this study proposes the following hypotheses:

H3: Business Model Innovation has a significant positive impact on Enterprise performance.

2.4 The Relationship between Digital transformation and Green Innovation

The digital economy can achieve green innovation and enhance physical efficiency (Lv Desheng, 2023). Enterprises carrying out green innovation activities need to integrate environmental related information and research and development resources. Digital transformation not only enhances the effect of information sharing, but also improves the efficiency of enterprise R&D resource allocation (Lin Yongjia, 2023). Green innovation in enterprises is a composite activity that involves improving resource utilization efficiency (Burki et al., 2019), applying new technologies or production processes to reduce environmental pollution (Burki and Dahlstrom, 2017), and promoting innovative efforts in management and sustainability (Aboelmaged, 2018). Liu Chang et al. (2023) empirically analyzed the impact and mechanism of Digital transformation on the green innovation efficiency of manufacturing enterprises. The empirical results showed that Digital transformation can significantly improve the green innovation efficiency of manufacturing enterprises. These studies mainly explore the improvement of traditional innovation in enterprises from the perspective of digitalization level. Based on this, this study proposes the following hypotheses:

H4: The Digital transformation of enterprises has a significant positive impact on Green Innovation.

2.5 The Relationship between Green Innovation and Enterprise performance

Against the backdrop of "peaking carbon emissions and achieving carbon neutrality," China is undergoing a transition towards a green and low-carbon economy. Among them, green innovation has become a key driving force for transforming economic development patterns and achieving sustainable development, and is also the core of promoting ecological civilization construction. The impact of green innovation on short-term earnings and long-term performance of enterprises has been widely discussed in academia. Delgado et al. (2014) found in their study of Spanish metal companies that the synergistic effect of green product innovation and corporate marketing capabilities can enhance economic performance, and a good environmental image can have a positive effect on the economic benefits of green product innovation. The analysis by Tian Hong (2019) found that companies implementing forward-looking environmental strategies have better environmental and social performance. Wang Liping et al. (2021) found through panel data analysis of the four major heavily polluting industries in China that implementing environmental strategies can achieve a win-win situation

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for both environmental and economic performance of enterprises. Based on this, this study proposes the following hypotheses:

H5: Green Innovation in enterprises has a significant positive impact on Enterprise performance.

2.6 The Relationship between Digital transformation and Entrepreneurial spirit

Entrepreneurial spirit is seen as a source of economic vitality (Orlandi et al., 2021) and plays a crucial role in the implementation of Digital transformation (Paoloni et al., 2020). The supply chain integration brought about by Digital transformation is not only an upgrade and transformation of existing systems, but also represents the innovative efforts of enterprises in resource integration and restructuring, aiming to expand the development and application of resources. The essence of this innovation is consistent with the core of entrepreneurial spirit. In addition, entrepreneurial spirit can enhance a company's awareness of risk-taking, accelerate the process of external knowledge transforming into internal knowledge, and thereby promote the growth of Enterprise performance. The empirical research by Li Qi et al. (2021) further confirms the positive regulatory role of entrepreneurial spirit in the relationship between Digital transformation and Enterprise performance. Based on this, this study proposes the following hypotheses:

H6: The Digital transformation of enterprises has a significant positive impact on Entrepreneurial spirit.

2.7 The Relationship between Entrepreneurial spirit and Enterprise performance

Entrepreneurial spirit plays a crucial role in driving economic development and has a significant impact on Digital transformation. Xiong Can (2022) believes that entrepreneurial spirit can be described by five factors, namely individual characteristics, enterprise, economy, culture, and system. The study of individual entrepreneurs is the beginning of the field of entrepreneurial spirit research, and a series of quantitative measurement methods have been developed, such as psychological scales and the behavioral performance of entrepreneurs in the entrepreneurial process (Jie Yunhui et al., 2023); The research on the impact of corporate factors on entrepreneurial spirit mainly focuses on two levels: internal and external (Liu Junhai, 2023). With the rapid changes in the corporate environment and the shortening of the business model lifecycle, enterprises are facing increasing uncertainty in the future, which requires them to continuously explore new opportunities. Based on this, this study proposes the following hypotheses:

H7: Entrepreneurial spirit has a significant positive impact on Enterprise performance.

2.8 The mediating relationship between variables

From the literature review above, it can be seen that academic research on Digital transformation is increasingly focused on the micro level, mainly exploring the performance of Digital transformation on the internal development of enterprises. For example, the Digital transformation of enterprises will have a certain impact on production costs and operational efficiency, promote the accelerated flow of internal information, improve operational efficiency

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(Liu Fei, 2020), change the business model and operation mode of traditional industries, significantly reduce the degree of information asymmetry among internal entities, enhance the level of internal control of enterprises, improve the main business performance and enterprise performance (Zhang Hua et al., 2023), and promote the level of green innovation and sustainable development of enterprises. Moreover, Digital transformation, in the face of many uncertainties, can also stimulate entrepreneurs' innovative, adventurous, and forward-looking thinking abilities, thereby improving Enterprise performance. (Xia Han, 2020; Zheng Jinhui et al., 2023). Based on this, this study proposes the following hypotheses: **The mediating role of Business model innovation (H8), Green innovation (H9) and Entrepreneurial spirit (H10): Enterprise Digital transformation and enterprise performance.**

3. RESEARCH DESIGN

3.1 Sample and Data Collection

In order to ensure the efficiency and effectiveness of questionnaire collection, our questionnaire distribution method is synchronized through online Wenjuanxing and offline documents, targeting companies that have completed enterprise Digital transformation or have been engaged in enterprise Digital transformation work for more than three years to ensure that it is in line with reality. The target audience for the questionnaire is employees of high-tech enterprises in Changsanjiang. A total of 422 questionnaires were collected, and 375 valid questionnaires were retained. From the perspective of company establishment time, 26.7% of companies are new companies established within five years, while 60% of companies have been established for more than six years. Considering that companies undergoing Digital transformation require a certain foundation and experience, and their performance is relatively stable, this ratio provides higher credibility for subsequent data analysis and hypothesis exploration; From the perspective of enterprise types, state-owned enterprises and private enterprises together account for 88.3%, making them the two main market entities; From an industry perspective, the industry is widely distributed, involving electronic information, biotechnology, new energy technology, etc., to ensure the adaptability of the scale; From the perspective of employee size, there are 220 companies with more than 100 employees; Finally, from the perspective of the region to which the enterprise belongs, according to the methods of stratified sampling and proportional sampling, samples 106, 95, 87, and 87 were extracted from Zhejiang Province, Anhui Province, Jiangsu Province, and Shanghai City respectively, and the distribution was relatively balanced. Overall, the demographic variables in the sample have a wide coverage and balanced distribution, which meets the basic requirements for further analysis.

3.2 Variable measurement

To ensure the reliability and validity of the questionnaire, this study used mature scales from existing literature and made appropriate adjustments to the scales based on the purpose of this study and pre-test results. All items on the scale are designed using a Likert 5-point scale, where 1 represents' strongly disagree 'and 5 represents' strongly agree'.

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3.2.1 Independent variable

The independent variable of this study is enterprise Digital transformation (DT). Based on the technical characteristics of the research object, this article mainly refers to the Digital transformation measurement indicators demonstrated by Wang Hecheng (2021) and the enterprise Digital transformation scale proven by Yu Feifei (2021), with a total of 17 items in four dimensions.

3.2.2 Dependent variable

The dependent variable of this study is Enterprise performance (EP). Considering the significant economic uncertainty faced by enterprises in the past three years, which has led to unstable financial performance, this scale integrates the views of Hu Qing (2020), Valdez Ju á rez (2021), Zhang Hua (2023), and others, with a total of 11 items across 4 dimensions.

3.2.3 Mediating Variables

The first mediating variable in the study is Business Model Innovation (BMI), and a three-dimensional 11 item Business Model Innovation Scale was developed by drawing on the perspectives of Claus (2017), Latifi et al. (2021), and others; The second mediating variable in the study is Green Innovation (GI), which was measured using the scales developed by Huang Xiaoxing et al. (2015) and Wang Liang (2021) to obtain 17 items across four dimensions; The third mediating variable studied is entrepreneurial spirit (ES), with a focus on referring to Si Haijian's (2022) research on entrepreneurial spirit, measuring entrepreneurial spirit indicators through 11 items across 3 dimensions. As shown in Figure 1, the optimized conceptual model.

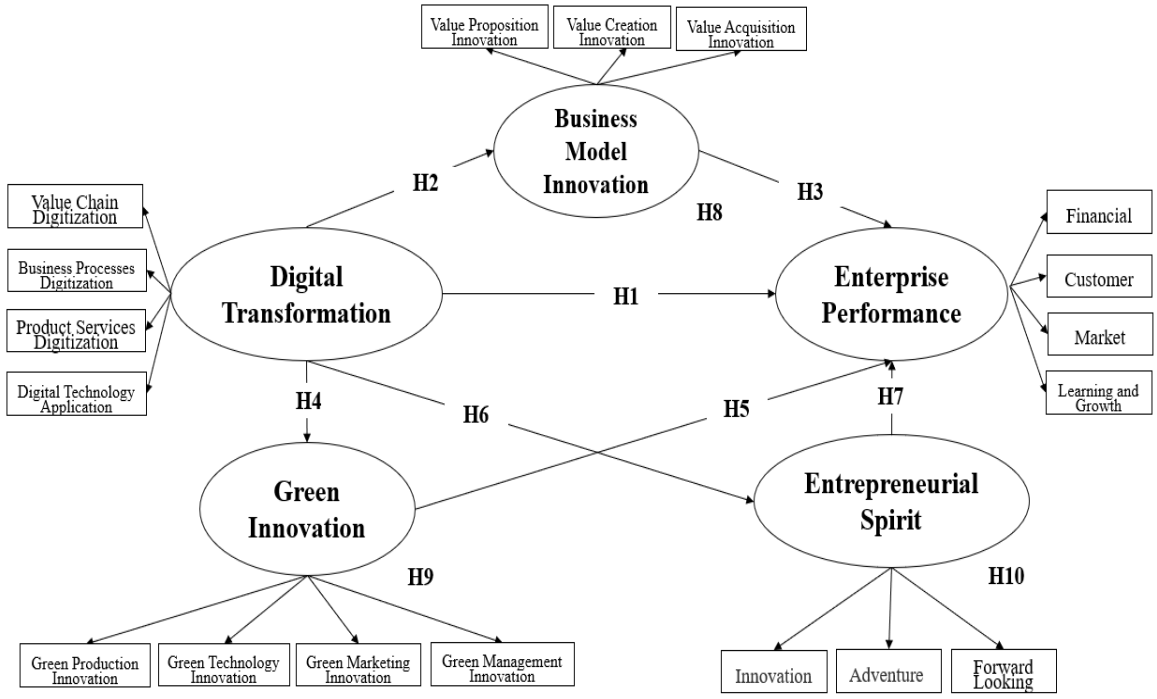

Figure 1: Conceptual Framework

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4. DATA ANALYSIS

4.1 Reliability and validity testing

4.1.1 Reliability testing

Perform reliability and validity analysis using SPSS26 software. Analyzed Cronbach's alpha coefficient. The reliability coefficients of all 5 variables, 18 dimensions, and 65 measurement items meet the requirements, and the reliability coefficients of all dimensions of the scale are greater than 0.8, indicating that the reliability quality of the research data is high. Secondly, regarding the CITC value, the CITC values of the analyzed items are all greater than 0.4, fully indicating a good level of reliability between the analyzed items.

4.1.2 Aggregation validity test

Aggregation validity research is used to analyze whether research projects are reasonable and meaningful. Using factor analysis as a data analysis method for research, comprehensive analysis was conducted using indicators such as AVE value (average variance extraction), CR value (combination reliability), and factor loading coefficient value to verify the level of aggregation validity of the data. The AVE and CR indicators meet the requirements, and the absolute values of the standard factor loadings are both greater than 0.6, showing significance, indicating a good measurement relationship.

4.1.3 sphericity test of KMO and Bartlett

After completing the content validity test, it is necessary to determine the applicability of information extraction through KMO value and Bartlett sphericity test, and analyze the KMO value. The KMO value of the variable and Bartlett's sphericity test are both within a reasonable range, indirectly indicating its good effectiveness.

4.1.4 Differential validity test

Discriminant validity testing refers to the ability of a test to discriminate validity if it can be statistically proven that indicators that should not be related to a predetermined structure are indeed unrelated to that structure. The discriminant validity test is usually conducted using the Fornell Laker standard scale. According to the Fornell Lacker standard table, all diagonal elements exceed 0.50, indicating that all structures have satisfactory convergence effectiveness. Most non diagonal elements are lower than their corresponding diagonal elements, indicating good discriminant validity.

4.2 Structural Equation Modeling Verification

Through multicollinearity analysis, both at the problem item level and latent variable level, all VIF values did not exceed 5. Therefore, we can safely use these data for subsequent structural equation modeling analysis. Figure 2 shows the results of modeling and structural equation modeling using SmartPLS4. The inner model displays the path coefficients and p-values, while the outer model displays the t-values. Moreover, after model output testing, the R-variance and adjusted R-squared of the latent variables were both above 0.7, indicating good explanatory power of the model. At the same time, Q^2 values were mostly above 0.6, indicating good correlation of the model in predicting these variables.

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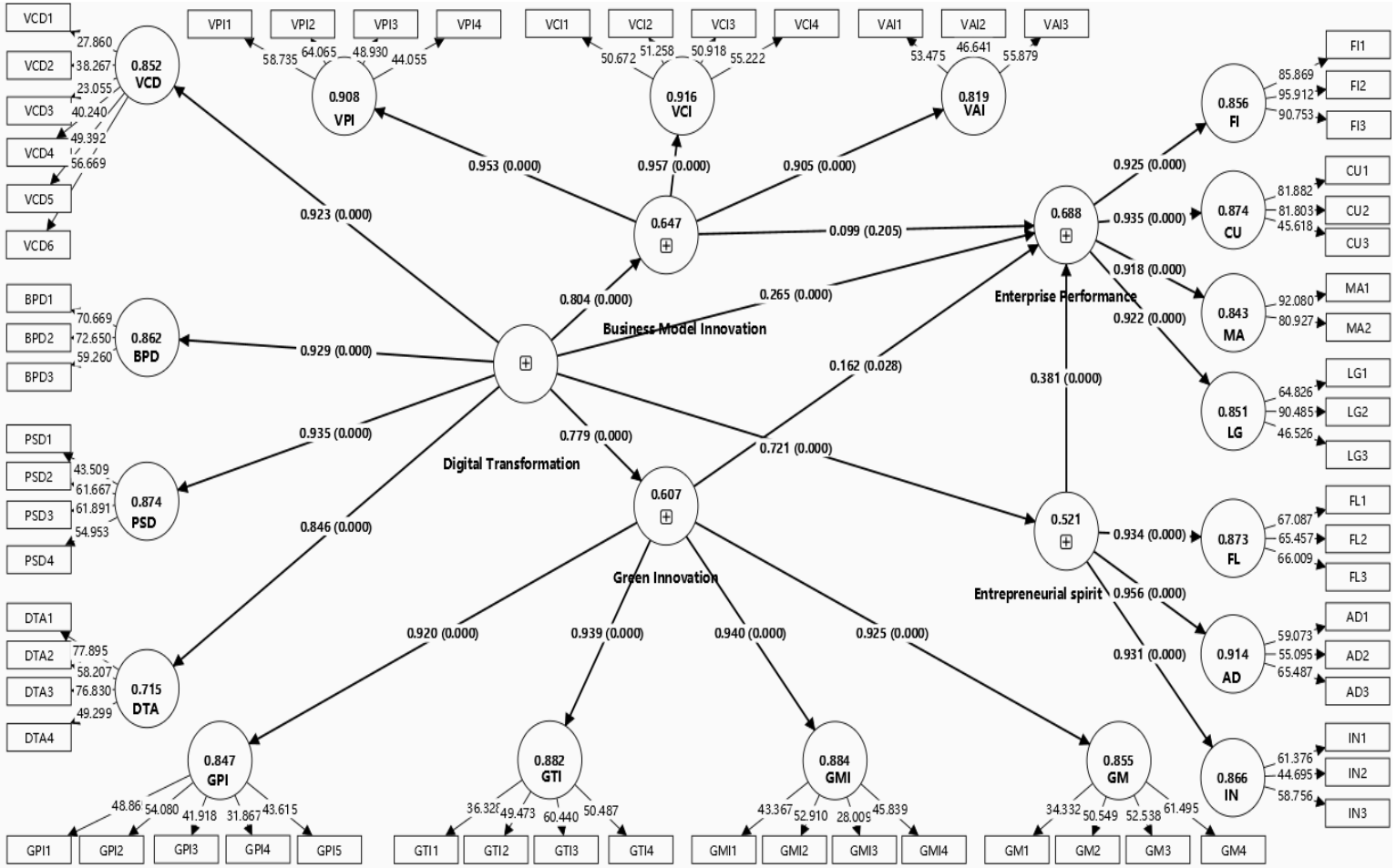

Figure 2: Structural Equation Model in SmartPLS 4

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4.2.1 Direct Path Analysis

Figure2 and Table4-1, indicating the relationship between the independent variable and the dependent variable.

1) The path coefficient of Digital transformation on Enterprise performance is 0.265, ($t = 4.017$, $p<0.01$), indicating that Digital transformation has a significantly positive impact on Enterprise performance, which supporting Hypothesis 1.
2) The path coefficient of Digital transformation on Business Model Innovation is 0.804, ($t=36.489$, $p<0.01$), indicating that Digital transformation has a significantly positive impact on Business Model Innovation, which supporting Hypothesis 2.
3) The path coefficient of Business Model Innovation on Enterprise performance is 0.099, ($t =1.267$, $p>0.05$), indicating that Business Model Innovation did not has a significantly positive impact on Enterprise performance, which cannot supporting Hypothesis 3.
4) The path coefficient of Digital transformation on Green Innovation is 0.779, ($t =27.744$, $p<0.01$), indicating that Digital transformation has a significantly positive impact on Green Innovation, which supporting Hypothesis 4.
5) The path coefficient of Green Innovation on Enterprise performance is 0.162, ($t = 2.200$, $p<0.05$), indicating that Green Innovation has a significantly positive impact on Enterprise performance, which supporting Hypothesis 5.
6) The path coefficient of Digital transformation on Entrepreneurial spirit is 0.721, ($t = 23.942$, $p<0.01$), indicating that Digital transformation has a significantly positive impact on Entrepreneurial spirit, which supporting Hypothesis 6.
7) The path coefficient of Entrepreneurial spirit on Enterprise performance is 0.381, ($t = 5.091$, $p<0.01$), indicating that Entrepreneurial has a significantly positive impact on Enterprise performance, which supporting Hypothesis 7.

4.2.2 Indirect path analysis

From the path coefficient results derived from Figure2 and Table4-1, we can further discover some indirect effects.

1) Digital transformation >Business Model Innovation >Enterprise performance, with a path coefficient of 0.080 ($t=1.262$, $p>0.05$), indicates that Business Model Innovation does not have a significant mediating effect on the impact of Digital transformation on Enterprise performance.
2) Digital transformation >Green Innovation >Enterprise performance, with a path coefficient of 0.126 ($t=2.157$, $p<0.05$), indicates that Green Innovation has a mediating effect on the impact of Digital transformation on Enterprise performance.
3) The path coefficient of Digital transformation >Entrepreneurial Spirit >Enterprise performance is 0.275 ($t=5.006$, $p<0.01$), indicating that Entrepreneurial Spirit has a mediating effect on the impact of Digital transformation on Enterprise performance.

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Table 4.1: Path Coefficients

Hypothesis	Direct Path	Original	Mean	STDEV	T	P	Confidence 2.5%	Confidence 97.5%
H1	Digital transformation > Enterprise performance	0.265	0.262	0.066	4.017	0.000	0.130	0.389
H2	Digital transformation > Business Model Innovation	0.804	0.805	0.022	36.489	0.000	0.760	0.845
H3	Business Model Innovation > Enterprise performance	0.099	0.101	0.078	1.267	0.205	-0.053	0.258
H4	Digital transformation > Green Innovation	0.779	0.779	0.028	27.744	0.000	0.722	0.830
H5	Green Innovation > Enterprise performance	0.162	0.165	0.074	2.200	0.028	0.023	0.311
H6	Digital transformation > Entrepreneurial spirit	0.721	0.723	0.030	23.942	0.000	0.659	0.779
H7	Entrepreneurial spirit > Enterprise performance	0.381	0.379	0.075	5.091	0.000	0.229	0.521
H8	Digital transformation > Business Model Innovation > Enterprise performance	0.080	0.081	0.063	1.262	0.207	0.043	0.207
H9	Digital transformation > Green Innovation > Enterprise performance	0.126	0.129	0.059	2.157	0.031	0.018	0.287
H10	Digital transformation > Entrepreneurial spirit >Enterprise performance	0.275	0.274	0.055	5.006	0.000	0.165	0.380

5. CONCLUSION AND DISCUSSION

5.1 Conclusion

Against the backdrop of China's pursuit of high-quality economic growth, Digital transformation of enterprises empowers high-quality development through digital technology capabilities. Considering the existence of the 'digital paradox', it is possible that many times a company's digital capabilities may not directly benefit its performance, and there may also be indirect responses, which provides ample research space for this article.

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The research results indicate that Digital transformation of enterprises has a significant positive impact on Enterprise performance through four aspects: value chain digitization, business process digitization, product and service digitization, and digital technology application, with an impact coefficient of 0.265.

In this process, we found that Digital transformation can affect Enterprise performance through green innovation measures such as developing green technologies, improving environmental capabilities, reducing costs and increasing efficiency, and talent management methods; In addition, taking the path of Digital transformation can further stimulate the innovation ability, adventurous spirit, and forward-looking thinking of enterprise managers or entrepreneurs.

It can be understood that facing the high uncertainty of the Digital transformation path, accompanied by high trial and error costs, entrepreneurs need strong abilities and psychological qualities as support, which will ultimately benefit the development of the enterprise.

5.2 Discussion

The article surprisingly found that the impact of business model innovation on Enterprise performance growth is not significant. The reason may be that: firstly, the business model innovation scale used in this article mainly refers to foreign scales, which have certain differences in understanding, and involves the vague concept of "value creation", which is difficult for questionnaire respondents;

Secondly, high-tech enterprises are a combination of knowledge intensive and technology intensive, and their performance is more reflected in the improvement of knowledge level, while business model innovation focuses on customer maintenance and operational innovation; Thirdly, in recent years, China's manufacturing industry has been promoting transformation and upgrading under new economic policies, pursuing high-quality development, including actively encouraging "bottleneck" technology research and development, developing and introducing new intelligent equipment.

This series of processes is accompanied by high capital and labor costs, which may contradict the expected results of business model innovation.

Finally, it should be emphasized that there is currently no unified conclusion on the relationship between Digital transformation and Enterprise performance, as Digital transformation of enterprises is an extremely complex and systematic project that includes various aspects of business development, including organizational strategy, operational system, management mechanism, as well as specific technologies, products, markets, etc.

In addition, there are differences in the resource elements possessed by different enterprises themselves. Therefore, when measuring Digital transformation, the design direction of indicators may also affect the impact mechanism of Digital transformation, leading to unclear economic outcomes after digitization. Therefore, the future research direction of this article is based on specific industries, further distinguishing and refining the dimensions and measurement methods of enterprise digitization, and exploring the objective value of enterprises' use of digital technology empowerment in a targeted manner.

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References

1) Acemoglu, D., & Restrepo, P. (2018). The race between man and machine: Implications of technology for growth, factor shares, and employment. *American Economic Review,* 108(6), 1488-1542.

2) Aboelmaged, M. (2018). Direct and indirect effects of eco-innovation, environmental orientation and supplier collaboration on hotel performance: An empirical study. *Journal of Cleaner Production***,** 184, 537-549.

3) Bouwman, H., Nikou, S., & de Reuver, M. (2019). Digitalization, business models, and SMEs: How do Business Model Innovation practices improve performance of digitizing SMEs? *Telecommunications Policy*, 43, 101828.

4) Burki, U., Ersoy, P., & Najam, U. (2019). Top management, Green Innovations, and the mediating effect of customer cooperation in green supply chains. *Sustainability***,** 11(4), 1031.

5) Burki, U., & Dahlstrom, R. (2017). Mediating effects of Green Innovations on interfirm cooperation. *Australasian Marketing Journal,* 25(2), 149-156.

6) Bouncken, R. B., Kraus, S., & Roig-Tierno, N. (2021). Knowledge- and innovation-based business models for future growth: Digitized business models and portfolio considerations. *Review of Managerial Science***,** 15(1), 1-14.

7) Chen, Y. (2023). Research on the Innovation Mechanism of Business Models Driven by Information Technology. *Doctoral dissertation, University of Science and Technology of China.*

8) Clauss, T. (2017). Measuring Business Model Innovation: Conceptualization, scale development, and proof of performance. *R & D Management***,** 47(3), 385-403.

9) Delgado, V. M., Martin, C. G., Navas, L. J., et al. (2014). Vertical relationships, complementarity, and product innovation: An intellectual capital-based view. *Knowledge Management Research & Practice,* 12, 226-235.

10) DaSilva, C. M. (2018). Understanding business model innovation from a practitioner perspective. *Journal of business models*, *6*(2), 19-24.

11) Ekata, G. E. (2012). The IT productivity paradox: Evidence from the Nigerian banking industry. *The Electronic Journal of Information Systems in Developing Countries***,** 51(1), 1-25.

12) Furrer, F., Schmidt, J., & Heidenreich, S. (2018). Effectuation or Causation as the Key to Corporate Venture Success? Investigating Effects of Entrepreneurial Behaviors on Business Model Innovation and Venture Performance. *Long Range Planning***,** 51(1), 64-81.

13) Hu, Q. (2020). Mechanism and performance of enterprise Digital transformation. *Zhejiang Tribune***,** 2020(02), 146-154.

14) Huang, X., Hu, Z., Fu, C. & Yu, D. (2015). The Mechanism of the Impact of Green Innovation Strategy on Enterprise performance - Mediating Effect Based on Green Dynamic Capability. *Science and Technology Progress and Countermeasures* (17), 104-109.

15) Jie, Y. & Cui, H. (2023). How does entrepreneurial spirit promote the formation of the main position of enterprise innovation Journal of Beihang University (Social Sciences Edition) (02), 124-133.

16) Lv, D., Wang, J. & Tang, Q. (2023). Has the digital economy achieved "incremental improvement" in green innovation? Based on the perspective of heterogeneous environmental concerns. *Shanxi University of Finance and Economics* (05), 55-68.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.13744310

17) Liu, J. (2023). Reconstruction of Director Responsibility System: Precise Accountability, Reasonable Fault Tolerance, and Tolerance for Failure - From the Perspective of Promoting Entrepreneurial Spirit. *Jiao Tong University Law* (03), 94-119.

18) Lin, Y., Yang, C. & Cai, X. (2023). Digital transformation of Enterprises and Upgrading of Green Innovation Capability - An Analysis Based on Network Effects. *Modern Finance and Economics* (Journal of Tianjin University of Finance and Economics) (02), 3-19.

19) Latifi, M. A., Nikou, S., & Bouwman, H. (2021). Business model innovation and firm performance: Exploring causal mechanisms in SMEs. *Technovation*, *107*, 102274.

20) Liu, C., Pan, H., Li, P. & Feng, Y. (2023). Research on the Impact and Mechanism of Digital transformation on Green Innovation Efficiency of Manufacturing Enterprises. *China Soft Science* (04), 121-129.

21) Liu, F. (2020). How Digital transformation enhances manufacturing productivity: Based on the triple impact mechanism of Digital transformation. *Economic Science*, 2020(10), 93-107.

22) Li, F. (2020). The Digital transformation of business models in the creative industries: A holistic framework and emerging trends. *Tech-novation*, 92-93, 102012.

23) Li, Q., Liu, L. & Shao, J. (2021). Digital transformation, Supply Chain Integration, and Enterprise performance - The moderating effect of entrepreneurial spirit. *Economic Management* (10), 5-23.

24) Mikalef, P., & Pateli, A. (2017). Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS-SEM and fs QCA. *Journal of Business Research*, 70(C), 1-16.

25) Orlandi, L. B., Zardini, A., & Rossignoli, C. (2021). Highway to Hell: Cultural Propensity and Digital Infrastructure Gap as Recipe to Entrepreneurial Death. *Journal of Business Research*, 123(2), 188-195.

26) Paoloni, M., Coluccia, D., & Fontana, S., et al. (2020). Knowledge Management, Intellectual Capital and Entrepreneurship: A Structured Literature Review. *Journal of Knowledge Management*, 24(8), 1797-1818.

27) Rosário, Albérico Travassos, and Joana Carmo Dias (2023). "The new digital economy and sustainability: challenges and opportunities." Sustainability 15.14: 10902.

28) Si, H. (2022). Research on the Impact and Mechanism of Chinese Entrepreneurial Spirit on Company Performance. Doctoral dissertation, Beijing Jiaotong University.

29) Tian, H., & Wang, Y. (2019). The Impact of Corporate Environmental Strategy on Triple Performance: A Study. *Journal of Xi'an Jiaotong University (Social Sciences Edition)*, 39(04), 19-26.

30) Valdez-Juárez, L. E., & Castillo-Vergara, M. (2021). Technological capabilities, open innovation, and eco-innovation: Dynamic capabilities to increase Enterprise performance of SMEs. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 8.

31) Wang, H., Wang, S., Liu, R. (2021). Research on Enterprise Digital Maturity Model. *Management Review*, 33(12), 152-162.

32) Wang, L. (2021). Mechanisms for Enhancing Sustainable Construction in Building Enterprises from the Perspective of Green Innovation. *[Doctoral dissertation]*.

33) Wu, Y., Han, W. & Shao, Y. (2023). Digital Platform Capability, Innovative Business Models, and Growth of New Entrepreneurs. *Research and Development Management* (06), 71-84.

34) Wang, L., Yao, Z., & Li, C. (2021). The Impact of Environmental Strategy on Environmental Performance and Economic Performance: Moderating Effects Based on Enterprise Growth and Market Competitiveness. *Resources Science*, 43(01), 23-39.

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.13744310

35) Xiong, C. (2022). Research on the Impact of Digital Finance on the Entrepreneurial Spirit of Regional Returning Home Entrepreneurship. *Doctoral dissertation, Hunan Agricultural University.*

36) Xu, M. Z., & Lv, T. (2020). Zhejiang's practice of the digital economy: Development process, model characteristics, and experiential insights. *Policy Review*, 2020(02), 49-53.

37) Xia, H (2020). The Impact of Entrepreneurial Spirit and Corporate Innovation on Corporate Growth, *Doctoral dissertation*, *Zhongnan University of Economics and Law.*

38) Yang, Z., Chen, J. & Wu, H. (2023). "Embrace" or "Reject": Economic Policy Uncertainty and Digital transformation of Enterprises. *Economist* (01), 45-54.

39) Yu, F., Cao, J., & Du, H. (2022). The digital paradox: the dual-edge effect of enterprise digitization on innovation performance. *Research and Development Management*, (02), 1-12.

40) Zhang, H. & Gu, X. (2023). Digital Capability, Open Innovation, and Enterprise performance - The moderating effect of innovation exclusivity. *Science and Technology Management* (06), 132-149.

41) Zhang, X., Wan, G., Zhang, J., & He, Z. (2019). Digital Economy, Inclusive Finance, and Inclusive Growth. *Economic Research*, 54(08), 71-86.

42) Zhang, Z., Zhang, J., Ye, B. & Chen, Y. (2022). The Impact of Enterprise Digital transformation on Business Model Innovation. *Technological Progress and Countermeasures* (11), 114-123.

43) Zheng, J., Xu, W. & Liu Chengjun (2023). Digital Finance, Entrepreneurial Spirit, and High Quality Development of the Private Real Economy in the Yangtze River Delta. *Finance and Economics* (05), 47-56.