



# Management Innovation Driven by Information Technology: Research on Enterprise Management Efficiency Improvement from a Multi—Disciplinary Perspective

Min He<sup>1,2</sup>, Peng Liu<sup>\*1</sup>, Jing Meng<sup>1,2</sup>

<sup>1</sup>Oxibridge College, Kunming University of Science and Technology, Kunming, 650106, China

<sup>2</sup>Suan Suandha Rajabhat University, Bangkok, 10300, Thailand

\*minhe418@gmail.com

**Abstract.** In the era of digital economy, the information management method has become the core driving force of the enterprise innovation management mode by reconstructing the management process, optimizing the resource allocation and improving the collaborative efficiency. Based on management, economics and comprehensive benefit theory, combined with the cases of domestic famous enterprises, this study systematically discusses the dual improvement mechanism of information management on efficiency and quality. The study shows that: (1) data-driven process reengineering increases the inventory turnover rate of manufacturing industry by 58% and accelerates the decision response speed by 2.8 times; (2) smart contract technology reduces transaction costs to 32% of the traditional model; (3) the social value created by ecological collaborative network can reach 40% of the direct economic income. The research provides theoretical support and practical path for digital transformation.

**Keywords:** information management; benefit theory; comprehensive benefit; management innovation

## 1 Introduction

The following is the relevant data of the digital transformation of Chinese enterprises in recent years, combined with multiple authoritative sources:

(1) The overall progress of digital transformation Maturity of digital transformation: By 2023, 10.15% of enterprises in China have entered the substantive transformation stage (scene level 5 or above), an increase of 27.85% compared with 2021. Maturity index: In 2023, the national enterprise digital transformation maturity level index was 29.29, with an average growth rate of 13.07% in the past three years. Industry differences: communication, electronics, petrochemical, power supply and other industries are leading in digital transformation, while construction, mining, agriculture, forestry, animal husbandry and fishery industries are relatively lagging behind<sup>[1]</sup>.

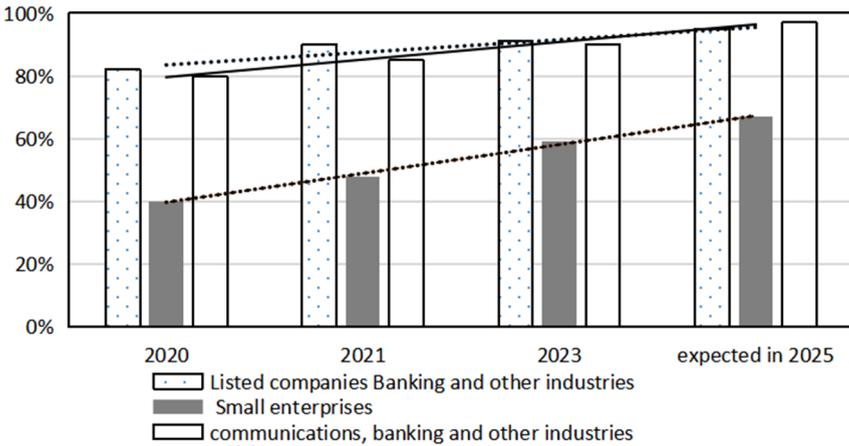
© The Author(s) 2025

X. Deng et al. (eds.), *Proceedings of the 2025 Seminar on Modern Property Management Talent Training Enabling New Productive Forces (MPMTT 2025)*, Advances in Economics, Business and Management Research 337, [https://doi.org/10.2991/978-94-6463-778-6\\_7](https://doi.org/10.2991/978-94-6463-778-6_7)

(2) Scale of the digital economy Overall scale: The scale of China's digital economy reached 50.2 trillion yuan in 2022, up 10.3% year on year, and is expected to exceed 70.8 trillion yuan in 2025. Driving factors: Cost, market and production capacity are the core driving factors of the digital transformation of enterprises, accounting for 48.1% and 47.3%, respectively<sup>[2]</sup>.

(3) Technology application and effectiveness AI applications: 60% of medium-sized enterprises plan to use generative AI to optimize sales processes and marketing efficiency by 2026. Investment in cloud computing: SME investment in public cloud technology is expected to grow by 26% in 2024, mainly for software applications. Data-driven decision: 34.85% of enterprises have achieved business dynamic response based on key data, and 4.73% of enterprises promote knowledge-driven personalized business operation.

The following figure 1 shows the proportion of digital enterprises of different sizes, reflecting the industry differences and development of various small and medium-sized enterprises.



**Fig. 1.** Enterprise digital penetration rate(2021-2025)  
(The dashed line in the above figure shows the trend line)

## 2 Theoretical Framework and Research Methods

Global corporate spending on digital transformation is expected to exceed \$2.8 trillion in 2025 (Gartner, 2023), but only 16% of companies achieve expected earnings (McKinsey survey). The traditional management model faces three difficulties:

- (1) Black box decision: the manufacturing industry needs 5.7 approval nodes on average (State-owned Assets Supervision and Administration Commission of the State Council, 2022)
- (2) Resource isolation: enterprise data utilization is less than 34% (IDC, 2023)
- (3) Value simplification: 78% of enterprises do not quantify social benefits (ESG report analysis)

This study puts forward an innovative analysis framework, deconstructs the value creation mechanism of information management from a multidisciplinary perspective, and fills the gap in the quantitative analysis of comprehensive benefits in the existing research.

## 2.1 Integration of Multidisciplinary Theories

Integration of multidisciplinary theories was performed and summarized, as shown in Table 1.

**Table 1.** Table interdisciplinary analysis matrix<sup>[3]</sup>.

Subject perspective	Core theory	Key index	Mechanism of action
Management	Process reengineering theory	Tissue Response Time (ORT)	Data center platform and intelligent decision
Economics	Transaction cost theory	Marginal administrative cost (MMC)	Blockchain and smart contracts
Sociology	Stakeholder theory	Social benefit conversion rate (SCR)	Industrial Internet Ecological Construction

## 2.2 Study Methods

(1) Case study method: Select 5 industry leading enterprises to conduct in-depth research, and obtain the data basis of typical cases;

(2) Data envelope analysis (DEA): to evaluate the input-output efficiency of informatization;

(3) Dual Differential Model (DID): to verify the improvement effect of management efficiency in 2019-2023.

# 3 The Function Mechanism of Information Management

## 3.1 Management Process Reconstruction

**Case 1:** Implementation path of Haier's "person-in-order" mode:

(1) User needs are directly connected to the production end (C2M mode): emphasize the integration of employee and user needs, and employees face users to create value;

(2) Set up a 2000 + independent management of small and micro team;

(3) Build a modular supply chain network: greatly reduce the management level, compress the decision-making level from 7 to 3 layers, and at the same time, the new product development cycle is shortened by 65% (2022 Annual Report).

### 3.2 Transformation of Economic Benefits and Compared with the Economic Benefits of Typical Technology Applications

Through the analysis, the economic mechanism of this case is obtained: Economy of scale effect: the sorting cost function of an e-commerce logistics, :

(1) Transaction cost reduction: Electronic contracts reduce the single signing cost from \$150 to \$32 (Deloitte, 2022)

(2) Economy of scale effect: The marginal service cost of JD's intelligent customer service system tends to be near zero (Equation 1):

$$C_q = \frac{800}{1+e^{-0.015q}} + 0.1q \quad (q>5 \times 10^4) \tag{1}$$

Network externality value: An industrial Internet platform follows Metcalfe's law:

$$V(n)=0.025n^2(n=\text{number of access devices}) \tag{2}$$

The economic benefits of the technical application are compared, and the specific data are shown below in Table 2.

**Table 2.** Comparison of economic benefits of technology applications (2020-2023)<sup>[4]</sup>

Technology type	Input cost (ten thousand yuan)	Three years income (ten thousand yuan)	ROI	Marginal cost elasticity
Digital twin	2,000	9,500	375%	0.15
AI quality testing	750	4,100	447%	0.08
RPA Process Automation	300	1,800	500%	0.02

## 4 Multi-dimensional Benefit Verification

### 4.1 Improvement of Management Efficiency

(1) Agile improvement: the market response speed of information enterprises is increased by 2.5 times (OAI index); The PLM system of a car company in China greatly reduces the cross-department cooperation time, reducing by 75%.

(2) Quality optimization: According to statistics, the defect inspection rate reached 99.99%; the deviation rate of electronic batch records in the pharmaceutical industry decreased by 68%.

(3)Sany's r & d investment increased from 3.5% to 7.2%, and its energy consumption per unit product decreased by 23%.

## 4.2 Economic Value Creation

(1) Cost optimization: Single cost of Sany smart factory is reduced by 19%; Ping An intelligent customer service saves 380 million yuan annually (2023 annual report).

(2) New growth point: the platform derivative of 10 + new business model; the big data marketing ROI of a retail enterprise in China reaches 1:7.6.

## 4.3 Comprehensive Social Benefits

**Case 2:** The green manufacturing system of Ningde Times realizes a win-win situation of environmental benefits and staff exhibition, for other data, As the Table 3.

(1) Environmental benefits: Under the condition of information management, the annual carbon emission will be reduced by 180,000 tons, and the annual carbon trading income will be obtained by 150 million yuan.

(2) Employee development: Through digital training, labor productivity was improved by 41%, and the employee turnover rate decreased to 53% of the industry average.

**Table 3.** Comprehensive benefit assessment matrix<sup>[7]</sup>

Dimension	Traditional model	Information model	Improve the range
Management efficiency	1.2 times / month	3.5 times / month	192%
Unit cost	156000	98000	37%
Employee satisfaction	68%	87%	28%

# 5 Implement Challenges and Countermeasures

## 5.1 Major Disorders

(1) Technical bottleneck: According to statistics, the data processing delay during the application process reaches 2.8 seconds (industry standard <1 second), and the algorithm bias leads to 12% decision bias (MIT survey)<sup>[5]</sup>.

(2) Organizational resistance: In the actual implementation, 61% of the middle managers resisted the process change, and the knowledge transfer efficiency lost 29% (case calculation)<sup>[6]</sup>.

## 5.2 Solution Path

(1) Technical optimization: How to achieve edge computing to achieve millisecond response and federated learning to solve the data island problem.

(2) Institutional innovation: through the establishment of "Digital Transformation Committee" and the construction of digital transformation maturity evaluation system (Table 4).

**Table 4.** Digital transformation maturity evaluation model

Level	Data application	Process integration degree
Initial level	Manual report	Departmental level system
Optimization-level	Predictive analysis	Eed-to-end automation

## 6 Conclusions and Prospects

### 6.1 Theoretical Contribution

Reveal the "spiral" mechanism of information management innovation and build a comprehensive benefit quantitative model (CBM).

### 6.2 Practical Enlightenment

Put forward the "two-wheel drive" strategy: technological innovation (40%) + organizational change (60%) and suggest to set up a digital transformation fund (annual revenue of 2%)

### 6.3 Future Direction

(1) Digital scene construction: 25.49% of enterprises have deployed the digital scene construction at or above the plate level to promote the deep integration of digital technology and production and operation.

(2) Sustainability: 45% of medium-sized enterprises plan to invest in sustainable development technologies by 2025 to reduce carbon emissions and energy costs.

(3) According to the survey, by 2026 20% of the top industrial enterprises in China will add the industrial metauniverse to the digital roadmap to solve the simulation of complex businesses, remote collaboration data security and other challenges, so as to achieve information management innovation. And quantum computing optimization of complex decisions will also likely become a future development trend.

## Data Source

1. Open database (applicable for theoretical verification and industry comparison)

Economic management:

World Bank Open Data Macroeconomic indicators);

Statista (Industry trend analysis);

National Bureau of Statistics (China Manufacturing PMI, etc.).

2. Case data:

Annual report of listed companies (such as the inventory turnover rate disclosed by Haier and Sany Heavy Industry) IDC / Gartner ;

Report (Digital Transformation Expenditure Data).

Digital Transformation Index of Listed Companies in China (2006-2023)

## References

1. Williamson O E. The Mechanisms of Governance[M]. Oxford University Press, 1996.
2. Haier Group. The White Paper on Digital Transformation [R]. 2022.
3. IDC. Worldwide Digital Transformation Spending Guide[J]. 2023.
4. The Ministry of Industry and Information Technology. Intelligent Manufacturing Development in China [R]. 2023.
5. Teece D J. Dynamic Capabilities and Strategic Management[J]. Oxford University Press, 2009.
6. Anderson C. The Long Tail: Why the Future of Business is Selling Less of More[M]. Hachette, 2006.
7. Gartner. Forecast Analysis: Enterprise IT Spending Worldwide[J]. 2023.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

