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PECULIARITIES OF CHOOSING ENTERPRISE MANAGEMENT STRATEGIES IN THE CONDITIONS OF CIRCULAR ECONOMY

ОСОБЛИВОСТІ ВИБОРУ СТРАТЕГІЙ УПРАВЛІННЯ ПІДПРИЄМСТВАМИ В УМОВАХ ЦИРКУЛЯРНОЇ ЕКОНОМІКИ

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This scientific article explores the peculiarities of choosing enterprise management strategies within the framework of circular economy. The article identifies and analyzes key research questions related to these challenges, including the peculiarities and challenges faced by enterprises, the factors influencing strategy selection, the balance between economic viability and environmental/social objectives. The significance of this study lies in its potential to provide valuable insights to enterprises seeking to navigate the transition towards sustainable resource management. By examining the challenges, factors, and potential outcomes, the study aims to contribute to the knowledge and understanding of circular economy management strategies. The insights gained from this research can guide enterprises towards more sustainable and resource-efficient practices, ultimately contributing to a more environmentally and economically resilient future.

Keywords: circular economy, strategic management, strategy alternatives, sustainable development, waste management, product life cycle.

У науковій статті ідентифікуються та аналізуються ключові дослідницькі питання, пов'язані з цими проблемою вибору стратегії впровадження та розвитку циркулярної економіки на підприємствах, включаючи фактори, що впливають на вибір стратегій, баланс між економічною доцільністю та екологічними/соціальними цілями, переваги та перешкоди, пов'язані з впровадженням стратегій управління в умовах циркулярної економіки. У дослідженні сформовано матриці вибору стратегій впровадження та розвитку циркулярної економіки, беручи до уваги їх ринкову та технологічну позиції, рівень утворення та поводження з відходами та життєвий цикл продукту. Наведено особливості оцінювання ключових факторів впливу на вибір стратегії впровадження та розвитку циркулярної економіки на підприємствах. Обґрутовано рекомендації щодо впровадження запропонованих стратегій впровадження та розвитку циркулярної економіки для груп підприємств згідно оцінки ключових факторів впливу зовнішнього та внутрішнього середовища, придатності підприємств та продуктів до впровадження циркулярних бізнес-моделей, адаптивності технологій та бізнес-процесів, ключових тенденцій ринку. Важливість дослідження полягає у його потенціалі надати рекомендації підприємствам, які прагнуть пройти перехід до сталого управління ресурсами. Розуміння ключових факторів допоможе організаціям приймати обґрунтовані рішення та відповідати вимогам конкретної галузі. Крім того, дослідження сприятиме розвитку наявних знань у галузі циркулярної економіки, розкриваючи взаємозв'язок між економічними, екологічними та соціальними факторами при формулюванні стратегій. Очікується, що отримані результати стануть цінними як для підприємств, так і для законодавців та дослідників, сприяючи обґрунтованому прийняттю рішень, формулюванню політики та подальшим науковим дослідженням у галузі циркулярної економіки. Отримані висновки з цього дослідження можуть сприяти переорієнтації підприємств на більш сталий та ресурсозберігаючий шлях, що сприятиме більш екологічно стійкому та економічно впевненому майбутньому.

Ключові слова: циркулярна економіка, стратегічне управління, стратегічні альтернативи, стійкий розвиток, поводження з відходами, життєвий цикл продукту.

Problem formulation. The concept of circular economy has gained significant attention in recent years as a means to address the environmental challenges posed by traditional linear economic models. Circular economy emphasizes the sustainable use of resources, minimizing waste generation, and maximizing resource efficiency through recycling, reuse, and remanufacturing. As a result, enterprises are increasingly recognizing the need to adopt management strategies that align with the principles of circular economy. However, the process of selecting appropriate strategies poses several peculiarities and challenges, which warrant thorough investigation and understanding.

The development of a model for choosing enterprise management strategies in the context of a circular economy is aimed at helping managers make informed management decisions in the direction of sustainable development.

Analysis of recent research and publications. Circular economy has gained increasing attention in both academic research and industry practice in recent years. Numerous studies have been conducted to explore various aspects of circular economy management strategies and their implementation in different sectors and organizational contexts. These studies often examine the challenges faced by enterprises, the factors influencing strategy selection, and the potential benefits and barriers associated with adopting circular economy principles.

Geissdoerfer M., Savaget P., Bocken N.M.P., Hultink E. J provided a comprehensive literature review on circular economy business models. The article explores various types of business models and their implementation within the context of the circular economy. The authors identify research gaps and propose a research agenda for further investigations in this area [1].

Tukker A., Aurisicchio M., and Dijkema G. examined the existing literature on the circular economy and highlights key themes and concepts. The study discusses the drivers, challenges, and potential benefits of transitioning to a circular economy. The authors also propose future research directions to advance the understanding and implementation of circular economy principles [2].

Boons F., Lüdeke-Freund F. identified decision-making processes, factors influencing strategy selection, and the role of stakeholders. The review provides insights into the challenges and opportunities associated with adopting circular economy strategies [3].

Pigosso D.C.A. and Behdad S. examined the drivers and barriers that influence the adoption and implementation of circular business models. The authors identify key elements and strategies to support the development of sustainable and circular business models [4].

Researchers have investigated the peculiarities of choosing circular economy management strategies by considering factors such as the circularity potential of different industries, the availability and flow of resources, technological advancements, policy frameworks, and stakeholder engagement. They have emphasized the need for enterprises to align their strategies with the specific characteristics of their industry, including product lifecycle, value chain structure, and customer behavior, but a systematized model for choosing recommended circular economy strategies at enterprises was not found in the research.

Formulation of research objectives. The main objectives of the following research are to identify and estimate key factors that influence the choice and implementation of circular economy management strategies in different industries and enterprise contexts, to create an approach to balance economic viability, environmental sustainability, and social responsibility when choosing and implementing circular economy management strategies, to build a systematized model for choosing recommended circular economy strategies based on identified factors and to describe potential benefits and barriers associated with adopting circular economy management strategies.

Presentation of the main research material. To build a model for choosing strategies in the circular economy, key factors should be taken into account, including the level of technological development, the market position of the enterprise, the level of waste generation and waste management and the life cycle of the product, networks of circular cooperation, the involvement of stakeholders, the suitability of the product and its components for recycling or reuse.

It is appropriate to separate approaches to the selection of implementation strategies and strategies for the development of the circular economy at enterprises.

Since the development of circular business models at enterprises is primarily related to the use of the latest technologies, the level of technological development of enterprises is one

of the key influencing factors when choosing a circular economy development strategy.

The technological position of the enterprise in terms of the circular economy can be assessed by the quantity and quality of renewable materials (the percentage of use of renewable materials in production); the efficiency of resource use (the number of materials and resources used to produce a unit of production), the possibility of using secondary raw materials and resources; the presence of technology for processing products and their components, the level of digitization of business processes, the use of circular product design, as well as the presence of a research and development department engaged in improving the technologies available at the enterprise in the direction of sustainable development [5].

Equally important is taking into account the market position of the enterprise for choosing a strategy for implementing the circular economy. The assessment of the market position of the enterprise, from the point of view of the circular economy, includes consideration of its competitive position, the ability to implement circular practices and compliance with market needs.

In order to assess the circular market position of the enterprise, it is advisable to analyze the market in which the enterprise operates and the share of the enterprise in this market. It is also important to take into account the circular solutions that competitors are already using and what advantages they get from such solutions, their approach to the use of secondary raw materials, renewable energy sources and efficient production technologies. It is appropriate to evaluate one's own circular practices and their competitiveness in the market, as well as the market of secondary raw materials available to the enterprise. It is worth analyzing the standards and certification in the chosen field that correspond to the principles of the circular economy. An important element of the assessment of the market position is the study of consumer behavior, their requirements for products and services, the level of awareness and consciousness in consumption within the circular economy.

In the Table 1 criteria for evaluating the technological and market position of enterprises for the purpose of choosing enterprise

Table 1

Assessment of the technological and market position of enterprises for the purpose of choosing enterprise management strategies in the conditions of the circular economy

Evaluation of the technological position of the enterprise in the conditions of the circular economy			
Position assesment / Criteria	**Weak**	**Middle**	**Strong**
1	2	3	4
Percentage of use of renewable materials in production	The company does not use renewable materials in the production of products	The company partially uses renewable materials in the production of products	The company uses 100% renewable materials in the production of products
The amount of materials and resources used to produce a unit of product	High level of consumption of energy, water, plastic, in the production of a unit of the product	The average level of consumption of energy, water, and plastic in the production of a unit of the product	Low level of consumption of energy, water, plastic, in the production of a unit of the product
Availability of technology for processing products and their components	There is no technology for processing products and their components	The technology of partial processing of products and their components is available	There is a technology for processing products and their components, which allows closing the production cycle
The possibility of using secondary raw materials and resources	Impossibility of using secondary raw materials and resources in production	Limited access to secondary raw materials and resources, only their partial use is possible	Free access to secondary raw materials and resources, established cooperation with circular suppliers

(End of Table 1)

1	2	3	4
Use of circular product design	Company products are not suitable for reuse or recovery	Some of the company's products or their components are suitable for reuse or recovery	The company's products are designed for further reuse or recovery
Availability of a specialized research and development department	There is no specialized research and development department	The company has responsible persons involved in the design of circular products and the development of renewable technologies	The company has a research and development department that designs circular products and develops renewable technologies
Evaluation of the market position of the enterprise in the conditions of the circular economy			
Enterprise market share	The company's market share is insignificant	The company's market share is average relative to its competitors	The company's market share exceeds its competitors
Use of circular solutions by competitors	The company's competitors actively use circular business models	The company's competitors partly use circular business models	The company's competitors do not use circular business models
Competitiveness of own circular practices	The company's circular practices are not unique in the market and are widely used by competitors	The company's circular practices are not unique in the market, but they are practically not used by competitors	The company's circular practices are unique in the market and are not used by competitors
Availability of secondary raw materials	The supply of secondary raw materials is unavailable to the enterprise	Limited access to secondary raw materials and resources	Free access to secondary raw materials and resources, established cooperation with circular suppliers
Availability and compliance with standards and certification	The enterprise does not have standards and certificates regarding the sustainability and environmental friendliness of products	The company has some sustainability and environmental standards or certificates for specific products	The company has sustainability and environmental standards and certificates for all products
Level of conscious consumer consumption	The use of circular practices is not a significant factor for consumers, there is a lack of awareness about conscious consumption	Consumers are informed about the principles of conscious consumption, but these are not the main motives that guide them when choosing a product	Consumers prefer ecological, sustainable products, understand the principles of circular economy and conscious consumption

management strategies in the conditions of the circular economy are summarized.

Figure 1 provides a matrix for choosing a circular economy implementation strategy, taking into account the position of enterprises regarding waste generation and the product life cycle.

As can be seen from Figure 1, the matrix for choosing a circular economy strategy at enterprises is divided into 4 quadrants, within each of which there are several options for strategies. Let's consider each of the quadrants in more detail.

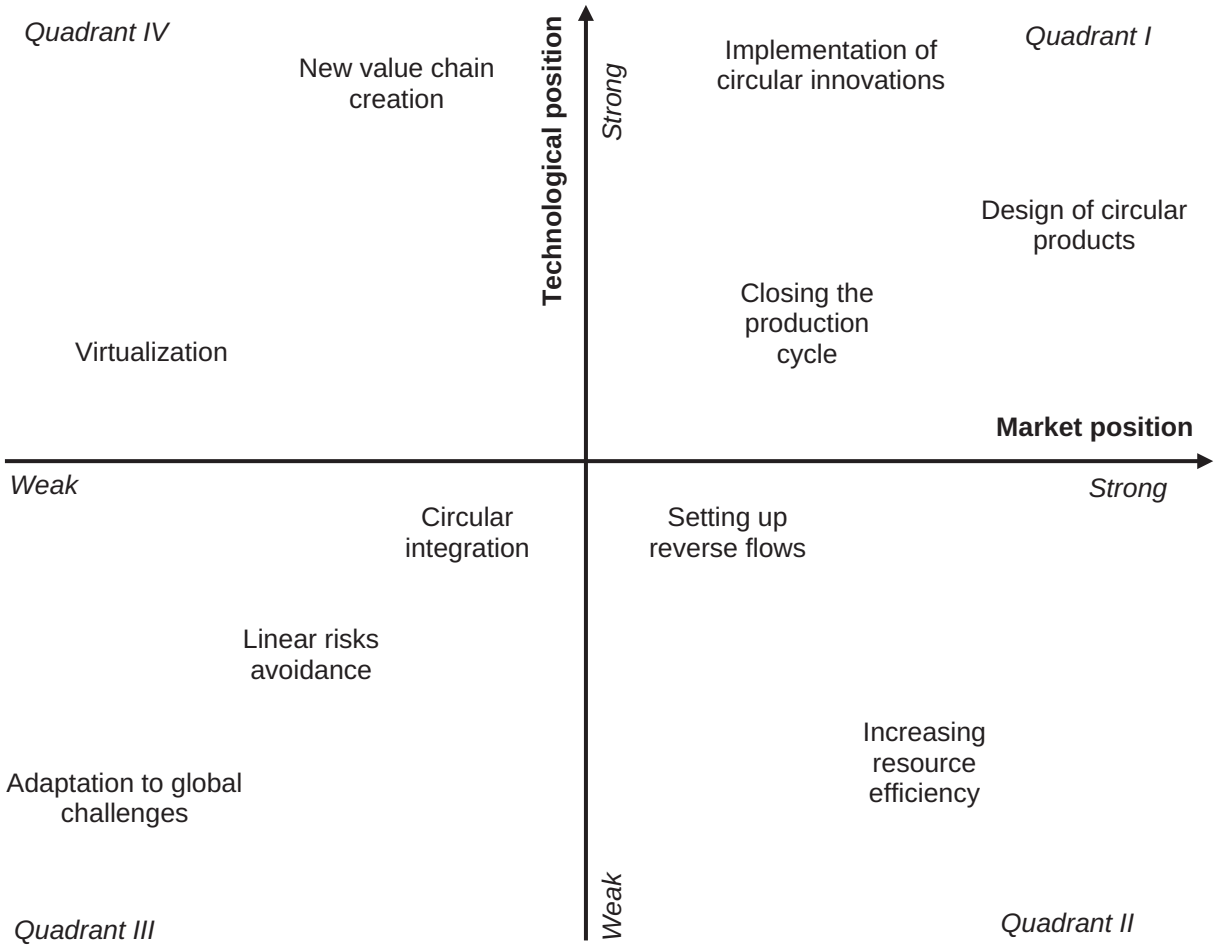

Figure 1. Matrix for choosing a circular economy implementation strategy at enterprises

Enterprises belonging to quadrant 1 have a strong technological and market position. This means that they can be market leaders in the level of implementation of circular practices. For these enterprises, it is recommended to implement a strategy of complete closure of the production cycle, since they have favorable technological capabilities for this. The implementation of circular innovations and the design of circular products are also effective strategies for enterprises in this quadrant, since the innovative products and technologies developed by them can immediately occupy a separate niche in the market and be competitive.

Firms in quadrant 2 have a strong market position and a weak technological position. For these enterprises, it is recommended to implement reverse flow and resource efficiency improvement strategies, as these strategies do not require significant technological input, but can help enterprises use their resources more efficiently and interact with value chain participants.

Quadrant 3 is characterized by the weak market and technological position of enterprises. For these enterprises, an effective strategy for implementing the circular economy will be circular integration. This strategy will provide an opportunity to establish cooperation with partners within the framework of the use of circular practices in order to increase one's own capacity to use circular models. It is also advisable for enterprises in quadrant 3 to implement strategies for adapting to global challenges and avoiding linear risks in order to increase the level of flexibility to environmental changes and to improve their market position.

Enterprises within quadrant 4 have a weak market and strong technological position. The high level of technology allows digitizing the business processes of enterprises in this quadrant, so the implementation of virtualization technology is recommended for them. In addition, these enterprises can choose the strategy of creating new value chains due to the development of innovative technologies and, thus, strengthen their market position.

If the company already uses circular business models and needs to choose a strategy for the further development of the circular economy, the key criteria for making strategic decisions will differ. Since the main priority for the enterprise when forming a circular economy development strategy is the improvement of already existing sustainable business models, it is advisable to choose the product life cycle and the level of waste generation as the most important influencing factors.

In order to assess the level of waste management at the enterprise, it is necessary to take into account the amount of generation of various types of waste, depending on the specifics of its activity.

In order to analyze the company's position regarding waste generation, it is worth calculating the volume of waste generation per unit of production and the share of waste in the total volume of production. The acceptable value may vary depending on various factors such as industry, product type, regulatory standards and organizational goals.

In addition to the volume of waste generation, it is also worth analyzing the methods of handling it [6]:

1) Waste prevention: development and implementation of processes and technologies aimed at reducing waste at the stage of product design or production process.

2) Processing and secondary use: development of a waste processing system at the enterprise with the aim of using them as secondary raw materials in the processes of recycling, processing and use of waste in other production processes.

3) Composting and Biodegradation: Composting techniques are used for organic waste, such as food or plant residues, to turn it into high-quality compost that can be used as fertilizer.

4) Energy use: some waste can be used for energy production (for example, by anaerobic digestion).

5) Disposal and safe storage: If the waste cannot be recycled, it must be disposed of or stored in a safe way to avoid negative impact on the environment.

6) Landfilling, which is considered the least desirable method of waste management from the point of view of the circular economy and sustainable resources. This method of waste management has disadvantages, such as potential negative impact on the environment, loss of resources, and irrational use of space.

Life cycle assessment of a product in the context of the circular economy in the context of the circular economy is also an important tool for analyzing the environmental and economic aspects of the product throughout its life. This allows you to take into account the impact of the product on the environment, energy resources, the use of raw materials and the possibility of its secondary use or recycling.

The main steps of product life cycle assessment in circular economy conditions include [7]:

1. Determining the limits of the useful life of the product: establishing time frames and stages of the product's life cycle. This may include the extraction of raw materials, production, packaging, delivery, use, disposal and reuse or recycling.

2. Identification of inputs and outputs: identification of all inputs (and outputs) associated with each stage of the product life cycle. This includes costs of raw materials, water, energy, greenhouse gas emissions, waste and other factors related to production , transportation, use and disposal of the product.

3. Environmental Impact Assessment: Identify and assess the potential environmental impact of a product at each stage of its life cycle (development, marketing, growth, maturity and decline).

In the Table 2 criteria for evaluating the position of enterprises regarding waste generation and the product life cycle are summarized for the purpose of choosing enterprise management strategies in the conditions of a circular economy.

Figure 2 provides a matrix for choosing a circular economy development strategy, taking into account the technological and market position of enterprises.

Companies in Quadrant 1 have a strong position on waste generation and management, as well as on the product life cycle, so it makes sense for them to apply technology leadership strategies and focus on circular business models, which will allow them to strengthen their competitiveness in the industry and be key players in the market of enterprises using circular business models.

Quadrant 2 includes enterprises with a weak position on waste generation and management, but a strong position on product life cycle. In order to optimize waste management, it is recommended for these enterprises to implement strategies to increase energy efficiency and reduce the carbon footprint. The strategy of circular decentralization is also

Table 2

Assessment of the position of enterprises regarding the generation of waste and the product life cycle in order to choose enterprise management strategies in the conditions of the circular economy

Assessment of the technological position of enterprises regarding waste generation in the conditions of the circular economy			
Position assesment / Criteria	**Weak**	**Middle**	**Strong**
Volume of waste generation	The volume of waste generation per unit of production and the share of waste in the total volume of production exceeds 20%	The volume of waste generation per unit of production and the share of waste in the total volume of production does not exceed 20%	The volume of waste generation per unit of production and the share of waste in the total volume of production does not exceed 5%
Level of hazardous waste generation	Hazardous waste is generated at the enterprise to a large extent and is not disposed of properly	Hazardous waste is generated at the enterprise in a small amount and disposed of in a safe way	The enterprise does not generate hazardous waste
Waste management methods	Disposal and safe storage, disposal in landfills	Processing and secondary use, Energy use	Waste prevention, composting and biodegradation
Evaluation of the life cycle of the product in the conditions of the circular economy			
Product useful life limits	Short useful life of the product (does not exceed 6 months)	The average useful life of the product (does not exceed 1 year)	Long useful life of the product (exceeds 1 year)
Resource intensity of the product	Product production requires significant consumption of raw materials, materials, water, energy, greenhouse gas emissions, etc	Production of the product requires moderate consumption of resources, some of the business processes are digitized	The production of the product does not require significant consumption of resources, a significant number of business processes are digitized
The impact of the product on the environment at each stage of the life cycle	The production and consumption of a product causes a negative impact on the environment at all stages of its life cycle	The production of the product causes a certain negative impact on the environment only at the stages of product development and its introduction to the market	The production and consumption of the product does not cause a negative impact on the environment at any stage of its life cycle

appropriate for these enterprises, as it involves a more efficient allocation of resources, which also helps to avoid the generation of excess waste.

Enterprises located in quadrant 3 have a weak position both in terms of waste generation and management, as well as in terms of product life cycle. Such a position is unfavorable for the development of the circular economy at enterprises, therefore, strategies are recommended for them, which involve more drastic changes in the strategic management of enterprises, namely, strategies for reengineering business processes and recycling resources. By implementing these strategies, the enterprise can change its approach to waste management and optimize the use of resources at each stage of the product's life cycle.

Quadrant 4 contains companies with a weak position on product life cycle, but a strong position on waste generation and management. For these enterprises, the recommended strategies are

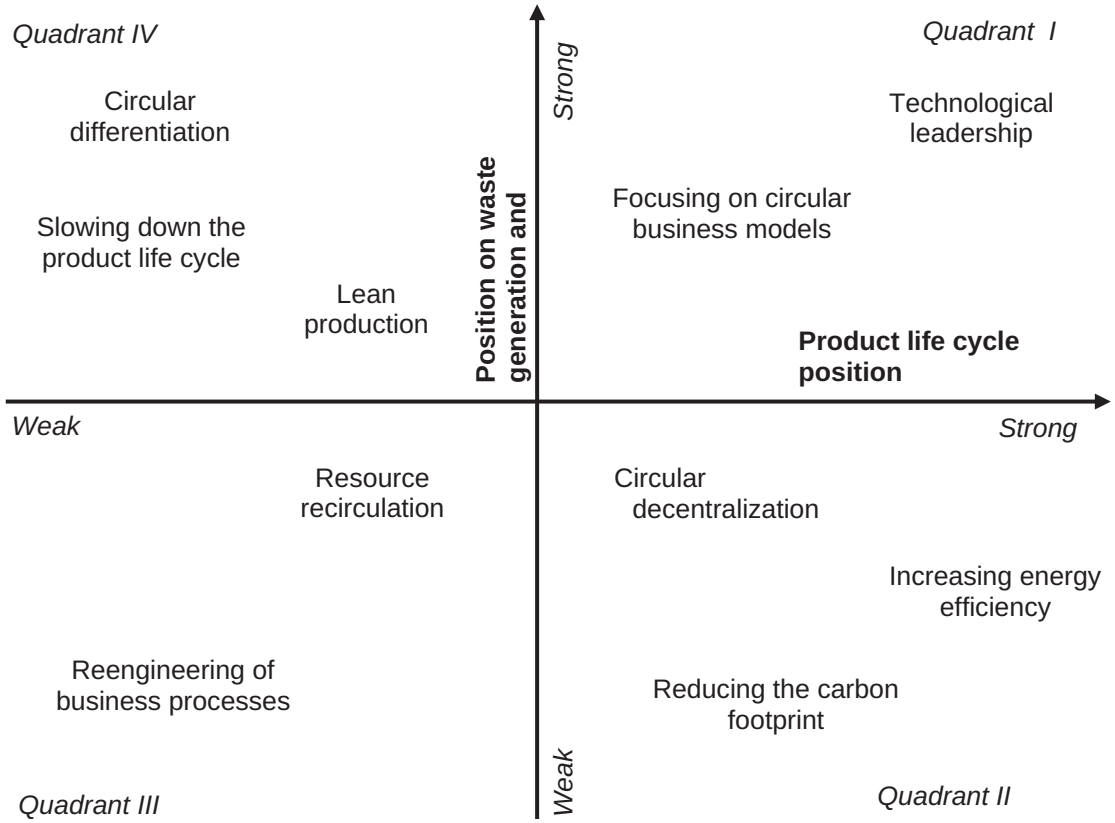

Figure 2. Matrix for choosing a circular economy development strategy at enterprises

lean production and slowing down the product life cycle, which will increase the suitability of products for circular economy business models. It is also advisable for these enterprises to implement a strategy of circular differentiation, which will increase the competitiveness of products with a short life cycle.

Conclusion. Therefore, the choice of enterprise management strategies in the conditions of the circular economy is a management process that involves the adoption of a management decision based on the analysis of the technological, market, environmental, product, sectoral suitability of enterprises for the implementation of circular practices.

Achieving a balanced approach that considers economic, environmental, and social dimensions is essential for successful circular economy strategy formulation. Enterprises must recognize the potential economic benefits, such as resource efficiency, cost savings, and new business opportunities, while also addressing environmental concerns, such as reduced resource extraction and waste generation. Additionally, they should consider the social implications, including job creation, skills development, and social equity, to ensure holistic and sustainable outcomes.

By recognizing the challenges, identifying key factors, and highlighting the importance of a balanced approach, this research provides valuable insights for enterprises, policymakers, and researchers. It is expected that these findings will contribute to informed decision-making, policy formulation, and further advancements in circular economy management strategies, ultimately driving the transition towards a more sustainable and resource-efficient future. In conclusion, this study contributes to the understanding of the peculiarities involved in choosing enterprise management strategies in the conditions of circular economy.

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