Collaborative Optimization of Technological Innovation and Economic Benefits of Enterprises under the Background of Intelligent Transformation

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Keywords: Intelligent Transformation; Enterprise Technological Innovation; Economic Benefits; Collaborative Optimization; Influence Mechanism

Abstract: Under the background of intelligent transformation, enterprises are faced with the important task of coordinated development of technological innovation and economic benefits. This paper aims to explore the collaborative optimization path of enterprise technological innovation and economic benefits under the background of intelligent transformation. By combing the related theories of intelligent transformation, enterprise technological innovation, economic benefit and coordination, this paper analyzes the influence of intelligent transformation on enterprise technological innovation and economic benefit, and reveals the interaction mechanism between them. It is found that intelligent transformation not only brings opportunities but also challenges to technological innovation and economic benefits of enterprises, and there is a close relationship between them. Based on this, this paper puts forward a collaborative optimization strategy from the aspects of strategy, resource allocation, organization and innovation ecology to help enterprises effectively promote the coordinated development of technological innovation and economic benefits and enhance their competitiveness in the process of intelligent transformation.

1. Introduction

With the vigorous development of digital economy, intelligent transformation has become the key path for enterprises to adapt to the changes of the times and enhance their competitiveness [1]. With the wide application of emerging technologies such as big data, artificial intelligence and Internet of Things, the operation mode, innovation mode and access to economic benefits of enterprises have undergone profound changes [2]. In this context, the collaborative optimization of enterprise technological innovation and economic benefits has attracted much attention.

Intelligent transformation has brought brand-new opportunities and challenges to enterprise technological innovation [3]. Massive data resources and advanced technical means provide strong support for enterprises to carry out more efficient and forward-looking technological innovation. The rapidly changing technological environment and market demand also make the technological innovation of enterprises face greater uncertainty [4]. At the same time, the impact of intelligent transformation on the economic benefits of enterprises is becoming increasingly significant. From the optimization of cost structure to the expansion of income model, from the improvement of operational efficiency to the competition for market share, it is closely related to intelligent transformation [5].

However, at present, there is still insufficient research on the complex interactive relationship between enterprise technological innovation and economic benefits under the background of intelligent transformation, and how to realize the collaborative optimization between them [6]. Some studies only focus on the one-way influence of technological innovation on economic benefits, ignoring the feedback effect of economic benefits on technological innovation; Or there is a lack of systematic theoretical framework and practical strategies when discussing synergy [7]. Therefore, it is of great significance to study this field deeply, reveal the internal mechanism of collaborative optimization and put forward practical strategies for guiding enterprises to achieve sustainable development in the wave of intelligent transformation. This paper aims to deeply analyze the relationship between technological innovation and economic benefits of enterprises under the background of intelligent transformation through systematic theoretical analysis, build a

  DOI: 10.25236/iceesr.2025.053

theoretical framework of collaborative optimization, and put forward targeted strategic suggestions.

2. Related theoretical basis

Intelligent transformation refers to the reshaping of business processes, organizational structures and business models by enterprises with the help of digital technologies, such as artificial intelligence, big data and Internet of Things, so as to realize intelligent decision-making and operation. The theory of technological innovation is the key driving force of intelligent transformation [8]. Schumpeter's innovation theory emphasizes the introduction of new production function, and intelligent transformation creates new value through new technology. Enterprises rely on technological innovation to realize intelligence, improve production processes and improve the quality of products and services. At the same time, institutional innovation provides support for intelligent transformation, such as the reform of enterprise management system and incentive mechanism, and promotes technology application and innovation.

Enterprise technological innovation is a process from the emergence of new ideas to product research and development, production and commercialization. It covers product innovation, that is, creating new products or improving existing products; Technological innovation, optimization of production process to improve efficiency and reduce costs. The technology-driven model holds that the breakthrough of science and technology leads to technological innovation, and enterprises develop new products based on new technologies [9]. The demand-driven model emphasizes that market demand is the driving force of innovation, and enterprises carry out innovation activities to meet market demand. The interaction model points out that the interaction between technology and market jointly promotes innovation, and enterprises need to take both into account to improve the success rate of innovation.

The economic benefits of enterprises reflect the relationship between input and output, and the pursuit of profit maximization is the core goal of enterprises. The cost-benefit theory emphasizes that enterprises should reduce costs and increase output to achieve economic benefits. In the production process, enterprises rationally allocate resources, improve the utilization rate of production factors and reduce production costs [10]. At the same time, through marketing, product innovation and other means, increase the added value of products and increase sales revenue. In addition, economic benefits also involve the long-term sustainable development of enterprises, and enterprises need to balance short-term interests and long-term strategies to achieve stable growth.

The synergetic theory was put forward by German physicist Haken, which emphasized that the synergistic effect of "1+1>2" was produced by mutual cooperation among the elements of the system. In enterprises, technological innovation and economic benefits can be regarded as two interrelated subsystems. When the two develop together, technological innovation provides impetus for improving economic benefits, such as new products bringing new market and profit growth points; Economic benefits provide resource support for technological innovation and ensure the continuous innovation activities. Through strategic coordination, resource sharing, organization and coordination, enterprises can promote their coordination and enhance their overall competitiveness.

3. Influence of intelligent transformation on technological innovation and economic benefit of enterprises

3.1. The impact of intelligent transformation on technological innovation of enterprises

Intelligent transformation has brought profound influence on technological innovation of enterprises in many aspects. From the perspective of innovation resources, massive data has become a new innovation factor. With the help of big data technology, enterprises can deeply explore information such as market demand and consumer preferences, and provide precise guidance for technological innovation. In the innovation mode, intelligence promotes the development of open innovation. Enterprises are no longer limited to internal research and development, but are closely connected with external subjects such as suppliers, customers and scientific research institutions

through technologies such as the Internet of Things to build an innovation ecosystem.

However, intelligent transformation also brings challenges to technological innovation of enterprises. The speed of technology upgrading is accelerating, which requires enterprises to have stronger technology tracking and rapid response capabilities. At the same time, the problems of data security and privacy protection are prominent, and enterprises need to guard against the risk of data leakage when using data for innovation.

3.2. The impact of intelligent transformation on the economic benefits of enterprises

Intelligent transformation plays a significant role in the economic benefits of enterprises at both ends of cost and income. In terms of cost control, the application of intelligent production system greatly improves production efficiency and reduces labor costs. For example, the widespread use of industrial robots in production lines not only improves the stability of product quality, but also reduces manual operation errors and manpower input. At the same time, intelligent supply chain management uses big data analysis to achieve accurate inventory control and reduce inventory costs.

In terms of income improvement, intelligent products and services have expanded the profit channels of enterprises. Enterprises can also obtain additional income by providing value-added services based on intelligent products, such as equipment remote monitoring and maintenance services. Table 1 shows the impact of intelligent transformation on some key indicators of enterprise economic benefits:

Table 1: Comparison of Partial Indicators of Economic Benefits Before and After Intelligent Transformation of Enterprises

Indicator	Before Transformation	After Transformation	Change Magnitude
Production Cost (per unit product)	200 yuan	160 yuan	-20%
Inventory Turnover Rate	3 times/year	5 times/year	+66.7%
Product Added Value (per piece)	50 yuan	80 yuan	+60%
Service Revenue Proportion	10%	25%	+150%

As can be seen from Table 1, after the intelligent transformation, the production cost of enterprises is reduced, the inventory turnover rate is increased, the added value of products is increased, and the proportion of service income is greatly increased. These changes have effectively promoted the growth of economic benefits of enterprises.

3.3. Interaction mechanism between technological innovation and economic benefits

Technological innovation is the key driving force to improve economic benefits. The transformation of new technological achievements into new products or new production processes can open up new markets and improve production efficiency, thus increasing sales revenue and profits. Economic benefits have a feedback effect on technological innovation. Good economic benefits provide enterprises with sufficient funds for R&D investment and support the continuous development of technological innovation activities. Profit growth enables enterprises to attract and retain high-end innovative talents, strengthen the strength of innovation teams and further promote technological innovation.

4. Enterprise technology innovation and economic benefits collaborative optimization strategy

4.1. Strategic synergy strategy

Enterprises should formulate a development strategy that integrates technological innovation and economic benefits. In the strategic planning stage, fully consider the trend of intelligent transformation, and closely combine the direction of technological innovation with market demand and economic benefit expectation. For example, the technological innovation strategy with intelligent product research and development as the core is clearly defined, and the corresponding

market share and profit growth targets are set at the same time. By regularly evaluating the implementation effect of the strategy, we can adjust the technical innovation and economic benefit targets in time according to market changes to ensure the coordinated promotion of the two.

4.2. Resource allocation coordination strategy

Rational allocation of resources is the key to realize collaborative optimization. In terms of human resources, we should cultivate compound talents who know both technology and economic management knowledge, set up an inter-departmental innovation team, and promote communication and cooperation between technology research and development and marketing, finance and other departments. In terms of capital resources, optimize the investment mechanism of R&D funds and allocate funds according to the market potential and economic benefit expectation of technological innovation projects. For example, for projects with high market potential but high R&D risks, appropriate financial support will be given at the initial stage, and investment will be increased after phased results are achieved. At the same time, actively expand external financing channels to provide sufficient funds for technological innovation. See Table 2 for the resource allocation of different technological innovation projects:

Table 2: Resource Allocation for Different Technological Innovation Projects

Type of Technological Innovation Project	Human Resource Allocation	Financial Resource Allocation (10,000 yuan)
Incremental Product Improvement Projects	Mainly product R&D department, with a small number of market research personnel involved	50 - 100 (based on project scale)
Breakthrough Technology R&D Projects	Cross-departmental teams, including technical experts, market analysts, financial specialists, etc.	200 - 500 (phased investment)
Process Optimization Innovation Projects	Led by the production department, in collaboration with the R&D and cost control departments	100 - 300 (depending on process complexity)

As can be seen from Table 2, for different types of technological innovation projects, enterprises need to allocate resources flexibly and pertinently to achieve the balance between technological innovation and economic benefits.

4.3. Organizational synergy strategy

It is very important to build an organizational structure and management model that adapts to coordinated development. Enterprises can break the barriers of traditional departments and establish innovative organizational forms of project system. Focusing on specific technological innovation projects, the project team is composed of personnel from various departments, giving the team full decision-making power and resource allocation power. In the management mode, flat management is adopted to reduce decision-making levels and improve information transmission and decision-making efficiency. At the same time, establish a collaborative incentive mechanism to link the performance of team members with technological innovation achievements and economic benefits, and stimulate the enthusiasm of employees for cooperation.

4.4. Innovative ecological synergy strategy

In the supply chain, enterprises can deepen cooperation with suppliers to jointly promote technological innovation of raw materials and parts, so as to reduce procurement costs and improve product quality. In terms of cooperation in Industry-University-Research, enterprises can cooperate with universities and scientific research institutions to carry out cutting-edge technology research with the help of their scientific research advantages and accelerate the transformation of scientific and technological achievements. In terms of market docking, enterprises should strengthen the interaction with customers, continuously optimize products and services by collecting user feedback,

and ensure the accurate matching of technological innovation and market demand. By building an innovation ecology, enterprises can integrate resources from all sides and realize the coordinated optimization of technological innovation and economic benefits.

5. Conclusions

This paper focuses on the collaborative optimization of enterprise technological innovation and economic benefits under the background of intelligent transformation. Under the wave of intelligent transformation, technological innovation and economic benefits of enterprises are facing profound changes. Intelligent transformation brings opportunities such as data-driven and open innovation to enterprise technological innovation, but it also brings challenges such as fast technology update and data security. On the economic benefits, it has a significant impact on cost control and income promotion, such as reducing production costs, improving inventory turnover rate, increasing the added value of products and the proportion of service income. At the same time, technological innovation interacts with economic benefits. Technological innovation is the driving force to improve economic benefits, and economic benefits have a feedback effect on technological innovation. In order to realize the collaborative optimization of the two, enterprises can start from many aspects. Strategically, integrate technological innovation and economic benefit objectives and dynamically adjust them; In terms of resource allocation, we should allocate human and financial resources reasonably and invest accurately in different innovative projects; In terms of organization, break departmental barriers and build an organizational structure and incentive mechanism that adapts to synergy; In terms of innovation ecology, strengthen cooperation with external entities such as suppliers, universities and customers.

This research is mainly based on theoretical analysis, and future research can consider introducing empirical research to further verify the effectiveness of collaborative optimization strategy. At the same time, with the continuous development of intelligent technology, there may be differences in collaborative optimization modes of enterprises in different industries and different development stages, which also provides a direction for follow-up research, so as to provide more targeted practical guidance for enterprises.

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