The Multiple Impacts of Digital Transformation on Corporate Performance in Manufacturing Enterprises

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Abstract. Manufacturing is currently the main battlefield of industrial digitalisation in China, for manufacturing enterprises that are actively seeking digital transformation strategies to improve corporate performance. The article takes manufacturing enterprises undergoing digital transformation in China as the research object, based on the annual report information of Chinese manufacturing enterprises listed in 2017-2021, and systematically explores the impact of digital transformation on the performance of manufacturing enterprises through the methods of text mining and regression analysis. The results show that: digital transformation has a significant positive impact on enterprise performance and servitization level, the implementation of servitization strategy by enterprises helps to improve enterprise performance, the level of servitization has a partially mediating effect between digital transformation and enterprise performance, the government's active release of digitization policies reinforces the impact of enterprise performance brought by digital transformation, and corporate executives are affected by multiple contexts on enterprise performance in the context of digitization, and the study The results provide relevant recommendations for government digitalisation policy formulation and the transformation and upgrading of manufacturing enterprises.

Keywords: Manufacturing ;Digital transformation; Enterprise performance; Text mining

1 Introduction

Big data, artificial intelligence, and other emerging digital technologies are continuing to emerge with the in-depth development of the current round of scientific and technology revolution and industrial change.The digital economy is constantly accelerating the pace of transformation and upgrading of traditional industries in China. General Secretary Xi Jinping has emphasised the importance of "promoting the integration of digital technology with the real economy and empowering traditional industries".Stressing how important it is for businesses to go digital in order to support future economic growth. The manufacturing sector, which supports China's whole economy, is a key indicator of the nation's innovation, competitiveness, and all-encompassing might.And the "Made in China 2025" also clearly puts forward the strategic goal of realising a strong manufacturing country through the "three-step" process, which puts forward higher requirements for the transformation of the manufacturing industry.

However, because most enterprises are difficult to predict the economic benefits of investment in digital transformation and the impact on enterprise development, and the impact of digital

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reform on enterprise performance there are differences, to a certain extent, hindering the reform and upgrade of the enterprise's positive initiative. So how to correctly guide the digital transformation to help enterprises to improve performance and reduce the uncertainty of enterprises on digital transformation is very important, so it is necessary to study the impact mechanism of digital transformation on manufacturing enterprises to promote enterprises to achieve the transformation of the enterprise, the high-quality development of enterprises and the government to formulate the relevant policies have important practical significance.

2 Theoretical Basis and Research Assumptions

2.1 Digital Transformation

[1]The concept of digital transformation mainly centres on the application of technology, which leads to organizational change. [2]The activity of enterprises utilizing information technology to develop and apply new digital businesses in the production process, which can bring new participants, management practices, and values, thereby changing or supplementing the existing organizational culture and business activities, [3]helping to continuously optimize business processes and organizational structures, cultivate new corporate culture, and improve research and development innovation capabilities. The digital transformation of the manufacturing industry is a strategic driven business transformation that promotes the bidirectional integration of business and systems. [4]With digitalization as the core and the use of networked means, it achieves intelligent empowerment, ensures efficient and high-quality delivery of products and services, and continuously enhances the competitiveness of enterprises.Digital transformation has become a powerful weapon for enterprises in this dynamic and complex environment.

2.2 Enterprise Performance

[5]Enterprise performance refers to the comprehensive benefits achieved by an enterprise, which reflects the overall operational results of the enterprise manager. It is a measurable standard for the economic benefits and operational status of the enterprise during its development process, mainly reflected in the business performance and operator performance of the enterprise. Scholars have also begun to discuss and verify the relationship between digital transformation and corporate performance,and have come to the following views: [6]Vial (2019) believes that digital transformation will change organizational strategies and mechanisms to create pathways, promote organizational change, and improve operational efficiency of enterprises. [7]Additionally, the manufacturing industry's industrial chain can be affected by digital technology, resulting in new models like networked collaborative manufacturing and enterprise service-oriented manufacturing that will improve the modernization and transformation of traditional manufacturing, and thus having a positive impact on performance. However, some scholars believe that digital transformation has negative effects on corporate performance: in manufacturing enterprises, the positive effect of information technology on performance requires continuous investment of a large amount of manpower, material resources, and funds. [8]Enterprises may face resource constraints and other difficulties, and the advantages brought by technological progress have not been fully demonstrated, so the impact on performance is not significant. [9]And in the real business

process, most enterprises find it difficult to meet these conditions, and only some enterprises can improve their performance by improving the degree of digital transformation.

It is clear that there are still differences in how the digital revolution affects the productivity of businesses. Therefore, it is very important to measure the impact of digital transformation on enterprise performance through factual evidence at this stage, providing important practical basis for subsequent enterprise transformation and upgrading. Most scholars use financial indicators such as Return on Assets (*ROA*) and Return on Equity (*ROE*) to measure corporate performance, while the Return on Assets (*ROA*) indicator used to measure corporate profitability can better reflect the comprehensive changes in corporate performance.

2.3 Research Assumptions

(1) The Direct Effect of Digital Transformation on Enterprise Performance

It is evident from the study that the impact of digital transformation on enterprise performance is still uneven, and digital transformation is a complex process that requires continuous exploration and attempts to organically integrate digital facilities with digital resources, and to continuously cultivate digital talents so that they can maximize the use of digital tools and digital knowledge to play a great role, and thus improve enterprise performance. Digital transformation is also a long-term process, and it takes a long time for enterprises to shape the activities of carrying out digital reforms into final corporate benefits, so there will be a certain time lag effect in the impact of digital reforms on corporate performance. But digital transformation in the long run will form a long-term positive impact on the economic benefits of enterprises, and this positive impact will be a decreasing trend over time.The following hypothesis is proposed:

H1: Digital transformation has a positive impact on enterprise performance

(2) The mediating effect of enterprise service level

Not only have the production and manufacturing models undergone new changes as a result of the growth of digital technology, but also promoted the emergence of digital marketing methods. [10]The implementation of the "product+service" strategy helps optimize the industrial chain of enterprises, promote the pace of digital transformation in the manufacturing industry, and help enterprises meet different service needs of consumers, thereby promoting personalized customized services, increasing consumer purchasing desire, and improving enterprise performance. [11]The level of service-oriented services has been improved through digital transformation and the use of digital technology to optimize supply chain processes, promoting a high degree of integration between digitalization and service-oriented services. [12]So there is a close correlation between digitization and service-oriented level. For traditional manufacturing enterprises, other business income can reflect the benefits and income obtained by providing services to a certain extent. In order to measure the amount of service-oriented services, the ratio of other business income to the total income of the enterprise is utilized, which is a widely accepted method in the academic community. The following assumption is proposed:

H2: Digital transformation can improve enterprise performance by improving service level

(3)The moderating effect of government policies and executive level

[13]The digital transformation policy of the manufacturing industry is a policy tool adopted by the government to encourage, support, and ensure the comprehensive transformation of the external support environment such as economy and society required during the transformation and upgrading process of the manufacturing industry. [14]Constructing a policy environment conducive to enterprise transformation and transformation can drive the upgrading effect of the manufacturing industry from the external environment and increase its competitiveness. [15]The transformation policy of the manufacturing industry clarifies the responsibility of relevant institutions to protect the rights and interests of enterprises, which will promote enterprises to firmly implement transformation and upgrading. In the short term, large state-owned manufacturing enterprises in the country will take the lead in transformation and upgrading according to corresponding national policies, which may affect their performance due to insufficient experience and technology in the first batch of transformation. However, in the long run, gGovernment policies are the guarantee for enterprise transformation. Therefore, the following assumption is proposed:

H3: Government policies strengthen the positive impact of digital transformation on corporate performance

[16]In the process of enterprise transformation and upgrading, high-quality talents with professional knowledge can apply digital technology more flexibly based on the actual production and operating conditions of the enterprise, promote the optimization of business processes, and thereby improve enterprise performance.The level of management directly determines the rational utilization of talent, resources, etc. The educational level of executives determines their own values and systems. They are more receptive to emerging knowledge and will approach it with a developmental perspective, making the right decisions at the appropriate time. Research has found that the education level of the executive team has a positive impact on the growth of high-tech enterprises. [17]Managers with higher education levels will have a higher architecture and consider issues from a global perspective rather than from their own perspective. It can be found that management teams with higher education levels are more inclined to make changes, implement transformation and upgrading, and thereby improve corporate performance. The following assumption is proposed:

H4: The management level strengthens the positive impact of digital transformation on corporate performance

Based on the above assumptions, the conceptual model of this article is shown in Figure 1.

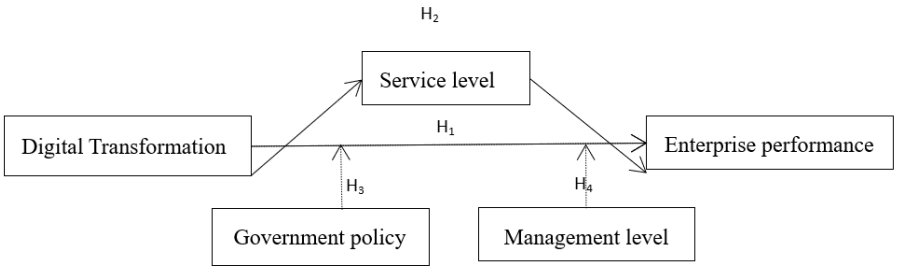

Fig. 1.A conceptual model of the impact of digital transformation on enterprise performance.

3 Research Design

3.1 Data Sources

Considering the availability of data related to enterprise digital transformation, this article uses the annual reports of large domestic manufacturing enterprises as the data source. Large manufacturing enterprises have the conditions to implement transformation and upgrading more successfully, and the performance of top ranked enterprises is more stable due to the impact of digital transformation. Therefore, this article selects the research object based on the "2021 Ranking of China's Top 500 Manufacturing Enterprises". At the same time, considering that some manufacturing industries themselves have a high degree of digitalization and are not representative compared to traditional manufacturing enterprises, after removing the high-tech manufacturing enterprises recognized by the country in this part, 10 listed manufacturing enterprises were selected as the research objects (see Table 1 for details), and a total of 50 annual report data from 2017 to 2021 were selected. The annual report made public by the listed firm, which is sourced from CNINFO, contains all of the pertinent financial information for the chosen company.

Table 1. Research Objects of Manufacturing Enterprises in Digital Transformation in 2021.

Ranking	Enterprise Name	Operating income (10000 yuan)	Type
1	Shanghai Automotive Group Co., Ltd	74213245	Automobile manufacturing
2	Midea Group Co., Ltd	28570972	Electrical manufacturing
3	Shanghai Pharmaceutical Group Co., Ltd	19190916	Pharmaceuticalm anufacturing
4	Zhuhai Gree Electric Appliances Co., Ltd	17049742	Electrical manufacturing
5	BYD Co., Ltd	15659769	Automobile manufacturing
6	New Hope Liuhe Co., Ltd	12626170	Food manufacturing
7	Youngor Group Co., Ltd	10481096	Clothing manufacturing
8	Inner Mongolia Yili Industrial Group Co., Ltd	9652396	Food manufacturing
9	Sichuan Kelun Pharmaceutical Co., Ltd	4042711	Pharmaceutical manufacturing
10	Dongfang Group Co., Ltd	1518288	food processing

3.2 Variable Design

Some financial indicators in this article are directly obtained from or calculated from the data in the annual report of the enterprise. Some data that cannot be directly measured is quantified using text mining methods in the discussion and analysis module of the enterprise's annual report. Data collection and keyword extraction of the annual report are achieved using text recognition software and word segmentation software. This article uses Python's pdfminer

package and Jieba Chinese word segmentation software to perform text recognition, noun statistics, extract keywords, and calculate word frequency, to measure the effect of the manufacturing industry's digital revolution on business performance.Generally speaking, the priority that the business accords to the matters indicated by the keywords is directly inversely proportionate to the frequency of keyword occurrences. Table 2 below presents the research variables and measurement methods extracted in this article. The keywords for digital transformation come from detailed definitions of digital technology, artificial intelligence, big data and other related technologies, digital scene applications, successful cases of digital transformation, and digital transformation forum meetings.

Due to the dynamic and complex environment in which enterprises operate, the absolute number of keywords does not have much significance. Therefore, in order to make measurement indicators meaningful, it is necessary to use other enterprises in the same industry as reference. After extracting the number of occurrences of each keyword in the annual reports of each listed company, this article uses the ratio of the number of occurrences of keyword combinations related to the measurement indicator to the total number of occurrences of similar keywords in sample companies in the same industry in the same year as the measurement indicator.

Table 2. Calculation Table of Factors and Indicators for the Impact of Digital Transformation on Enterprise Performance.

Variable type	Variable	Number	Data source or calculation method
Dependent variable	Enterprise performance	ROA	Net profit/average total amount of total assets
Explanatory variable	Digital Transformation	DT	Conduct word frequency analysis on keywords related to digital transformation in the discussion and analysis module of the annual report's business situation
Mediating variable	Service level	SERV	Ratio of other business income to total income
Adjusting variables	government policy	POR	Conduct word frequency analysis on policies related to digital transformation in the discussion and analysis module of the annual report's business situation
control variable	Management level	HC	Proportion of directors, supervisors, and executives with a master's degree or above
	Enterprise size	SIZE	The natural logarithm of the total assets of a company
	Asset liability ratio	LEV	Total liabilities/total assets
	Equity concentration	CRI	The shareholding ratio of the largest shareholder in the research year
	Growth rate of total operating revenue	GRO	(Current year's operating revenue - previous year's operating revenue)/total operating revenue of the previous year

4 Empirical analysis

4.1 Descriptive Statistical Analysis

A statistical description was conducted on 50 observed values in China's listed manufacturing industry from 2017 to 2021, and the results are shown in Table 3.

Table 3. Descriptive Statistical Analysis of Variables.

Variable	Observations	Mean value	Minimum value	Maximum value
ROA	50	0.052	-0.079	0.177
DT	50	0.022	0.004	0.052
SERV	50	0.033	0.002	0.229
POR	50	0.021	0.011	0.031
HC	50	0.578	0.375	0.857
SIZE	50	25.589	24.060	27.560
LEV	50	0.597	0.382	0.689
CRI	50	0.291	0.093	0.712
GRO	50	0.131	-0.339	0.821

Note: All values are rounded to three decimal places

From descriptive analysis, it can be seen that the minimum value of the explanatory variable enterprise performance (*ROA)* is -0.079 and the maximum value is 0.177, indicating that there is not much difference in performance levels among the top 500 enterprises in the manufacturing industry. The minimum value of Digital Transformation Degree (*DT)* is 0.004 and the maximum value is 0.052, indicating that the overall digital transformation and upgrading process of manufacturing enterprises is slow and there is a certain gap, which is in the initial stage. The minimum service-oriented value (*SERV*) is 0.002, and the maximum value is 0.229, which is generally low. The large distance indicates that some enterprises have transitioned from manufacturing to "manufacturing+service", and some are still in the exploration stage. The average government policy is 0.021, and the overall level of application is also low. The minimum level of education for management personnel is 0.375, while the maximum level is 0.857. They generally have high educational qualifications and are not far apart. The average size of enterprises is 25.589, and representative large enterprises in China were selected. The minimum and maximum growth rates of total operating revenue are -0.339 and 0.821, indicating a significant difference in the operating conditions and market share of enterprises. From a horizontal perspective, the growth rates of different enterprises in different years are not significantly different. However, from a vertical perspective, due to the volatile market environment in the first two years, there is a significant difference in the growth rates of total operating revenue.

4.2 Correlation analysis

Before conducting regression analysis, in order to understand the correlation between various variables and avoid multicollinearity issues to make the conclusion more reliable, Pearson coefficient was used to perform correlation analysis on the variables. The results are shown in Table 4.

Table 4. Correlation Analysis.

	ROA	DT	SERV	POR	HC	SIZE	LEV	CRI	GRO
ROA	1								
DT	0.467***	1							
SERV	0.541***	0.506***	1						
POR	-0.124	0.263*	-0.010	1					
HC	-0.088	0.116	-0.172	0.195	1				
SIZE	0.025	0.487***	0.164	0.110	0.301**	1			
LEV	0.130	0.411***	0.150	0.182	0.164	0.323**	1		
CRI	-0.177	0.162	-0.119	0.066	0.247*	0.616***	0.112	1	
GRO	0.051	-0.073	-0.024	-0.093	-0.015	-0.176	0.153	-0.220	1

Note: *, * *, and * * indicate significant differences at 10%, 5%, and 1%, respectively

From the above table, it can be seen that the correlation coefficient between the *ROA* and the *DT* is 0.467, which is significant at the 1% level, indicating that digital transformation can positively promote enterprise performance, which is preliminarily consistent with hypothesis H1. The correlation coefficient between digital transformation (*DT*) and service-oriented level (*SERV*) is 0.506, and it is positively correlated at a significance level of 1%, preliminarily verifying hypothesis H2. The correlation coefficient between enterprise performance and service level is 0.541, which is positively correlated at the 10% significance level, indicating that service level has a positive impact on enterprise performance, which is preliminarily consistent with hypothesis H3. And the correlation coefficient between each variable is less than 0.5, indicating that there is no multicollinearity between the selected variables and regression analysis can be conducted.

4.3 Hypothesis testing

(1)Regression analysis of the direct effects of digital transformation

Demonstrating how the digital revolution has a direct influence on business success, regression analysis was conducted using enterprise performance (*ROA)* as the dependent variable, *DT* as the explanatory variable, and *SIZE,* LE*, CRI*, and GRO as the control variables. The results shown in Table 5 indicate that the coefficient of the degree of digital transformation (*DT) in the* manufacturing industry is 0.631, and the t-value is 3.741, which is significant at the 1% level. After adjustment, the R^2 is 0.650, which is greater than 0.6. The model has a good fit. The digital transformation of the manufacturing industry has a significant positive impact on enterprise performance, assuming $_{H1}$ validation is passed.

Table 5. Regression Results of Digital Transformation on Enterprise Performance

Regression analysis (N=50)		System significance		Model fitting indicators
Result variable	Predictive variables	Standardization coefficient β	T-value	Adjusted R^2
ROA	DT	0.631***	3.741	
	SIZE	0.794	0.994	
	LEV	-0.259	-3.321	0.650
	CRI	-0.386*	-1.949	
	GRO	0.039	0.362	

(2) Testing the Mediation Effect of Service Level

To test the mediating effect of enterprise service level (*SERV)* on the relationship between digital transformation (*DT*) and enterprise performance (*ROA*) under the control of enterprise size (SIZE), asset liability ratio (*LEV*), first largest shareholder shareholding (*CRI*), and total revenue growth rate (GRO). The results are shown in Tables 6 and 7 below.

Table 6. Mediation Effect Test of Service Level.

Regression analysis (N=50)		System significance		Model fitting indicators		
Result variable	Predictive variables	*β*	*t*	R^2	Adjusted R^2	*F（df）*
ROA	DT	0.631	3.741***			
	SIZE	0.794	0.994	0.685	0.650	19.542
	LEV	-0.259	-0.321			
	CRI	-0.386	-1.949*			
	CRO	0.039	0.362			
SERV	DT	0.816	4.063***			
	SIZE	0.71	0.745	0.552	0.502	11.069
	LEV	-0.437	-0.454			
	CRI	-0.398	-1.684*			
	GRO	-0.018	-0.141			
ROA	DT	0.388	2.083**	0.725	0.687	19.286
	SERV	0.298	2.524**			
	SIZE	0.582	0.767			
	LEV	-0.129	-0.168			
	CRI	-0.267	-1.385			
	GRO	0.044	0.436			

Table 7. Test Table for Total Effect, Direct Effect, and Intermediary Effect.

	Effect	se	t	p	LLCI	ULCI	Relative effect value
Total effect	1.856	0.496	3.744	0.000	0.857	2.8545	
Direct effct	1.231	0.527	2.335	0.024	0.168	2.294	66.33%
Indirect effct	0.625	0.308	/	/	0.625	0.308	33.67%

Note: The LLLCI upper limit and ULCI lower limit refer to the lower and upper limits of the 95% confidence interval; All values are rounded to three decimal places.

From the results, it can be seen that digital transformation has a significant positive impact on enterprise performance（ β= 0.631, t=3.741, p<0.001). And when the intermediary variable of service-oriented level is added, the positive impact of digital transformation on enterprise performance is still significant（ β= 0.388, t=2.083, p<0.05). The positive impact of digital transformation on the service-oriented level of enterprises is significant（ β= 0.816, t=4.063, p<0.001), the level of enterprise service has a significant positive effect on enterprise performance（ β= 0.298, t=2.524, p<0.05). The direct effect of digital transformation on enterprise performance and the mediating effect of enterprise service level do not exceed 0 at the upper and lower limits of the bootstrap 95% confidence interval (see Table 7), indicating that digital transformation can not only have a significant positive impact on enterprise

performance directly, but also affect enterprise performance through the mediating effect of enterprise service level. The direct effect of digital transformation (1.231) and the intermediary effect of enterprise service-oriented level (0.625) account for 66.30% and 33.67% of the total effect (1.856), respectively.

(3)Analysis of the moderating effect of government policies and executive level

To test the moderating effects of government policies (*POR*) and executive level (*HC*) on the relationship between *DT* and *ROA* under the control of enterprise size (*SIZE*), asset liability ratio (*LEV*), first largest shareholder shareholding (CRI), and total revenue growth rate (GRO). The results are shown in Tables 8 and 9 below.

Table 8. Adjustment Model Test of Government Policies and Executive Level

Regression analysis (N=50)		System significance		Model fitting indicators		
Result variable	Predictive variables	β	t	R^2	Adjusted R^2	F（df）
ROA	DT	0.511	3.012***			
	POR	-0.635	-2.036**			
	DT×POR	0.235	2.567**			
	SIZE	1.192	1.568	0.747	0.750	18.105
	LEV	0.094	0.125			
	CRI	-0.424	-2.329			
	CRO	-0.076	-0.715			
ROA	DT	0.629	3.669***			
	HC	-0.254	-0.634			
	DT×HC	0.04	0.444			
	SIZE	1.053	1.192	0.689	0.638	13.590
	LEV	-0.265	-0.32			
	CRI	-0.39	-1.855*			
	GRO	0.033	0.294			

Table 9. Test Table for the Adjustment Effect of Government Policies and Executive Level

	R2-chng	F	P	df1	df1
DT×POR	0.074	5.206	0.028	1.000	40.000
DT×HC	0.001	0.793	0.778	1.000	40.000
Total regulatory effect	0.074	2.607	0.086	2.000	40.000

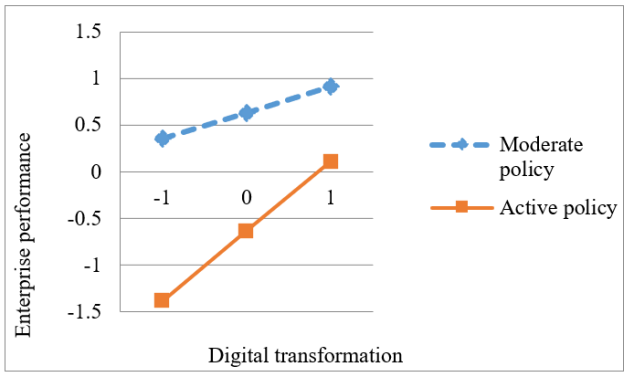

Figure 2. The moderating role of government policies in the relationship between digital transformation and corporate performance.

From the results,after adding government policy (POR) into the model, the interaction term between digital transformation and government policy has a positive impact on enterprise performance (β=0.235, t=2.567, p<0.05), indicating that government digital policy can play a positive moderating role in the impact of digital transformation on enterprise performance. A further simple slope analysis is shown in Figure 2. When the government actively implements and releases digital policies, it has a significant impact on providing financial support and policy incentives for enterprises undergoing digital transformation; When the government does not actively implement digital policies, that is, the enthusiasm of issuing digital policies gradually becomes flat from an upward trend. Although digital transformation also has a significant positive impact on enterprise performance, the impact is smaller than that of actively implementing policies, indicating that with the improvement of the role of the government's digital transformation policies, The positive impact of digital transformation on enterprise performance is gradually increasing. After inserting C-level (HC) into the model, the interaction term of digital transformation and C-level has a positive impact on enterprise performance but is not significant (β=0.040, t=0.444, p>0.05), indicating that C-level cannot play a significant positive moderating role in the impact of enterprise digital transformation on enterprise performance. It shows that executive education can not be used as an influencing factor to adjust the effect of digital transformation on enterprise performance, and the executive level may be affected by multiple background factors, and academic education can only represent a certain ability of the executive team. It can be seen from Table 9 that after adding government policies and executive level into the model, it is found that the total regulatory effect is the regulatory effect value of government policy performance, which once again proves that the regulatory effect of executive level does not play a role.

5 Conclusion and Outlook

5.1 Conclusion

This paper explores in depth the impact of digital transformation on business performance based on data from the top 500 listed manufacturing companies, and the following conclusions can be drawn.

Digital transformation has a significant positive impact on business performance. Digital transformation is a long-term and complex process, which can help enterprises optimise resources, assist top management in decision-making Enterprises should actively implement the digital transformation strategy to promote a wider integration of digital technology and manufacturing to achieve transformation . Enterprises should fully explore their own resource integration capabilities, identify heterogeneous resources that are difficult to be replaced, and invest funds appropriately in the field of digitalisation. And, the Internet of Things, automation, intelligent production technology can help manufacturing enterprises achieve refined management and effective control, and should vigorously introduce digital technology. And enterprises should use the digital platform to accurately capture user demand information to achieve customer demand diversification and personalisation.

Digital transformation can improve business performance by increasing the level of servitising, and there is a partial mediating effect in the relationship between the level of servitising on the impact of digital transformation and business performance. The level of enterprise servitization positively affects enterprise performance, enterprise servitization strategy is the future development trend, enterprise servitization can have a good connection with the user, the use of the provision of services to obtain the data manufacturing benefits, a greater degree of access to and to meet the needs of the user, and then through the diversification and personalisation of the product to make the increase in the main business, to enhance enterprise performance. Enterprises in the process of digital transformation, should also use emerging technologies to improve the level of service-oriented enterprises, and then greater use of user data to enable enterprises to occupy a larger market. China's manufacturing enterprises service level gap between large, and through the enterprise service for digital transformation and enterprise performance between the positive effect is significant, digital transformation and service level between the research is also worth further depth.

Long-term understanding of the policy, will respond to the enterprise in the digital transformation process in order to obtain greater benefits, the domestic large-scale enterprises for the national policy will be the first to actively correspond to, so in the short term the enterprise for the corresponding policy reform process due to insufficient understanding, lack of experience and lack of technical personnel and other circumstances of enterprise performance will be temporarily reduced, but the use of long-term data from the enterprise to see the government policy will still strengthen the enterprise's digital transformation The performance impact. Therefore, Policy support is still needed for enterprise transformation and upgrading, now large enterprises have been guided by the policy of transformation, the government of digital transformation of enterprises to provide more policy and financial support to encourage enterprises to carry out digital reform, for enterprises in the process of transformation of the many uncertainties in the process of the government should provide policy protection.

The characteristics of top executives deserve further in-depth analysis in the future, and the study found that the average level of education of top executives does not have a significant impact on corporate performance. Top management is the controller and advocate of corporate operations, determining the direction of corporate development, and the study found that executive education does not represent the overall level and ability of the top management, the future should be analysed from a number of characteristics of executives, such as education, tenure, background and age. In the future, we should analyse multiple characteristics of

executives, such as education, tenure, background and age, etc. From the use of the diversity of the background of executives to optimize the team structure of the top management team, so as to enhance the rationality and science of the enterprise development decision-making.And the background characteristics of the main R&D personnel are also the focus of the next research step.

5.2 Research Shortcomings and Prospects

The results of the study provide a factual basis and relevant recommendations for the digital transformation of the manufacturing industry. The following aspects need to be further deepened and expanded: firstly, the measurement of executive level variables can be further deepened; secondly, this study mainly focuses on large-scale manufacturing enterprises, and in the future, the research object can be expanded to small and medium-sized manufacturing enterprises, so as to further analyse the validity of this paper's conclusions; and thirdly, the sample capacity can be further expanded in order to enhance the robustness of the conclusions.

Reference

[1] Karagiannaki A, Vergados G, Fouskas K. The impact of digital transformation in the financial services industry: Insights from an open innovation initiative in fintech in Greece[J]. 2017.

[2] Hinings B, Gegenhuber T, Greenwood R. Digital innovation and transformation: An institutional perspective[J]. Information and Organization, 2018, 28(1): 52-61.

[3] Gurbaxani V, Dunkle D. Gearing up for successful digital transformation[J]. MIS Q. Executive, 2019, 18(3): 6.

[4] Yudong Qi, YueHao, NaHou, Enhuai Zhou. Exploring the Models and Paths of Digital and Intelligent Transformation in Equipment Manufacturing Enterprises: A Case Study Based on Shanhe Intelligence [J]. Economic Management,2022,44(11):25-45.

[5] Yuqin Zhang . Reflections on the Performance Evaluation System of Enterprises [J]. Research on Financial Issues, 2014 (S2): 107-111

[6] Vial G. Understanding digital transformation: A review and a research agenda[J]. The journal of strategic information systems, 2019, 28(2): 118-144.

[7] Chunfa Li, Dongdong Li,Chi Zhou. The Mechanism of the Transformation and Upgrading of the Manufacturing Industry Driven by the Digital Economy: An Analysis from the Perspective of the Industrial Chain [J]. Business Research, 2020 (02): 73-82

[8] Zhengang Zhang, Huan Yi,Xueyao Chen. The impact of innovation network resource integration and dual innovation on the innovation performance of manufacturing enterprises: the moderating effect of environmental uncertainty [J]. Technology and Economics, 2020,39 (03): 58-65+73

[9] Li M, Jia S. Resource orchestration for innovation: the dual role of information technology[J]. Technology Analysis & Strategic Management, 2018, 30(10): 1136-1147.

[10] Renzhi Zhang. Research on the Reconstruction of the Value Chain in the Manufacturing Industry Driven by New Generation Information Technology: From the Perspective of Modular Theory [J]. Learning and Exploration, 2022 (10): 121-128

[11] Xiaohua Li. Digital Transformation of Manufacturing Industry and Improvement of Value Creation Ability [J]. Reform, 2022 (11): 24-36

[12] Ting Xiao,Qunhua Nie,Hua Liu. A Study on the Impact of Manufacturing Services on Enterprise Performance: Based on Empirical Evidence from Chinese Manufacturing Enterprises [J]. Science and

Technology Management, 2014,35 (04): 154-162
[13] Dandan Na,Ying Li . Research on Policy Tools for Digital Transformation of China's Manufacturing Industry [J]. Administrative Forum, 2021,28 (01): 92-97
[14] Sendi Zhu. China's Manufacturing Transformation and Upgrading: How Should Intelligent Manufacturing Make Efforts? [J] Robotics Industry, 2017 (01): 36-41
[15] Jun He. The development of intelligent manufacturing industry policies urgently needs to be followed up [N]. Economic Daily, 2016-10-13 (014)
[16] Xiangxiang Sun,Xiaoliang Zhou. Research on the Impact of Service Industry Openness on the Efficiency of Manufacturing Value Chain Escalation: An Empirical Analysis Based on Threshold Regression [J]. International Trade Issues, 2018 (08): 94-107
[17] Camelo-Ordaz C, García-Cruz J, Sousa-Ginel E. The influence of top management team conflict on firm innovativeness[J]. Group Decision and Negotiation, 2015, 24: 957-980.