

The Gain and Regeneration Path of Enterprise Quality Immune System Resilience from the Perspective of Scientific and Technological Innovation and GVC Embedding

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Abstract: With technological innovation and GVC embeddedness, enterprises are facing more and more quality challenges and risks. The purpose of this paper is to explore how to achieve continuous improvement and regenerative gain of enterprise quality management by building the resilience of the quality immune system. First, the challenges and resilience needs of enterprises in terms of quality are analyzed. Secondly, the concept of mass immune system resilience is proposed. Finally, the regenerative pathways to achieve the resilience of the mass immune system were discussed. Through the implementation of these paths, enterprises can continuously improve their own quality management level, enhance market competitiveness, and realize the gain and regeneration of the resilience of the quality immune system.

Keywords: Scientific and Technological Innovation; GVC Embedding; Immune System; Resilience; Buff the Regeneration Path

1. Introduction

In today's globalized economy, businesses are facing increasingly fierce competition and rapidly changing market demands. In this context, technological innovation and global value chain (Global Value Chains, GVC) embedding have become the key pathways for enterprises to improve the resilience of the quality immune system. The resilience of the quality immune system refers to a company's ability to effectively adjust and maintain the high quality of its products and services in the face of challenges such as market volatility, supply chain disruptions, and technological change. The purpose of this paper is to explore how enterprises can build the resilience of the

quality immune system from the perspective of technological innovation and GVC embeddedness, and realize the path of gain regeneration.

First of all, scientific and technological innovation, as an important driving force for the development of enterprises, provides new opportunities for enterprises to improve product quality and production efficiency. By introducing advanced technologies, digital transformation, and developing innovative products, companies can continuously improve their competitiveness and adaptability, thereby building a more flexible and stable quality immune system. Second, the embeddedness of global value chains provides a platform for enterprises to cooperate and integrate resources across borders. By participating in global value chains, companies can collaborate with partners from different regions to carry out innovation activities, share best practices and improve product quality. This collaboration not only helps reduce costs, but also strengthens the resilience of companies' supply chains, enabling them to better respond to market changes and risk challenges. Therefore, through technological innovation and embedding in global value chains, companies can build a more resilient quality immune system and achieve regeneration in the face of challenges. This paper will conduct an in-depth discussion on this issue, and analyze the impact of technological innovation and GVC embedding on the resilience of enterprises' quality immune system, in order to provide new ideas and strategies for enterprises to maintain their competitive advantage in the context of globalization.

2. Challenges and the Need for Resilience for Businesses

From the perspective of technological

innovation and GVC embeddedness, companies face a series of challenges and the need for resilience that need to be effectively responded to remain competitive and sustainable[1]. First of all, the rapid changes brought about by technological innovation pose challenges to enterprises. The continuous emergence of new technologies and the rapid changes in the market mean that companies need to constantly update their technologies and products to adapt to the changing needs of consumers. At the same time, the upgrading of technology may lead to the renewal of equipment and the adjustment of technological processes[2], which puts forward higher requirements for enterprise production management. Second, the embeddedness of global value chains makes enterprises face more complex supply chain management challenges. Companies need to work closely with suppliers, partners, and customers around the world to build resilient supply chains to reduce risk. Raw material shortages, transportation delays, and other issues in the supply chain can have an impact on production and delivery[3], so companies need to increase transparency and flexibility in their supply chains.

While dealing with these challenges, companies also need to be resilient and resilient. First, companies need to be market agile, able to make decisions quickly and adjust strategies to adapt to market changes. Second, enterprises need to establish a flexible organizational structure and management mechanism to quickly respond to changes in the external environment, adjust resource allocation and optimize operational processes. In addition, enterprises need to strengthen talent training and management in the context of technological innovation and global value chain embeddedness[4]. Enterprises need to attract and retain talents with scientific and technological innovation capabilities, and cultivate employees' cross-cultural communication skills and global perspectives to better adapt to the global competitive environment[5]. In conclusion, technological innovation and global value chain embeddedness present both opportunities and challenges for companies to strengthen their resilience through continuous innovation, enhanced supply chain management, increased market agility and enhanced talent

development to remain competitive and achieve sustainable development[6].

3. The Concept of Mass Immune System Resilience

The resilience of the quality immune system refers to the ability of enterprises to quickly adapt, adjust and respond to effective quality management systems and measures in the face of changes in the external environment[7], market competition pressure and internal challenges, so as to maintain quality stability and continuous improvement. This resilience enables companies to withstand risks and challenges, enhance competitiveness, and achieve sustainable development. The concept of resilience of the quality immune system emphasizes the flexibility, adaptability, and responsiveness of a business in quality management to respond to changing market demands and environmental conditions. By establishing a resilient and resilient quality management system, companies can better prevent problems from occurring, respond quickly to emergencies, and continuously improve and optimize quality management practices[8]. These factors work together to promote enterprises to continuously improve the quality level, meet challenges, and ensure that the quality of products and services is continuously improved, so as to enhance market competitiveness and achieve sustainable development. Through the synergy of these key elements, enterprises can build a framework with the resilience of the quality immune system to achieve stable improvement and continuous improvement of quality, thereby enhancing market competitiveness and sustainable development.

Businesses may face the following challenges when building and maintaining quality immune system resilience. First of all, the uncertainty of market competition is an important challenge. Changes in market demand and consumer preferences may lead to a decrease in demand for products or services, which can put pressure on the quality immune system of the enterprise; Second, supply chain risk is another key challenge. The complexity of globalized supply chains makes companies vulnerable to raw material supply disruptions, transportation delays[9], and other issues that negatively impact product quality and delivery capabilities; Then, technological change is also

a challenge. With the rapid development of technology, enterprises need to constantly update equipment and processes to remain competitive and adapt to new quality standards; Fourth, talent and training issues can also pose a challenge to the quality immune system. Businesses need to have high-quality employees and provide them with training and development opportunities to ensure that they are equipped to adapt to new technologies and quality requirements[10]; Fifth, regulatory compliance is a major challenge. Companies must comply with various regulations and standards to ensure that products meet quality, safety and environmental requirements, which can increase the cost and complexity of management. Finally, financial risk is also a challenge. Financial problems such as shortage of funds and exchange rate fluctuations may affect the quality immune system of enterprises, limiting their investment and improvement in quality assurance. In the face of these challenges, enterprises need to establish a flexible quality management system, focus on innovation and continuous improvement, strengthen supply chain cooperation and risk management, and pay attention to talent training and regulatory compliance, so as to enhance the resilience and competitiveness of the quality immune system and ensure the long-term sustainable development of enterprises in the ever-changing market environment[11].

4. The Path to Gain Regeneration of the Resilience of the Enterprise Quality Immune System

The gain and regeneration path of quality immune system resilience refers to the continuous improvement and regeneration of quality through a series of measures and strategies to build a resilient quality management system in order to cope with changes and challenges in the external environment[12-13]. Through the following paths, enterprises can build a quality immune system that flexibly responds to market changes, has strong anti-risk ability, and continuously improves the quality level, realizes the regeneration of quality, and promotes the sustainable development and competitiveness of enterprises.

(1) Establish a strong quality culture: cultivate the quality awareness of employees, emphasize

the concept of full participation and quality first, and ensure that every employee understands the importance of quality to the long-term development of the enterprise.

(2) Develop a standardized process standardize the process to ensure the consistency and stability of products and services, and reduce the risk of quality problems.

(3) Data-driven decision-making: use data analysis and business intelligence technology to make decisions, realize scientific and refined quality management, find problems in time and take corresponding measures.

(4) Continuous improvement and learning: encourage employees to continuously improve and learn, establish a feedback mechanism, continuously optimize the quality management system, and improve the quality level.

(5) Supply chain management optimization: establish a solid cooperative relationship with suppliers to ensure that the quality of raw materials and parts is controllable and reduce quality risks.

(6) Technological innovation and application: the introduction of new technologies, such as intelligent technology and automation equipment, to improve production efficiency and quality management level.

5. Conclusion

Technological innovation and GVC embedding provide an important path for the resilience of the quality immune system of enterprises. By continuously introducing new technologies, improving workflows, strengthening partnerships, and participating in global value chains, companies can improve product quality, reduce risk, and better adapt to market changes. The digital transformation and the improvement of intelligent production capacity brought about by technological innovation enable enterprises to respond to challenges and changes more quickly and maintain a competitive advantage. At the same time, GVC embedding provides enterprises with opportunities for cross-border cooperation and resource integration, sharing technology, knowledge and experience, reducing costs, expanding markets, and enhancing the resilience of supply chains. On the whole, scientific and technological innovation and GVC embedding complement each other to jointly promote the gain and regeneration of the resilience of the quality immune system of

enterprises, and provide key support and strategic direction for the sustainable development of enterprises in the fiercely competitive market environment. Therefore, enterprises should pay attention to technological innovation and the application of global value chains when formulating development strategies, and continuously optimize their own quality immune system to meet future challenges and achieve sustainable growth.

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