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The Development of Green Management System in Enterprise: Analysis from the Perspective of Enterprise Management

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Abstract
The emergence of sustainable thinking has given rise to a pioneering management concept known as "green management." However, numerous enterprises are currently facing substantial environmental pollution challenges arising from diverse sources such as wastewater, exhaust gases, solid waste, and noise. Consequently, the need to reform the management approach becomes a matter of utmost importance.In response to this pressing concern, this article undertakes a meticulous analysis of environmental indicators to develop a comprehensive green performance evaluation system for enterprises. Through this endeavor, the study aims to furnish a more rigorous and well-founded assessment of the efficacy of green management practices. By implementing this systematic evaluation, enterprises can gain insights into the environmental impact and adopt more sustainable strategies in operations.
Keywords: Green Management, Environment Protection, Enterprise Management

Introduction

Green management, driven by the core principles of promoting ecological, economic, and social benefits in tandem, while employing resource conservation and pollution reduction as its instrumental approach, effectively weaves the tenets of sustainable development into every aspect of enterprises' production and operations (Chong et al., 2017). Its ultimate objective lies in fostering a harmonious co-development between humanity and the natural environment (Nishii, 2011). The comprehensive evaluation of green management involves encompassing all facets of environmental relevance within the realm of enterprise production and operations (Inderwildi et al., 2013). This evaluation serves as a powerful tool in gauging whether the activities align with the requisites of green management, thus encouraging enterprises to bolster the green production efficiency and elevate product quality.

Undoubtedly, enterprises hold a pivotal role as significant economic pillars, reaping substantial profits. However, these gains often come at the cost of severe environmental pollution and over exploitation of resources. This not only undermines ecological civilization but also poses a profound threat to humanity itself. Consequently, the urgency for enterprises to undergo a transformative shift towards green management cannot be overstated (Jing & Jun, 2009). While some enterprises have gradually come to recognize the importance of green management, the prevailing focus on economic interests still impedes the widespread adoption of green management principles throughout the entire organizational structure (Lei, 2016). Enterprises must seize the opportune moment, making strategic adjustments to the

production models and actively improving product quality as they steer resolutely toward embracing green management practices.

Overview of Green Management Evaluation System

Environmental sustainability has progressively garnered significant attention from both society and business firms due to tightening regulatory requirements and evolving customer demands (Albino et al., 2012).The effectiveness of environmental strategies heavily relies on successful green enterprise management, which involves integrating all organizational aspects into a set of activities aimed at achieving sustainable objectives (Vachon & Klassen, 2006). In 1990s,The World Business Council for Sustainable Development introduced the world's first set of eco-efficiency which included some environment assessment standards (Shiwanthi et al., 2018). Since the 21st century, there have been significant breakthroughs in research on green management.Start from 2007,the researchers had emphasized the relationship between corporate economic benefits and sustainable development (Guang, 2007). These significant achievements highlight the growing recognition and importance of green management in promoting sustainable practices worldwide. As research in this field continues to progress, it is expected to contribute further to the development and implementation of effective green management strategies for businesses and industries across the globe (Napathorn, 2020).Over the following decade, various researchers have put forward the following points

(a)Constructing a green management evaluation system oriented towards a resource-cycling economy. This system not only facilitates resource conservation and environmental protection but also encourages employee creativity and innovation within the enterprise (Bo & Anyong, 2009; Mittal & Dhar, 2016).

(b)Developing a green management evaluation system for the circular economy, encompassing five aspects: economic performance, operations, resource and energy utilization, environmental protection, and innovation. This system emphasizes that enterprises should focus on environmental protection while achieving economic benefits, thus achieving a win-win situation (Zhang et al., 2009; Gao et al., 2021; Huang et al., 2017).

(c)Establishing a series of green evaluation indicators that reflect resource utilization. This system emphasizes that enterprises should prioritize resource conservation to not only save resources but also reduce costs (Zhi et al., 2010).

(d)Creating a green management evaluation system that integrates enterprises, society, and the environment. This comprehensive system covers various departments within the enterprise and the entire production and operational processes. It enables a multi-faceted and multi-level assessment of the green management performance of enterprises and serves as the most widely applicable green management system (Wu, 2014).

Characteristics of the Green Management Evaluation System

Integrating enterprises, society, and nature in an attempt to achieve the harmonization of economic development and nature conservation (Chuan, 1997).The green management system has been expanded to cover various aspects of life, enabling a more comprehensive reflection of the implementation of sustainable thinking within enterprises (Skordoulis et al., 2017).The Green Management Evaluation System can urge enterprises to eliminate any factors that are inconsistent with "green" principles, including environmental pollution, conflicts among individuals, and personal confusions (Sheldon, 2000; Storek, 2020).

Significance of the Green Management Evaluation System

This system benefits enterprises by providing a more comprehensive and objective understanding of the shortcomings, thus prompting improvements where needed and striving for excellence where already achieved.By aligning enterprise behavior with performance measures, the system stimulates employee motivation and fosters the development of the enterprise itself (Zhang et al., 2021).The system enables enterprises to evaluate the strengths and weaknesses, capitalize on the advantages, overcome disadvantages, tap into the full potential, and enhance green management performance (Nazeri et al., 2021).

Establishment of green management evaluation system

(I) Establishment of Green Manufacturing Evaluation System

Green manufacturing refers to the integration of green development concepts into the production activities of enterprises. It spans the entire product life-cycle, including product design, material procurement, product manufacturing, packaging, transportation, and post-processing, with the aim of improving resource utilization and reducing environmental impacts (Tien et al., 2006; Datta et al., 2012).

The selection of indicators for enterprise green manufacturing should adhere to the following principles:(a)Objectivity: When evaluating green manufacturing in enterprises, it should be based on actual circumstances, avoiding distortion and fabrication of facts (Cai & Man, 2004).(b)Coherence: When evaluating green manufacturing indicators, attention should be paid to the coordination between different indicators, ensuring consistency of information (Yue, 2017).(c)Quality Integration: When evaluating indicators, enterprises should focus not only on quantity but also on the quality of indicators, achieving unified quality standards (Yu et al., 2021).(d)Practicability: Green manufacturing indicators of enterprises should be aligned with practical applications and verified through practice (Mei et al., 2005).

The Indicators of the Green Manufacturing Evaluation System

Enterprise Green Economic Feature: Enterprise green economic feature require enterprises to demonstrate the green nature from the perspective of manufacturing costs, design costs, and other economic aspects.Economic feature could help to optimize enterprise green costs,the increasing green costs signifying that the enterprise has intensified its efforts in green management and attached increasing importance to environmentally friendly practices (Roychowdhury et al., 2015).

Enterprise Green Environmental Feature: Green Environmental enables enterprises to gain a proper understanding of pollutant emissions, thereby improving production patterns and reducing the discharge of wastewater, exhaust gases, and other pollutants. Enterprises' emissions of wastewater, exhaust gases, and waste residues could progressively decrease over the years,this could indicate an increasing level of green management implementation and a significant improvement in pollution treatment capabilities (Suriyachan, 2023).

Enterprise Green Resource Feature: Green resource feature allow enterprises to enhance resource utilization efficiency and shift to more sustainable operation modes.By green resource feature the enterprise may achieved a notable increase in resource utilization

efficiency, with a substantial rise in the environmental investment ratio (Logothetis et al., 2012).
Enterprise Green Energy Feature: Enterprise green energy feature encourages enterprises to conserve energy and protect the environment.The company may increase its investment in energy conservation over the green management for the improvement of energy utilization efficiency (Logothetis et al., 2012).

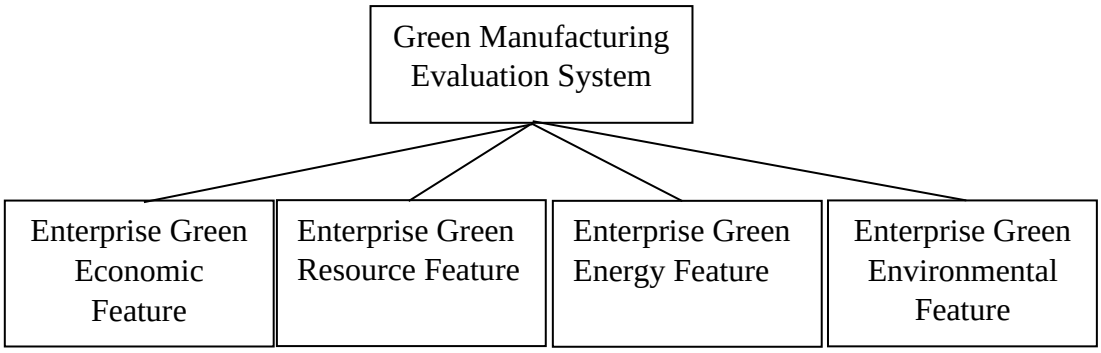

Figure 1.Green Manufacturing Evaluation System

(II)The establishment of the Green Enterprise Culture Evaluation System
Green culture refers to the collective ideological characteristics formed by the entire enterprise during its economic activities. These characteristics should align with the concepts of resource conservation and environmental protection. Green culture not only drives the development of green management within the enterprise but also stimulates innovation, leading to increased economic benefits.The performance of green culture by enterprises should adhere to certain principles:(a)Objectivity: When evaluating green culture, it should be based on objective facts, avoiding distortion and fabrication (Wang, 2017).(b)Practicability: Green culture is derived from practice, and its results should also undergo practical verification (Shuai & Architects, 2013).(c)Hierarchy: When assessing green culture, enterprises should pay attention to hierarchy and progression, conducting evaluations in a systematic and orderly manner (Li et al., 2011).
The establishment of the Green Culture Evaluation System includes the following indicators:
Green Enterprise Values: Green values refer to the enterprise's self-assessment of its production and operational methods that align with the concept of sustainable development while pursuing success (Belcher, 2006).High participation in green management, a suitable proportion of environmental investment, and relatively strong environmental awareness among employees, could make it achievable to reach green management goals (Choi & Donghyun, 2012).As the level of green management deepened, the proportion of environmental investment increased, and employees' environmental awareness improved, leading to a significant improvement in the achievement of green management objectives (Ma et al., 2016).
Green Enterprise Spirit: The green spirit enables the entire enterprise not only to possess an awareness of sustainable thinking but also to have employees actively follow green management principles (Skenderovic et al., 2014).In green enterprise spirit,the intensity of green management increased, the investment in green education rose, leading to a substantial increase in employee satisfaction and social contribution rates.Additionally, the entrepreneurial green spirit also can be gradually improved (Kuk et al., 2008).

Green Enterprise Image: The green Enterprise image reflects the operational status of green management within the enterprise (Min, 2011).With the widespread adoption of green management systems,the enterprise could optimize the green image in the eyes of customers, and its global recognition also increased noticeably (Araghi et al., 2020).

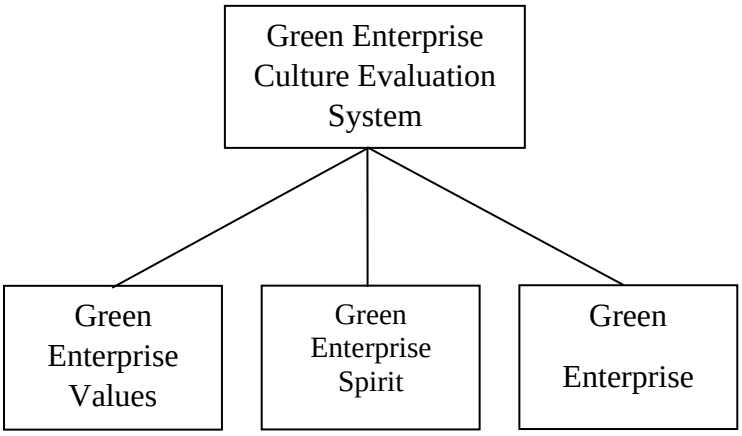

Figure 2.Green Enterprise Culture Evaluation System

(III) Establishment of the Green Marketing Evaluation System
Green marketing refers to the integration of the concept of "harmonious coexistence between humans and nature" into the marketing process, aiming to protect the environment and conserve resources while maintaining sales performance (Pradeep et al., 2016). The green marketing concept permeates various stages of the marketing process.The performance of green marketing by enterprises should meet specific requirements.The green management system should be dynamic, recognizing that marketing methods are not static and should be evaluated with a forward-looking perspective (Bomi & Donghyun2018). It should also adhere to objectivity when assessing enterprises' green marketing efforts (Cluley, 2022). Additionally, the evaluation should be comprehensive, not only assessing marketing methods but also various aspects related to marketing, such as green management and green promotion (Oxoli et al., 2020).
The establishment of the green marketing evaluation system includes the following aspects:(a)Green Pricing: Green pricing requires enterprises to consider environmental costs when setting prices to align with sustainable development demands (Jamali & Rasti, 2018). The increasing internalization rates of ecological and social costs in the table demonstrate the company's growing awareness of green development (Mannarswamy, 2011).(b)Green Products: Green products incorporate environmental protection concepts during production, promoting resource conservation (Baptiste et al., 2016).(c)Green Promotion: Green promotion not only involves advertising green products to consumers but also propagating the idea of green development (Kaur et al., 2021). Customer outreach capabilities have notably improved, with the promotional effectiveness and market expansion of green products increasing year by year,the significant impact of green promotional strategies will show (Jamal et al., 2021).(d)Green Logistics: Green logistics demand the integration of green management concepts into the distribution process.Enterprise has consistently maintained a high level of green channel utilization and clean fuel utilization rate, with an increasing rate of safe distribution. This indicates a favorable operational trend in the company's green channels (Engelage & Borgert, 2022).

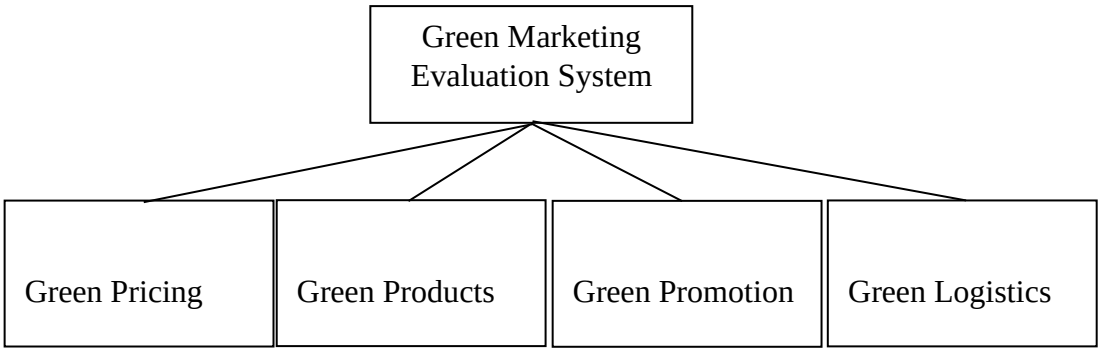

Figure 3.Green Marketing Evaluation System

Summary for The Green Management Evaluation System

Based on the obtained evaluation indicators, a system suitable for green management evaluation has been preliminary proposed.The following table shows the established theoretical evaluation system for green management evaluation system:

Table 1

Theoretical Summary for Green Management Evaluation System

Green Management Evaluation System										
Green Manufacturing Evaluation System(A)				Green Culture System(B)			Enterprise Evaluation	Green Marketing Evaluation System (C)		
Enterprise Green Economic Feature (A1)	Enterprise Green Resource Feature (A2)	Enterprise Green Energy Feature (A3)	Enterprise Green Environmental Feature (A4)	Green Enterprise Values (B1)	Green Enterprise Spirit (B2)	Green Enterprise Image (B3)	Green Pricing (C1)	Green Products (C2)	Green Promotion (C3)	Green Logistics (C4)

Related Evaluation System and Indicators or Evaluation systems

The related results were summarized in the 20 articles (see Table 2). Integrating all organizational aspects were introduced by the scholar (Vachon & Klassen, 2006; Muntean & Stremtan, 2010). Evaluation systems were designed to help improve the green management (Bo & Anyong, 2009). Environmental Features were mentioned many times by different scholar in differ research (Wu et al., 2014; Lei, 2016; Špirková et al., 2013; Ma et al., 2016; Albino, 2012； Vachon & Klassen, 2006; Bo & Anyong, 2009). Nearly all the indicators of evaluation system mentioned in table 1 were introduced in varies research for some extent,such as green marketing Lei (2016); Shiwanthi et al (2018); Kaur et al (2021), green enterprise values Lei (2016); Yi et al (2019); Gunden et al (2020), green manufacturing Inderwildi et al (2013); Špirková et al (2013), green product (Albino, 2012;Melander & Lisa.

2018),green energy and material Jing & Jun (2009); Shiwanthi et al (2018); Tong (2017), green image Min (2011); Wen (2012), etc.

Table 2
Overview of Green Management Theories or Evaluation System related

Green Management Theories or Evaluation System	Frequency	Reference
Planned behavior	1	Wu et al., 2014
Green Marketing	3	Lei, 2016;Shiwanthi et al., 2018;Kaur et al., 2021
Green Enterprise Values	3	Lei, 2016;Yi et al., 2019;Gunden et al., 2020
economy model	1	Špirková et al., 2013
Green Manufacturing	2	Inderwildi,et al., 2013;Špirková et al., 2013;
Entrepreneurial orientation	1	Ma et al., 2016;
Environmental Feature	5	Wu et al., 2014;Lei, 2016;Špirková et al., 2013;Ma et al., 2016; Albino, 2012 ; Vachon & Klassen, 2006;Bo & Anyong, 2009
Green Product	2	Albino, 2012;Melander & Lisa. 2018
Integrating all organizational aspects	2	Vachon & Klassen, 2006;Muntean & Stremtan, 2010
Environment assessment	2	Shiwanthi et al., 2018;Kazancoglu et al., 2020
Green Energy, material	3	Jing & Jun, 2009;Shiwanthi et al., 2018;Tong, 2017
Evaluation system	1	Bo & Anyong, 2009
Green Image	2	Min, 2011;Wen, 2012
Green Logistics	2	Engelage & Borgert, 2022;Rakhmangulov et al., 2017;

Research Contribution

Enterprises serve as both the main agents of social responsibility and crucial proponents of green management.Effectively propelling innovative green management within enterprises is highly instrumental, contributing to the alignment of corporate and societal interests with long-term environmental preservation. The Green Manufacturing Evaluation System, Green Enterprise Culture Evaluation System, and Green Marketing Evaluation System, to a certain extent, hold the potential to foster innovation in green management. However, prudent consideration should also be exercised to prevent excessive investments.Through the implementation of green management practices, enterprises can diminish their

environmental risks, thus facilitating sustainable development for both the corporate entity and the larger society.

Conclusion

The implementation of green management practices yields not only further environmental improvements and an enhanced corporate image but also substantial economic benefits.The importance of green management system confers advantages upon enterprises by furnishing a more exhaustive and impartial comprehension of their deficiencies, thereby catalyzing enhancements in areas requiring attention and endeavoring for further excellence in domains where proficiency has already been attained. The significance of this research is that through the synchronization of enterprise conduct with green management metrics, the system augments employee green motivation and nurtures the holistic green advancement of the enterprise.As a result, an increasing number of enterprises are now joining the reform wave of green management. However, it is crucial to recognize that environmental governance is a complex and ongoing process that requires sustained effort. Given that enterprises serve as representative symbols of the nation's image, the enterprise must lead by example and maintain a steadfast commitment to environmental protection.

To achieve this, enterprises should not rest on the laurels but instead, build upon existing evaluation systems and continuously seek innovative approaches. By doing so, enterprises can play a more influential role in contributing to environmental conservation efforts. Taking on this proactive role is vital in creating a positive impact on both the environment and society as a whole.

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Declaration of Interest

In relation to this research, the authors declare that there are no relevant financial or non-financial competing interests to report. Funding information.This study was entirely self-funded, as there were no external funding sources or grant-granting bodies involved in providing financial support for research.

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