

Study on the Influencing Factors of Green Quality Management System in Manufacturing Enterprises

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Abstract: Environmental management is a focal issue that manufacturing companies have been facing, and under the guidance of sustainable goals, companies are also committed to building green quality management systems. The green quality management means that enterprises integrate the "green" concept of economy, harmony and environmental protection into the quality management of enterprises, and take green quality as the quality strategic goal. On the basis of traditional quality management, the green quality management pays attention to the management of life period, resources and environment, and all staff undertakes the quality responsibility of the whole life cycle of products, processes or services. The green quality management pursuits the balance of economy, resources and environment in a large system, at the same time, meets the green needs of customers and achieves sustainable development of enterprises. The article first briefly discusses the meaning of green quality management, and then compares and analyzes the differences and advantages between green quality management and traditional quality management system from the characteristics of green quality management system, finally analyzes the development of enterprise green quality management system from four aspects: institutional environmental factors, technical environmental factors, stakeholder factors and organizational characteristics. The article hope to promote the green transformation of manufacturing enterprises in the production process.

1. Introduction

Quality management systems can provide a stable management structure for companies, help improve product performance ^[1], increase the value of corporate assets, and accelerate continuous development ^[2]. The application of quality management systems in the manufacturing industry has been effective in improving the market competitiveness of companies. With the proposal of sustainable development goals, companies are aware of the price of managing products and pollution ^[3], and companies are using green quality management systems as their primary management approach. With the increasing global awareness of climate change and environmental sustainability, manufacturing enterprises must cater to the concept of environmental protection. Enterprises should integrate the green concept of environmental friendliness and health promotion

into total quality management, which can achieve sustainable competitiveness and process improvement ^[4].

The green quality management system is a management system that takes into account ecological interests, consumer interests and enterprise interests at the same time. It can effectively help enterprises achieve green production and improve market competitiveness. In the past research in China, people have paid more attention to the concept and significance of green management, and the necessity of green quality management system of enterprises. The paper focuses on the in-depth study of the characteristics and advantages of green quality management system, reveals the influencing factors of green quality management system of manufacturing enterprises, and analyzes the relationship between green quality management system and enterprise performance.

2. Green Quality Management System

2.1. The Characteristics of Traditional Quality Management System

Quality management in manufacturing companies is manifested in specific activities that may produce higher or lower efficiency. The traditional quality management system is characterized by maturity, which refers to the fact that the company has a specific level of development, reflected in a set of activities related to quality prevention ^[5]. The maturity of the quality management system can be demonstrated by product quality control and correction of non-conforming products. In the highest maturity level, companies are able to determine product quality according to customer needs. In contrast, an immature quality management system is characterized by a continuous focus on product quality control while correcting any non-qualified reproduction, resulting in higher error rates and assessment costs.

2.2. The Meaning of Green Quality Management System

The development goals between economy and environment have often been inconsistent because of the green conception. And in order to meet environmental objectives, more and more companies are integrating the environment into their business strategies to improve profits and productivity, by reducing waste and emissions. As a formal management system that helps companies clarify goals and make decisions, green quality management systems are considered the most systematic and complete mechanism for protecting environment and business ^[6]. Green quality management is an extension of the core principles of quality management to environmental management ^[7]. Manufacturing enterprises should integrate the concept of energy conservation and environmental protection into the quality management process, and establish a green quality management system that requires comprehensive consideration of whether the quality of products and sales process meets the sustainable development needs of the market and whether it can meet the green consumption concepts of consumers ^[4].

2.3 The Characteristics of Green Quality Management System

2.3.1. Surpassing Traditional Quality Management, Pursuing of Green Quality Management

Traditional quality management is required to meet customer needs while ensuring product performance, but also includes product production cycle, manufacturing costs, service life and maintenance costs, lacking consideration of the production environment and resources. Green quality management is based on quality management integrated into the goal of sustainable development, with the concept of energy saving, environmental protection and harmony in

production. Managers are faced with environmental issues in production decisions that not only take into account the economic interests and cultural values of the company, but also ensure sustainable economic success ^[8].

2.3.2. Extension of Quality Requirement Orientation

Traditional quality management focuses on customer requirements, production processes, organizational management systems, and member management within the organization, with the primary goal of reducing waste, eliminating errors, and improving business efficiency while ensuring product quality and customer satisfaction. Green quality management continues to extend the quality requirements. Green quality management requires companies to improve their competitive advantage through environmental sustainability, gain better profits for environmentally safe and clean products and services, and gain greater market share by increasing consumer demand for clean products or improving processes to save costs ^[9].

2.3.3. Expansion of the Scope of Quality Management

Quality management theory has been in the process of development, and its management scope has been expanding. In the early stage, quality management focused on product performance and pursued product life; in the middle stage, it pursued product function and standardized product production process; finally, it formed the stage of total quality management which controlled the whole cycle of product quality. But in the face of the current requirements of environmental sustainability, its scope is still limited. The management model under green quality management system will pay more attention to the efficiency of resource use, control the pollution caused by the product from production to consumption and reduce the impact on the environment. The successful implementation of environmental sustainability practices by companies involves three main parties: the company that produces the product or provides the service, the consumer that purchases the product or service, and the regulatory or external body that certifies green products and services ^[9].

2.3.4. Harmonization of Internal Quality and External Quality

As manufacturing companies produce products or services to gain revenue and drive their growth and market expansion, their quality management activities involve not only the internal but also the external environment ^[10]. Accordingly, the scope of green quality management includes not only the internal production quality and profitability of the enterprise, but also the environmental impact and resource efficiency of the product distribution chain. Therefore, green quality management is a unified management model of internal and external quality.

3. The Influence Factors of Green Quality Management System of Manufacturing Enterprises

3.1. Institutional Environment Factors

3.1.1. Normative Pressure

Normative pressure means that social norms produce common ideas or thinking patterns, and organizations and individuals gradually accept these social norms or ways of thinking and tend to be the same in the formation and promotion of professional knowledge. At present, green and coordinated development has long become the development goal of the economic market, and the government departments and the public are constantly concerned about environmental issues. As a result, under the regulation of the green concept, manufacturing enterprises have made changes to

their management mode to promote the production of green products ^[11]. The green quality management system injects the concept of sustainable development into the process of enterprise quality management, making enterprises aware of the severity of current environmental problems and promoting them to coordinate the conflict between economic development and environmental protection.

3.1.2. Competitive Pressure

The competitive pressure on companies is mainly reflected in the production of products by companies in the industry. Nowadays, under the requirements of ISO14000 environmental management standard, environmental protection is one of the criteria for many internationally renowned companies to choose their partners, and if companies do not strictly implement the green concept, they will lose many partners and production opportunities. Companies are proactively implementing green products that meet environmental protection requirements in order to expand their domestic markets and open up international markets. Porter ^[12] argues that setting environmental standards properly can motivate innovation, reduce products' total cost or increase value. These innovations can enable firms to use resources and labor more efficiently and increase their competitiveness, thereby offsetting the expenses incurred to improve the environment and reaping additional profits ^[13].

3.2. Technical Environmental Factors

3.2.1. Green Technology

Green technology, as an emerging technology, is the main method to solve the problem of resource waste and environmental pollution when manufacturing products are produced. Green technology aims to reduce consumption, reduce pollution and improve the environment, which not only improves the efficiency and enhances the competitiveness of enterprises, but also promotes the construction of ecological civilization, which is the key to building green enterprises ^[11]. Green technology is divided into end treatment technology, clean process and green products. End treatment technology refers to the reduction of pollutants through the methods of incineration, separation and disposal of waste; clean process is the use of advanced production technology in the production process to improve the efficiency of raw material utilization and strengthen the internal management of enterprise production; green products refer to the production and consumption of products that do not cause pollution to the environment and can be recycled twice^[14]. The management mode of enterprises shifts from quality management to green quality management, which requires enterprises to meet the concept of sustainable development, protect the production environment and achieve high-quality development of enterprises. For enterprises, green technology can improve the efficiency of resource utilization, optimize product performance while reducing production waste, focus on recycling and reuse of used products, and achieve the goal of reducing environmental pollution.

3.2.2. Green Technology Environment

As an emerging technology in the field of global industrial revolution and technological innovation, green technology is the main driving force for establishing a green and low-carbon economic system in China. A good green technology environment can promote technology, therefore, manufacturing enterprises can guide technology toward green technology through corresponding policies, innovate the original technology, and enhance the economic and environmental power of enterprises and society. In addition, enterprises need to cultivate a green

culture and disseminate green technology in a planned way to increase the acceptance of green technology by manufacturers. At the same time, the competitive environment can effectively motivate enterprises to develop green products, so as to improve the market performance and ecological performance of products, and improve the environment and promote the construction of ecological civilization.

3.3. Stakeholder Factors

3.3.1. Public Media

The importance of corporate image is self-evident. A good corporate image can determine the impression of the public on the enterprise and enhance the competitiveness of products. A green corporate image is conducive to breaking green barriers, developing green product business and getting wide recognition from consumers. Mass communication can help enterprises quickly establish a green image. While implementing green management in the whole production process, enterprises should take the initiative to provide information to the public media, shape a good image on the social side, help the public recognize the green production concept of enterprises, and strengthen the social recognition of enterprises.

3.3.2. Consumers

As lifestyles have changed, consumer attitudes have also shifted, and nowadays Chinese consumers are increasingly aware of environmental protection, and sustainable consumption has become the normative concept ^[15]. With the rapid formation and popularity of the green consumption concept, more and more consumers uphold the green consumption perspective in their daily lives, tend to choose natural and pollution-free products, and are willing to pay energy and money for environmental protection. Therefore, products with secondary replacement and idle recycling functions have become the new fashion for consumers to purchase. In order to meet the needs of consumers, the manufacturing industry to strengthen the protection of the environment and the conservation and rational use of resources, improve the green quality management system, the production of environmentally friendly products is also in line with the current trend of the times.

3.3.3. Government and Environmental NGOs

The government and environmental NGOs play a regulatory role in environmental issues and can regulate the production process of enterprises ^[16]. Realistically, some firms develop corporate environmental governance policies for legitimacy reasons, but do not actually implement these policies. Or companies reluctantly hire environmental stakeholders based on corporate policies, and the demands of these stakeholders are not taken into account in corporate decision making. These are situations where governments and environmental NGOs can play a role. Government agencies refer to ISO14000 environmental management standards to formulate corresponding policies and regulations, improve social supervision mechanisms and other measures to require companies to carry out green quality management and promote the green development of the economic market. According to the results of social survey, the supervision and management mechanism of government and environmental NGOs can significantly improve the green management awareness of enterprises.

3.4. Organizational Characteristics Factors

3.4.1. Organizational Structure

Organizational structure is the basic framework of a firm and determines the way organizational units within the firm interact with each other ^[17]. Different organizational structures can produce different management activities for the enterprise, thus producing different performance. Under the influence of the green concept, enterprises should change their management mode, add the concept of sustainable development to the original organizational structure, and build a green management organizational structure that is compatible with the current environment. The establishment of a sound green quality management system requires enterprises to uphold the concept of sustainable development in the production management process. Manufacturing enterprises not only need to educate and train managers and employees with the development goal of green environment protection, so that all workers have green awareness, but also need to set up green production management tasks in specific functional departments and set up corresponding green production departments and supervision departments.

3.4.2. Organization Size

The management model of a company is influenced to some extent by the size of the organization. The size of an organization reflects the number of employees it has and the relationship between employees. Generally speaking, the size of an enterprise is directly proportional to the scope of management, and the larger the size of an enterprise, the more levels of management and the greater the scope of management. Enterprise size can reflect the strength of the enterprise. Larger enterprises generally have formal management mechanisms and are subject to greater governmental supervision and social binding, so they can actively develop green management systems. Enterprises should develop new projects to enhance the strength of the enterprise. Green investment can be used as a turning point and breakthrough point in the green management of the enterprise.

3.4.3. Organizational Goals and Organizational Culture

Organizational goals and organizational culture indicate the development direction of the enterprise, which are very important to establish green quality management system. Organizational goals determine the production direction of the enterprise, and organizational culture guides the development mode of the enterprise. The concept of green development should be reflected in the organizational goals and organizational culture of the in manufacturing enterprises. Ethical and social responsibility, especially green management, should be an integral part of the enterprise. Such a management system will be favored when the decision makers of a company realize that implementing proactive environmental strategies and pollution prevention measures may help improve the company's financial performance and improve the environment ^[8]. Green development goals are ecologically friendly production methods that are shared by most organizational members and represent the collective beliefs of business members. In order to guarantee better operation of green quality management system in production management, it is important to set green development goals within the company, actively establish a green organizational culture, and urge employees to be goal-oriented and conscientious in implementing green concepts ^[15].

4. Conclusion

With the change of market economic development needs, domestic and foreign manufacturing

industries have integrated green management into quality management system. Therefore, the implementation of green quality management system has become an important trend in the economic development of enterprises, and green quality management system is a relatively complex project. In this paper, from the viewpoint of the operation mechanism of green quality management system in manufacturing enterprises, its influencing factors mainly come from four aspects: institutional environment factors, technical environment factors, stakeholder factors and organizational characteristics factors, and focus on analyzing the influence process and influence results of these four aspects.

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