

The Formation Mechanism of Green Quality Immune System Resilience in Specialized, Refined, and Innovative Enterprises

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Abstract: Quality is the lifeline for the survival and development of enterprises. With the continuous infiltration of sustainable development green concepts and the occurrence of quality and safety incidents, the green quality crisis of enterprises is gradually being valued by enterprises. The green quality immune system of enterprises is an important defense line when facing crises, which includes three immune methods: supervision, defense, and memory. This article analyzes the green quality immune system of enterprises before, during, and after the crisis, revealing the formation mechanism of the resilience of the "specialized, refined, and new" enterprise green quality immune system, making the "specialized, refined, and new" enterprise green quality immune system more resilient.

Keywords: "Specialized, refined, unique, and new" Enterprises; Green Quality Management; Enterprise Quality Immunity; System Resilience; Formation Mechanism

1. Introduction

As an important force in promoting high-quality economic development, "specialized, refined, and innovative" enterprises are in a constantly changing internal and external dynamic environment. The environment will bring opportunities and threats to enterprises. The practice of green quality management not only ensures the sustainable development of "specialized, refined, unique, and new" enterprises with green benefits, but also faces threats from fatal factors, harmful substances, antigens, viruses, bacteria, and other factors from both internal and external development environments. The green quality immune system of "specialized, refined, and innovative" enterprises can

effectively identify potential viruses, take a series of defense measures, and generate memory storage in the face of unknown internal and external threats. In the multi-step immunization process of the green quality immune system in "specialized, refined, and innovative" enterprises, any interference at any stage will lead to a decrease in the resilience of the quality immune system, ultimately inducing the occurrence of quality and safety incidents. Many scholars have attempted to solve quality management problems from the perspective of traditional total quality management, but this has only solved the quality dilemma of some enterprises, and the resilience of the enterprise's green quality immune system has not been effectively improved. This article uses the theory of biological immunology to study the formation mechanism of the resilience of the immune system in enterprise green quality management. The aim is to comprehensively present the internal logic of the formation of the resilience of the immune system in enterprise green quality management, provide suggestions for enterprises to improve product green quality, implement enterprise green quality management, and enhance the resilience of the immune system in green quality management, and effectively achieve the strategic goal of sustainable development of green quality management.

2. Literature Review

"Specialization, refinement, uniqueness, and novelty" is a new concept first proposed in the "Opinions on Further Supporting the Healthy Development of Small and Micro Enterprises" in 2012 [1-3]. High quality green products are the main reliance for "specialized, refined, unique, and new" enterprises to achieve long-term development, and product quality management has always been highly valued by most "specialized, refined, unique, and new"

enterprises. In recent years, developing green industries and achieving sustainable and healthy development has become a necessary path for enterprises [4-5], gradually forming a complete connotation of green quality management [6]. Enterprise green quality management extends the connotation and characteristics of traditional total quality management, focusing not only on internal production to provide customers with products that meet consumer expectations, but also on the green and social benefits brought by enterprise production [7-9].

Immunity is a physiological function of the body that relies on it to identify non self components, resist or prevent antigenic substances that enter the body due to infections or other harmful organisms such as microorganisms [10]. Due to the increasing number of uncertain factors faced by enterprises, more and more scholars are applying the concept of "immunity" to their business management. They believe that enterprises also have immune system functions similar to the human body, which can effectively identify and quickly eliminate adverse threat factors when facing external environments, and maintain the health of enterprises by memorizing the immune process [11,12]. Enterprise quality immunity is the expansion of the immune system in the field of enterprise quality management, which is the ability of organizations to identify and eliminate external factors related to quality, and form relevant quality memories [13]. Drawing on a large amount of research on organizational quality immunity [14-16], the enterprise green quality immune system is defined as the performance of the enterprise immune system in the practice of enterprise green quality management. Enterprises identify internal and external unfavorable factors that affect product quality, eliminate interfering factors that may affect enterprise green quality, and generate green quality related memories, enhance the level of green quality management in enterprises and maintain their ability to achieve healthy and sustainable development.

With the integration and expansion of interdisciplinary research, scholars have applied the term "resilience" in physics to the field of management, believing that the development of organizations also has

resilience similar to that of objects. However, the difference is that enterprise resilience refers to the ability of enterprises to still have good adaptability when facing uncertain impacts from internal and external environments, as well as the ability to quickly recover from such impacts [17,18]. The resilience of the enterprise's green quality immune system is the refinement of enterprise resilience in terms of green quality immunity, and it is the immune ability of the quality immune system to respond to sudden crises. The enhancement of the resilience of the enterprise's green quality immune system can alleviate quality and safety issues caused by improper green quality management, and help "specialized, refined, and innovative" enterprises achieve sustainable and healthy development.

3. The Mechanism of Resilience Formation of Green Quality Immune System in "Specialized, Refined, Unique, and New" Enterprises

The internal logical mechanism of the resilience formation of the green quality immune system in "specialized, refined, unique, and new" enterprises is a characteristic and dynamic ability of the green quality management system of "specialized, refined, unique, and new" enterprises in the face of special crisis situations. Before the crisis, the immune system for green quality management in enterprises should be prepared in advance; Under the impact of crisis, the immune system of enterprise green quality management responds, controls, and solves the crisis; After the crisis, the immune system of enterprise green quality management is restored and remembered. This article believes that the internal logical mechanism for the formation of resilience in the green quality immune system of "specialized, refined, unique, and new" enterprises includes the multi-dimensional dynamic organizational ability of "specialized, refined, unique, and new" enterprise green quality management practices in the face of crises, including pre preparation, response, post recovery, and ultimately adaptation to dynamic environments [19]. That is to say, the resilience of the green quality immune system of "specialized, refined, unique, and new" enterprises includes the preparation and prediction for internal and

external threats, actively and quickly responding to changes in the internal and external environment, making correct and effective defense decisions and measures, learning from experience and lessons to restore the original state or achieve a new equilibrium state of dynamic ability, and adapting to environmental changes through continuous cycles before, during, and after to achieve sustainable development.

Before the arrival of internal and external threats that affect the green quality level of enterprise products, that is, in the pre event stage, the green quality management practices of "specialized, refined, and innovative" enterprises use the immune recognition function of their own immune system to identify and monitor adverse factors from both internal and external sources. For the risk factors and quality and safety events that are expected to be faced in the future, enterprises need to take action measures in advance and be fully prepared to deal with crises, in order to reduce the possibility of future crises. In the pre event stage, enterprises need to adopt a proactive attitude towards green quality crises, accustomed to considering green quality and safety issues as the key to winning in long-term development ^[20]. They realize that green quality management is related to the long-term survival and interests of enterprises, learn to integrate different perspectives, continuously perceive and identify weak signals in external market environment and internal organizational environment that affect quality and safety, establish risk and crisis awareness in advance, evaluate current preparedness, and predict potential factors for future crises.

The occurrence of green product quality and safety incidents in enterprises is uncertain. When facing the impact of quality and safety incidents, that is, during the intermediate stage, the "specialized, refined, and innovative" green quality management practices of enterprises use the immune defense function of their own immune system to respond and defend against unfavorable factors from both internal and external sources. Response capability refers to the ability of an organization to respond promptly and effectively to internal and external changes, disturbances, interruptions, and unexpected situations ^[21]. The enterprise green quality

immune system can quickly identify and diagnose potential quality and safety factors based on the system's stored experience and knowledge in the first time of a crisis. This rapid response and processing of threat information in the internal and external environment is the key to reducing the impact of events and solving threat impacts for enterprises. In the intermediate stage, "specialized, refined, and innovative" enterprises conduct a clear analysis of the threats posed by uncertain green quality events, quickly evaluate the adverse effects and urgency of quality events, and adopt flexible and efficient response solutions based on the experience and resources accumulated by the enterprise's green quality immune system in the early stage of green quality and safety uncertainty events, achieving a high-quality transformation of the enterprise's green quality management strategy.

After the internal and external threats that affect the green quality level of enterprise products are resolved, that is, in the post event stage, the green quality management practice of "specialized, refined, unique, and new" enterprises utilizes the immune memory function of their own immune system to summarize and memorize adverse factors from both internal and external sources, and gradually recovers and continuously develops through learning new skills, acquiring new experiences, and interacting more frequently with the surrounding environment ^[22]. The green quality immune system of "specialized, refined, and innovative" enterprises is good at summarizing and learning from the crises they face, memorizing them, and forming new experiences. At the same time, it is able to combine new experiences with new internal and external environments, dare to meet challenges, continuously enhance the function of the immune system, and make its own immune system more resilient to adapt to future changes in the new environment after a crisis.

4. Conclusion and Policy Recommendations

The green quality immune system of enterprises is an important line of defense when facing crises, which includes three immune methods: supervision, defense, and memory. They play a crucial role in the green quality and safety of enterprises before, during,

and after the crisis. Therefore, in order to make the green quality immune system of "specialized, refined, unique, and new" enterprises more resilient, "specialized, refined, unique, and new" enterprises should attach importance to the importance of each stage of crisis occurrence, attach importance to the supervisory function of the green quality immune system in advance, and try to nip crises in the bud of quality and safety events as much as possible; When a crisis occurs, establish a dedicated team to calmly analyze the green quality issues faced by the enterprise based on internal and external environmental factors, so that the crisis can be quickly and long-term resolved; After the crisis, it is emphasized to summarize the experience of new quality management, be good at reflecting and learning from quality and safety incidents, learn and develop from challenges, improve and update the recovery and adaptation ability of one's own green quality immune system, and enhance the resilience of the "specialized, refined, and innovative" enterprise green quality immune system.

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