

EXPLORATION OF DIGITAL TRANSFORMATION MECHANISM AND DEVELOPMENT LEVEL OF ENTERPRISE ECONOMIC MANAGEMENT

Yong-Cai*

- Hunan College of Finance and Economics, Changsha, Hunan, 410000, China
- 313486070@qq.com

Reception: 16 February 2024 | **Acceptance:** 10 April 2024 | **Publication:** 25 May 2024

Suggested citation:

Cai, Y. (2024). **Exploration of digital transformation mechanism and development level of enterprise economic management.** *3C Empresa. Investigación y pensamiento crítico*, 13(1), 232-250. <https://doi.org/10.17993/3cemp.2024.130153.232-250>

ABSTRACT

This paper is based on the digital economy, the traditional enterprise economic management of digital transformation. Utilizing supply chain technology to establish cooperation channels to provide customers with quality services to complete the transformation of management mode. Integrate information technology in the production process to improve the quality of the enterprise's products, improve the enterprise's sales model to achieve the purpose of performance transformation. The impact of digital technology on the economic transformation of enterprises is examined by constructing a quality model, and the stability of the economic quality development of enterprises is examined by regression analysis. The results show that the growth rate of operating income of digital enterprises is more than 50%, the market share of digital products has reached 33.8%, and the digital economic variables are significantly greater than 0, indicating that the digital transformation of the enterprise's economic management can improve the sustainable competitiveness of the enterprise and promote the development of the enterprise's economic quality.

KEYWORDS

Digital transformation; economic management; supply chain technology; information technology; regression analysis

INDEX

ABSTRACT	2
KEYWORDS	2
1. INTRODUCTION	4
2. LITERATURE REVIEW	5
3. THE ROLE OF DIGITAL TECHNOLOGY IN THE ECONOMIC MANAGEMENT OF ENTERPRISES	6
3.1. Enterprise digital transformation path	6
3.2. Digital production management	7
3.3. Production performance transformation	7
4. CONSTRUCTING A QUALITY MODEL FOR THE TRANSFORMATION OF THE ENTERPRISE'S ECONOMIC MANAGEMENT	8
4.1. Quality modeling	8
4.2. Regression models	9
5. EXAMINATION OF THE LEVEL OF DEVELOPMENT OF THE ENTERPRISE'S DIGITAL TRANSFORMATION ECONOMY	10
5.1. Analysis of the impact of the digital economy on business transformation	10
5.2. Analysis of the economic efficiency of digital enterprises	12
5.2.1. Profitability analysis.....	12
5.2.2. Market share of digital products	14
5.2.3. Digital Products Operating Revenue Percentage.....	15
5.3. Robustness Tests	16
6. CONCLUSION	17
7. DISCUSSION	17
REFERENCES	18

1. INTRODUCTION

With the rapid growth of the digital economy and the deep integration with the real economy, the digital transformation of enterprise management has increasingly become a focal issue in the academic world. Enterprise management digitalization, as a key process of enterprise digital transformation, generally refers to the systematic reshaping of enterprise structure, management mode, operation mechanism and production process through the introduction of through technology in the existing enterprise management structure [1-2]. Management of digital investment can enhance the sustainable competitiveness of enterprises, help to reduce enterprise costs, improve enterprise output and performance. However, the overall strength of the economy in some regions is still not strong, especially the low level of enterprise digitization, weak high-tech industries, and the development of industrial clusters is not obvious [3]. There are also problems within each enterprise such as financing difficulties, informal enterprise management, and insufficient advantages in talent introduction. This is due to the small scale and slow development of enterprises, largely caused by the enterprise itself, especially the backwardness of the enterprise management concept. A large number of small and medium-sized enterprises still use family-style enterprise management mode, and the core management team often has rich production experience, but lacks advanced enterprise management experience, or does not have the ability to manage large enterprises [4-5]. Therefore, it is important to utilize network and information platforms centered on communication technology and intelligent control technology to manage logistics and production processes, which in turn improves the efficiency of factories and enhances their competitive advantages. Eliminate various barriers and make full use of new digital technologies to upgrade traditional production and operation, so as to realize the sustainable development of enterprises [6].

This paper focuses on the digital features to build the configuration and study the digital transformation path of the enterprise network. First of all, through the supply chain technology to establish a rapid channel of cooperation and communication with suppliers and distributors, at the same time, the digital technology developed by information technology enterprises into the production process, product content, and improve the enterprise's sales model to achieve high-quality development. Then the impact of the digital economy on the transformation of enterprises is reflected by constructing an economic quality model, and finally the economic development level of digital enterprises is verified through the analysis of the impact of the digital economy on the transformation of enterprises, the analysis of the economic benefits of digital enterprises, and the robustness test. It is proved that the digital transformation and upgrading of the enterprise improves the overall production level of the enterprise, reduces the unit cost and brings more profits.

2. LITERATURE REVIEW

Chen, Q analyzed blockchain technology and smart contracts with future supply chain management applications based on the development of the marine economy through an explanatory framework model. The model examines the structure and process of marine supply chain risk mechanisms, provides a scientific framework for marine supply chain risk control, and makes corresponding recommendations for reducing and monitoring marine supply chain risks [7]. Vasin, S et al. considered decision-making models and methods for enterprise competitiveness management from the perspective of benchmarking, and a competitive interaction model in the form of coupled Vanderbilt equation system with time lag introduced was successfully tested in radio physics. The methodology uses the enterprise's own competitive advantages to achieve the highest score of actual competitiveness of an industry in order to improve the quality of produced products, reduce production costs and increase labor efficiency [8]. The subject of the research Shevchenko, A is the prospects of development of the forest sector and rural areas in the digital economy, with the goal of developing theoretical prescriptions and practical recommendations for the improvement of interactions. Methodological approaches of general scientific and specific nature were used, targeted actions were taken to provide a new system of scientific support for the development of the forest sector and rural areas, which contributes to the improvement of the quality of life in rural areas [9]. Subaeva, A. et al. in order to form a modern system of training of personnel in agriculture in the digital economy, designed a cluster of advanced training and training of personnel in conditions of digital transformation of agriculture model of a network platform that adapts the educational potential of the curriculum to specific requirements and the formation of digital competencies; an effective system of end-to-end and continuous acquisition of new competencies in the digital economy by bringing together representatives of science, government and business in a single digital space [10].

Klymchuk, M presents a model of development of recursive convergence approach to the formation of business development strategies based on the digital economy. The model of formation of the enterprise development strategy taking into account the digital economy is proposed, and the problems of management of investments in the digital transformation of the enterprise are studied. It allows to distinguish the directions of development of digital technologies, to incorporate them into the advantages of productive business activity of the enterprise and to provide the basis of theoretical tools for the study of the problems of investment in digital processes [11]. Batova, M. Development of methodological and practical tools for effective digital transformation of high-tech enterprises develops the concept of transformation of the enterprise by means of innovative modernization, affecting the product, technological operations, as well as organizational and production structural changes. Development of an organizational design methodology for flexible robotic structures and a model for determining the flexibility and productivity parameters of robotic structures [12]. Rossini, M evaluates the transformation models of companies in the digital economy by studying several manufacturing companies and analyzing the insights from the cases to determine the direction of transformation based on the leanness and maturity

of the companies. The results of the study show that the introduction of Industry 4.0 technology is an effective way to improve the leanness of companies, and that this technology allows the integration of traditional manufacturing companies with digital technology, thus promoting the development of the company [13]. Charalampidis, I. et al. develop a macro-economic regional model, where the new manufacturing technologies and infrastructures are evaluated to achieve a dynamic and fully endogenous agglomeration-dispersion mechanism. The model considers national economic trends as boundary conditions and simulates the impact on the regional economy, inducing macroeconomic changes in the national and regional economy in terms of activity and employment [14].

3. THE ROLE OF DIGITAL TECHNOLOGY IN THE ECONOMIC MANAGEMENT OF ENTERPRISES

3.1. ENTERPRISE DIGITAL TRANSFORMATION PATH

Enterprises form enterprise networks due to the connection between them, and the way of node connection not only affects all kinds of behaviors between nodes, but also determines the digital transformation path of enterprise networks [15]. The era of the digital economy requires nodes to carry out digital cooperation at the enterprise network level, and the cooperative linkage makes digital resources further integrated into the enterprise network, which then forms the basis of network digital transformation, that is to say, the enterprise network empowers nodes to digitize through relational linkage, and the network linkage drives the digital transformation of the enterprise network from the micro level [16-17]. Figure 1 shows the path diagram of enterprise digital transformation, considering the internal and external factors of the process of enterprise network digital transformation, selecting a reasonable and representative nucleated enterprise network as a sample, grouping and constructing around the digital features, researching the enterprise network digital transformation path, and further exploring the basic logic and evolution characteristics of the enterprise network digital transformation in the context of the digital economy.

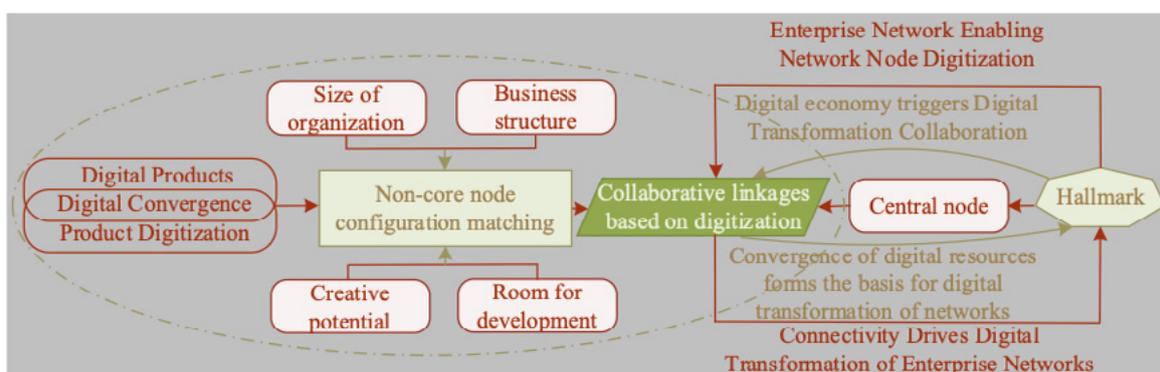


Figure 1. Roadmap for enterprise digital transformation

3.2. DIGITAL PRODUCTION MANAGEMENT

In order to seize the opportunity of the development of the digital economy, enterprises make every effort to promote the digital transformation of the management mode of design and research and development, production services and other links. Under the background of digital economy, enterprise management tends to be more grid mode, and the management transformation of traditional manufacturing enterprises can be carried out through the application of digital technology in enterprise production and manufacturing, sales and logistics, product innovation and other links [18-19]. In this way, enterprises can improve customer experience, innovate value propositions, and enhance organizational effectiveness. Figure 2 shows the enterprise production digital management process, combined with the background characteristics of the digital economy era, in which the supply chain management, the establishment of rapid cooperation and communication channels with suppliers and distributors, supply chain oriented to the market point of view of the entire business activities of the planning, design and implementation of the overall structure. Production and R&D, the key is to optimize the production process, reduce production costs and improve production efficiency. Customer relationship management, the rapid development of data and its related technology in the era of digital economy, the use of data and information to improve customer relationship management has become the key. Data information plays an important role in providing customers with quality services and establishing good relationships, etc. The effective use of data information to improve customer relations has become the key to the digital transformation of enterprise management.

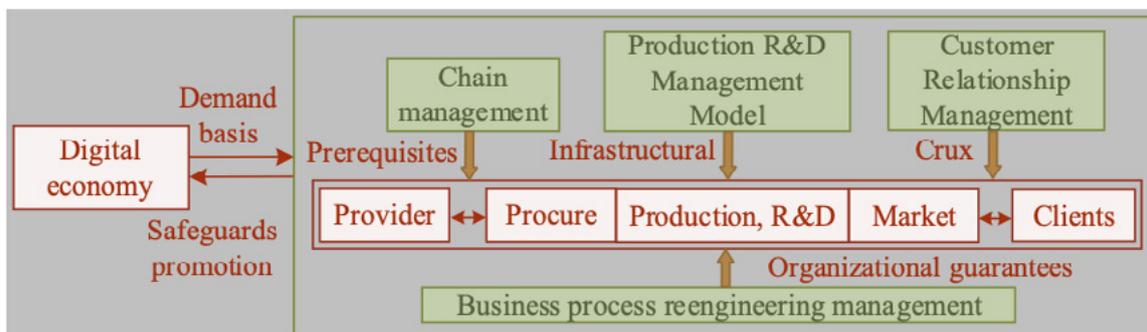


Figure 2. Enterprise production digital management process

3.3. PRODUCTION PERFORMANCE TRANSFORMATION

In the era of digital economy, with the continuous change of production technology and sales technology, enterprises are forced to adapt to the new market demand, maintain and improve the competitiveness of enterprises. Small and medium-sized manufacturing enterprises do not have talent and capital support, and lack advantages in active development and innovation, but digital technology provides a channel for indirect innovation of enterprises [20]. The integration of digital economy

technologies with traditional enterprises mainly enhances the transformational performance of enterprises through three channels, namely, promoting indirect innovation, reducing the cost of sales, and improving production efficiency [21]. Figure 3 shows the schematic diagram of the digital economy to promote the transformation of enterprise performance, the enterprise can integrate the digital technology developed by information technology enterprises into their production process and product content to improve the quality of enterprise products, improve the sales model of the enterprise, and realize the transformation and upgrading and high-quality development of the enterprise. The use of big data, cloud computing and other technologies to effectively combine data flow, capital flow and talent flow can enable enterprises to more accurately grasp market dynamics and customer demand, meet more complex personalized needs, constantly change their product characteristics and sales positioning, and promote the enterprise can be more active, proactive, scientifically involved in product innovation, sales innovation and organizational innovation, to form a diversified, market-oriented and networked Precision innovation system. The use of digital economy technology by enterprises can make production more intelligent, management more data-oriented and sales more humanized, realize the fundamental transformation of enterprises in production, organization and sales mode, promote the transformation and upgrading of enterprises, and also improve the operating efficiency of enterprises.

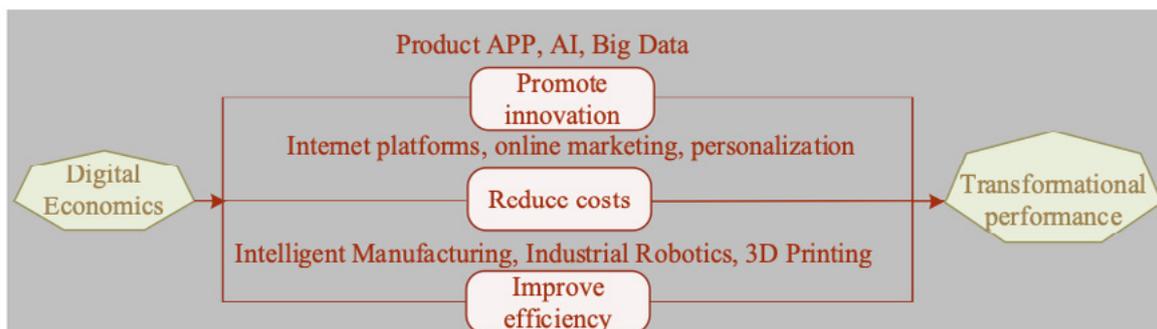


Figure 3. Schematic diagram of enterprise performance transformation

4. CONSTRUCTING A QUALITY MODEL FOR THE TRANSFORMATION OF THE ENTERPRISE'S ECONOMIC MANAGEMENT

4.1. QUALITY MODELING

In order to test the impact of the application of digital technology on the economic transformation of enterprises and the path of transformation, the following model is established for observation under the condition of limited data indicators:

$$\text{per}_{it} = C + \alpha_1 \times DE_{it} + \sum \gamma_j \times \text{control}_{j,it} \quad (1)$$

$$Z_{it} = C + \beta_1 \times DE_{it} + \sum_j \gamma_j \times \text{control}_{j,it} \quad (2)$$

$$\text{per}_{it} = C + \beta_2 \times Z_{it} + \sum_j \gamma_j \times \text{control}_{j,it} + \varepsilon_{it} \quad (3)$$

In the above equation, per_{it} is the transformation performance of the i nd enterprise t years, DE_{it} is the digital economy application status of the i th enterprise t years, $\text{control}_{j,i}$ is the control variable, C is the constant term. Z_{it} is the i th enterprise t years of potential transformation path variables, equations (2), (3) are used to observe in the equation (1) holds on the basis of Z variables whether the SME digital economy application for enterprise transformation and upgrading of the intermediate path.

Table 1 shows the content definition of each indicator; enterprise economic transformation is measured by return on total assets and operating profit margin, and the control variables include enterprise size and debt ratio. The intermediate path variables include gross profit margin, which measures the improvement of the enterprise's product competitiveness, sales expense ratio, which measures the cost reduction, and labor productivity, which measures the production efficiency. The digital economy is expressed using the number of types of digital economy technologies applied by the firm in the current year.

Table 1. Definitions of each indicator

Variable type	Variable	Variable symbol	Metrics
Explanatory variables	Business performance	roa	Return on total assets
		pro	Operating margin
Explanatory variables	Digital economy	DE	The number of types of digital economy applied
Mediation variables	Product quality improvement	mrate	Gross profit margin of the enterprise
	The cost of sales decreased	cost	Selling expense ratio
	Productivity	productivity	Labour productivity
Control variables	The size of the enterprise	size	The natural logarithm of total assets
	Financial leverage	lev	Debt-to-asset ratio

4.2. REGRESSION MODELS

Considering the impact of the timeliness and lag of the digital transformation policy on the productivity of enterprises, this paper conducts the test of the impact of time policy on digital transformation. In order to ensure the robustness of the test results, construct a dummy variable of whether the enterprise carries out digital

transformation, assign a value of 1 if the enterprise carries out digital transformation, otherwise assign a value of 0 to measure the enterprise's digital transformation, and construct the following regression model:

$$\text{Logit}(\text{restate}_{i,t}) = \alpha_0 + \beta_1 \text{dcg}_{i,t} + \beta_2 \text{roa} + \beta_3 \text{pro} + \beta_4 \text{DE} + \beta_5 \text{mrate} + \beta_6 \text{cost} + \beta_7 \text{productivity} + \beta_8 \text{size} + \beta_9 \text{lev} + \sum \text{ind} + \sum \text{year} + \varepsilon_{it} \quad (4)$$

where $\text{restate}_{i,t}$ denotes the economic restatement, $\text{dcg}_{i,t}$ denotes the degree of digital transformation of firms, and i denotes different firms. t denotes different years, ε_{it} is the random error term, α_0 is the constant term, and β_1 is the regression coefficient of the variable to be estimated.

5. EXAMINATION OF THE LEVEL OF DEVELOPMENT OF THE ENTERPRISE'S DIGITAL TRANSFORMATION ECONOMY

5.1. ANALYSIS OF THE IMPACT OF THE DIGITAL ECONOMY ON BUSINESS TRANSFORMATION

In order to better mention the mechanism of the impact of digital technology on the transformation of the economic management of enterprises, this paper reflects the level of economic development of the company by constructing a quality model. Therefore, this paper shows the simple statistical results of each variable by analyzing the financial information of enterprises in a region after digital transformation. Table 2 shows the statistical results of each variable, and the average return on total assets of the sample companies is 2.7%, and the average net operating profit margin is 5.5%. Of the digital economy applications, the average number of overall digital economy applications was 1.478. Of the three potential transformation paths, the average gross profit margin was 35.8%, the average sales expense ratio was 10.1%, and the natural logarithm of the average labor productivity was 13.266. Of the four control variables, the natural logarithm of the total assets of the firms averaged 18.403, and the gearing ratio averaged 26.2%. Enterprise economic management digital transformation type in the specific guidance of digital technology, make full use of the through the network, blockchain and artificial intelligence and other technologies, through the digital technology and management of business intertwined, but to promote the enterprise to create greater value.

Table 2. Statistical results of each variable

Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum
Business performance	427	27	85	-0.45	383
Digital economy	427	1.478	1.277	0	5.000
Product quality improvement	427	358	190	-243	901
The cost of sales decreased	427	101	106	0	722
Productivity	427	13.266	578	10.452	16.741
The size of the enterprise	427	18.403	633	15.545	20.008
Financial leverage	427	262	226	10	1.645

Digital transformation of business management is positively correlated with high quality development of business economy. However, since total factor productivity is affected by many factors, further regression checks need to be done. Fixed effects were chosen by determining the model and period effects were controlled. Table 3 shows the results of the impact regression analysis, in which the first three columns are proxied by the return on total assets for enterprise performance, and the results show that the digital economy variable is significantly greater than 0 at 1% probability, and the positive effect is stronger. It shows that digital economy application can promote the transformation performance of SMEs through cost reduction and quality improvement, so enterprises should make full use of the advantages of the digital economy, increase the investment in R&D, reduce the investment in physical advertisements, make more use of the digital economy technology to promote the commodities, and utilize the cutting-edge production technology to create the products with higher efficiency and more popular in the market, in order to stimulate the creativity of the enterprise and enhance the competitiveness of the enterprise in the market.

Table 3. Affects the results of regression analysis

Variable	Return on total assets	Operating margin				
	(1)	(2)	(3)	(4)	(5)	(6)
Digital economy	0.078*** (0.010)			0.198*** (0.050)		
The size of the enterprise	0.092*** (0.017)	0.096*** (0.018)	0.086*** (0.017)	0.311*** (0.082)	0.323*** (0.083)	0.298*** (0.083)
Financial leverage	-0.302*** (0.043)	-0.315*** (0.046)	-0.326*** (0.003)	-0.108*** (0.207)	-1.139*** (0.211)	-1.172*** (0.207)
Constant terms	-0.634*** (0.339)	-1.721*** (0.360)	-1.488*** (0.344)	-5.550*** (1.630)	-5.778*** (1.659)	-5.190*** (1.643)
Period	Control	Control	Control	Control	Control	Control

5.2. ANALYSIS OF THE ECONOMIC EFFICIENCY OF DIGITAL ENTERPRISES

5.2.1. PROFITABILITY ANALYSIS

The monitoring and management of the overall operation process of a digital enterprise can improve the information transfer efficiency and synergy between various departments, reduce related costs and improve the operational efficiency of the enterprise. This paper selects an enterprise A for digital transformation in 2013, and analyzes the economic development level of the enterprise after transformation. Figure 4 shows the changes in operating profit after the transformation of the enterprise, compared with the pre-transformation, the gross profit margin of enterprise A has been accelerating significantly since 2013 and has been maintaining a good trend of steady increase. There was a turning point in 2017, when the year-on-year growth rates of both revenue and costs for Enterprise A exceeded 50%, but the increase in operating costs was about 4.8% higher than the increase in revenue. The trend of net profit margin throughout the interval is basically the same as that of gross profit margin, and in 2017, on the basis of a very small gap between the enterprise's sales revenues and costs, there was a certain increase in period expenses, especially selling expenses, which led to a smaller rise in the enterprise's net profit, which increased by 17.33% year-on-year, ultimately causing a year-on-year decrease in Enterprise A's net profit margin in 2017. The operating profit margin also shows the same trend of change as the previous two indicators, and because it does not take into account non-operating income and expenditure as well as corporate income tax, the volatility of this indicator was reduced in 2017. It shows that the digital environment has guided SMEs to realize the necessity and urgency of enterprise

digital transformation and upgrading, which has improved the overall production level, reduced the unit cost, and brought more profits.

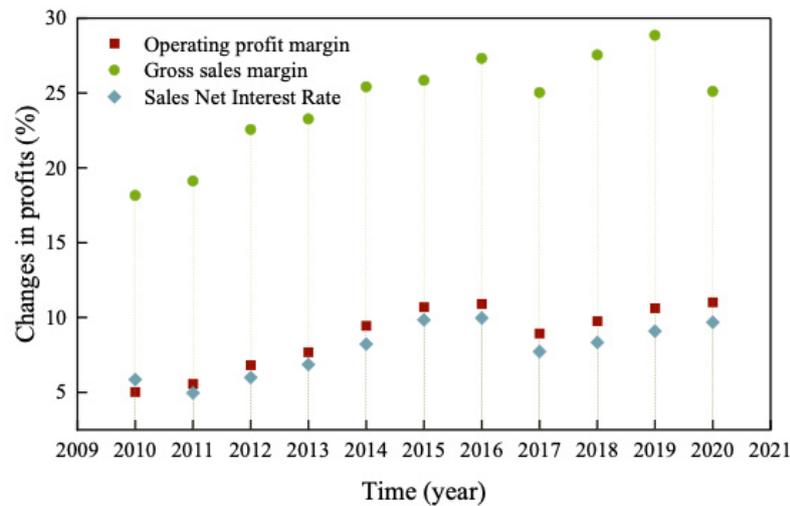


Figure 4. Changes in operating profit after the transformation

After vertically comparing the performance of Enterprise A before and after digital transformation, and based on the four different perspectives of profitability, operations, debt service and growth, the performance of the four aspects of the ability of Enterprise A is compared with the average of Enterprises B and C and the industry, and the two enterprises did not carry out the digital transformation, and attempts to further validate whether the performance of Enterprise A has been effectively improved after digitization through cross-sectional comparative analysis. Effectively improved after digitization. Figure 5 shows the results of the average net interest rate comparison analysis, first of all, through the comparison of the net interest rate can be seen that the net interest rate level of enterprise A is above the industry average in the whole interval, and the net interest rate in each year is higher than that of enterprise C, and the whole shows a good growth trend. However, the net interest rate level of Enterprise A is lower than that of Enterprise B throughout the interval, and the gap gradually increases from 2015 until 2018 when the gap starts to shorten from. Since 2017, the average net interest rate of enterprise B has continued to decrease from 15.18% to 13.25%, while enterprise A has continued to increase from 7.73% to 9.68%, and the continuous increase in the scale of period expenses has directly led to the lower level of net interest rate of enterprise A than enterprise B, which promotes the creation and increase of the gap between the two enterprises' net interest rates. It shows that the digital transformation of enterprises helps to improve the productivity of enterprises, promotes the automation and intelligence of production through digital technology, and enables workers to get rid of low-end repetitive labor, thus improving the input-output ratio of enterprises.

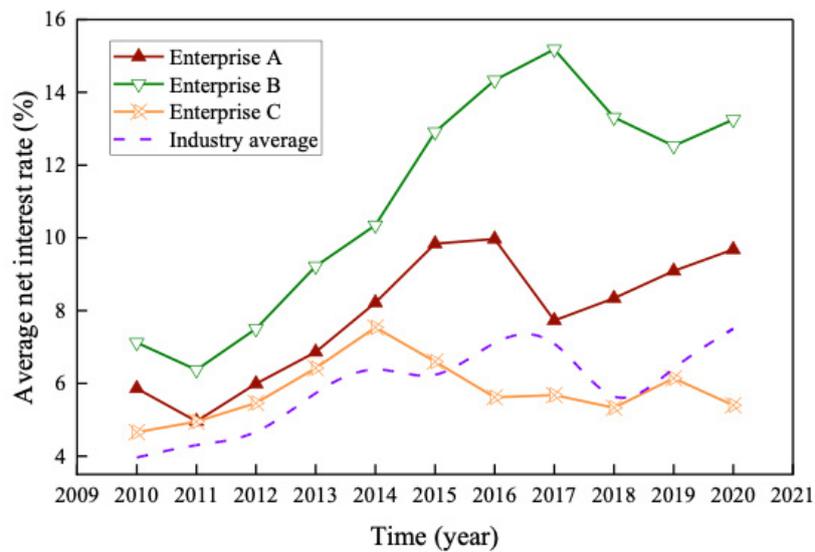


Figure 5. Comparative analysis of average net profit margin

5.2.2. MARKET SHARE OF DIGITAL PRODUCTS

In 2013 after a digital transformation to create a new growth point for A enterprise. Started to devote to the research and development of the intelligent industry, enhance consumer access through product intelligence, provide customers with a variety of scenarios of smart home solutions, to achieve new development of the enterprise. From 2013 to the present, Enterprise A's digital strategy runs situations to realize the intelligence of individual products. Then through the establishment of a platform to realize the interconnection between individual smart products and the remote control of users. And in-depth cooperation with other companies, to break down the barriers between platforms, so that external platforms and products can access the management system, to achieve multi-product, multi-platform interoperability. Table 4 shows the results of the analysis of the market share of digital products, which began to be transformed through intelligentization in 2013, and the market share of enterprise A has thus been significantly expanded. Until 2019, the sales volume of Enterprise A's digital products exceeded 70 million units globally. In addition to this, the market share of the 3 products in the market has gradually increased since 2014, with Product A reaching 33.8%. It can be seen that the implementation of the digital transformation strategy of enterprise economic management has promoted the process of product high-end, all kinds of advanced intelligent technology empowered by the product makes its functions become more diverse and complex, and then equipped with advanced design concepts, high-end materials and precision manufacturing, giving birth to a high-end product that combines a variety of high-quality conditions.

Table 4. Analysis results of digital product market share

Year	Products 1%	Products 2%	Products 3%
2011	22.7	6.5	17.5
2012	19.7	9.3	16.5
2013	21.6	7.3	16.8
2014	24.7	8.2	18.4
2015	25.2	9.6	21.3
2016	23.9	10.5	23
2017	24.6	10.7	24.6
2018	25	11	26
2019	28.9	12.6	27.4
2020	33.8	12.5	26.4

5.2.3. DIGITAL PRODUCTS OPERATING REVENUE PERCENTAGE

After the transformation of the enterprise's products, its gross profit rate of sales will appear a certain decline, because in the huge impact of e-commerce enterprises, enterprises strongly support the expansion of the Internet business, but the market competition is particularly fierce, in order to quickly occupy the market share, the enterprise needs to carry out frequent promotional activities online, coupled with the digital products in the operating categories still occupy a larger share, so the gross profit rate will appear a certain decline in the Phenomenon. Figure 6 shows the proportion of operating income from digital products, which basically remains above 30%, and after the digital model transformation in 2013, the proportion of its products in operating income increased year by year, reaching 39.5% in 2017, realizing the fundamental transformation of the enterprise's production, organization, and sales model, promoting the transformation and upgrading of the enterprise, and also improving the enterprise's operating efficiency.

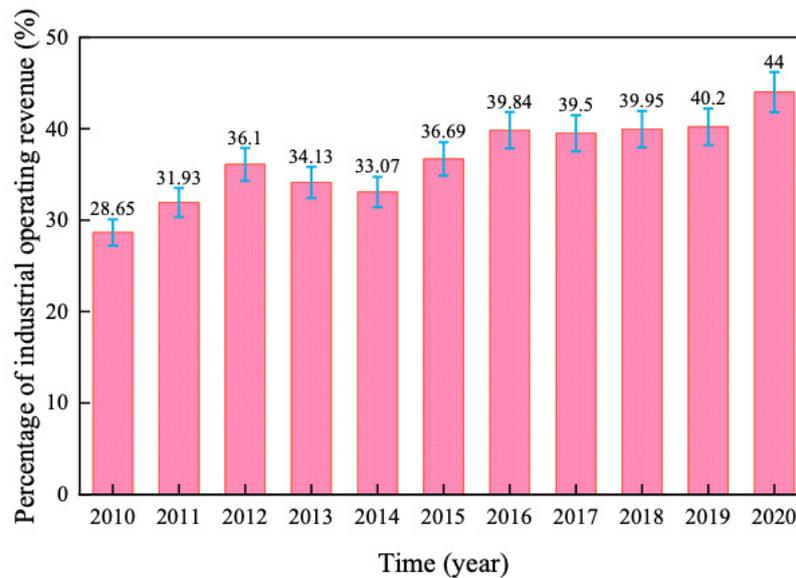


Figure 6. Proportion of operating income of digital products

5.3. ROBUSTNESS TESTS

The development of digital economy may promote the technological innovation level of enterprises by promoting innovation synergy among different subjects. Table 5 shows the results of the innovation synergy effect test, in which column (1) is the benchmark regression and column (2) tests whether the digital economy has a significant impact on the degree of enterprise innovation synergy. The results show that the impact of the digital economy in terms of deep connectivity and reduced collaboration costs significantly enhances the degree of collaboration among innovation agents. (3) Column uses the number of enterprise innovations to regress the digital economy and the degree of innovation synergy, and finds that innovation synergy has a significant positive effect on the number of enterprise innovations, indicating that the deepening of the degree of inter-agency innovation collaboration significantly increases the innovation output of enterprises. Meanwhile, the estimated coefficient of the degree of digital economy development declined after adding the degree of innovation synergy, indicating that innovation synergy is one of the mediating effects of the digital economy to promote the technological innovation level of enterprises. Further, columns (4)-(6) provide a test on the mediating effect of the degree of innovation synergy on the quality of innovation, and the results are consistent with the quantity of innovation. It shows that innovation synergy and technology absorption are important mechanisms for the digital economy to promote technological innovation of enterprises, and that the innovation promotion effect of the digital economy has a certain degree of correlation with the characteristics of enterprises.

Table 5. Test results of innovation synergy

Variable	Number of innovations			Innovative quality		
	(1)	(2)	(3)	(4)	(5)	(6)
Digital economy	0.1476*** (3.34)	0.0023** (4.20)	0.0673 (23.52)	0.0668** (4.00)	0.0023** (4.20)	0.0605 (3.43)
Period	Control	Control	Control	Control	Control	Control
	432	0.3153	0.4345	0.2418	0.3153	0.2419
Observations	427	427	427	427	427	427

6. CONCLUSION

This paper takes the digital transformation mechanism of enterprise economic management as the research objective, uses digital technology to enhance enterprise production, and tests the formula development water by constructing economic quality model, and the conclusions are as follows:

1. In the impact analysis, the digital economy variable is significantly greater than 0 at 1% probability, and the positive effect is stronger. It indicates that the digital economy application can promote the transformation performance of SMEs through cost reduction and quality improvement in order to stimulate the creativity and enhance the market competitiveness of enterprises.
2. In the analysis of economic benefits, the growth rate of operating income of digital enterprises is more than 50%, and the market share of digital products has reached 33.8%, and the proportion of operating income is basically maintained at more than 30%. It shows that the digital transformation of the enterprise helps to improve the productivity of the enterprise, thus improving the input-output ratio of the enterprise.
3. The robustness test shows that the digital economy brings deep connection, collaboration cost reduction and other aspects of the impact of the digital economy significantly enhanced the degree of collaboration between innovative subjects, and has a significant positive impact on the number of enterprise innovation.

7. DISCUSSION

With the rapid development of technology, the digital transformation of the economic management of enterprises will enter a more in-depth and complex stage. In the future, one can look forward to the emergence of more intelligent and personalized digital management tools that will better meet the growing needs of

enterprises. The widespread application of cutting-edge technologies such as artificial intelligence, big data analytics and the Internet of Things will provide enterprises with more accurate data support and help decision makers make strategic decisions more quickly and intelligently. There will be a focus on flatter and more flexible organizational models, collaboration among employees will be more efficient, and decision-making hierarchies will be more flexible, driving more resilient overall business operations. Digital transformation will also promote closer interaction between the enterprise and the external environment, strengthening the links between the enterprise and its customers, suppliers and partners, and forming a closer business ecosystem.

REFERENCES

- (1) Ding Y, Zhang H, Tang S. How does the digital economy affect the domestic value-added rate of Chinese exports?. *J Glob Inf Manag.* 2021;29(5):71-85.
- (2) Sultana S, Akter S, Kyriazis E, Wamba SF. Architecting and developing big data-driven innovation (DDI) in the digital economy. *J Glob Inf Manag.* 2021;29(3):165-187.
- (3) A JT, A YL. Research on total factor productivity measurement and influencing factors of digital economy enterprises. *Procedia Comput Sci.* 2021;187:390-395.
- (4) Xiong L, Ning J, Wang J, Dong Y. Coupling degree evaluation of heavy metal ecological capacity and enterprise digital transformation in river basins. *Ecol Indic.* 2021;133:108358.
- (5) Qiang X. Technical methods for accelerating digital transformation of Chinese enterprises. *MATEC Web Conf.* 2021;336:09024.
- (6) A PH, A KP, A MW, B GH. The impact of servitization and digital transformation - a conceptual extension of the IPOO-framework. *Procedia CIRP.* 2019;81:914-919.
- (7) Chen Q. Research on marine economic development information management system based on supply chain technology. *J Interconnect Netw.* 2022;22(Supp03).
- (8) Vasin SM, Gamidullaeva LA, Finogeev AG, Mkrtychian VS, Berezin AA. The use of benchmarking tool to improve efficiency of company's innovation activities in the conditions of digital economy. *Int J Process Manag Benchmarking.* 2021;11(2):151.
- (9) Shevchenko A. Structure of tasks for the development of the forest complex in the digital economy. *Actual Dir Sci Res XXI Century Theory Pract.* 2021;9(1):87-95.
- (10) Subaeva A, Avhadiev F. Training of personnel for agriculture in the digital economy. *Vestnik Kazan State Agrarin Univ.* 2021;16(2):133-137.
- (11) Klymchuk M, Achkasov I, Klymchuk S, Poliak O. Influence of risk management on the formation of the enterprise's business process management strategy in the digital economy: the international experience. *Bus Inf.* 2021;1:272-278.
- (12) Batova MM, Baranova IV, Mayorov SV, Korobchenko OV. Methodology and practical tools for digital transformation of high-tech enterprises. *MIR (Moderniz Innov Res).* 2019;10(4):543-560.
- (13) Rossini M, Cifone FD, Kassem B, Costa F, Portioli-Staudacher A. Being lean: how to shape digital transformation in the manufacturing sector. *J Manuf Technol Manag.* 2021;32(9):239-259.

- (14) Charalampidis I, Karkatsoulis P, Capros P. A regional economy-energy-transport model of the EU for assessing decarbonization in transport. *Energies*. 2019;12(16):3128.
- (15) Efimova LG. An alternative view of the legal regulation of civil law relations in the digital economy. *Actual Probl Russ Law*. 2021;16(8):52-62.
- (16) Shcherbakova NV. Issues of information security of society under the conditions of the development of digital economy. *Vestnik NSUEM*. 2021;1:245-253.
- (17) Mammadova GM. Innovative tools for investment management in the digital economy: a guide for post-socialist countries. *Mark Manag Innov*. 2020;4:181-190.
- (18) Voskresenskaya E, Vorona-Slivinskaya L, Achba L. Digital economy: theoretical and legal enforcement issues in terms of regional aspect. *E3S Web Conf*. 2020;164:09016.
- (19) Craig TK, Zhao YY. Organizational redesign through digital transformation: a case study in the life science industry. John Wiley & Sons, Ltd. 2021;1229-1240.
- (20) Alagarsamy A, Ponnusamy M. AI integrated with IoT and block chain for production cycle in manufacturing industries. *Solid State Technol*. 2020;63(6):14979-14989.
- (21) Harrmann LK, Eggert A, Bhm E. Digital technology usage as a driver of servitization paths in manufacturing industries. *Eur J Mark*. 2023;57(3):834-857.