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The Mechanism of the Impact of Digital Transformation of Shanghai Automotive Industry Corporation Group on Enterprise Financial Performance

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Abstract. Under the policy guidance of the deep integration of the digital economy and the real economy, the intelligent transformation of the automotive industry has accelerated. The intense market competition and the upgrading of user demands have compelled traditional automakers to undergo digital transformation. This paper takes Shanghai Automotive Industry Corporation (SAIC) Motor as the research object and focuses on the impact mechanism of digital transformation on the financial performance of the enterprise. The study found that SAIC Motor has formed a complete transformation system by building technical bases such as the Starry Cloud Pure Electric Architecture and the Galaxy Electronic Architecture, integrating the "large passenger vehicle" sector, establishing digital channels, and conducting ecological collaboration; however, the financial performance shows differentiated performance: the debt-paying ability has steadily improved, the current ratio and quick ratio have reached their peak in ten years, the asset-liability ratio remains at a safe level, while the profitability, operational ability, and development ability have continued to decline, reflecting the reality of large-scale investment in the early stage of transformation and the failure to achieve expected profits from new businesses. This research analyzes the practical samples of traditional automakers' transformation to provide a reference for the industry to solve the problem of "imbalance between transformation investment and performance return".

Keywords: Digital transformation, SAIC group, enterprise financial performance.

1. Introduction

Digitalization is the core driving force of the new economic era. Both the report of the 20th National Congress of the Communist Party of China and the national "14th Five-Year Plan" for digital economic development have pointed out that "people should accelerate the deep integration of the digital economy and the real economy, and vigorously promote the digital transformation of enterprises." With the rapid development of the digital economy, digitalization has become a key measure for enterprises to enhance their core competitiveness. Existing research has found that digital transformation is mainly achieved through two major sections: cost reduction and efficiency

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improvement, and innovation-driven, which promote the financial performance of enterprises [1]. However, digital transformation cannot be accomplished overnight. The mode selection, strategy designation, and investment intensity all concern the performance and development of the enterprise and also require strong hardware strength and software costs as support. In 2016, SAIC Group proposed the new four-in-one strategy as the company's digital transformation strategy, and in 2017, it officially launched the new four-in-one development strategy of "electrification, networking, intelligence, and sharing" [2]. In summary, digital transformation is both an essential question for enterprises under the digital economy and a core factor affecting the performance and competitiveness of enterprises. This article takes SAIC Group as the object, through the analysis of its digital transformation measures and the changes in its business performance, to study the interaction and connection between the two, and to explore.

2. Analysis of the driving forces for digital transformation

The industrial transformation is irreversible. The penetration rate of electrification exceeds 55%, and intelligence has become the core selling point. The penetration rate of L2+ has exceeded 40%. Automakers need to restructure their products and services with digital technologies. The market competition is intense. Brands like BYD have risen, and new forces have seized market share by directly connecting with users and rapidly iterating. The advantages of traditional automakers have weakened, and price wars have intensified, forcing efficiency and value upgrades. Policy and technology-driven, the country promotes the integration of digital economy and the automotive industry. Technologies such as AI, big data, cloud computing, and 5G have matured, providing a foundation and compliance requirements for the full-chain digitalization. User demand has upgraded. Users have shifted from "buying products" to "buying experiences", demanding personalized, intelligent, and online services, forcing enterprises to shift from a "product-centered" approach to a "user-centered" one. The continuously improved charging infrastructure network further stimulates consumers' choice of pure electric vehicles [3]. This is a transformation from products to "smart terminals".

The strategic transformation demand has shifted from "scale expansion" to "value creation", building an electric and intelligent technology foundation, and transforming into a technology enterprise. Organizational and efficient bottlenecks. Traditional departmental barriers have led to data silos, and performance and scalability are difficult to meet the development needs. The R&D cycle is long, and the market response is slow. It is necessary to eliminate barriers through digitalization and organizational restructuring (such as brand integration) to enhance collaborative efficiency. Core capability weaknesses. Under the joint venture model, product definition rights are limited, and there is insufficient independent technology accumulation. It is necessary to strengthen the R&D, manufacturing, and marketing full-chain capabilities through digitalization to grasp technology and market dominance.

Cost and quality pressure. The costs of raw materials and intelligence have increased. It is necessary to optimize production and supply chain through digital twins, industrial internet, etc., to reduce costs and increase efficiency, and ensure product quality. Ecological innovation gains reputation resources for the enterprise, enhancing the enterprise's recognition, and thereby having a positive effect on the stock price of listed companies, enabling the enterprise to gain competitive advantages and achieve brand premium [4]. Global development needs. The expansion of overseas markets requires digital support for the integration of R&D, manufacturing, marketing, and service, improving global operation and response capabilities.

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3. The process and measures of SAIC group's digital transformation

SAIC Group has changed its technological layout. In 2022, SAIC Group established the Xingyun pure electric exclusive architecture, which is a pure electric module platform designed exclusively for pure electric vehicles and incompatible with fuel vehicles. It embodies the electrification strategy and the "cloud-manage-end" technology, covering various vehicle levels, and is compatible with advanced technologies such as high-voltage casting, solid-state batteries, and line-controlled chassis, shortening the development cycle of new energy vehicles and enabling "expandability, upgradeability, and quick replaceability". The Galaxy Full Stack 3.0/4.0 electronic architecture, through the construction of a centralized architecture at the central level to regional control, enhances the data bandwidth of the entire vehicle and speeds up the download and installation of OTA. The 4.0 "cloud-manage-end" AI deployment provides the underlying support for the production of autonomous driving and intelligent driving. SAIC has covered full-stack intelligent driving technologies from L2 to L4 level through cooperation with Horizon, Huawei, DJI, etc. These technology layouts have enhanced SAIC's competitiveness and technical support in digital transformation.

SAIC Group has made business adjustments. Current research indicates that for traditional manufacturing enterprises to enhance operational efficiency, improve financial indicators, and strengthen their competitive advantages in the industrial chain, they can achieve these goals through the full-process digital penetration, the establishment of an industrial chain collaboration platform, and continuous technological investment [5]. SAIC Group launched the "OEMization Year" in 2024, integrating core businesses such as passenger vehicles, the R&D headquarters, and Zero Beam Technology into the "Large Passenger Vehicle" sector, forming a closed-loop throughout the research, production, and sales chain.

It launched the "SAIC Shangjie" brand, the first model jointly developed with Huawei, and achieved sales of over 50,000 units in 2024, becoming a rising star in the high-end new energy market. It is mainly engaged in new energy vehicle business. Based on the original products of the original subsidiary brand Feifan Automobile under SAIC, the enterprise carried out secondary development and based on the assessment of the quality and efficiency of assets, disposed or optimized idle or inefficient assets. Through optimizing the asset structure, it achieved an improvement in financial performance [6]. The core lies in the integration of Huawei's electronic and electrical architecture and intelligent technology, and the incubation of "technical symbiotic bodies" in areas such as intelligent chassis and data security, exploring a new ecosystem for intelligent mobility.It established a "Rongwei M Network" digital channel sub-network, with digitalization, standardization, and direct TOC connection as its core, specifically serving new energy vehicle models such as M7 and DMH. By unifying service standards, striving to eliminate terminal differences, and strengthening high-end, digitalized, and customer-direct service channels, operations enhance user stickiness and develop long-term customers. TOC is a system synergy of products, marketing, and channels, with its goal not being a one-time transaction but rather making users willing to "make friends" with Roewe. The group has cumulatively invested over 150 billion yuan in research and development, covering seven key technological foundations such as hydrogen energy and full-stack intelligence. By 2025, nearly 70% of its new investments will be concentrated in new productivity areas like AI and humanoid robots. Moreover, since 2021, it has made strategic investments totaling over 18 billion yuan, building an industrial ecosystem characterized by "internal drive, external collaboration, and foundational support" through a "industry + capital" model.The technological layout (such as the Galaxy Electronic Architecture) provides the underlying support for business integration ("Large Passenger Vehicle" segment), ecological

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collaboration (cooperation with Huawei) strengthens the technological advantages, and channel upgrade (Roewe M Network) enhances the efficiency of user reach, forming a collaborative closed loop of "technology - business - ecology - channel".

4. Analysis of the impact of digital transformation on the performance of SAIC group

This article selected 11 indicators from four dimensions: profitability, solvency, operational efficiency, and development capability. Construct a financial performance evaluation index system and analyze the financial data of the selected area from 2014 to 2024.

4.1. Enterprise profitability analysis

Through the inductive analysis of the financial data of SAIC Group from 2014 to 2024, The data of total asset rate of return, net asset rate of return, and net sales margin are obtained respectively, as shown in Table 1.

The return on total assets slowed down from 9.7% in 2014 to 7.17% in 2017, and the return on net assets decreased from 18.97% in 2014 to 16.87% in 2017. The slow decline in profitability at this stage comes from the weakening of the competitiveness of the traditional automobile market and the early investment of enterprises for data transformation, such as research and development, system construction, etc. These inputs have temporarily diluted profits, but the impact on operational efficiency is not significant. Enterprises are still in the stage of combining traditional business and digital exploration and transformation, and the change of operational capacity is relatively stable. From 2018 to 2021, the return on total assets decreased from 6.43% to 3.3%, rebounded slightly to 3.7% in 2021, and the return on net assets also fell from 15.67% to 8.02%, and then rose to 9.19%. At this stage, enterprises are in the deepening period of digital transformation, and the large fluctuation of business capacity during this period reflects the increase in investment in transformation and the impact of the external environment. The rebound in 2021 is partly due to the results of digital transformation in supply chain management and production efficiency improvement. This has improved the efficiency of operating capacity, thus driving a small part of the profit to rise. The return on total assets from 2022 to 2024 plummeted from 2.4% to 0.59%, the return on net assets fell from 5.84% to 0.58%, and the net interest rate fell to 0.95%. This part is in the difficult period of digital transformation of enterprises, and the profitability is plummeting, indicating that enterprises are facing severe operational pressure at this stage. On the one hand, the traditional automobile business model is facing the competitive pressure of the gradual opening of the new energy vehicle market; on the other hand, the early investment and return ratio of digital transformation does not meet the ideal expectations. The profitability of the new business has not effectively made up for the decline of the traditional business. Excess returns can be achieved in the medium to long term through patent barriers or technology premiums, breaking the homogenization dilemma of price competition [7]. If a company is too eager for immediate success and invests a large amount of funds and energy in patent strategy layout in the short term, the rapid increase in costs may lead to a capital rupture. Therefore, enterprises need to carry out a moderate range of technology patent strategic layout at the appropriate time [8]. At the same time, pay attention to whether there are multiple original information systems, the amount of data is large, the systems are not fully connected, and there are data islands; Challenges such as insufficient data quality, inconsistent standard fragmentation and decentralization, and the inability to carry out unified digital management.

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Table 1. Profitability indicators

Year	Return on Total Assets	Return on Equity	Net Profit Margin
2014	9.7	18.97	6.1
2015	8.64	17.91	6.06
2016	7.97	17.51	5.89
2017	7.17	16.87	5.49
2018	6.43	15.67	5.45
2019	4.32	10.53	4.27
2020	3.3	8.02	4.04
2021	3.7	9.19	4.47
2022	2.4	5.84	3.17
2023	2.01	4.98	2.76
2024	0.59	0.58	0.95

Unit: %

Data source: Eastmoney

4.2. Analysis of corporate debt repayment ability

The debt repayment ability indicators of SAIC Group reveal the company's effectiveness in financial risk control from both long-term and short-term debt repayment abilities, based on the data in Table 2.

From 2014 to 2017, the current ratio decreased from 1.19% to 1%, and the quick ratio decreased from 0.99% to 0.87%, both showing a downward trend. At this stage, the company mainly invested funds for phased pilot projects, resulting in an increase in the proportion of current assets and some impact on short-term liquidity indicators. In terms of long-term debt repayment ability, the increase in the company's asset liability ratio from 55.41% to 62.39% reflects the company's expenditure on supporting digital transformation through debt financing, and its debt repayment ability is considerable. From 2018 to 2021, the current ratio continued to rise to 1.13%, and the quick ratio rose to 1.02%. With the implementation and promotion of digital projects, for example, digital collaboration in the supply chain, development of intelligent driving technology, etc. can improve the turnover efficiency of current assets driven by the operational efficiency of enterprises, and reduce short-term liquidity pressure. The capital liability ratio has fallen from its highest point of 66.28% to 64.14%, reflecting the company's expansion of debt financing while optimizing its asset structure through digitization. Debt pressure is gradually matching profitability, and long-term solvency is stable. The current ratio will rise to 1.03% from 2022 to 2024, and the quick ratio will rise to 1.03%, reaching the highest level in a decade. During this period, companies greatly improved their short-term debt paying ability by building digital operational structures. At the same time, the asset liability ratio fell back to 63.77%, indicating that the company has reduced its dependence on debt financing through profit accumulation and capital structure adjustment during the transformation process, ensuring long-term debt security.

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Table 2. Solvency ratios

Year	Current Ratio	Quick Ratio	Debt-to-Asset Ratio
2014	1.19	0.99	55.41
2015	1.05	0.9	58.78
2016	1.11	0.99	60.2
2017	1	0.87	62.39
2018	1.09	0.95	63.63
2019	1.1	0.99	64.58
2020	1.11	0.97	66.28
2021	1.13	1.02	64.14
2022	1.07	0.91	66.03
2023	1.13	0.95	65.94
2024	1.18	1.03	63.77

Unit: %

Data source: Eastmoney

4.3. Analysis of enterprise operational capability

The changes in operational capability indicators of SAIC Group can demonstrate the systematic impact of digital transformation on enterprises. This article compiles data from SAIC Group from 2014 to 2024, analyzing three indicators: total asset turnover, inventory turnover, and accounts receivable turnover, as shown in Table 3.

According to Table 3, the total asset turnover rate of SAIC Group decreased from 1.6 to 1.32 from 2014 to 2017, while the inventory turnover rate briefly rebounded to 17.51 in 2016 before falling back, and the accounts receivable turnover rate overall declined. At this stage, enterprises have begun to lay out digital infrastructure such as intelligent manufacturing and supply chain platforms, but the transformation investment has not yet achieved asset conversion. At the same time, traditional automotive models still dominate, and operational efficiency is greatly affected by industry cycles. From 2018 to 2021, all three indicators showed a downward trend due to external factors. The digital transformation has entered a deepening period, and enterprises have increased their investment in research and development and production capacity in areas such as new energy vehicles and intelligent networking, resulting in a significant expansion of their asset scale. At the same time, industry competition and policy relaxation have increased the pressure on accounts receivable turnover. From 2022 to 2024, the total asset turnover rate, inventory turnover rate, and accounts receivable turnover rate are still on a downward trend, with their respective lows of 0.64, 6.33, and 8.92 times. During this stage, SAIC Group's traditional and new businesses were running parallel, resulting in resource dispersion; The digital supply chain and intelligent manufacturing system are not yet fully mature; How to integrate digital technology with specific business application scenarios has become a key issue currently facing us. The operational capability is in a period of transition pains. Previous studies have shown that the effectiveness of new quality productivity in improving corporate financial performance varies due to differences in technological attributes. From the perspectives of marginal benefits, innovation thresholds, and government policies, it is found that its driving effect on non high tech financial performance is more significant

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[9]. Facing the challenges of scenario deviation, capability gap, and institutional lag in the application of technology [10].

Table 3. Operating capability indicators

Year	Total Asset Turnover Ratio	Inventory Turnover Ratio	Accounts Receivable Turnover Ratio
2014	1.6	15.76	31.38
2015	1.45	15.41	26.44
2016	1.37	17.51	24.88
2017	1.32	17.05	26.27
2018	1.2	14.13	23.73
2019	1.03	12.81	20.29
2020	0.84	10.63	17.02
2021	0.85	10.9	16.69
2022	0.78	8.98	13.06
2023	0.75	7.03	11.09
2024	0.64	6.33	8.92

Unit: times

Data source: Eastmoney

4.4. Analysis of enterprise development capability

The development capability mainly reflects the long-term potential of enterprise revenue growth, profit expansion, and market share increase. The relevant indicators of development capability from 2014 to 2024 are shown in Table 4.

From 2014 to 2018, the year-on-year growth rate of SAIC Group's total revenue and net profit growth rate maintained an overall growth trend. At this stage, SAIC Group relies on the advantages of traditional automotive models to accumulate sufficient funds to provide support for digital transformation. The initial investment in the transformation stage has not yet had a significant impact on profit sharing. In 2019, revenue decreased by 6.53% year-on-year, and net profit decreased by 28.9% year-on-year. In 2020, the revenue decreased by 12% year-on-year, and the net profit decreased by 20.2% year-on-year. The industry's electrification and intelligent transformation is accelerating, and SAIC has increased its research and development investment in areas such as new energy vehicles and intelligent driving systems. At the same time, the share of traditional automotive models is being squeezed, resulting in a decline in revenue and profits. The investment in digital transformation is greater than the output. From 2021 to 2024, there were significant fluctuations in revenue and profit growth. There was a small rebound in 2021, but later it fell back into a negative growth phase, with a year-on-year decrease of 88.19% in net profit in 2024. During this period, SAIC Group was still in a loss making stage in its new energy vehicle business, coupled with intensified market competition pressure and high supply chain costs, resulting in significant fluctuations in its development capacity indicators. The short-term loss effect of digital transformation is highlighted, and sufficient profit contribution has not yet been made.

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Table 4. Development capacity indicators

Year	Year-on-Year Growth in Total Operating Revenue	Year-on-Year Growth in Net Profit Attributable to Shareholders
2014	11.35	11.35
2015	6.42	6.51
2016	12.82	7.42
2017	15.1	7.51
2018	3.62	4.65
2019	-6.53	-28.9
2020	-12	-20.2
2021	5.08	20.08
2022	-4.59	-34.3

Unit: %

5. Conclusion

This study takes SAIC Group as a case study to deeply analyze its digital transformation path and its impact on financial performance. The main conclusions drawn are as follows:

SAIC Group has established a complete system from technology foundation to business collaboration through digital transformation. Its R&D investment, organizational restructuring, and ecological layout have not only enhanced product competitiveness, but also promoted the upgrade of business models from "manufacturing" to "intelligent manufacturing and service". Establishing initial advantages in the field of intelligent electrification. The transformation practice of SAIC Group provides a reference sample for traditional manufacturing industries, verifying the feasibility of digital transformation for traditional car companies to break through growth bottlenecks, and has important industry demonstration significance. Since SAIC Group's digital transformation is still in the development stage and not yet mature, its transformation also needs to be continuously optimized and promoted. In terms of technological research and development, SAIC Group will focus on the evolution of intelligent driving technology towards L4 level, upgrade the Galaxy full stack electronic architecture, and lay out cutting-edge fields such as quantum computing, constantly breaking through. In terms of business ecology, enterprises will build an integrated ecosystem of "vehicle energy road cloud", upgrade the channel end, continue to deepen technical cooperation with partners such as Huawei and DJI, and achieve transformation from "selling products" to "selling services". And through modular technology base, it adapts to the global market, builds overseas digital channels and supply chain systems, strengthens network services, achieves comprehensive construction of "products, technology, and ecology", and adapts to economic globalization. Introducing and cultivating versatile talents to build a data-driven decision-making system. Reducing data cost requirements to achieve strategic goals.

Author contribution

All the authors contributed equally and their names were listed in alphabetical order.

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