

Digital Transformation and Sustainable Development Performance of Hunan A-Share Listed Companies: Basis for Enhanced Sustainable Development Model

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Abstract: This study mainly explores the relationship between digital transformation and sustainable development performance of A-share listed companies in Hunan Province through a survey questionnaire, and proposes an enhanced sustainable development model. The study finds a positive correlation between digital transformation and sustainable development performance, emphasizing the critical role of digital transformation in enhancing various aspects of corporate sustainability. Based on this, a sustainable development model based on digital transformation is proposed to promote the long-term development of enterprises. The study's recommendations include strengthening strategic planning, deepening technology application, promoting business innovation, facilitating organizational change, enhancing operational efficiency, improving social responsibility fulfillment, optimizing governance structure, and increasing investment in innovation and research and development.

Keywords: Digital Transformation, Sustainable Development Performance.

1. Introduction

During the year 2016, China actively responded to the United Nations initiative and issued the "China's strategy for executing the 2030 Sustainable Development Agenda". Sustainable development is an important mission of every enterprise. When enterprises implement the principles of 'sustainable development', it mainly means that enterprises should not only meet their own sustainable profit growth, but also make reasonable use of various resources To minimize the negative effects of production activities on the environment, which has been long-term held by internal and external stakeholders (Jamal et al., 2021). Scholars have conducted extensive discussions based on the perspective of capabilities, and have successively proposed concepts such as IT capabilities, intelligence capabilities, and technological capabilities, exploring their relationship with sustainable development (Zeng et al., 2018; Dubey, 2023).

Simultaneously, the surge of digital transformation is sweeping the world, and technological innovations technologies like mobile internet, AI, big data, and cloud computing are constantly accelerating, gradually integrating into various aspects and entire processes of economic and societal progress. Major countries and regions around the world have accelerated their strategic layout for digital transformation. In China, The Comprehensive Framework for Constructing a Digital China, released by the CPC Central Committee and the State Council, emphasized that establishing a digital China serves as a crucial driver for advancing China's modernization in the digital age and provides robust backing for developing new national competitive edges. This has set the course for digital transformation in the contemporary era and significantly influenced the sustainable growth of enterprises.

However, according to the 2022 China Enterprise Digital Transformation Index, the inclination of Chinese businesses to pursue digital transformation is on the rise, although the percentage of substantial transformation outcomes is only

17%. The 2022 White Paper on the Digital Economy of Listed Companies points out that 41.82% of the sample enterprises are in the exploratory pilot stage among those who have already started to promote digital transformation, 49.27% of them have achieved initial results, while the proportion of relatively mature and completed digital transformation enterprises is relatively small, with a quantity of 8.73% and 0.18%, respectively. It can be seen that the overall effectiveness is not significant.

Overall, Existing literature There is an inadequate examination of how digital transformation affects the sustainable development performance within businesses. As a crucial micro entity in economic growth, especially amidst the swift advancement of the digital economy, it is essential to understand how digital transformation can more effectively leverage digital technology to fulfill the sustainable development objectives of businesses. and what specific impacts exist between the two are currently urgent issues that need to be addressed.

Cao (2021), through research and analysis, through clarifying the digital transformation goal of the traditional wholesale market, analyzed the transformation strategy, and further elaborated the strategic choice of the market digital transformation, so as to formulate the corresponding specific countermeasures of the digital transformation. Ye (2022) explores how traditional manufacturing enterprises can successfully implement digital transformation strategic plans by matching digital technology capabilities and organizational legitimacy resources under dynamic environmental and institutional pressures. Ma and Li (2020) mentioned the integration of digital technology into production and operational activities throughout the digital transformation journey of businesses. The company utilizes digital technology to strategically change its behavior by aligning its internal resources with the external environment to achieve a competitive edge (Verhoef et al., 2021). Kohli et al. (2019) are of the opinion that the learning capability and innovative thinking of management teams are internal factors

driving the integration of digital technologies into business operations within companies. In addition, from the viewpoint of information technology development, digital "authorization" refers to value innovation in various links. (Jian et al., 2020). Liu and Li (2021) found through case studies that in digital transformation, how to actively adapt to corresponding internal organizational changes is the key to transformation. An et al (2022) delved into organizational change, stating that in order to achieve the implementation of digital technologies within the manufacturing sector, it is necessary to actively respond to changes throughout the entire process. Liu and Zhang (2023) studied the influence of enterprise digital transformation on supply chain efficiency, highlighting that digital transformation positively affects supply chain efficiency. Yang (2023) studied in the digital evolution of businesses, governance capability and information environment improvement are crucial in improving green innovation efficiency.

Relevant studies show that the financial outcomes of companies it serves as a crucial benchmark for assessing a company's profitability, asset management efficiency, and debt repayment capacity, directly indicating its potential for future growth (Liu et al., 2019). In the age of sustainable development, it is imperative for companies to increase their awareness of corporate responsibility, addressing issues such as global warming and human rights, as demanded by all stakeholders (Agnolucci and Arvanitopoulos, 2019).

Zhang (2023) combines financial indicators and ESG

indicators in line with the context of today's social development, and developed a framework for evaluating corporate sustainability performance. with "financial-environmental-social-corporate governance" as the indicators. Green credit can increase the financial limitations faced by companies, encourage their green innovation efforts, and influence their sustainable development performance through these financial constraints and the pathway of green innovation (Yan et al., 2022).

Digital transformation exerts a substantial positive influence on the capacity of enterprises to develop sustainably. Through the four paths of innovation power, resource support, cultural shaping and internal governance, we can cultivate the multi-dimensional core competitiveness of businesses, and significantly boosts their capacity for sustainable development (Xu et al., 2023).

Therefore, this research collected the relevant information and data, combined with companies listed on the A-share market in Hunan province as the research object ,combined with the digital transformation of Strategic Planning, Application of Digital Transformation Technology, Enterprise Business Innovation, Corporate Organizational Change, Enterprise Efficiency Improvement as A digital transformation and the influence between the sustainable development performance of enterprise variables, construct an enhancement model for the sustainable development of publicly traded companies.

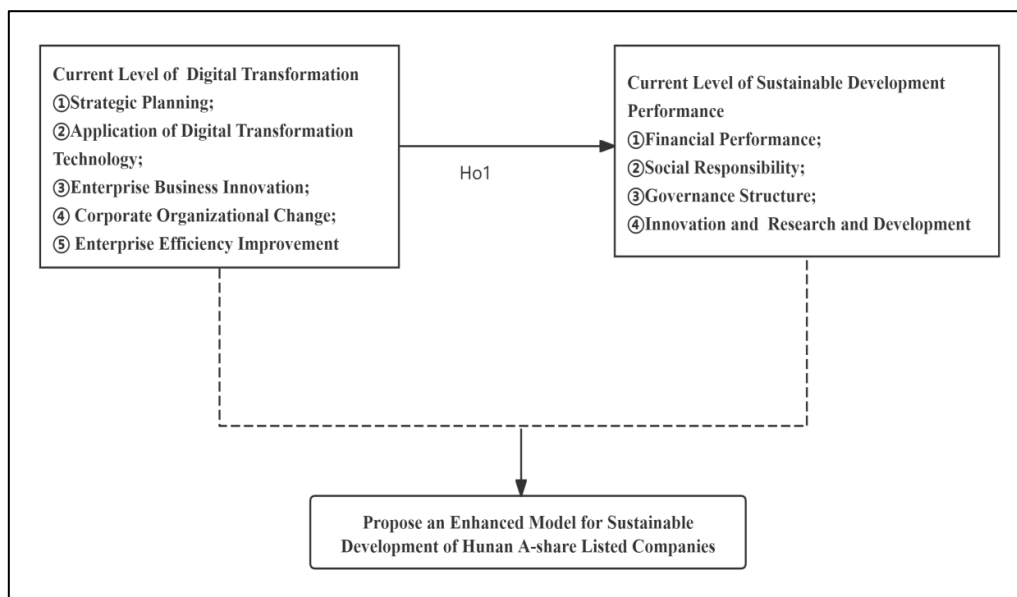


Figure 1. Conceptual Research Model

1.1. Problem Statement

This research will examine the effects of digital transformation concerning the sustainable development outcomes of A-share listed firms in the Hunan area. Specifically, it aims to tackle the following inquiries:

(1) What is the current level of digital transformation for Hunan A-share listed companies?

(2) What is the current level of sustainable development performance for Hunan A-share listed companies?

(3) Is there a significant relationship correlation between the digital transformation level and the performance level of sustainable development of Hunan a-share listed companies?

(4) From the results of the study, what enhancement model can be proposed?

1.2. Hypothesis

Assuming that the following invalid hypothesis was tested based on the problem statement:

Ho1: There is no significant relationship correlation between the current level of digital transformation and the performance level of sustainable development.

2. Method

The method of quantitative studies was used in this study. The participants of this study were selected from 10 publicly traded companies on the A-share market in Hunan Province that have experienced digital transformation. To comprehensively understand the current status of digital

transformation and the sustainability performance of businesses, the selection process of respondents strictly followed the principles of scientificity, representativeness, and feasibility to guarantee the dependability and accuracy of the questionnaire data. Therefore, a detailed analysis was initially carried out on the composition of the company's workforce, including the selection of executives, technical personnel, and ordinary employees. Then, 20%, 30%, and 50% of samples were selected from executives, technicians, and ordinary employees respectively, with the main purpose of ensuring diversity and representativeness of the samples, which can comprehensively reflect the views and opinions of employees in different positions.

In the specific operation process, this study adopted a stratified random sampling method to ensure that every employee has an equal opportunity to be selected. By using this method, respondents were selected from 10 companies. This study used Raosoft software to analyze 10 companies, with a 95% confidence level, a 5% confidence interval, and a proportion of 50%. The analysis determined a sample size of 280, indicating that 280 samples will be utilized for statistical evaluation.

The main method of data collection is collection through questionnaires, which are divided into three parts. Part 1, respondent Basic Information, Part 2 to Part 3, measures the current level of digital transformation on a 4-point Likert scale (from very low to very high), mainly from Ye (2022), Ma and Li (2020), Jin, Wang and Shen (2022), Deng (2022), Pan (2022). The performance level of enterprise sustainable development, the measured items are mainly from Jiang, Yang and Liu (2023), Zhang (2023), Huo (2022), Li and Xue (2022). And financial indicators, mainly from Bai et al. (2022) and Wang et al. After sorting out the data collected through the questionnaire, first, descriptive statistical techniques, including mean, standard deviation and frequency distribution, are used to evaluate the current situation of digital transformation and the sustainable performance of the

enterprise. Furthermore, a structural equation model was used to determine the interrelationships between these variables.

Fifty participants in this study were selected to participate in the preliminary survey. When selecting these respondents, it is necessary to consider their work and other backgrounds in order to more comprehensively assess the applicability and logic of the questionnaire. Furthermore, to ensure the objectivity of the formal survey, respondents participating in the pre-survey should no longer participate in the formal survey.

The pre-survey concludes that the overall the Cronbach's alpha coefficient for the scale is recorded as 0.994, demonstrating good reliability of the questionnaire scale used in this study. the KMO value of the questionnaire is above 0.7, and it meets the criteria for Bartlett's test of sphericity with a significance level of 0.05. Therefore, the data from the questionnaire has successfully passed the validity evaluation, indicating that the data employed in this study's questionnaire can accurately represent the variables for the ensuing research.

This study used descriptive statistical analysis and structural equation modeling analysis. By employing SPSS 29.0 and AMOS 26.0 software to conduct data analysis through a range of techniques, encompassing reliability and validity assessments, confirmatory factor analysis, path analysis, correlation analysis, and impact evaluation.

3. Results

The statistical results of the data were obtained from SPSS and AMOS software, and the statistical results were interpreted in the same order as listed in the problem statement.

3.1. The Current Level of Digital Transformation of Hunan A-Share Listed Companies

Table 1. The current level of digital transformation

Statements	Mean	Standard Deviation	Interpretation
Strategic Planning	3.11	0.85	High Level
Application of Digital Transformation Technology	3.07	0.93	High Level
Enterprise Business Innovation	3.18	0.86	High Level
Corporate Organizational Change	3.14	0.94	High Level
Enterprise Efficiency Improvement	3.30	0.79	Very High Level

Note. Very High Level (4) = 3.26 to 4; High Level (3) = 2.51 to 3.25; Low Level (2) = 1.76 to 2.5; Very Low Level (1) = 1 to 1.75

The findings presented in Table 1 reveal that participants employed strategic planning to evaluate the extent of digital transformation among Hunan A-share listed companies. The overall dimension (M=3.11, SD=0.85) suggests that respondents generally recognize the positive characteristics associated with digital transformation.

The participants assessed the extent of digital transformation in A-share listed firms in Hunan Province by examining the use of digital transformation technologies. In this overall dimension (M=3.07, SD=0.93), respondents generally recognized the positive characteristics associated through the use of digital transformation technologies.

The participants evaluated the degree of digital transformation among A-share listed companies in Hunan Province by assessing business innovation. In this overall dimension (M=3.18, SD=0.86), respondents generally recognized the positive features related to business innovation.

The respondents used organizational change to assess the extent of digital transformation among companies listed on the A-share market in Hunan Province. In this overall dimension (M=3.14, SD=0.94), respondents generally recognized the positive characteristics associated with organizational change.

The respondents assessed the degree of digital transformation among companies listed on the A-share market in Hunan Province by assessing improvements in corporate efficiency. This overall dimension (M=3.30, SD=0.79) suggests that respondents generally recognize the positive characteristics associated with improvements in corporate efficiency.

In summary, from the evaluation attitudes of the respondents towards each sub dimension, it can be seen that in the process of digital transformation, the importance of implementing each link and the evaluation of technology

application are lower than other dimensions. Enterprises should take certain measures in this regard to improve the application of technology and better adapt to the transformation goals.

3.2. The current Sustainable Development Performance Level of Hunan A-Share Listed Companies

Table 2. Current level of sustainable development performance

Statements	Mean	Standard Deviation	Interpretation
Financial Performance	3.22	0.86	High Level
Social Responsibility	3.18	0.92	High Level
Governance Structure	3.14	0.88	High Level
Innovation and Research and Development	3.18	0.92	High Level

Note. Very High Level (4) = 3.26 to 4; High Level (3) = 2.51 to 3.25; Low Level (2) = 1.76 to 2.5; Very Low Level (1) = 1 to 1.75

The results in Table 2 indicate that respondents used economic outcomes to evaluate the extent of sustainable development performance of A-share listed companies in Hunan Province. In this overall dimension (M=3.22, SD=0.86), respondents generally held a "High Level" attitude towards the financial performance of the companies. The participants utilized social responsibility as a metric to evaluate the degree of sustainable development performance of A-share listed companies in Hunan Province. In this overall dimension (M=3.18, SD=0.92), respondents generally held a "High Level" attitude towards the companies' social responsibility.

The respondents used governance structure to assess the degree of sustainable development performance of A-share listed companies in Hunan Province. In this overall dimension (M=3.14, SD=0.88), respondents generally held a "High Level" attitude towards the governance structure of the companies. Respondents gave a "High Level" rating to the performance of A-share listed companies in Hunan Province regarding innovation and research and development, In this overall dimension (M=3.18, SD=0.92). This indicates that these companies have shown a certain level of positivity and effectiveness in innovation and R&D, but there is still room for improvement.

Overall, the respondents evaluated the sustainable

development performance level of the enterprise from the four sub dimensions mentioned above, and the results were positive, reaching a high level of evaluation.

3.3. The Correlation Between the Digital Transformation Level of Hunan A-Share Listed Companies and The Performance Level of Sustainable Development

3.3.1. Part 1: Measurement Model Output Results

It showcases the findings on the construct reliability and validity, including both convergent and discriminant aspects, of the measurement model.

The measurement results indicate that the measurement model has a high degree of consistency and reliability in evaluating all variables in this study. The results of convergent validity indicate that all variables in this study have good convergent validity. The results of discriminant validity demonstrate the good discriminant validity of all variables in this study. Therefore, this study can be analyzed using structural equation modeling.

3.3.2. Part 2: Output Results of Structural Equation Modeling

(1) Illustration of the Structural Equation Model

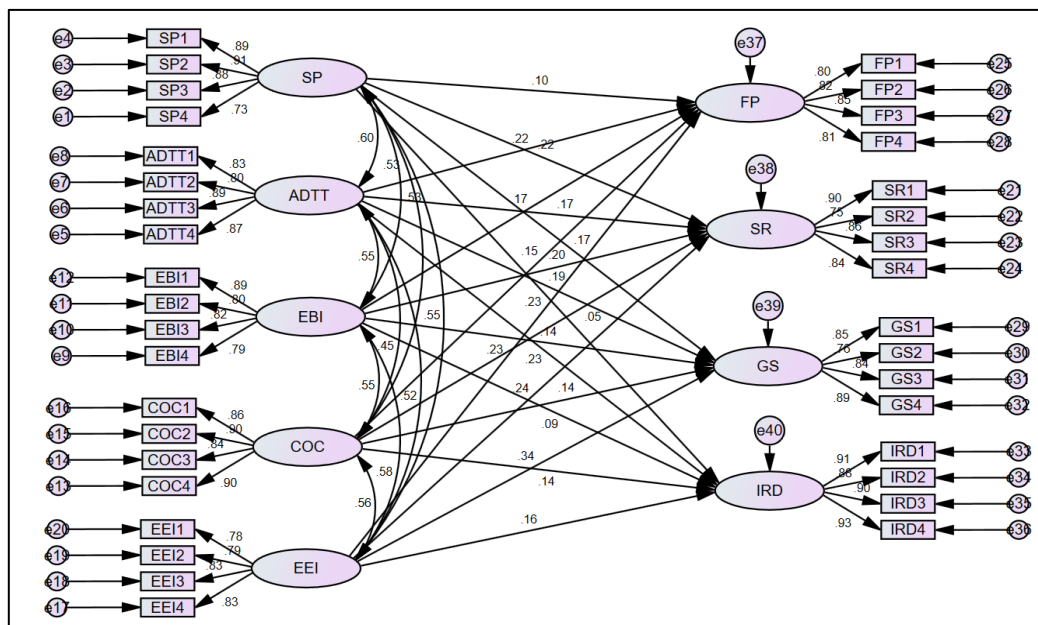


Figure 2. Structural Equation Model Diagram

Note. 1) The figure's numerical value (such as 0.10) denotes the path coefficient, which signifies the strength of the connection between the variables.

2) e1-e60: The error term of the observed variable accounts

for the portion of its variance that remains unexplained by the latent variable.

3) SP: Strategic Planning; ADTT: Application of Digital Transformation Technology; EBI: Enterprise Business

Innovation; COC: Corporate Organizational Change; EEI: Enterprise Efficiency Improvement; FP: Financial Performance; SR: Social Responsibility; GS: Governance Structure; IRD: Innovation and Research and Development.

(2) Model fit and quality indicator analysis

The gathered sample data were entered into the AMOS software to conduct a fit evaluation of the structural equation model. Model fit evaluation examines how effectively the proposed model reflects the observed data, utilizing various fit indices to assess its adequacy.

Table 3. Model Fit and Quality Indices

Model fit metrics	Value	Criteria	Remark
CMIN	743.031	—	
DF	564	—	
CMIN/DF	1.317	<3	acceptable
RMR	0.042	<0.08	acceptable
GFI	0.876	>0.9	unacceptable
AGFI	0.853	>0.9	unacceptable
NFI	0.915	>0.9	acceptable
IFI	0.978	>0.9	acceptable
TLI	0.975	>0.9	acceptable
CFI	0.978	>0.9	acceptable
RMSEA	0.034	<0.08	acceptable

Note. CMIN: Minimum Discrepancy Function of Chi-square.

DF: Represents the degrees of freedom.

CMIN/DF: Represents the ratio of the Chi-square statistic to the degrees of freedom. which should ideally be below 3, as suggested by Carmines & McIver in 1981.

RMR: The Root Mean Square Residual, which should be under 0.08, according to Hu & Bentler's 1999 guidelines.

GFI: The Goodness of Fit Index, which should be greater than 0.9 according to Jöreskog and Sörbom's 1984 guidelines.

AGFI: The Adjusted Goodness of Fit Index, also recommended to be above 0.9 as per Jöreskog and Sörbom (1984).

NFI: Normed Fit Index. (>0.9, Bentler & Bonett (1980)). IFI: Or Incremental Fit Index, is a metric used to assess the goodness of fit in a statistical model. which should be above 0.9, as suggested by Bollen (1989).

TLI: Tucker-Lewis Index, recommended to be over 0.9 according to Tucker and Lewis (1973).

CFI: Stands for Comparative Fit Index, which is a metric used to compare the fit of a proposed model to a baseline model. expected to surpass 0.9 based on Bentler's guidelines (1990).

RMSEA: Or Root Mean Square Error of Approximation, should ideally be less than 0.08, as indicated by Browne and Cudeck (1993).

Table 4. Model Testing and Path Analysis Results

		Estimate	Std. Estimate	S.E.	C.R.	P	Remarks
FP	SP→FP	0.115	0.095	0.088	1.302	0.193	No Significant
	ADTT→FP	0.194	0.218	0.065	2.994	0.003	Significant
	EBI→FP	0.201	0.173	0.087	2.304	0.021	Significant
	COC→FP	0.135	0.154	0.061	2.222	0.026	Significant
	EEI→FP	0.241	0.229	0.081	2.979	0.003	Significant
SR	SP→SR	0.319	0.221	0.102	3.128	0.002	Significant
	ADTT→SR	0.181	0.169	0.073	2.462	0.014	Significant
	EBI→SR	0.284	0.204	0.1	2.848	0.004	Significant
	COC→SR	0.054	0.051	0.069	0.781	0.435	No Significant
	EEI→SR	0.308	0.243	0.092	3.331	***	Significant
GS	SP→GS	0.223	0.171	0.084	2.639	0.008	Significant
	ADTT→GS	0.181	0.187	0.061	2.953	0.003	Significant
	EBI→GS	0.178	0.141	0.083	2.148	0.032	Significant
	COC→GS	0.138	0.145	0.058	2.393	0.017	Significant
	EEI→GS	0.385	0.336	0.079	4.891	***	Significant
IRD	SP→IRD	0.325	0.226	0.102	3.175	0.002	Significant
	ADT→IRD	0.249	0.234	0.074	3.357	***	Significant
	EBI→IRD	0.121	0.087	0.099	1.219	0.223	No Significant
	COC→IRD	0.144	0.137	0.069	2.075	0.038	Significant
	EEI→IRD	0.207	0.164	0.092	2.245	0.025	Significant
Digital transformation→Sustainable development performance		1.022	0.937	0.091	11.234	***	Significant

Note: Estimate: This is the calculated path coefficient value, showing the direct impact size of the independent variable on the dependent variable

Std. Estimate (Standardized Estimate): This is the path coefficient after standardization, which removes the influence of units, allowing for direct comparison between different path coefficients.

S.E. (Standard Error): Represents the estimate's uncertainty. A smaller standard error indicates a more reliable estimate.

C.R. (Critical Ratio): Refers to the value obtained by dividing the estimate by the standard error. akin to a t-value, used to assess the significance of the path coefficient.

P (Significance Level): This represents the probability that the path coefficient is significant.

According to Table 3, the model demonstrates good fit indices: CMIN/DF = 1.317, which is < 3, indicating a good

model fit. The Root Mean Square Residual (RMR) is 0.042, while the Root Mean Square Error of Approximation

(RMSEA) is 0.034, both of which are less than 0.08, confirming a good fit. The fit indices are as follows: Goodness of Fit Index (GFI) is 0.876, Adjusted Goodness of Fit Index (AGFI) is 0.853, Normed Fit Index (NFI) is 0.915, Incremental Fit Index (IFI) is 0.978, Tucker-Lewis Index (TLI) is 0.975, and Comparative Fit Index (CFI) is 0.978. GFI, AGFI do not meet the 0.9 requirement but have reached 0.8, which is only slightly below the standard and can be considered acceptable. The other indices meet the requirements. Overall, the model fit is acceptable.

The structural equation path coefficients reveal that. The application of technology, enterprise business innovation, corporate organizational change, and enterprise efficiency improvement all have significant positive impacts on financial performance, suggesting that these elements are crucial in boosting an organization's financial outcomes. However, the influence of strategic planning for digital transformation on financial performance is currently not significant, which may require a longer observation period and deeper implementation to reveal its effects. Companies should continue to focus on and optimize these key areas to achieve better financial performance.

The digital transformation strategic planning, technology application, business innovation, and efficiency improvement all have significant positive impacts on the fulfillment of corporate social responsibility. This indicates that as companies advance their digital transformation, they can improve both their financial and operational outcomes while also more effectively meeting their social obligations. However, organizational change in enterprises has no impact on social responsibility, suggesting that further exploration is needed on how organizational change can enhance a company's social responsibility performance.

The significant positive impact of these factors on corporate governance structure suggests that digital transformation and related corporate change measures can effectively improve governance structures, enhancing performance in areas such as board balance, incentive mechanisms, internal control, and information transparency. This improvement may help companies maintain competitiveness and sustainable development in a rapidly changing market environment.

The digital transformation strategic planning, technology application, organizational change, and efficiency improvement all have significant positive impacts on innovation and R&D, indicating that these factors can effectively support a company's innovation activities and R & D investment. The impact of enterprise business innovation on IRD is not significant, possibly due to its different focus. When promoting innovation and R&D, companies should focus on strategic planning and technology application, while also optimizing resource allocation through organizational change and efficiency improvement.

Finally, the standardized path coefficient for digital transformation's impact on sustainable development performance is 0.937, with a p-value less than 0.05, indicating statistical significance, signifying a meaningful positive impact, leading to the rejection of the null hypothesis HO1. Therefore, digital transformation exhibits a strong positive correlation with sustainable development performance.

The study by Zhang et al. (2024) demonstrates that digital transformation is vital in enhancing a company's sustainable development performance. This impact is especially significant in state-owned enterprises, small-scale businesses, and industries with high pollution levels. These findings align closely with the outcomes of the current study.

3.4. Propose a Sustainable Development Enhancement Model Based on Digital Transformation

In this research thoroughly examined how digital transformation influences the sustainable development performance of enterprises using quantitative approaches. The digital transformation investigated includes five sub-dimensions: strategic planning, technology application, business innovation, organizational change, and efficiency enhancement. Meanwhile, the level of sustainable development was measured by four dependent variables: financial performance, social responsibility, governance structure, and innovation and research and development.

The standardized path coefficients for digital transformation's effect on sustainable development performance was 0.937, respectively, with $p < 0.05$, demonstrating significant positive impacts. Consequently, the null hypotheses HO1 was rejected, establishing a notable positive relationship between digital transformation and sustainable development performance.

Specifically, the research results indicate that A-share listed companies in Hunan have achieved certain successes in digital transformation, particularly in areas such as strategic planning, technology application, enterprise business innovation, organizational change, and efficiency improvement. These factors have positively impacted the company's financial performance, social responsibility, governance structure, and innovation and R&D capabilities. This suggests that digital transformation enhances both operational efficiency and profitability, as well as enhances performance in social responsibility and governance. Consequently, it bolsters the overall competitiveness and sustainable development capabilities of businesses.

The research also highlights that strategic planning does not have a significant effect on financial performance in the short term, possibly requiring more time and deeper implementation to manifest its effects. Additionally, enterprise business innovation does not have a direct significant impact on innovation and R&D, possibly because it focuses more on market and product levels. Overall, when advancing digital transformation, companies should focus on technology application and strategic planning, while enhancing resource allocation by means of organizational change and efficiency improvements to reach greater innovation and sustainable development. From this, a model for enhancing sustainable development through digital transformation is proposed, suggesting that companies should comprehensively consider technology application, business innovation, organizational change, and efficiency improvement during the digital transformation process to fully enhance their sustainable development capabilities.

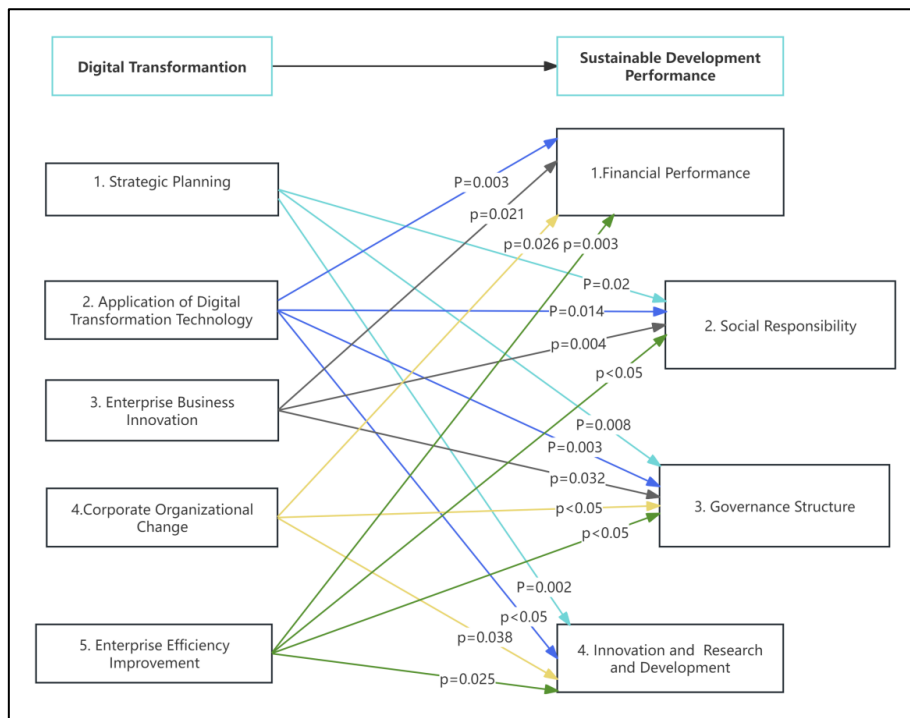


Figure 3. Sustainable Development Model

4. Conclusion and Recommendations

4.1. Conclusion

The present state of digital transformation within these companies is largely favorable, with effective recognition from respondents for strategic planning, technology application, business innovation, organizational change, and efficiency improvement. But there is still room for improvement, especially with relatively low ratings for the application of digital technology in enterprises, indicating that further efforts are needed to improve overall effectiveness in this area. Zhao (2023) mentioned that digital strategic planning is the key to business success. (Verhoef et al., 2021) indicate that gaining competitive advantage through the application of digital technology. Yuan (2023) mentioned that business innovation contributes to digital transformation. Liu and Li (2021) indicate that the success of digital transformation depends on aligning internal organizational changes with the digital evolution of the enterprise. Feng (2022) proposed the complementary relationship between enterprise digital transformation and efficiency improvement.

Research shows that respondents have a positive attitude towards the sustainability performance of these companies. However, the evaluation of governance structure is relatively low, indicating that there is still room for improvement in this area. Yuan (2023), starting from the four major evaluation index systems of economy, society, environment, and management, has enhanced the sustainable development capability of enterprises through a scientific and applicable evaluation system verified by specific cases. Agnolucci and Arvanitopoulos (2019) mentioned that all stakeholders of the company are demanding that they increase their awareness of fulfilling corporate responsibility. Zhang (2023) also uses corporate governance as a performance evaluation indicator to measure sustainable growth of enterprises, in order to monitor internal governance issues. Li et al. (2022) also considers technological innovation as a measure of sustainable development.

There exists a positive relationship between the overall effectiveness of digital transformation and sustainable development. However, in these aspects, there is no significant impact, strategic planning has no significant relationship with financial performance, organizational change has no significant relationship with social responsibility, and business innovation has no significant relationship with innovative research and development. Therefore, enterprises should pay special attention to these aspects and take corresponding measures. Liu (2023) asserts that digital transformation has a substantial impact on the sustainable development performance of enterprises by enhancing corporate governance standards. Zhang et al. (2024) described how digital transformation can have a positive and substantial impact on the sustainable development of enterprises through technological innovation. Duan (2024) examined the more pronounced effect of digital transformation on the sustainable development performance of manufacturing industries with high pollution levels.

This study proposes a sustainable development model based on digital transformation, emphasizing its importance in promoting sustainable development of enterprises. According to the research results, sub dimensions with insignificant impact should be reevaluated and improved during the planning and implementation process. For example, the impact of digital transformation strategic planning on financial performance is not significant, the impact of digital business innovation on innovation and research and development is not significant, and the effect of organizational change on social responsibility. Cao (2021) highlights the significance of digital transformation strategy in his study. Building on the objectives and strategies of digital transformation, we will further discuss strategic options and develop corresponding digital transformation strategies. Jin et al. (2022) also highlighted in their study that business innovation is an essential aspect of the digital transformation phase for enterprises. Liu et al. (2022) also concluded that organizational change is a pivotal step in the digital transformation process for businesses. In addition, for

other sub dimensions that have a significant impact, companies should further strengthen the implementation of these dimensions to achieve better results and enhance their sustainable development. Liu (2023) underscored the importance of selecting appropriate digital platforms and methods for technology application in his study. Xiong (2023) also noted the crucial role of improving overall efficiency in driving digital transformation forward.

4.2. Recommendations

For the current level of digital transformation of Hunan A-share listed companies, enterprises should further improve and implement the formulation of transformation goals, and further enhance the scope of their use in the application of digital transformation technology and improve the security and privacy of data. Regular introduction of innovative products and services relevant to the company, so that it can play the biggest role. In the organizational change, the internal organizational structure of the enterprise should be adjusted appropriately. At the same time, in the process of efficiency improvement, we should strengthen the improvement of cost control measures and efficiency, so that it can achieve efficient transformation.

For the current sustainable development performance level of A-share listed companies in Hunan Province, enterprises should focus on the balanced development of performance levels in various dimensions, integrate digital transformation into the enterprise based on their own development situation, further improve the profitability of the enterprise, improve environmental protection measures, establish comprehensive internal control systems, and allocate reasonable research and development budgets. Just achieving a higher level of sustainable development performance.

A positive relationship exists between digital transformation and the sustainable development performance of enterprises. Among them, there are a few sub dimensions with insignificant relationships. According to this conclusion, enterprises should improve their digital related strategies and implementation based on their actual development. For example, appropriate digital transformation strategies should be developed to align with the overall development goals of the enterprise, considering long-term development to enhance overall financial performance. Strengthen the application of digital transformation technology in enterprises to further enhance the overall performance of sustainable development. In addition, improving enterprise digital transformation business innovation fully considers the rationality between business innovation and research and development. When adjusting organizational change, in addition to considering internal coordination, the social responsibility that the enterprise should undertake should also be taken into account. Finally, strengthening the efficiency improvement of enterprises will enable Hunan A-share listed companies to further enhance their overall performance in sustainable development, in order to achieve sustainable development of the enterprise.

Under the sustainable development model based on digital transformation, enterprises should formulate more specific digital transformation strategies, taking into account changes in resource allocation, market pressure, and leadership methods. Enterprises should integrate, develop, or introduce digital transformation technologies for shutdown keys and apply them. We should overcome the limitations of industry characteristics and internal culture, and comprehensively

innovate our business. In addition, enterprises should refine process management and continuously adjust organizational structure based on the overall development needs of the enterprise, in order to meet the needs of digital transformation. Finally, companies should seek various methods to improve efficiency. This not only helps promote digital transformation, but also helps reduce costs and allows for more strategic investments in digital initiatives. Ensuring the efficiency of the digital transformation process can achieve sustainable development for enterprises.

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