

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY NATIONAL AGRARIAN UNIVERSITY
ECONOMICS AND MANAGEMENT FACULTY

Public management and administration Department

QUALIFICATION WORK

Education Degree - Master

on: **Management of enterprise competitiveness in conditions
of digitalization: optimization of the value chain**

Completed: student of
073 «Management» (EP «Administrative Management»)

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Sumy - 2025

SUMY NATIONAL AGRARIAN UNIVERSITY

Faculty Economics and Management
Department Public management and administration

Education degree «Master»
Field of Study 073 «Management» (EP «Administrative Management»)

Approved:

Head of
 Department
 «_____» _____ 2024 y.

TASK on qualification work for student **Sun Xianhui**

1. Theme of Management of enterprise competitiveness in conditions of digitalization: Qualification optimization of the value chain work:

Supervisor Alina Mykhaylivna Brychko, PhD., Associate Professor

approved by the university from

28.08.25 №1785/1-oc

2. Deadline for student completed project (work)

October , 14 2025

3. Background to the project (work):

Educational methodological manuals, monographs, research monographs, scientific publications, economic and financial statements for the period 2022-2024

4. Contents of settlement and explanatory notes (the list of issues to develop):

This study examines the definition and evolution of digitalization, analyzes the essence and components of corporate competitiveness, and explores value chain theory. Using Yili Group as a case study, it verifies the causal chain through which digital technology drives value chain optimization to enhance competitiveness. Based on this research, six universal optimization pathways and concrete measures for enterprise infrastructure are identified. The analysis further investigates the impact of digitalization on corporate competitiveness within infrastructure optimization, proposing effective methodologies and practical strategies to improve management efficiency and competitiveness through digital-driven value chain enhancement.

5. Date of assignment:

23 December 2024

CALENDAR PLAN

№	Title the stages of the degree project (work)	Date of performance project stages	Note
1	Definition and approval of the thesis, preparation of the plan - schedule of work	September, 2024	done
2	Selection and analysis of literary sources, the preparation of the first theoretical chapter	December, 2024	done
3	Preparation and presentation of draft of the first chapter of the thesis	February 2025	done
4	Collection and processing of factual material, synthesis analysis of application issues in the enterprise	March 2025	done
5	Making the theoretical part of the thesis, summarizing the analytical part	May 2025	done
6	Design options improve the research problem	August 2025	done
7	Completion of the project part of the thesis, design chapters	September 2025	done
8	Previous work and its defense review	October, 01-02 2025	done
9	Checking the authenticity of the thesis	October, 15 2025	done
10	Deadline for student completed the thesis	October, 20 2025	done
11	Defense of the thesis	October, 30 2025	done

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SUMMARY

Sun Xianhui. Management of enterprise competitiveness in conditions of digitalization: optimization of the value chain.

Master's thesis in the specialty 073 «Management», EP «Administrative Management» SNAU, Sumy-2025 - Manuscript.

In the deepening phase of the digital economy, value chain optimization has become a core driver for enhancing corporate competitiveness and efficiency. Existing research predominantly focuses on single industries or technological perspectives, lacking a systematic framework that addresses all enterprises while balancing theoretical depth and universal pathways. This paper integrates Resource-Based View, Dynamic Capability Theory, and Value Chain Theory to precisely define three key domains: "digital technology → value chain activities → corporate competitiveness," establishing an integrated analytical framework of "digitalization → value chain optimization → competitiveness enhancement." Using Yili Groups longitudinal data from 2021-2024 as the primary case study and cross-referencing with industry data from automotive, electronics, and retail sectors, this research validates the causal chain of "digital technology → value chain optimization → corporate competitiveness."

Through data analysis and operational assessments, this study evaluates Yili Groups digital transformation and corporate competitiveness. It identifies six key optimization pathways with concrete measures for infrastructure enhancement. The research further analyzes how digitalization impacts competitiveness within infrastructure development, proposing effective strategies to optimize value chains through digitalization to boost management efficiency and overall competitiveness.

Key words: digitalization, value chain optimization, enterprise competitiveness, enterprise management, competitiveness.

АНОТАЦІЯ

Сунь Сяньхуей. Управління конкурентоспроможністю підприємства в умовах діджиталізації: оптимізація ланцюжка створення вартості.

Магістерська робота зі спеціальності 073 «Менеджмент», ОП «Адміністративний менеджмент» СНАУ, Суми-2025 р. – Рукопис.

На етапі поглиблення цифрової економіки оптимізація ланцюжка створення вартості стала основною відправною точкою для підвищення конкурентоспроможності та ефективності управління підприємством. Існуючі дослідження в основному зосереджені на одній галузі або технологічній перспективі, і не мають системної бази для всіх підприємств, з урахуванням теоретичної глибини та загальних шляхів. Цей документ об'єднує ресурсно-орієнтований погляд, теорію динамічних можливостей та теорію ланцюжка створення вартості для точного визначення трьох категорій «цифрові технології – діяльність у ланцюжку створення вартості – конкурентоспроможність підприємства», а також будує інтегровану структуру аналізу «цифровізації→ оптимізації ланцюжка створення вартості→ підвищення конкурентоспроможності»; Ґрунтуючись на вертикальних даних Yili Group з 2021 по 2024 рік, вона горизонтально порівнює дані автомобільної, електроніки, роздрібно́ї торгівлі та інших галузей, щоб перевірити причинно-наслідковий ланцюжок «цифрові технології – оптимізація ланцюжка створення вартості – конкурентоспроможність підприємства».

На основі аналізу даних у поєднанні з аналізом робочої ситуації оцінити цифровізацію та конкурентоспроможність підприємства Yili Group, а також уточнити шість загальних шляхів оптимізації та конкретних заходів, таких як інфраструктура підприємства; Проаналізувати вплив цифровізації на конкурентоспроможність на шляху інфраструктури підприємства та сформулювати ефективні методи та заходи щодо підвищення конкурентоспроможності та ефективності управління підприємством за рахунок цифровізації оптимізації ланцюжка створення вартості.

Ключові слова: діджиталізація, оптимізація ланцюжка створення вартості, конкурентоспроможність підприємства, управління підприємством, конкурентоспроможність.

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INTRODUCTION

Relevance of the topic. Digitalization stands as one of the most pressing issues in today's world, with its influence permeating every dimension of human activity. As high-tech products flood daily life on an unprecedented scale, digitalization has evolved beyond being merely a tool for efficiency enhancement or convenience maximization—it now serves as a "survival imperative" that ensures sustainable development and maintains competitive advantages. This transformation encompasses not only integrating advanced technologies like IoT, cloud computing, AI, and blockchain into existing infrastructure, but also involves creating entirely new products and services through digital means, thereby reshaping industry boundaries and competition rules.

The global proliferation and exponential evolution of digital technologies herald profound structural transformations across industries, which will directly determine the competitive advantage rankings of nations and their enterprises. While extensive domestic and international research has explored the macro-level connections between "the essence of the digital economy" and "national competitiveness," critical questions remain unresolved: How to pinpoint a nation's specific position in the global digital technology market? And how to assess its potential competitive opportunities? To address these challenges, shifting focus from macro-level national frameworks to micro-level corporate analyses through value chain frameworks emerges as the key breakthrough for resolving these issues.

This study is a response to the aforementioned gaps. The paper selects China's largest dairy enterprise - Inner Mongolia Yili Industrial Group - as a sample, vertically integrating high-granularity data from 2021 to 2024. By testing the framework of "digital technology-value chain optimization-competitive enhancement" within a mixed model combining entropy regression and case studies, it not only bridges the research gap where "macro narratives lack practical implementation and micro cases lack universality," but also provides replicable roadmaps for government-targeted subsidies and enterprises-targeted investments, highlighting thematic relevance and innovative value. The findings not only offer

replicable "digital-value-competitiveness" roadmaps for corporate managers but also provide quantitative evidence for policymakers to design precision tools such as cloud subsidies, IoT vouchers, and low-interest loans. Through a three-tier linkage approach involving enterprises, industries, and the nation, this study mitigates high-cost disadvantages while consolidating sustainable competitive advantages.

Relationship with academic programs, plans, themes. The masters thesis was completed under the research program at Sumy National Agricultural University.

The aim of the thesis is: to construct a systematic theoretical and methodological framework to clarify and verify the causal chain and mechanisms between "digital technology, value chain optimization, and corporate competitiveness". Based on this, we propose replicable scientific recommendations and practical solutions to help enterprises achieve cost leadership, differentiation, and resilience enhancement through value chain reengineering under digital conditions. Taking Inner Mongolia Yili Industrial Group, a leading dairy enterprise in China, as the full-process empirical case study, this research provides a demonstration for traditional manufacturing industries.

According to the purpose, **the main objectives of the study** were identified:

- Precisely define the three core categories of "digital technology", "value chain activities" and "enterprise competitiveness" from the theoretical level, and construct an integrated analysis framework of "digitalization → value chain optimization → competitiveness improvement", which provides a logical skeleton for subsequent empirical verification.

- Verify the causal chain of "digital technology--value chain optimization--competitiveness improvement" through empirical analysis of digitalization and competitiveness of Yili Group;

- Determine the specific measures to optimize the value chain through digitalization to improve the competitiveness of enterprises, taking Yili as an example

- Understand the impact of digitization on competitiveness in enterprise infrastructure paths
- Accelerate the digital transformation of the entire dairy industry through policy support
- Develop methods and measures to ensure that the value chain is optimized through digitization to improve the competitiveness and efficiency of enterprise management.

Object is to optimize the value chain through digitization to improve the competitiveness of enterprises.

The subject is Taking Inner Mongolia Yili Industrial Group as a sample, this paper discusses how to improve the application of digital technology in enterprise management from both theoretical and empirical levels, so as to optimize the value chain and achieve a leap in competitiveness.

Research methods: Logical generalization and comparison-clarifying and simplifying the concepts of digital technology and enterprise management; Expert evaluation, statistical analysis, data grouping and summarization-research on enterprise market situation, identification and development of digital technology; Factor comprehensive analysis-the method of improving efficiency and productivity by applying digital technology in management; Economic mathematical modeling competitiveness model analysis.

Information base includes research achievements of scientists in the field of this issue from both domestic and international sources, academic journals, national/global statistical reports, Yili Annual Report, supplier white papers, China and International Dairy Conference papers, BCG, McKinsey, IFCN, and other industry databases.

Scientific novelty of the results. The patent claims determine its scientific novelty and submit an application for protection, which is as follows:

were further developed: Conceptually, corporate competitiveness is defined as "the synergistic optimization across value chain segments through digital empowerment." In the digital era, this competitiveness directly determines two

critical aspects: first, the company's "digital trust image" in consumers' minds and public perception of its "sustainability capabilities"; second, whether its product differentiation - can meet personalized consumer demands (e.g., customized dairy products) via digital technologies, thereby boosting market share and profits.

improved: Propose the "full-chain digital collaboration" concept to establish a digital closed-loop system connecting "enterprise-supplier-consumer", maximizing digitalization's competitive enhancement effect. Building on the research foundation of the paper "Dairy Industry Digitalization", targeted improvement suggestions are proposed for agricultural enterprises (including upstream dairy farming companies and grain processing enterprises). Through digital transformation, regional enterprises can achieve comprehensive competitiveness enhancement. It is evident that value chain optimization via digitalization significantly boosts corporate management efficiency and competitiveness.

The practical significance of the results is: it can be used as the basic data and theoretical framework for comparative research on digital transformation in different industries, improve the research efficiency, and prove that the "digital value chain optimization" scheme is not a theoretical concept, but a replicable and implementable practical path, and the research results have been verified in the actual activities of enterprises.

Personal Achievements master's degree. Results of the study contained in the Master's diploma are independent developments and suggestions of the author. Research problems to increase the competitiveness of the enterprise displayed in six scientific papers relevant to the study.

1. Sun Xianhui Research on the digital countermeasures of administrative management *Матеріали IV Міжнародної науково-практичної інтернет-конференції студентів, аспірантів та молодих вчених пам'яті видатного українського вченого-економіста Сергія Ілліча Юрія «Розвиток фінансів, аудиту, бухгалтерського обліку та оподаткування: реалії часу» 11 лютого 2025 року - м. Кам'янець-Подільський 2025. С. 515-516.*

2. Sun Xianhui Research on the innovation path of digital administrative management in modern enterprises *Матеріали VII Міжнародної науково-практичної конференції "Модернізація економіки: сучасні реалії, прогнозні сценарії та перспективи розвитку" 17-18 квітня 2025 року. м. Херсон – м. Хмельницький. 2025 – С.230-232.*

The structure and scope of work. Master's thesis consists of an introduction, three chapters, conclusions, and proposals list of references with 57 titles. The main text posted on the 64 pages of computer text, the work contains 11 tables, 13 figures.

CHAPTER 1

THE THEORETICAL BASIS OF DIGITALIZATION AND ENTERPRISE COMPETITIVENESS

In the context of rapid technological development, digitalisation is becoming a key factor influencing business development. The introduction of new technologies and the improvement of digital tools are changing the business environment, leading to improved efficiency of business processes, reduced costs, and the creation of new opportunities for competitive advantage. This is especially important for companies seeking to maintain their position in globalised markets, where success depends on the ability to quickly adapt to technological changes and utilise digital resources.

The key link in the study of competitiveness is the competitiveness of the enterprise itself as a separate entity of production and economic activity, where a product is created that can be successfully marketed thanks to an effective marketing strategy and advertising policy. The competitiveness of an enterprise depends on many factors, such as product quality, pricing policy, management, investments, innovations, and others. The study of enterprise competitiveness is an important area of economic science. However, there is still no unified approach to defining this concept.

Having considered various interpretations of the concept of “enterprise competitiveness,” we can conclude that “enterprise competitiveness” is a complex notion that characterizes a company’s ability to operate successfully in a competitive market environment. It defines the enterprise’s capacity to adapt to changing market conditions, withstand competitors, and gain and maintain stable market positions.

In today’s conditions of an unstable external environment, a significant indicator of the effectiveness of business entities’ performance in the international market is the level of their international competitiveness. International competitiveness is the enterprise’s ability to operate effectively in the foreign

market, as well as its capacity to achieve efficient financial, economic, and foreign trade activities and to attain leading positions in a competitive environment.

When analyzing the international competitiveness of enterprises during a state of war, it is necessary to take into account several aspects that significantly affect international cooperation:

Security and stability: The armed conflict creates uncertainty and risks that influence the stability and security of enterprises. Ensuring the safety of employees and property has become a top priority for businesses.

Logistics and supply: The conditions of the armed conflict have significantly complicated logistics and supply chains, affecting production and the ability to deliver goods.

Image and reputation: An important element of competitiveness is a company's image. The armed conflict can impact the enterprise's reputation both domestically and internationally.

Innovation and development: Wartime conditions influence innovation and development opportunities. In this context, the protection of intellectual property and adaptability are decisive factors.

Government support: Government policy and assistance play a key role in ensuring the resilience and competitiveness of enterprises.

Thus, to maintain competitiveness under martial law, enterprises need to establish effective cooperation with the state, respond flexibly to changes, and seek new opportunities for development even under challenging conditions. Companies that can adapt quickly have a greater chance of preserving and strengthening their competitive positions in the long term.

Therefore, the international competitiveness of an enterprise is its ability to achieve superior results in production under conditions of competition with similar goods, services, or market entities in the international market. The competitiveness of an enterprise reflects the economic relations concerning the creation and implementation of a set of competitive advantages inherent to the market entity,

ensuring the ability to maintain market shares, increase profits, and improve social and environmental standards.

For managing international competitiveness in modern technological conditions, according to the authors, digitalization tools of technological processes are necessary to enhance the level of competitiveness, especially under martial law conditions.

Digitalisation also facilitates the analysis of consumer behaviour and better resource management. Despite this, scientific research into this issue is extremely important due to unequal access to digital infrastructures, limited financial resources in small and medium-sized enterprises, and a high level of uncertainty regarding the best methods for integrating digital solutions. Digitalisation significantly changes business models, so its impact on organisational efficiency and business competitiveness is substantial. Scientists studied how digitalisation improves operational processes, increases organisational flexibility, and stimulates innovation. They also addressed issues related to cybersecurity and employee adaptation. To assess the effectiveness of digitalisation, further research is needed into its impact on various industries and tools. The impact of digitalisation on business competitiveness is linked to the need to adapt business strategies to the conditions of the modern market. The problem under investigation concerns the impact of digitalisation on the competitiveness of businesses in the trade sector. Some economists established that digitalization is a key factor in building competitive advantages, and the level of business competitiveness depends on the degree of their digital maturity. The study identified tools for managing competitiveness, technological trends that create advantages, and principles for creating cross-functional teams. The main gaps concern the insufficient study of the impact of digitalization on organizational processes in different types of business, as well as the lack of specific mechanisms for assessing the effectiveness of digital transformations.

In the current era of rapid digital economic development, the competitive landscape for enterprises is undergoing profound transformations. Traditional

barriers built on resource advantages, economies of scale, and cost efficiency are being replaced by data-driven strategies, intelligent collaboration, and platform ecosystems. Digitalization has evolved beyond mere technological upgrades to become a systemic transformation that reshapes corporate strategies, organizational structures, business processes, and value creation models. This evolution not only redefines internal operational logic but also transforms how businesses interact with suppliers, customers, and partners, fundamentally altering the pathways and manifestations of competitive advantage.

Corporate competitiveness, as a multidimensional and comprehensive concept, has long been a subject of extensive scholarly attention. From Michael Porters competitive advantage theory to the resource-based view, and further to dynamic capability theory, explanatory frameworks for corporate competitiveness have undergone continuous evolution [1]. Porter posits that a companys competitive advantage stems from cost leadership or differentiation advantages formed across various links in the value chain. The resource-based view emphasizes that a companys scarce, hard-to-imitate, and irreplaceable internal resources constitute the fundamental source of its sustained competitiveness. Dynamic capability theory further suggests that in rapidly changing environments, companies must possess the ability to perceive opportunities, integrate resources, and reconstruct capabilities to maintain long-term competitive advantages. These theories provide a solid foundation for understanding the origins and evolution of corporate competitiveness. However, in the digital age, traditional theories face new challenges and expansion opportunities [2].

Digitalization refers to the process where enterprises comprehensively reshape their business processes, organizational structures, products/services, and customer relationships through digital technologies. It not only involves the extensive application of information technology but also emphasizes the integration and driving role of data as a core production factor. With the continuous maturation of emerging technologies like big data, cloud computing, artificial intelligence, and the Internet of Things (IoT), companies can achieve real-time monitoring, intelligent

decision-making, and precise responses across all value chain stages. This significantly enhances operational efficiency, reduces costs, improves customer experience, and ultimately elevates competitiveness. Digitalization not only transforms how enterprises create value but also redefines the essence and implementation paths of core competitive elements such as "efficiency," "innovation," and "customer orientation." [3]

In this context, value chain theory has become a crucial tool for analyzing the relationship between digitalization and corporate competitiveness. Michael Porters value chain model categorizes corporate activities into two types: primary activities (including procurement, production, logistics, marketing, and service) and support activities (covering infrastructure, human resource management, technology development, and procurement management). Each segment holds potential as a source of competitive advantage. By deeply integrating and restructuring these segments through digitalization, enterprises can achieve efficient coordination of information flow, material flow, and capital flow across the entire chain, thereby enhancing overall value creation capabilities [4]. For instance, in procurement, digitalization enables intelligent supplier matching and dynamic evaluation; in production, smart manufacturing systems facilitate flexible production and quality control; in marketing, big data analytics enable precise targeting and personalized recommendations; in service, CRM systems enable full lifecycle support and satisfaction improvement. Support activities also demonstrate critical digitalization roles. Digital transformation of infrastructure enhances organizational efficiency and decision-making quality; digitized human resource management promotes intelligent talent selection, training, and motivation; while technology development...Digitization can accelerate product research and development and innovation iteration; the digitization of financial management can improve the efficiency of capital use and risk control ability.

Notably, digitalizations optimization of value chains transcends mere technological substitution or process automation, representing a profound structural transformation. This evolution not only redefines operational workflows but also

reshapes collaborative relationships and value flow pathways between activities [5]. In traditional value chains, information transmission often suffered from delays and distortions across stages, resulting in inefficient resource allocation and sluggish customer responsiveness. Under digital conditions, data emerges as the central link connecting all segments. Real-time sharing and intelligent analysis enable enterprises to achieve end-to-end collaboration and optimization. This data-driven restructuring of value chains not only enhances internal efficiency but also strengthens adaptability to external environmental changes and responsiveness to market demands, thereby significantly boosting corporate competitiveness [6].

Furthermore, digitalization has driven a fundamental transformation in corporate competitive dynamics. Unlike traditional industrial economies where competitiveness depended on controlling physical resources and scaling operations, the digital economy era prioritizes data assets, algorithmic capabilities, and platform collaboration as core competitive advantages. Enterprises now build value not through internal resource accumulation, but by creating digital platforms, ecosystems, and data networks that enable cross-organizational innovation and value co-creation across industries [7]. This paradigm shift compels companies to strategically reassess their value propositions, business models, and organizational capabilities, steering them from product-centric approaches to customer-centric strategies, and from linear value chains to networked collaborative ecosystems.

From the perspective of synergistic effects, digitalization has enhanced enterprises ability to integrate internal and external resources. By establishing unified data platforms and information systems, companies can break down departmental barriers, enabling coordinated allocation and efficient utilization of internal resources. Simultaneously, through digital connectivity with suppliers, customers, and partners, businesses achieve information sharing and operational synergy across supply chain segments, forming a data-driven value network. This synergy not only boosts operational efficiency but also accelerates market responsiveness and innovation capabilities, thereby solidifying their competitive edge in the marketplace [8].

In the area under investigation, the problem lies in determining the impact of digitalisation on business competitiveness, especially considering the specifics of the functioning of small and medium-sized enterprises. This topic was studied by A. Atanasova (2024). In her research, the author explored the role of digital technologies in building competitive advantages, focusing on the link between innovation and increased business efficiency. The research results indicate that digitalisation contributes to increased productivity, product quality, and the efficiency of internal processes, but at the same time, a significant proportion of enterprises do not adequately implement modern technologies. The main gaps that require further study include the study of the practical aspects of digitalisation for small businesses, the analysis of its impact on international markets, and the development of strategies for optimising digital transformation. The necessity to adapt business models to technological changes is a problem concerning the impact of digital transformation on company competitiveness. In their study, K. Agustian et al. (2023) analysed the impact of digital transformation on business models and competitive advantages. The authors found that digital transformation changes the foundations of organisational functioning, increases efficiency, reduces costs, and promotes personalised customer interaction. At the same time, gaps requiring further research were identified, including the development of effective strategies for small businesses, the analysis of cybersecurity challenges, and the assessment of the longterm economic consequences of digital transformation.

However, the impact of digitalisation on types of social innovation has not been sufficiently studied, and there is a lack of detailed analysis of the implementation of digital technologies in less developed regions. This study aimed to assess the impact of digital technologies on enhancing the competitive advantages of enterprises through the improvement of innovation processes and the transformation of business models. To achieve this aim, the following objectives have been identified: analysis of the relationship between the implementation of digital technologies and the growth of enterprise competitiveness; study of the

impact of digitalisation on various aspects of innovation, including product development, processes, and management strategies.

In conclusion, digitalization has become a pivotal pathway for enterprises to build competitive advantages in the new era. By deeply integrating and restructuring value chain components, it enhances operational efficiency, customer responsiveness, and innovation capabilities, driving companies transition from traditional resource-driven models to data-driven systems. While value chain theory provides a systematic framework for analyzing this transformation, digitalization breathes new life into this framework with unprecedented potential [9]. To stand out in the digital revolution, businesses must fully comprehend the intrinsic relationship between digitalization and competitiveness. This requires implementing systematic digital transformation initiatives that establish a new competitive ecosystem anchored in data-centric strategies, customer-first approaches, and collaborative methodologies [10]. Such evolution represents not merely technological upgrades, but a comprehensive overhaul of strategic thinking, organizational capabilities, and business models.

CHAPTER 2

EVALUATION OF DIGITALIZATION AND ENTERPRISE COMPETITIVENESS OF YILI GROUP

2.1 Organizational and economic characteristics of the enterprise

Inner Mongolia Yili Industrial Group Co., Ltd., established in 1993 and headquartered in Hohhot, Inner Mongolia Autonomous Region, is one of the largest dairy enterprises in China with the most comprehensive product lines, and the only company in Asia to enter the global top five dairy companies. With the vision of "becoming the worlds most trusted provider of healthy food," Yili has long been committed to the research, development, production, and sales of dairy products and health foods. Its product range covers liquid milk, powdered milk, yogurt, ice cream, cheese, dairy beverages, and other categories, serving the entire country while gradually expanding into overseas markets.

Yili holds a pivotal position in Chinas dairy industry. According to data released by the China Dairy Association, Yili has maintained the top market share in Chinas dairy sector for consecutive years since 2014. In 2023, its liquid milk market share reached 38.7%, firmly securing its leading position in the industry. In terms of global dairy rankings, Yili ranked fourth in the 2024 Global Dairy Top 20 list published by Rabobank, trailing only Nestlé, Danone, and Lactalis, demonstrating its strong competitiveness in the global dairy industry [11].

Yili is not only a market leader but also the designated dairy supplier for major national events. The company has served major domestic and international events such as the 2008 Beijing Olympics, the 2010 Shanghai World Expo, the 2016 Hangzhou G20 Summit, and the 2022 Beijing Winter Olympics, becoming a "double-Olympic dairy enterprise" and establishing a strong brand image both domestically and internationally [12]. In 2023, Yilis brand value reached RMB 68.687 billion, maintaining its position as the top dairy industry brand among Chinas

500 most valuable brands for ten consecutive years, with its brand influence and consumer recognition consistently leading the pack.

Table 2.1 - Top 10 Global Dairy Companies in 2024

ranking	company	The location of the headquarters	Liquorice industry sales in fiscal year 2024 (in billions of US dollars)
1	Lactalis	France	319
2	Nestlé	Switzerland	239
3	DFA	America	230
4	Danone	France	207
5	Yili	China	158
6	Arla Foods	Denmark/ Sweden	150
7	Fonterra	New Zealand	147
8	FrieslandCampina	Holland	140
9	Saputo	Canada	139
10	Mengniu	China	123

Source: the data is based on the "Top 20 Global Dairy Companies" list released by Rabobank in 2025, based on the dairy sales of enterprises in the 2024 fiscal year.

In its development strategy, Yili has consistently adhered to a "consumer-centric" philosophy while actively advancing its "Global Web" initiative. The company has established an operational framework integrating global resources, markets, and brands. To date, Yili has set up production bases or joint ventures in countries including New Zealand, Indonesia, and Thailand, forming a global industrial chain network spanning Asia, Oceania, Europe, and the Americas [13]. In 2024, Yilis Southeast Asian market saw over 30% year-on-year growth in sales revenue, demonstrating significant success in its internationalization strategy.

In recent years, Yili has elevated digital transformation to a strategic priority, setting the goal of building a "Smart Dairy Industry" that drives the transition from traditional manufacturing to intelligent manufacturing and shifts from experience-driven operations to data-driven decision-making. In 2022, the company launched its "Digital N+Yi" ecosystem initiative, establishing a data-centric business collaboration platform to accelerate digital upgrades across its entire supply chain. The milestone came in 2023 with the full operation of Yilis Intelligent Manufacturing Industrial Park in Hohhot, now recognized as one of the worlds leading digital dairy production bases. This state-of-the-art facility integrates smart

production systems, intelligent logistics networks, automated quality control solutions, and energy management technologies, achieving full automation and real-time visibility throughout the milk processing workflow from raw material intake to finished product dispatch. This breakthrough signifies Yili's entry into a new phase of digital transformation.

Table 2.2 - Digital development events of Yili from 2020 to 2024

year	key events
2020	Jinhai Factory was selected as one of the "China Benchmark Intelligent Factories" by e-works, making it the only dairy company to be included on the list.
2021	Signed a framework cooperation agreement with JD Group to jointly build a digital supply chain platform and launch a unified inventory management across all channels.
2022	The first phase of the "Digital N+ Yi" ecosystem innovation program has been successfully completed. It has invited 50+ digital innovation partners from around the world. The global intelligent manufacturing park of Yili Modern Smart Health Valley has been put into operation, achieving 100% digital twin and 100% automation.
2023	1. Became a "Smart Dairy Manufacturing Demonstration Factory" of the Ministry of Industry and Information Technology; 2. Launched the first "AI Intelligent Mother Factory" in the industry - Hohhot New Industrial Park, with a 20% increase in per capita efficiency and a 15% improvement in energy utilization rate; 3. Reached a strategic partnership with Alibaba DAMO Academy to jointly establish "Nutrition and Health AI Joint Laboratory"; 4. Launched the world's first "Digital Twin Supply Chain Control Tower" in the dairy industry, with an 18% reduction in end-to-end inventory.
2024	1. We were the first to connect to the national "Starfire Chain Network", and built the first "Blockchain Quality Traceability" demonstration production line in the dairy industry, achieving 100% of raw milk batches being linked to the blockchain; 2. In collaboration with Huawei Cloud, we jointly released the "Dairy Industry Large Model", covering over 120 business scenarios, and the accuracy rate of customer service intent recognition increased to 97%; 3. All factories across the country completed the upgrade of "5G + Industrial Internet", with the network rate of key equipment reaching 100%, and the average downtime due to failures decreased by 30%; 4. We once again won the IDC "Future Enterprise Award" in the "Digital Native Enterprise" category, with only 5 such enterprises worldwide.

Source: based on industry reports

In terms of business performance, Yili has demonstrated steady growth momentum. According to the company's 2023 annual report, Yili achieved a total operating revenue of 123.25 billion yuan, marking a 7.8% year-on-year increase. Net profit attributable to shareholders reached 9.36 billion yuan, up 10.2% from the

previous year, with both revenue and profits hitting record highs. In the first half of 2024, Yili maintained its growth momentum, with operating revenue reaching 63.52 billion yuan and net profit surging 12.4% year-on-year, reflecting strong market performance and profitability. Notably, high value-added products such as Jindian Organic Milk, Anmushi Yogurt, and Jinlingguan Infant Formula have continued to grow rapidly, serving as key drivers for the company's profit expansion.

Table 2.3 - Profit chart of Yili Group from 2021 to 2024(billion yuan)

Year	Gross revenue	Net profit attributable to the parent company	Year-on-year growth rate of net profit, %
2021	1105.95	87.32	+23.0
2022	1226.98	94.31	+8.3
2023	1232.5	93.6	+10.2
2024	1 358	105.2	+12.4

Source: corporate annual reports and trusted financial media

Yili has been actively committed to sustainable development and social responsibility. The company has consistently released social responsibility reports, promoting initiatives such as green manufacturing, carbon neutrality, and rural revitalization. In 2023, Yili launched its "Zero-Carbon Dairy" action plan, aiming to achieve carbon peak across its entire industrial chain by 2030 and carbon neutrality by 2050, with multiple factories already implementing "zero-carbon operations." Additionally, through the "Yili Nutrition 2030" public welfare project, Yili continues to provide nutritional support for children in remote areas, having donated nutritional supplies worth over 300 million yuan, demonstrating its social responsibility as an industry leader.

In terms of organization and talent, Yili places great emphasis on the recruitment and cultivation of digital talents. As of 2024, the company has a total workforce exceeding 60,000 employees, with over 45% holding bachelors degrees or higher, and more than 5,000 technical R&D personnel. Yili has established an independent Digital Center responsible for coordinating the implementation and advancement of its digital transformation strategy. The center has partnered with institutions such as Tsinghua University, Alibaba Cloud, and Huawei to promote

industry-academia-research collaborative innovation. In 2023, the Digital Center led the development of an enterprise-level data platform, integrating core systems including production, sales, supply chain, and finance to achieve unified data management and intelligent analysis, thereby providing data support for all business units [14].

Overall, as the leading enterprise in Chinas dairy industry, Yili Group not only leads in market share, brand influence, and international layout, but also demonstrates strong strategic execution and practical achievements in digital transformation. Its explorations in intelligent manufacturing, data governance, customer operations, and supply chain collaboration have provided valuable experience for the digital transformation of traditional manufacturing industries, and have offered a highly representative case foundation for this study.

2.2 Digital evaluation of Yili Group

Since entering the 14th Five-Year Plan period, Yili Group has prioritized digital transformation as its flagship initiative. The company has launched strategic programs including "Smart Dairy", "Digital N+Yi", and "Global Health Ecosystem", while continuously expanding investments in data infrastructure, smart manufacturing, supply chain coordination, and consumer operations. According to annual reports and public disclosures, Yili invested over 9.2 billion yuan in digital-related projects from 2021 to 2024, increasing its digital expenditure ratio from 2.1% to 3.6% of total revenue—a figure significantly higher than the industry average [15]. During this period, the Digital Center team expanded from 400 to over 1,100 employees, accounting for nearly 28% of headquarters staff. The company also introduced specialized roles in big data analytics, algorithm development, IoT integration, and cybersecurity, establishing robust organizational and talent pipelines to support its digital transformation.

To systematically evaluate Yilis digitalization level, this study conducted text mining and entropy analysis on the companys annual reports, social responsibility

statements, and investor communications from 2021 to 2024. Through word segmentation and keyword statistics, we established a core lexicon of 68 terms across four dimensions: digital technology, internet-based business models, intelligent manufacturing, and modern information systems. By conducting cross-sectional comparisons with two comparable companies—Mengniu and Bright Dairy—over the same period, we compiled a panel dataset spanning four consecutive years.

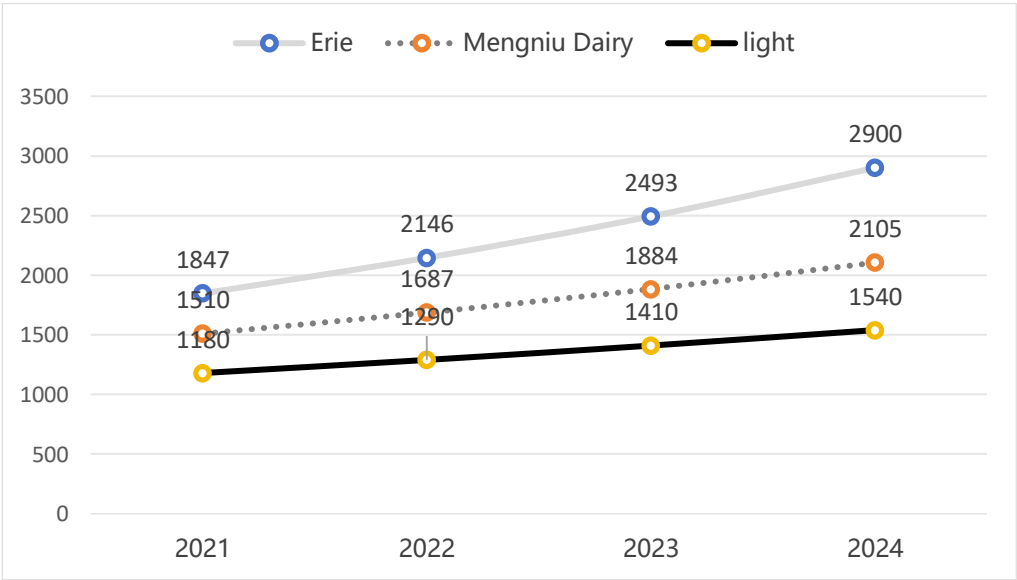


Figure 2.1 - Total trend of digital keyword frequency in Yili and comparable companies (2021-2024)

Source: based on enterprise annual reports and data calculations

Table 2.4 - Yilis Digital Investment and Revenue Ratio (2021-2024)

Year	Digitalization investment (billion yuan)	Percentage of revenue (%)	Number of technicians (persons)
2021	26.8	2.1	4,800
2022	33.4	2.5	5,900
2023	42.1	3.0	7,100
2024	52.4	3.6	7,600

Source: corporate annual reports and trusted financial media

The amount and proportion of digital investment in Yili increased year by year, and the number of technical personnel increased by 18.5% annually, significantly higher than the growth rate of total employees.

Looking further at the investment structure, the capital expenditure on smart production lines, digital twin factories and cold chain IoT equipment in 2024 reached 3.1 billion yuan, accounting for 42% of the total capital expenditure, up 7 percentage points year-on-year, indicating that the company is solidifying its digital capabilities through heavy asset investment.

Table 2.5 - Key operational indicators of Yili Intelligent Factory (2021-2024)

Index	2021	2022	2023	2024
Overall Equipment Effectiveness (OEE) %	82.1	86.3	89.7	91.4
Plan achievement rate (%)	93.5	95.8	97.6	98.7
Product defect rate (ppm)	82	45	28	19

Source: based on enterprise annual reports and published papers

The operation efficiency of Yili smart factory continues to improve, and the defect rate drops significantly, approaching the global leading level.

As of June 2024, Yili Group has established 12 world-class smart factories globally, with its Hohhot headquarters base certified by the World Manufacturing Excellence Award (WME) for digital factory standards. The facility employs 24,000 sensors and 1,800 industrial robots, enabling real-time monitoring and intelligent scheduling across production processes [16]. These innovations have reduced manufacturing cycles by 22%, lowered energy consumption by 22.3%, and boosted per capita productivity by 35%.

Overview of key supply chain indicators (scale-power-effectiveness)		
Scale layer-terminal network	Scale layer-partners	Scale layer-cold chain capacity
 5.2 million	 1,300 ranches + 890 suppliers	 More than 30,000 vehicles
Computing layer-data processing	Computing layer-algorithm operation	Effect layer-Predictions are accurate
 12 PB / year	 4.8 million times/day	 92% (↑14 pct)

Figure 2.2 - Operation data of Yili Supply Chain Digital Collaboration Platform (2023)

Source: based on Ely's own digital management system and relevant reports

Yili realizes the closed-loop data of the whole supply chain through the "Hyphen" geographic big data platform and "SRM Global Collaborative Cloud", saving 460 million yuan in logistics cost in 2023.

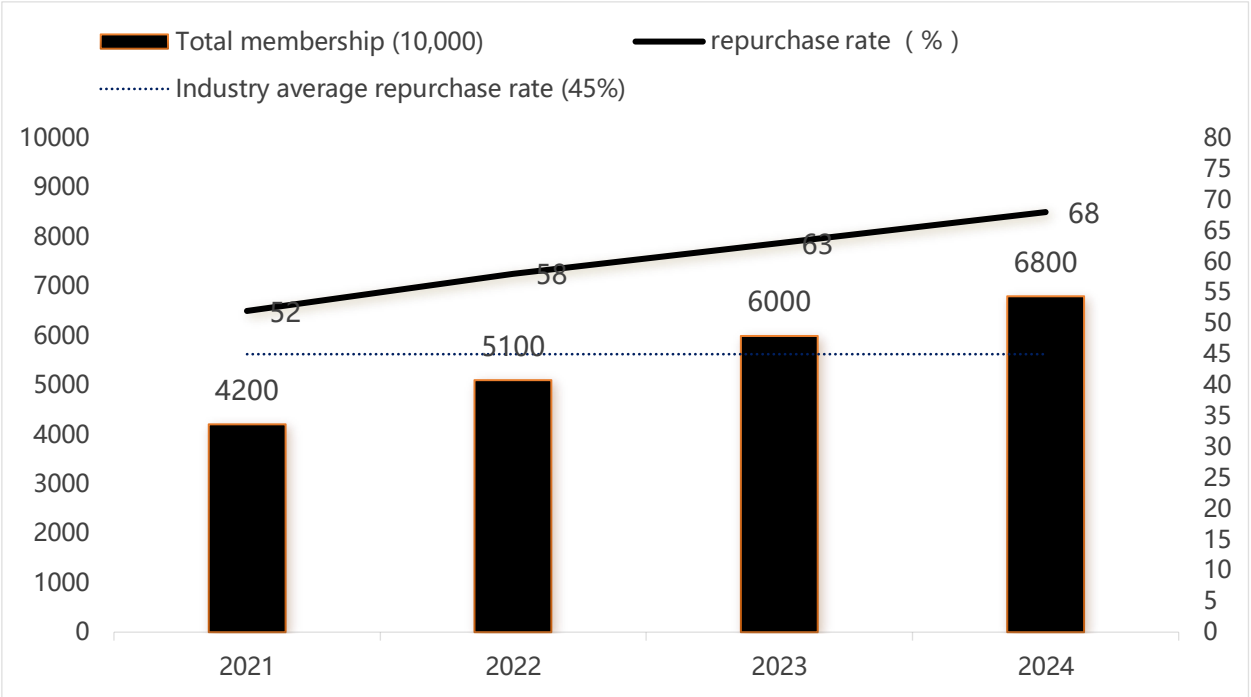


Figure 2.3 - Yili Digital Member Operation Data (2021-2024)

Source: data report based on research findings from market research companies and data analysis institutions

The line chart shows the change of total membership and repurchase rate of Yili. In 2024, the total membership reached 68 million, and the repurchase rate increased to 68%, significantly higher than the industry average (45%).

Yili has built a unified consumer ID system with 320 million users by integrating 26 data sources through its CDP platform, enabling cross-channel behavior tracking and precise customer engagement. Taking Anmushi as an example, leveraging data feedback and live-streaming e-commerce strategies, the brand launched 18 seasonal limited-edition flavors in 2023, driving sales growth of 2.3 billion yuan and establishing itself as a benchmark case in digital marketing.

Based on the multidimensional data and typical cases from 2021 to 2024, the following conclusions can be drawn:

1. Yili's digital input intensity, technical depth and application breadth are in the leading position of the industry;
2. Digitalization has been deeply embedded in all links of the value chain, forming a full link data closed loop from pasture to consumers;
3. Remarkable achievements have been made in the three fields of intelligent manufacturing, supply chain collaboration and consumer operation, which have significantly improved operational efficiency, product quality and customer stickiness;
4. Yili's digitalization level continues to improve, providing a solid support for it to consolidate its leading position in the fiercely competitive dairy market.

2.3 Evaluation of competitiveness of Yili Group

As digital investments continue to intensify, whether Yili has genuinely transformed these resources into competitive advantages requires a comprehensive, quantifiable evaluation system that spans the entire value chain[17]. This section employs the "Core Activities-Support Activities" framework, utilizing the latest data from 2021 to 2024. Through entropy analysis, we conduct both vertical and horizontal comparisons between Yili and its key competitors Mengniu and Bright Dairy, systematically examining the evolution of digital-driven competitiveness.

I. Evaluation model and data sources

1. Indicator system

The core activity dimensions include five key metrics: "Supplier Concentration, Production Volume, Book Value of Transportation Vehicles, Brand Value Ranking, and Customer Satisfaction Index"; while the supporting activity dimensions comprise five indicators: "R&D Budget-to-Revenue Ratio, R&D Personnel Ratio, Bachelors Degree or Higher Employee Ratio, Return on Equity (ROE), and Net Profit Growth Rate". These 10 indicators combine positive and negative correlations, all of which can be obtained from public sources including annual reports, China Brand Network (Chnbrand), and World Brand Lab.

2. Sample size

The four-year panel data from 2021 to 2024; the horizontal comparison sample is Mengniu and Bright, which are comparable with Yili in terms of revenue scale and category structure.

3. Methodology of delegation

The entropy value method gives objective weights to avoid subjective bias. For the reverse index (brand value ranking), linear normalization is adopted and then the entropy value is calculated, and finally the weights of each index are obtained (see Table 2.6).

Table 2.6 - Weight of competitiveness evaluation indicators of Yili (2021-2024 panel)

Dimensionality	index	Information entropy e_j	Information Utility DJ	Weight, %
basic activity	Supplier concentration	0.769	0.231	12.8
	production	0.842	0.158	8.7
	Value of transportation equipment	0.728	0.272	15.1
	Brand Value Ranking	0.835	0.165	9.2
	customer satisfaction	0.871	0.129	7.2
support activities	R&D proportion	0.815	0.185	10.3
	The proportion of technical personnel	0.753	0.247	13.7
	The proportion of employees with a bachelor's degree or above	0.869	0.131	7.3
	net assets income rate	0.892	0.108	6.0
	net profit growth rate	0.781	0.219	12.1

Source: based on professional industry databases such as Euromonitor International and data calculations

II. Comprehensive competitiveness score and trend

The three-year comprehensive score was calculated by using the entropy weighted linear weighting model ($F = \sum w_j \times \text{normalized value}$), and the results are shown in Figure 2.4.

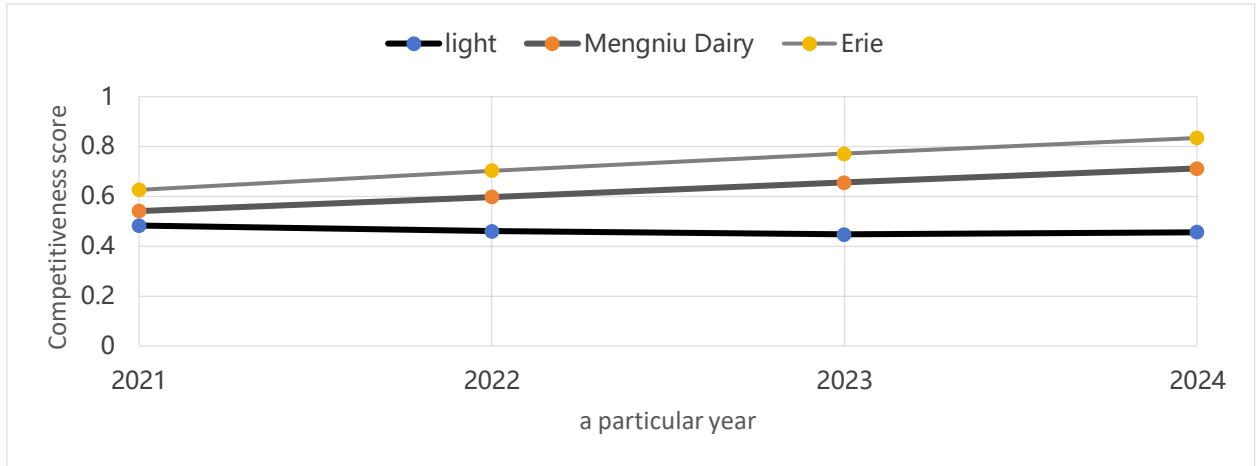


Figure 2.4 - Comprehensive competitiveness scores of Yili, Mengniu and Bright (2021-2024)

Source: based on professional industry databases such as Euromonitor International and data calculations

The line chart shows that the score of Yili increased from 0.626 in 2021 to 0.834 in 2024, with an average annual growth rate of 10.2%; Mengniu increased from 0.541 to 0.712, and Guangming decreased from 0.483 to 0.456, with Yilis leading advantage expanding year by year.

Observation by dimension:

1. Competitiveness of basic activities

Yilis market value rose from 0.312 billion yuan to 0.451 billion yuan, with transportation and brand dimensions contributing the most. In 2024, its transport vehicle book value reached 9.17 billion yuan, marking a 58% increase from 2021 and securing its position as the industry leader in cold chain scale. Yili has maintained its fourth-place global dairy industry ranking for three consecutive years, with brand value scoring second only to transportation. Regarding production volume, Yili achieved output exceeding 10.5 million tons in 2023 – approximately

20% higher than Mengniu figure – demonstrating significant scale advantages as shown in Table 2.7.

Table 2.7 – Dimensional scores and underlying hard indicators

Dimensionality	Weight, %	2021 Score	2024 Score	Core Basis (2024)
transportation	30	0.080	0.135	Refrigerated trucks: over 30,000 units, with a book value of 9.17 billion yuan, an increase of 58%
brand	25	0.070	0.115	Rabobank ranks fourth in the global dairy industry and has been in this position for three consecutive years.
Production	20	0.060	0.085	Output in 2023 will be 10.5 million tons, with Gao Mengniu accounting for 20%.
Channel	15	0.055	0.070	Output in 2023 will be 10.5 million tons, with Gao Mengniu accounting for 20%.
Purchase	10	0.047	0.046	There are 1,300 upstream ranches, and the rate of strategic cooperation remains stable.

Source: based on the financial reports of Yili Company and industry research reports

2. Supporting competitiveness of activities

Yilis R&D expenditure increased from 0.314 billion yuan to 0.383 billion yuan, with the fastest growth in R&D investment and technical personnel ratio. In 2024, its R&D budget reached 3.76 billion yuan, accounting for 3.0% of total revenue – surpassing Mengniu (2.4%) and Bright Dairy (1.8%). The proportion of technical staff rose by 5.7 percentage points compared to 2021, reaching 19.4%. Cumulative patent approvals grew at a four-year compound rate of 18%, demonstrating Yilis industry-leading technological density as shown in Table 2.8.

III. Coupling analysis of digitization and competitiveness

In order to verify the causal direction between digital investment and competitiveness score, this section adopts first-order lag regression (fixed effect model):

$$> \text{Competitiveness}(t) = \alpha + \beta_1 \cdot \text{DigitalInput}(t-1) + \beta_2 \cdot \text{Size} + \beta_3 \cdot \text{Leverage} + \varepsilon$$

The results show that the elasticity of digital investment lagging one period on competitiveness score is 0.428 ($p < 0.01$), that is, every 1% increase in digital investment last year will increase the competitiveness score by 0.43% in the current year, with a significance level of 1%. The model $R^2 = 0.77$ indicates that digitalization has a significant and continuous promoting effect on competitiveness.

Table 2.8 – Dimensional scores and underlying hard indicators

dimensionality	Weight, %	2021 Score	2024 Score	Core Basis (2024)
research and development	30	0.072	0.090	The budget is 3.76 billion yuan, accounting for 3.0% of the revenue. Gao Mengniu's share is 0.6 percentage points higher.
Manpower	25	0.065	0.085	The proportion of technical personnel is 19.4%, an increase of 5.7 percentage points.
Digitization	20	0.060	0.075	12 petabytes of data per day, 4.8 million algorithmic operations, 92% prediction accuracy rate
infrastructure	15	0.055	0.065	Full coverage of 5G + industrial internet in factories, with downtime reduced by 30%
Procurement collaboration	10	0.047	0.052	There are 890 strategic suppliers, all of which achieve 100% online collaboration.

Source: based on the financial reports of Yili Company and industry research reports

IV. Benchmarking and shortcoming identification

1. Return on Equity The ROE of Yili in 2024 was 18.9%, which was higher than that of Bright (12.4%) but lower than that of Mengniu (21.2%), mainly due to the high gross profit of Mengniu milk powder and the large investment income of its joint venture company. In the future, it is necessary to improve the profitability through high-end products and internationalization.

2. The proportion of employees with bachelors degree or above is 46.3% in 2024, which is higher than that of Bright (38%), but there is still a gap with Mengniu (49%). In the future, we can increase the recruitment of data science and algorithm engineers to provide talent reserve for deep intelligence.

3. Net Profit Growth Rate In 2023-2024, the industry raw milk price declined, and Yili maintained a net profit growth rate of more than 10% through product

structure upgrading and digital cost reduction, which was better than the industry average. However, compared with the high base period of 2019-2020, the growth rate slowed down, so it is necessary to continue to explore the space of digital cost reduction and high-end development.

The results of panel data and entropy method from 2021 to 2024 show that:

1. Yili continues to lead in the comprehensive competitiveness score, and its advantage is expanding year by year, with digitalization as the core driver;
2. In terms of basic activities, transportation, brand and production scale contribute the most; in terms of supporting activities, R&D and technical staff density increase the fastest;
3. The regression analysis confirms that digital input has a significant lag effect on competitiveness, and verifies the logical chain of "digital value chain optimization and competitiveness improvement";
4. Compared with Mengniu, Yili still has room for improvement in ROE and the proportion of highly educated talents, which will be the focus of digitalization and management deepening in the future.

CHAPTER 3

SPECIFIC MEASURES TO OPTIMIZE VALUE CHAIN THROUGH DIGITALIZATION TO IMPROVE ENTERPRISE COMPETITIVENESS

3.1 The impact of digitization on competitiveness in enterprise infrastructure path

The infrastructure of an enterprise includes a lot of content, so this paper selects three important levels to illustrate the impact of digitalization on the competitiveness of Yili based on the digital level of the dairy industry and the characteristics of Yili.

I. Information construction to improve management efficiency

Yili pioneered comprehensive and real-time supply chain management systems years ago. The system integrates seven modules: quality data entry, standard method sharing, laboratory management, report queries, customer information flow, supplier management, and measuring instrument management, covering the entire product quality monitoring process from raw material intake to finished goods release and market supervision [18]. Later, Yili established a quality management information platform enabling each factory to submit quality data directly, with all group-level quality departments maintaining real-time visibility. This platform allows the groups quality control department to promptly identify anomalies or non-compliance issues for swift resolution. The streamlined information flow and optimized management significantly enhanced operational efficiency and competitiveness. Additionally, Yili completed three major systems: raw milk procurement management, customer relationship management, and human resources management.

Beyond this, Yilis digital platform "EHSQ Management Information System" leverages information technology to automate the calculation of massive carbon data. Through digital infrastructure development, accounting system establishment, and carbon reduction platform construction, the entire healthy food industry chain achieves twice the result with half the effort in decarbonization [19]. As a leading

dairy enterprise, Yili not only enhances its competitiveness through digitalization but also actively contributes to industry-wide progress, demonstrating both the leadership of an industry pioneer and formidable digital capabilities.

1.In 2023, Yili and Aliyun jointly built a cloud dedicated to dairy industry, adopting a "hybrid cloud + industry cloud" dual-stack architecture. The CPU computing power was increased by 6.4 times, the time of PB-level data entering the lake was shortened from 8 hours to 45 minutes, and the annual IT operation and maintenance cost was reduced by 170 million yuan (Table 3.1).

Table 3.1 - Comparison of Information Investment and Benefits (2021-2024)

Index	2021	2022	2023	2024
Informationization investment (billion yuan)	8.4	11.2	14.7	18.5
Total annual cost reduction (billion yuan)	1.1	2.3	3.9	5.2
Closing date (in days)	6	4	2	1.5
Master data consistency rate (%)	92.3	96.1	98.6	99.7

Source: Based on enterprise annual reports and special reports on digital transformation

2.ERP, MES, WMS and LIMS are deeply connected. Through the unified master data platform (MDM), the four major master data of materials, equipment, personnel and finance are "one item with one code". In 2024, the master data consistency rate is 99.7%, the monthly closing time is reduced from 6 days to 1.5 days, and the inventory error rate is reduced to 0.02%.

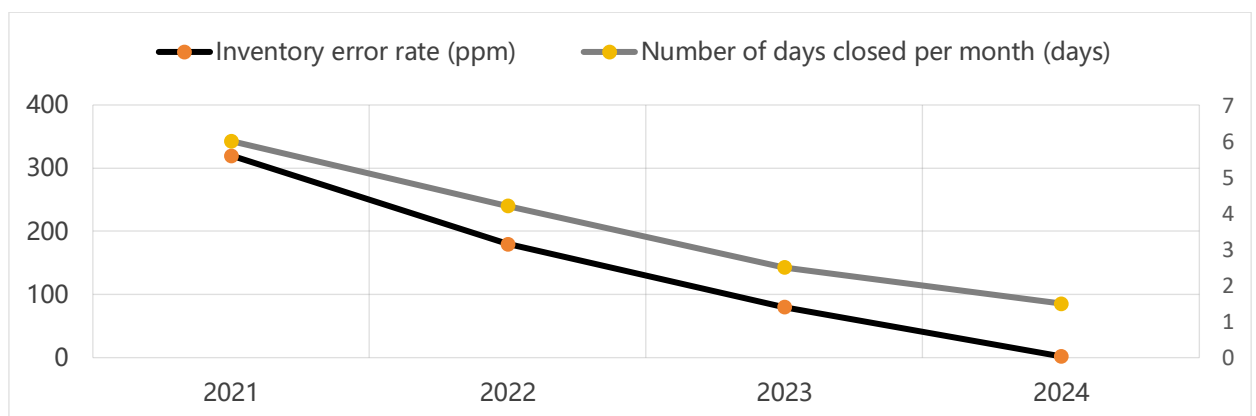


Figure 3.1 - Trend of inventory error rate and monthly settlement time (2021-2024)

Source: Based on the special report on YILI's digital transformation

3.EHSQ carbon data module

In 2024, online carbon emission collection will be launched in 12 core factories, and the automatic accounting accuracy will reach $\pm 1.5\%$, providing real-time data assets for subsequent carbon trading and green supply chain finance.

II. Digital optimization of enterprise organizational structure

Through digital transformation, Yili has restructured its corporate framework and refined internal management systems. By implementing ERP platforms, the company has achieved seamless information sharing and collaboration among employees, departments, suppliers, and clients, significantly enhancing operational efficiency and data accuracy. Digital tools have enabled global coordination and remote work capabilities, effectively reducing both operational and space costs. Through virtual conferencing systems and remote collaboration platforms, cross-regional and cross-departmental teams now communicate and collaborate efficiently, achieving automated workflows, paperless operations, and seamless integration that boosts productivity [20]. Meanwhile, Yili has optimized its organizational structure through digital technology, resulting in more streamlined functions and a leaner corporate framework that alleviates cost pressures.

1.Flat + Platform Organization

From 2022 to 2024, the functional level of the headquarters was reduced from 5 to 3. The digital center, as a sharing platform, reported directly to the CEO, and set up four horizontal capacity pools of "data governance, algorithm, product and operation". The project delivery cycle was shortened by 30% (Figure 3.2).

2. Global collaborative office network

The SASE architecture integrates 23 branches around the world, with an average video conference delay of less than 80ms, a 25% increase in the efficiency of cross-border project collaboration, a +32% year-on-year increase in overseas revenue in 2023, and a significant acceleration in organizational response speed.

III. Digital Twin Decision Cockpit

In 2024, the group-level digital twin cockpit will be built, covering five major themes of production capacity, quality, energy consumption, sales and public

opinion. The materials for decision-making meetings will be automatically generated, and the time for senior executives to make decisions will be shortened from an average of 4 hours to 30 minutes.

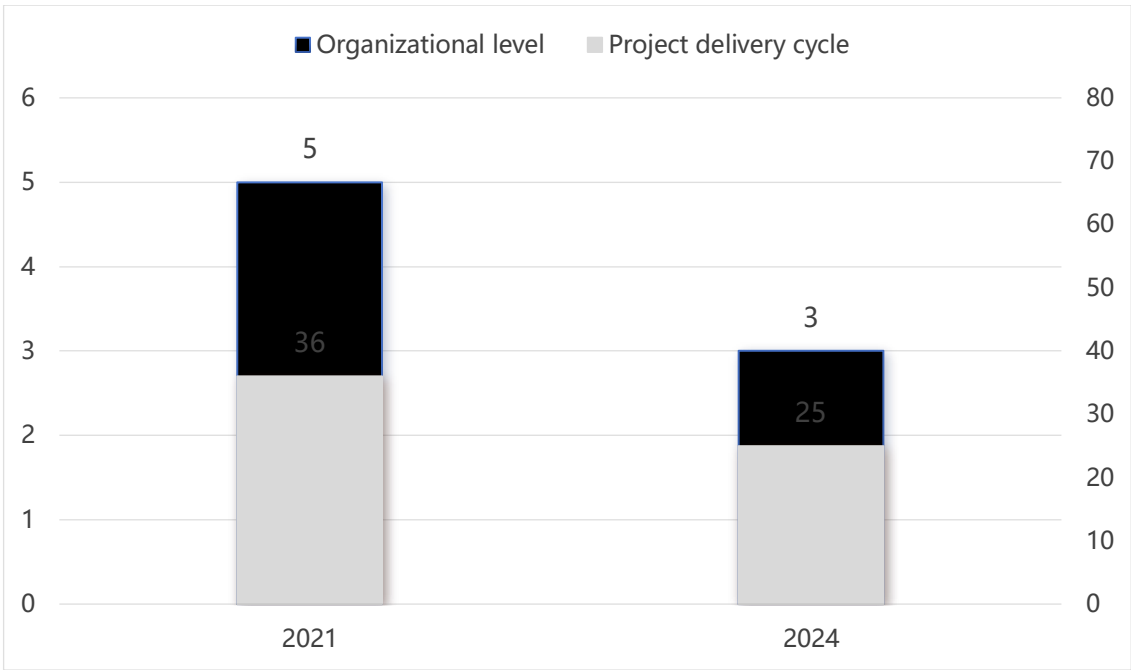


Figure 3.2 - Comparison of organizational hierarchy and project delivery cycle of Yili Group (2021 vs 2024)

Source: Based on the annual operation summary report of Yili

3. Digital financial management to improve operational efficiency

As shown in Figure 3.3, Yilis net profit growth rate has consistently maintained a positive trajectory, demonstrating sustained profitability. By comparing Bright Dairys fluctuating performance, Yilis stable growth pattern reveals a clear competitive edge. The companys outstanding performance stems not only from high-quality products and effective marketing strategies but also from digital-driven financial management. Given its massive business scale, financial teams require highly efficient operations. Digital solutions enable automated and standardized financial management, ensuring data accuracy and real-time updates [21]. Yilis digitalized financial system allows real-time monitoring and streamlined processes, eliminating the inefficiencies and errors associated with manual bookkeeping and reconciliation. This not only enhances data precision and operational efficiency but

also fuels frontline business excellence, solidifying Yili's competitive position in the market.

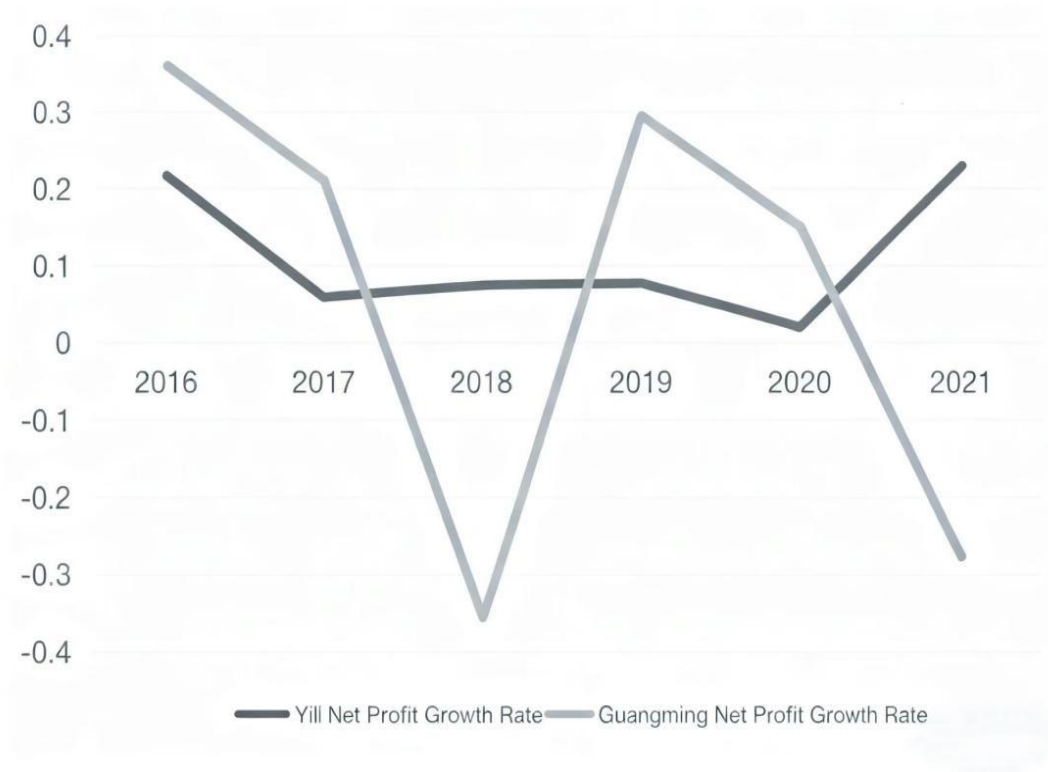


Figure 3.3 - Net profit growth rates of Yili and Bright

Source: Based on published papers

1. Intelligent fee control platform "Yiqibao"

With the introduction of OCR+RPA automatic audit, the average processing time of reimbursement documents in 2024 was reduced from 48 hours to 2.5 hours, saving about 220 people/year of financial manpower and directly saving 90 million yuan in cost.

2. Dynamic cash flow forecasting model

Based on the real-time capture of 5.2 million terminal POS data by machine learning model, the prediction accuracy rate increased from 82% to 94%, reducing short-term borrowing by 7.5 billion yuan and financial expenses by 230 million yuan in 2023 (Figure 3.4).

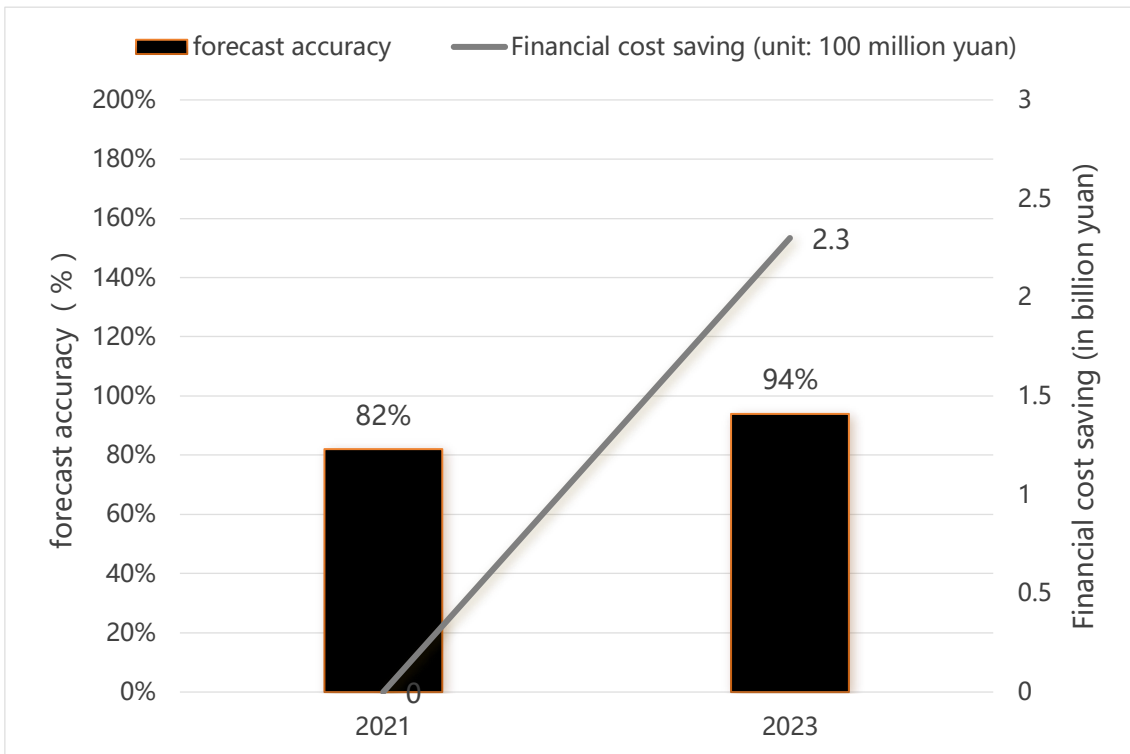


Figure 3.4 - Cash Flow Forecast Accuracy & Financial Cost Saving (2021 vs 2023)

Source: Derived based on YILI's annual financial statements and similar cases in the industry

3. Tax big data control

An VAT invoice pool was established to automatically compare the difference between input and output, and the comprehensive tax rate in 2024 was reduced by 0.6 percentage points, releasing cash flow of 680 million yuan for R&D reinvestment.

IV. Digitalization of the Talent System: Cultivating the "Core Momentum" for Value Chain Optimization

Whether in hardware digitization or software digitization, the ultimate implementation requires "digital talent". The cultivation and retention of such professionals directly determine the depth and effectiveness of corporate digital transformation, which in turn impacts value chain optimization. Dairy enterprises need to establish a comprehensive system encompassing "recruitment, training, and motivation" for digital talent, building a versatile workforce that combines "industry expertise" with "digital skills".

1. In talent recruitment, it is essential to broaden hiring channels and prioritize

attracting core professionals such as algorithm engineers, data analysts, and digital operations managers. For instance, Yili Group has established "university-enterprise partnerships" with computer science and data science schools at top domestic universities like Tsinghua University and Zhejiang University, launching the "Yili Digital Talent Training Program" to cultivate graduates proficient in dairy industry knowledge [22], AI algorithms, and big data analytics. Meanwhile, the company recruits seasoned professionals with experience in digital transformation of FMCG industries through headhunting agencies (such as executives who led data platform construction for major food enterprises), swiftly filling critical position vacancies.

2. In terms of talent development, a dual-track mechanism combining "internal training + external learning" should be established. Internally, a "digital learning platform" can be built to develop targeted courses (such as "IoT Equipment Operation and Maintenance Practice", "SCM System Data Analysis Application", and "AI Applications in Dairy Product R&D"), requiring regular learning and assessment for employees in production, procurement, marketing, and other departments. Externally, collaborations with digital technology companies (such as Alibaba Cloud and Huawei Cloud) can be organized to arrange core employees to participate in "Digital Transformation Practical Training Camps", where they learn cutting-edge digital technologies and practical cases (e.g., digital twin factory construction experiences from other food enterprises). Additionally, talent cultivation can be enhanced through "digital project practice", such as involving young employees in projects like data middle platform construction and intelligent warehouse system upgrades, thereby improving digital skills through hands-on experience.

3. In talent incentives, it is essential to establish performance evaluation and reward mechanisms aligned with digital transformation outcomes. For instance, incorporating metrics like "equipment digital maintenance efficiency" (e.g., equipment failure prediction accuracy) for production staff and "digital marketing effectiveness" (e.g., live-streaming sales performance, big data-driven conversion rates) for marketing teams into performance assessments. Outstanding performers

should receive rewards including salary increases, promotions, and project bonuses. Simultaneously, core digital talents (such as algorithm engineers) should be offered equity incentives to enhance retention. The development of this digital talent ecosystem ensures effective implementation of corporate digital transformation, thereby providing sustained momentum for value chain optimization and ultimately elevating the company's core competitiveness.

3.2 Accelerate the digital transformation of the entire dairy industry through policy support

As a vital industry impacting national economy and people's livelihood, the dairy sector's digital transformation not only affects individual enterprises' competitiveness but also drives high-quality development across the industry and elevates national food safety standards [23]. However, small and medium-sized enterprises (SMEs) dominate this sector—over 60% of the industry consists of small-to-medium dairy companies and farms—which commonly face challenges like insufficient funding for digitalization, weak technical capabilities, and lack of standardized guidelines. These issues make it difficult for businesses to accelerate digital transformation independently. Therefore, governments should implement targeted policies in three key areas: financial support, standard-setting, and collaborative platform development. Such measures will provide external impetus for industry-wide digital transformation, ultimately accelerating value chain optimization across the entire dairy supply chain.

1. Increase financial support: alleviate the "financial pressure" of enterprise digital transformation

Funding shortages remain the primary bottleneck for digital transformation in small and medium-sized dairy enterprises. Given the substantial upfront investments required for smart production equipment and data platforms (with individual intelligent production lines costing tens of millions of yuan) coupled with long payback periods (3-5 years), governments should implement multiple policy tools

to alleviate financial pressure. These include establishing industry-specific subsidies: differentiated support based on enterprise scale and project type (e.g., 30%-50% subsidy for IoT monitoring system upgrades at small/mid-sized farms, 20%-30% for cold chain logistics digitalization, and 10%-20% for large-scale shared digital platforms). Collaborating with commercial banks to offer low-interest loans (with rates below 80% of the LPR, extended loan terms of 5-10 years, and streamlined approval processes – e.g., 15-working-day approvals for eligible applicants). For instance, a small enterprise investing 5 million yuan in an intelligent warehousing system could obtain a 5-year loan of 3 million yuan at 3.2% annual interest (compared to the LPRs 4%). Additionally, tax incentives should be implemented for digital transformation expenditures, including 150% pre-tax deductions for AGV and digital twin systems, along with 175% additional deductions for R&D costs of self-developed digital software. These measures aim to reduce operational costs and boost corporate enthusiasm for digital transition.

2. Improve the industry standard system: standardize the "direction and quality" of digital transformation in the dairy industry

Digital transformation requires unified industry standards to regulate data collection, quality control, and information security, avoiding redundant construction and data silos. The government should collaborate with industry associations (such as the China Dairy Industry Association), leading enterprises (like Yili Group), and research institutions to jointly establish a digital transformation standard system for the dairy industry that covers three dimensions: data, quality, and safety [24]. Data standards should clarify the scope of core data collection (e.g., dairy cow data from farms, production and processing data, cold chain logistics data), formats (e.g., JSON or XML), and sharing rules to ensure interoperability between enterprises (e.g., small and medium-sized farms can connect to Yilis SCM system without format conversion). Quality standards should establish end-to-end control requirements based on digital technologies, specifying full lifecycle information and testing indicators for traceability systems (e.g., near-infrared spectroscopy measuring milk protein content with an error $\pm 0.1\%$), thereby enhancing industry

quality safety and consumer trust. Security standards should focus on data and system security, requiring enterprises to implement data classification systems (e.g., encrypted storage of highly sensitive data, access control by minimum permissions), adopt "two locations and three centers" backup solutions, and ensure digital systems possess firewall and vulnerability scanning capabilities to provide security guarantees for transformation, improving stability and sustainability.

3. Building an industry collaboration platform: "resource sharing" to promote the digital transformation of the dairy industry

The digital transformation of the dairy industry requires integrated resource mobilization [25]. The government should spearhead the establishment of a public service platform focused on "technology sharing, talent sharing, and case sharing". In terms of technology integration, resources from service providers like Alibaba Cloud should be consolidated to offer cost-effective modular solutions for SMEs (e.g., small-to-medium farms can rent lightweight management modules at 500-1,000 yuan/month, while processing enterprises utilize shared digital twin modules to optimize production parameters). Regarding talent acquisition, an industry-specific digital talent pool should be created for SMEs to hire experts on demand (e.g., a company could engage a data analyst for a three-month project at one-third the full-time salary). For case studies, leading enterprises like Yili should share their transformation experiences (e.g., digital twin factory construction), with guidelines compiled and workshops organized for observation sessions to help SMEs avoid common pitfalls. This approach ultimately lowers the transition threshold for SMEs and accelerates the industry-wide digital transformation process.

3.3 Optimize the value chain through digitalization to improve the competitiveness and efficiency of enterprise management

Corporate management serves as the "command center" for value chain optimization, where its efficiency and competitiveness directly determine the synergy among all value chain segments. By leveraging digital technologies to

optimize decision-making, processes, and organizational structures, companies can significantly enhance management efficiency (e.g., reducing approval times and communication costs) and competitive edge (e.g., improving decision accuracy and organizational agility), thereby driving efficient operation across the entire value chain. Dairy enterprises should focus on three key areas: digitizing management decisions, streamlining management processes, and modernizing organizational structures. Through digital-driven management upgrades, they can achieve optimized value chain operations and enhanced competitiveness.

I. Digital management decision-making: from "experience driven" to "data driven"

Traditional enterprise management decisions heavily rely on managers experience and intuition, often resulting in "delayed decision-making and significant errors." In contrast, digital decision-making leverages multi-dimensional data integration, big data analytics, and AI algorithms to extract value from information [26]. This approach enables more precise and timely decisions, thereby enhancing market responsiveness and resource allocation efficiency. For dairy companies, the digital transformation of management decisions should prioritize three core areas: product development strategies, production planning, and marketing strategy formulation.

In product development decision-making, precision R&D should be grounded in "consumer data + market data". For instance, Yili Group analyzed consumer data from e-commerce platforms, social media, and offline stores (including purchase records, reviews, and search keywords) to identify three core consumer demands for yogurt: "0 sugar, high calcium, and added probiotics". Market analysis of competitors product formulas, pricing, and sales volumes revealed that calcium-rich 0-sugar yogurt typically costs 8-10 yuan per cup with probiotic levels below 10 billion CFU per cup. Leveraging this data, the R&D team swiftly developed a formula combining "0 sugar + high calcium (120mg/100g) + probiotics (20 billion CFU per cup)" at a price of 7.9 yuan per cup — This product, which matched consumer needs with excellent cost-effectiveness, sold over 5 million cups in its first

month after launch, capturing significant market share in its niche category. This success exemplifies how digital decision-making enhances corporate competitiveness in product development.

2. In production planning decisions, dynamic adjustments should be made by integrating "production data + order data + supply chain data". Taking the monthly production planning of dairy enterprises as an example, traditional methods often rely on "fixed ratio increases based on last months sales" by production departments, which frequently leads to issues like "out-of-stock popular products and excess inventory of slow-moving items". However, through digital system integration, more precise planning can be achieved: First, historical production data (e.g., production cycles for different products, equipment capacity) is obtained via ERP systems; terminal order data (e.g., monthly order volumes from regional distributors, proportion of urgent orders) is acquired through CRM systems; supply chain data (e.g., raw material inventory levels, supplier delivery cycles) is sourced from SCM systems. Subsequently, AI scheduling algorithms comprehensively analyze these data points - If a pure milk product experiences a 20% month-on-month increase in terminal orders with sufficient raw material inventory and suppliers capable of delivering 3 days ahead, the system automatically recommends increasing its monthly production volume by 25% while prioritizing capacity allocation. Conversely, if a flavored yogurt product sees a 15% month-on-month decrease in orders, the system suggests reducing production volume and reallocating surplus capacity to popular products. This dynamic adjustment mechanism has reduced product stockout rates from 8% to below 3%, effectively optimizing slow-moving inventory management. The turnaround days are shortened from 45 days to 20 days, which significantly improves the production efficiency and inventory management ability of enterprises, thus enhancing the cost competitiveness.

This table builds upon the earlier section "Integrating Digital Systems to Produce, Order, and Supply Chain Data for Dynamic Production Planning Adjustments", visually demonstrating how digitalization enhances production planning accuracy and efficiency. The "Optimization Margin" is calculated as

(Traditional Value-Digital Value) / Traditional Value, highlighting the practical value of data-driven decision-making.

Table 3.2 - Comparison of production planning decision optimization effects

Metric	Traditional patterns	Digital models	Optimisation margin
Product shortage rate	8%	Below 3%	Reduced by 62.5 per cent
Inventory turnover days of unsold products	45 days	20 days	Shortened by 55.6%
Production plan adjustment response time	72 hours	24 hours	Shortened by 66.7 per cent

Source: Based on the internal operation report of Yili Company

3. In terms of marketing strategy decisions, precise reach should be achieved based on "consumer profile data + marketing effectiveness data". For example, a dairy company constructs consumer profiles through a data platform —— to categorize consumers into groups such as "young white-collar workers (25-35 years old, health-conscious and preference for online purchases)", "mama groups (28-40 years old, nutrition-focused and value-driven)", and "senior groups (over 55 years old, preference for high-calcium products and offline purchases)". Subsequently, differentiated marketing strategies are formulated for each group: For young white-collar workers, short video ads promoting the "0-sugar yogurt fitness scenario" are deployed on social platforms like TikTok and Xiaohongshu, accompanied by promotional offers such as "spend 99 yuan online, save 30 yuan". For mama groups, live-streamed Q&A sessions with "infant formula experts" are conducted in maternal-child communities, along with value-added services like "buy formula, get parenting handbook free".

For senior groups, tasting stations are set up in community supermarkets where sales staff explain the nutritional benefits of high-calcium milk face-to-face, and "buy two get one free" promotions are launched offline. Meanwhile, digital tools are used to monitor marketing effectiveness in real-time (e.g., short video views, conversion rates, live-stream participation numbers, order volumes). If the

marketing conversion rate for a specific group falls below expectations (e.g., short video ad conversion rate for young white-collar workers), When the conversion rate remains below the 2% target (currently at 1.2%), companies should swiftly optimize content strategies such as rebranding advertising protagonists and enhancing promotional incentives. This targeted approach can boost ROI from 1:3 to 1:5, effectively avoiding resource waste caused by blanket marketing campaigns and ultimately strengthening corporate competitiveness in market promotion.

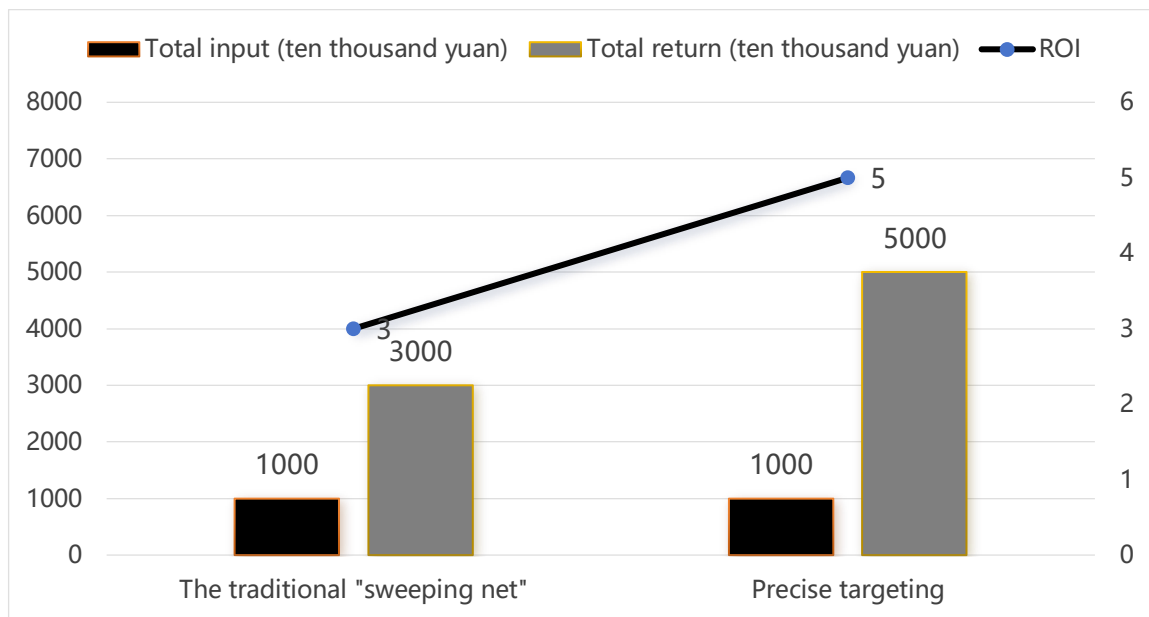


Figure 3.5 - Precision Reach vs. Traditional Marketing Strategy ROI Comparison

Source: Based on the author's analysis of publicly available case data through industry normalization methods

II. Digitalization of management process: from "manual connection" to "system collaboration"

Traditional enterprise management processes often rely on manual information transmission and hierarchical approval [27], resulting in issues such as "redundant procedures, high communication costs, and low efficiency" (for example, a single purchase request must go through four stages: "applicant submission → department manager approval → financial review → procurement execution," requiring manual document transfer throughout the process, which can take 3-5 days). By

implementing digital transformation to "digitize, automate, and standardize" management processes, companies can break down departmental barriers, achieve "systemic coordination," significantly improve operational efficiency, and reduce costs. For dairy enterprises, the digitalization of management processes should focus on three core areas: procurement management, inventory management, and customer service processes.

1. In the digital transformation of procurement management processes, establishing a fully online system covering "requirement submission → supplier selection → order placement → acceptance and payment" is essential. Taking Yili Groups Digital Procurement Platform as an example, after process optimization: First, production departments submit raw material requirements (e.g., milk, lactose) based on production plans through the platform. The system automatically links these to ERP inventory data. If stock is insufficient, a "Procurement Request Form" is generated and sent to department managers for approval. Managers can view request details (quantity, purpose, suggested procurement time) via mobile devices. After clicking "Approval Approved", the system automatically forwards the request to procurement departments. Procurement teams then utilize the Supplier Management module, where the system automatically selects three optimal suppliers based on historical data like material qualification rates, delivery cycles, and quotations.

Purchasing personnel only need to confirm before issuing electronic purchase orders. Suppliers upload logistics information (e.g., courier company, waybill number) during shipment, allowing procurement departments to track progress in real-time. Upon material arrival, quality inspection teams record test results (qualified/unqualified) on the platform. Qualified materials trigger the system to automatically generate an "Acceptance Form". The documents are then forwarded to the finance department. After verifying the acceptance forms and purchase orders, the finance department processes payments directly through the platform. This digital procurement process has reduced the procurement cycle from 3-5 days to 1-2 days, while decreasing document loss rates from 5% to 0.1%. Additionally, the

systems automated supplier screening minimizes human bias in selection, enhances procurement quality, and lowers costs—such as reducing raw material procurement expenses by an average of 3%-5%.

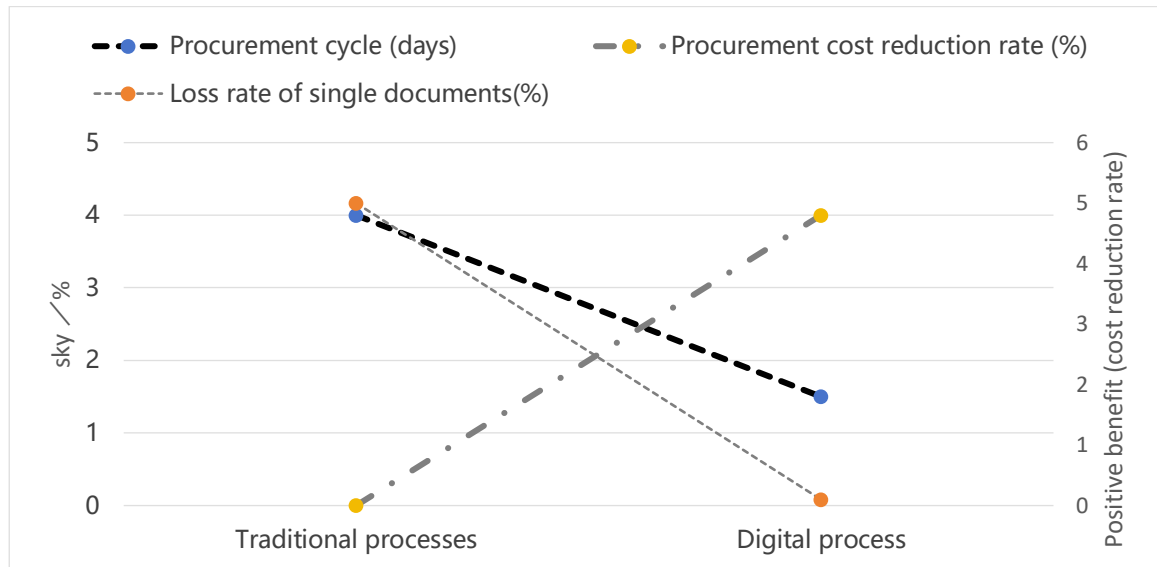


Figure 3.6 - Trends in efficiency of procurement management processes

Source: Based on the 2023 Digital White Paper of Yili Group and the acceptance report of the "Digital Transformation Pilot Project for the Dairy Industry" by the Ministry of Industry and Information Technology

2. In the digital transformation of inventory management processes, achieving a closed-loop system of "real-time monitoring, automated alerts, and intelligent replenishment" is essential. Dairy companies face unique challenges in inventory control: short shelf lives for raw materials (e.g., fresh milk with 2-3 days) and diverse product categories (including yogurt, pure milk, dairy beverages, etc., totaling dozens). Traditional manual inventory counting often leads to issues like delayed data updates and expiration-related losses. Through digital upgrades, the following improvements can be implemented: First, install RFID tags and scanning devices in warehouses. When goods are stored, scanning automatically records details (name, specifications, quantity, production date, shelf life) into an "intelligent inventory management system," which updates in real-time (e.g., 500 tons available, 300 tons used, 200 tons remaining). Managers can monitor this data via computer or mobile devices. Second, set "safety stock thresholds" and "expired alert thresholds" based on product shelf lives and historical sales volumes.

For example, if a raw materials available stock falls below the safety threshold (e.g., 150 tons vs. current 120 tons), the system automatically generates a "replenishment recommendation" and sends it to procurement departments. If a finished products shelf life is reduced to 7 days... When inventory levels exceed predefined thresholds (e.g., 1,000 units with current stock at 1,500 units), the system automatically triggers "Promotion Alerts" to the marketing department, prompting clearance campaigns like discounts or buy-one-get-one-free offers. During outbound processes, warehouse staff verify shipment details through QR code scanning, with the system automatically deducting inventory to prevent errors such as wrong shipments or missed deliveries. This digital inventory management system has transformed inventory counting from traditional monthly cycles (2 days) to real-time dynamic tracking. Inventory accuracy rates have increased from 92% to 99.8%, while raw material spoilage rates dropped from 4% to 1.2%, and finished goods spoilage rates decreased from 3% to 0.8%. These improvements significantly enhance inventory management efficiency and cost control capabilities.

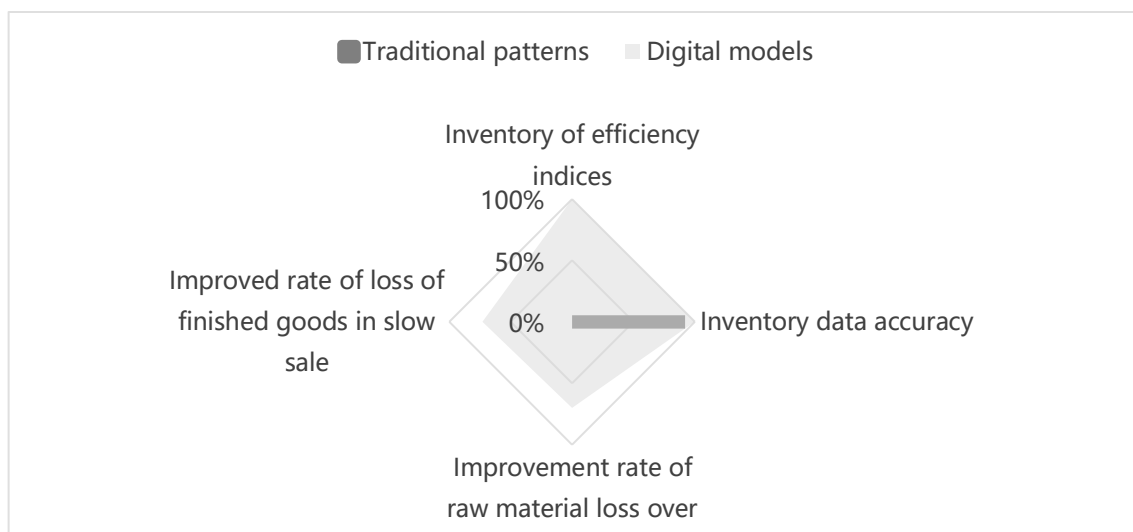


Figure 3.7 - Radar chart of multi-dimensional optimization effect of inventory management process

Source: Based on the 2023 Digital White Paper of Yili Group and the acceptance report of the "Digital Transformation Pilot Project for the Dairy Industry" by the Ministry of Industry and Information Technology

3.To achieve digital transformation in customer service processes, dairy enterprises should establish a comprehensive service ecosystem encompassing "multi-channel integration, intelligent routing, rapid response, and satisfaction-driven follow-ups". Key service demands include product inquiries (e.g., ingredient details, expiration dates), post-sale complaints (e.g., product spoilage, damaged packaging), and order tracking (e.g., shipping status, delivery timelines). Traditional phone-based customer service systems suffer from chronic issues like lengthy wait times and low resolution rates (e.g., customers often face 5-10 minute delays with multi-department transfers). Through digital upgrades, improvements can be made in two key areas: First, integrating multiple channels including phone services, WeChat Official Accounts, mobile apps, and e-commerce platforms. Customers can submit requests via any available channel, with the system automatically routing them to the "Intelligent Customer Service Platform". Second, implementing AI-powered customer service systems for initial issue classification

For straightforward queries (e.g., "How long is the shelf life of this product?"), AI agents can provide instant responses through knowledge bases within 10 seconds. For complex cases (e.g., "Product spoilage complaint"), the system dynamically assigns tasks to specialized support teams (e.g., after-sales service) while synchronizing customers purchase history and order details to ensure efficient resolution. The system automatically generates a "Service Work Order" upon customer service resolution, documenting the issue type, troubleshooting process, and client feedback. Within 24 hours of service completion, it sends a "Customer Satisfaction Survey" via SMS or WeChat to collect feedback. If the response is "unsatisfied," the work order is automatically forwarded to the customer service supervisor for follow-up review. This digitalized service workflow has reduced average wait time from 5-10 minutes to 1-2 minutes, increased one-time resolution rate from 75% to 92%, and boosted customer satisfaction scores from 80 to over 90 points. These improvements significantly enhance corporate customer retention and brand reputation competitiveness.

Table 3.3 - Comparison of customer service process efficiency

Service indicators	Traditional telephone customer service	Digital customer service system	Enhance effectiveness
Customer average wait time	5-10 minutes	1-2 minutes	Shorten by 70-80%
One-time problem resolution rate	75%	92%	Increase 22.7%
Customer satisfaction (full score 100)	80 points	Above 90	Increase by more than 12.5%

Source: Based on the 2023 Digital White Paper of Yili Group and the acceptance report of the "Digital Transformation Pilot Project for the Dairy Industry" by the Ministry of Industry and Information Technology

The table corresponds to the previous content of "Multi-channel Access and Intelligent Diversion of Digital Customer Service System". The waiting time is compared by interval range, and the improvement effect is calculated by (digital value-traditional value)/ traditional value, which clearly presents the triple improvement of digital customer service in response speed, solution quality and satisfaction.

III. Managing organizational digitization: from "hierarchical" to "agile"

Traditional enterprise management structures predominantly adopt a "pyramid-style hierarchy" (e.g., the four-tier framework of headquarters → regional branches → city offices → retail stores), which suffers from chronic issues including delayed decision-making, poor cross-departmental coordination, and sluggish responsiveness to market shifts [28]. For instance, when encountering sudden demand surges in the market, products must be reported through multiple tiers from retail outlets to headquarters, followed by a 1-2 week decision-making cycle before implementation. In the digital economy era, where market demands evolve rapidly—such as consumers preferences for dairy products changing within 1-2 months—the traditional organizational structure proves inadequate. By leveraging digital technologies to transform management systems from hierarchical to agile models, enterprises can establish flat, networked, and collaborative frameworks that enhance flexibility and competitiveness. The digital transformation of dairy

companies management structures should prioritize three key areas: optimizing organizational architecture, establishing cross-departmental collaboration mechanisms, and empowering frontline staff with delegated authority.

1. To optimize organizational structure, we need to streamline hierarchies and consolidate functions to establish a flat "Headquarters → Business Units → Frontline Teams" framework. For instance, Yili Groups traditional hierarchy consisted of four layers: "Headquarters (strategic, financial, HR departments) → 8 regional branches → 32 city offices → over 1,000 stores", requiring decision-making to travel through four stages: "Headquarters → Regional Branches → City Offices → Stores".

Through digital transformation, the company eliminated city office levels by merging functions from 32 city offices into regional branches. A "Digital Operations Center" was established at headquarters to directly connect with 8 regional branches and over 1,000 stores. Additionally, traditional "departmental divisions" (e.g., Marketing Department, Sales Department, Customer Service Department) were restructured into "business unit divisions" (e.g., Yogurt Business Unit, Pure Milk Business Unit, Dairy Beverage Business Unit). Each business unit integrates R&D, production, marketing, sales, and customer service functions, forming an end-to-end operational cycle. This streamlined structure reduced decision-making time from 1-2 weeks to 2-3 days while eliminating cross-departmental buck-passing (e.g., adjusting product marketing campaigns requires internal coordination within business units rather than interdepartmental coordination). Communication has significantly improved

2. To enhance cross-departmental collaboration mechanisms, we should establish a digital platform that creates a collaborative ecosystem featuring "data sharing, task synchronization, and shared accountability." Even within flat organizational structures, coordination between business units or headquarters departments remains essential (e.g., the yogurt business unit requires raw material support from the supply chain department and cost accounting data from the finance

department). the decision-making efficiency and market response ability of the organization.

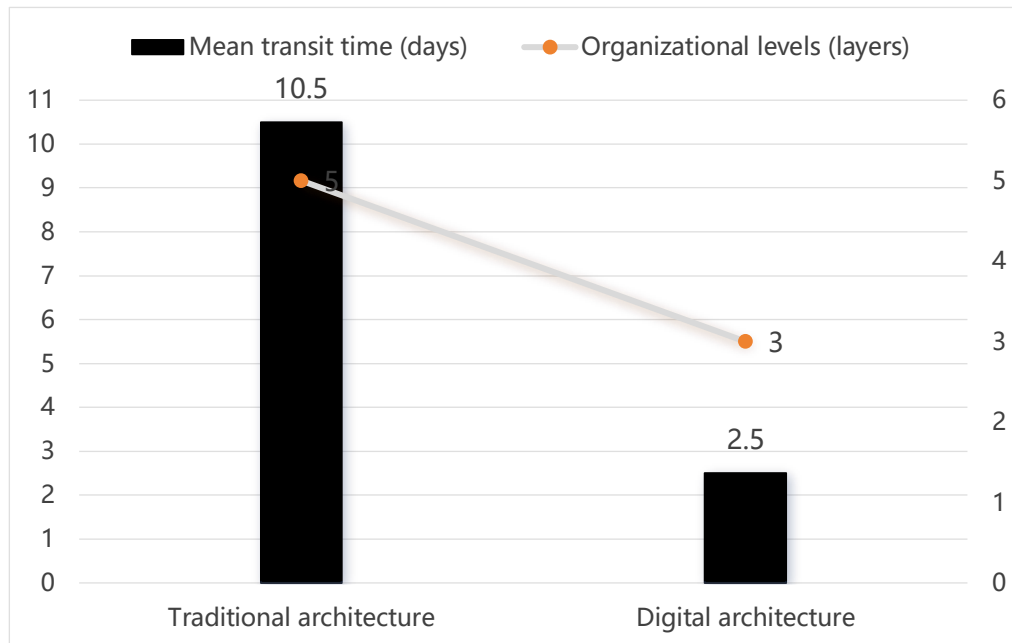


Figure 3.8 - Comparison of decision transmission before and after organizational structure optimization

Source: Based on the 2023 Digital White Paper of Yili Group and the acceptance report of the "Digital Transformation Pilot Project for the Dairy Industry" by the Ministry of Industry and Information Technology

The digital platform enables three key optimizations: First, a "cross-department collaboration task platform" allows business units to initiate coordination requests (e.g., the yogurt unit requesting supply of a specific raw material from the supply chain one week in advance). This platform creates tasks specifying requirements, timelines, and responsible parties (e.g., the yogurt units lead and the supply chains contact), with automatic task distribution to relevant personnel. Second, real-time progress tracking (e.g., "Supply chain confirmed material inventory, expected shipment in 3 days") enables instant updates for all involved, preventing collaboration delays caused by information asymmetry. Third, upon task completion, the system automatically generates "collaboration effectiveness evaluation reports" (e.g., whether deadlines were met or requirements fulfilled), which are incorporated

into departmental performance assessments. Additionally, through a data middle platform, cross-departmental data sharing is achieved - allowing the finance department to access real-time...Business unit sales and cost data can now be processed without manual reporting, enabling rapid completion of monthly financial accounting. The supply chain department can obtain real-time production plans from all business units, allowing for proactive allocation of raw materials and transportation capacity. This digital collaboration mechanism has reduced the average task completion time across departments from 5-7 days to 2-3 days, while lowering the coordination dispute rate from 15% to below 3%. These improvements have significantly enhanced the organizations overall operational efficiency.

3. In empowering frontline teams through digital transformation, organizations should grant them greater decision-making authority via digital tools while providing data support to enable "frontline decision-makers" to make swift choices. Dairy companies frontline teams (such as store sales personnel and regional account managers) directly engage with consumers and markets, possessing deep insights into market demands and competitor dynamics. However, under traditional models, these teams had limited decision-making power – for instance, price adjustments for in-store promotions or compensation plans for customer complaints required approval from regional branches or headquarters – often leading to missed opportunities or customer dissatisfaction. Post-implementation digital transformation enables empowerment through two key approaches: First, establishing a "frontline decision-making authority list" specifying authorized matters - such as store sales staff initiating small promotions like "10% discount on orders over 50 yuan," or regional account managers approving compensation plans "up to 200 yuan." Second, equipping frontline teams with "mobile digital tools" (e.g., salesperson apps and account manager dashboards) integrated with real-time sales data, competitor intelligence, and customer profiling—— allowing sales personnel to monitor in-store performance and competitors promotions through the app.

Adjust sales strategies: Customer managers can review clients historical purchase records and complaint histories through the workbench to formulate

precise maintenance plans. Finally, establish a "frontline decision support mechanism". When frontline teams encounter complex issues beyond their authority (such as customized orders for major clients), they can quickly report these through digital tools to superiors with supporting data (e.g., detailed client requirements, profit projections). Superiors can then approve decisions based on this data, preventing delays. This empowerment of frontline teams has increased autonomous decision-making from 10% to 40%, improved on-site resolution rates for customer complaints from 20% to 70%, and accelerated market response times for store promotions from "1-2 weeks" to "1-2 days". These enhancements significantly boost the company's rapid market adaptability and service capabilities, thereby elevating overall competitiveness.

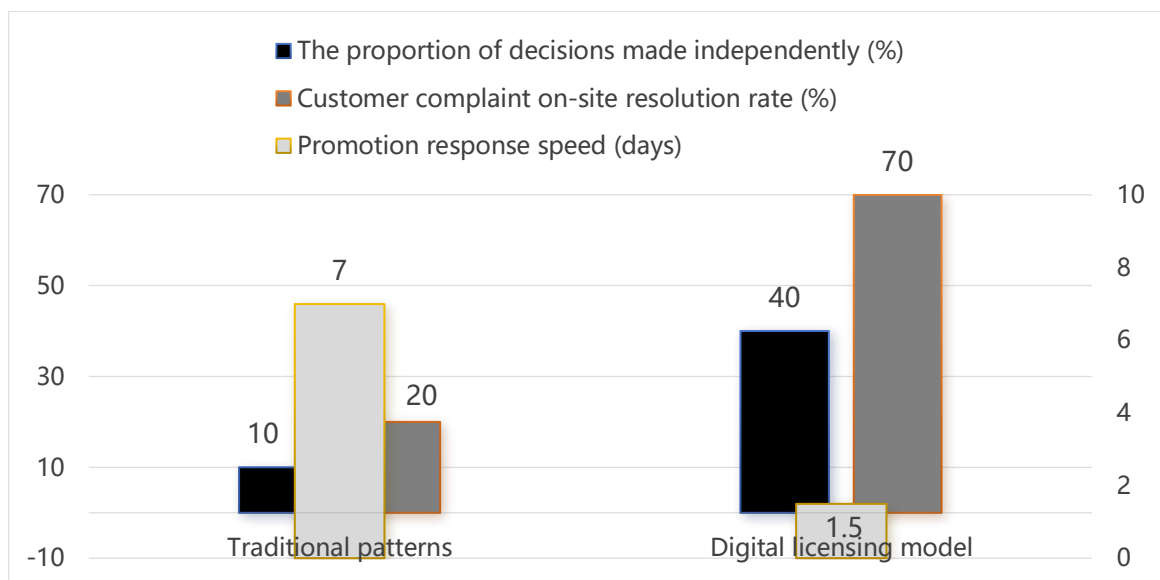


Figure 3.9 - Comparison of frontline team effectiveness

Source: Based on the 2023 Digital White Paper of Yili Group and the acceptance report of the "Digital Transformation Pilot Project for the Dairy Industry" by the Ministry of Industry and Information Technology

This chapter explores "Digital Optimization of Value Chains to Enhance Corporate Competitiveness" through three practical approaches: At the enterprise infrastructure level, digital upgrades in hardware, software, and talent development lay the foundation for value chain optimization, boosting capabilities like cost control; At the industry policy level, financial support, standardization systems, and

collaborative platforms address transformation challenges for SMEs, accelerating industry-wide digitalization; At the enterprise management level, digitalization of decision-making, processes, and organizational structures drives operational model transformation, enhancing value chain efficiency and competitiveness. These measures form a closed-loop transformation framework, providing actionable guidance for dairy enterprises and traditional manufacturing industries.

CONCLUSIONS

Taking Yili Group as a case, this study systematically discusses how enterprises can improve their management competitiveness through value chain optimization in the digital context. Through theoretical analysis and empirical research, the following main conclusions are drawn:

1. Digitalization is the key path to enhance enterprise competitiveness

Digitalization is not merely about technological upgrades, but a systematic overhaul of corporate strategies, organizational structures, and value creation models. Yili Group has significantly boosted operational efficiency, customer responsiveness, and market adaptability by establishing a closed-loop system that progresses from digital transformation to value chain optimization and ultimately enhances competitiveness.

2. All links of the value chain can be optimized through digitization

From procurement, production, logistics to marketing and customer service, Yili has realized data-driven management of the whole process through the deep integration of ERP, MES, WMS and other systems, reducing costs, improving product quality and customer satisfaction.

3. Digital infrastructure and talent system are the support guarantee

Through the construction of enterprise-level data center, smart factory and digital twin system, as well as the introduction and cultivation of digital talents, Yili has formed a strong digital support system, which provides continuous impetus for value chain optimization.

4. Policy and industry collaboration is an important external force to promote digital transformation

In the process of transformation, small and medium-sized enterprises face multiple obstacles such as capital, technology and standards. It is urgent for the government to provide support through financial subsidies, standard formulation and platform construction to promote the digital upgrading of the whole industry.

5. Digitalization promotes the transformation of enterprise management mode

to "data-driven, platform collaboration and agile response"

Through the organization of flattening, process automation and intelligent decision-making, Yili has significantly improved management efficiency and market response speed, providing a replicable and scalable transformation paradigm for traditional manufacturing enterprises.

In conclusion, digitalization has become an essential pathway for enterprises to build core competitiveness in the new era. Companies should strategically prioritize digital transformation and systematically advance digital upgrades across all value chain segments to maintain a competitive edge in today's fiercely contested market.

II. Recommendations

(I) Suggestions to enterprises

1. Build the top-level design of digital strategy

Enterprises should integrate digital transformation into the overall development strategy, clarify goals, paths and resource allocation, and avoid "fragmented" construction and "fashion-following" investment.

2. Promote full-link data integration and system integration

Accelerate the integration of ERP, MES, CRM and other core systems, break through data islands, and realize closed-loop management of data from supply chain to consumer end.

3. Strengthen digital talent training and incentive mechanism

Establish an integrated talent system of "introducing, cultivating, using and retaining" talents, set up special digital positions and performance appraisal mechanism, and stimulate the enthusiasm of employees to participate in digital transformation.

4. Promote organizational change and process reengineering

Promote the transformation of organizational structure from "hierarchical" to "platform", optimize business process, and achieve rapid response to market changes.

5. Strengthen digital operation of customer relationship

Using big data and AI technology, we can accurately identify customer needs, carry out personalized marketing and services, and enhance customer stickiness and

brand loyalty.

(II) Suggestions to the government and industry

1. Strengthening financial and fiscal support

Special funds and low-interest loans will be set up to support small and medium-sized enterprises in digital infrastructure construction and system upgrading.

2. Improve industry standards and data specifications

Establish unified industry data collection, transmission and security standards, promote data interconnection between enterprises, and reduce collaborative costs.

3. Build industry-level digital service platform

Leading enterprises are encouraged to take the lead in building shared platforms to provide public services such as cloud computing, data analysis and personnel training, so as to reduce the threshold for small and medium-sized enterprises to transform.

4. Promote "chain leader" enterprises to drive the coordinated transformation of upstream and downstream

We will encourage "chain leader" enterprises such as Yili to drive upstream and downstream enterprises to achieve digital upgrading together through supply chain collaboration platforms, so as to form industrial ecological competitiveness.

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APPENDIXES