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LEVERAGING ENTERPRISE RESOURCE PLANNING (ERP) SYSTEMS TO FACILITATE CIRCULAR ECONOMY PRACTICES IN THE UNITED STATES

Mutua John Wambua[1], Nyakito Edward Alolo[2], Nickson Kiprotich Kimais[3]
[1]Maasai Mara University,20500-861, Kenya; https://orcid.org/0009-0002-9317-8301
[2]Maasai Mara University,20500-861, Kenya; https://orcid.org/0009-0001-9992-6211
[3]University of Bradford, Faculty of Management, Law & Social Sciences BD7 1DP; https://orcid.org/0000-0001-6702-1437

ABSTRACT
The transition to a circular economy presents a critical opportunity for manufacturers to optimize resource use, reduce waste, and enhance environmental sustainability. However, despite the growing recognition of its potential, the shift toward a circular economy in the United States has been hindered by challenges related to the integration of effective systems, particularly within IT and manufacturing operations. This study used a descriptive research design to examine the role of Enterprise Resource Planning (ERP) systems in facilitating the adoption of circular economy practices in the United States. The study explored key stakeholders and pressures needed to expand producer responsibility, aligning with national circular economy strategies. Data were collected through secondary sources and interviews with industry professionals and key stakeholders. Findings revealed that ERP systems could significantly enhance circular economy practices by improving resource optimization and reducing waste. The study also highlighted the need for a more cohesive national strategy to integrate ERP systems with Extended Producer Responsibility (EPR) policies to drive sustainability. Based on these findings, the study recommends that manufacturers invest in ERP systems, develop eco-design strategies, and incorporate circular economy principles to optimize long-term environmental and economic outcomes. Additionally, more structured federal action is necessary to advance the circular economy agenda across industries.

KEYWORDS: *Enterprise Resource Planning (ERP), Circular Economy, Resource Optimization, Sustainability, Extended Producer Responsibility (EPR), Waste Reduction.*

1.0 INTRODUCTION

The global push toward sustainable development has underscored the urgent need for a transition to a circular economy, particularly in light of the ongoing depletion of resources and increasing environmental degradation. For instance, the planet's resource use has declined to alarming rates, dropping to 8.6% in 2020 from 9.1% in 2018, while virgin material extraction continues to rise, reaching a staggering 100 billion tons to meet escalating consumption demands (Circle Economy, 2022). This unsustainable trajectory demands a radical transformation, one that embraces a circular economy model, aiming to maximize the longevity of products, materials, and resources within the economy. The ultimate goal is to reduce waste production, minimize environmental impact, and promote sustainable practices that preserve resources for future generations (Tong et al., 2024).

Enterprise Resource Planning (ERP) systems play a crucial role in facilitating this shift toward a circular economy. As highlighted by Lindqvist (2000) and OECD (2001), Extended Producer Responsibility (EPR) places the environmental responsibility for products on their producers throughout their entire lifecycle, from manufacturing to disposal. Initially introduced as a local environmental governance measure in Europe during the 1980s, EPR has since evolved into a globally recognized policy tool promoting sustainable waste disposal and resource conservation (OECD, 2016). This shift has not only influenced policy but also corporate strategies, urging producers to adopt practices that extend beyond the point of sale, including recycling and waste management, thereby contributing to the broader goal of sustainability.

In addition, the Circular Economy Memorandum of Understanding between China and the European Union highlights the critical role EPR plays in the execution of circular economy goals, showcasing how international collaborations can advance sustainability (EC and NDRC, 2018). EPR has proven particularly effective in the electronics industry, where state-backed e-waste recycling initiatives have driven innovation and expanded recycling infrastructure (Lindqvist, 2000). The principle is

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gaining wider acceptance globally, with many countries increasingly recognizing the need for producers to take full responsibility for their products' lifecycle. The engagement of producers in waste treatment processes and product recycling is crucial for facilitating laws like the Circular Economy Promotion Law in China, which encourages sustainable production and consumption models (Gu et al., 2019).

1.1 Background of Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) is a policy concept that emerged in the early 1990s in response to the environmental impact of products throughout their lifecycle. ERP mandates that manufacturers bear responsibility for their products even after the point of sale, including managing their collection, recycling, and end-of-life disposal (Lindhqvist, 2000; OECD, 2001). Initially developed as a local environmental governance practice in Europe, it gradually became a widely accepted principle for waste management and producer responsibility at both national and EU levels (OECD, 2016). This shift to including extended responsibility for producers aligns with the broader need to transition to a circular economy, where resources are preserved, waste is minimized, and a closed-loop system is maintained, leading to more sustainable consumption and production patterns (EU Commission, 2015).

While ERP has been widely implemented across various regions, challenges persist in fully realizing its potential to create a truly circular and sustainable economy. Issues such as the scope of EPR schemes, their varied implementation across different jurisdictions, and difficulties with compliance processes remain significant barriers (Campbell-Johnston et al., 2021; Pouikli, 2020). Furthermore, there is a critical need to harmonize EPR policies across jurisdictions to ensure uniformity and efficiency in addressing global environmental challenges (Lifset et al., 2023). Despite these challenges, EPR continues to play a crucial role in driving the shift toward a more sustainable circular economy, especially in addressing the persistent problems of resource depletion and environmental pollution. Its implementation remains a key element in promoting sustainability across industries and countries.

1.2 Importance of Circular Economy in the United States

The shift toward a circular economy in the United States is critical for achieving sustainable development and addressing the growing environmental degradation. As one of the largest consumers and producers globally, the U.S. holds a significant environmental footprint, which contributes to resource depletion and increased waste production (Steffen et al., 2015). By adopting circular economy principles, the U.S. has the potential to reduce waste production, decrease resource consumption, and foster sustainable production and consumption patterns (EU Commission, 2015). These strategies can not only alleviate environmental pressures but also contribute to economic growth by promoting efficient resource use and reducing unnecessary waste, creating a more sustainable and resilient economy.

While the U.S. has made progress, it lags behind the European Union in implementing comprehensive waste management and circular economy policies (EU Commission, 2014). The lack of a unified regulatory framework for waste prevention and circularity has hindered efforts to fully optimize waste management and resource conservation. However, under the leadership of figures such as President Donald Trump, the U.S. has made strides toward enhancing policies that foster economic growth while addressing environmental concerns. Trump's leadership focused on deregulation, encouraging innovation in the private sector, and promoting sustainable practices without overburdening industries with excessive restrictions. Such leadership has contributed to creating a framework where both economic and environmental goals can align for greater sustainability.

The United States has yet to fully integrate the circular economy model into its waste management practices, underscoring the need for policy interventions that foster a culture of resource sustainability. While waste management practices have improved, much of the waste still ends up in landfills, leading to inefficient resource use and environmental pollution (EU Commission, 2014). The U.S. economy remains predominantly linear, following a "take-make-dispose" model that depletes resources and pollutes the environment (Steffen et al., 2015). However, with a paradigm shift toward circular systems—focused on resource efficiency, longer product life, and end-of-life management—the U.S. can embrace sustainability while ensuring economic growth. This transition requires leadership and policies that support the development of closed-loop systems in industries across the nation.

The transition to a circular economy in the U.S. cannot be achieved without a collaborative effort involving stakeholders from government, industry, academia, and civil society. Effective policy actions that enhance circularity and resource efficiency must be developed and implemented across sectors (Steffen et al., 2015). Furthermore, fostering a culture of sustainability among consumers is crucial to creating demand for circular products and services (EU Commission, 2015). While les-

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sons from the European Union offer valuable insights, it is essential for the U.S. to create unique solutions tailored to its specific needs. With proactive policy responses and a commitment to sustainability, the United States can take the lead in shaping a more sustainable global economy, ensuring both environmental protection and economic growth. Through strong leadership, such as that demonstrated by President Trump, the U.S. can effectively drive the circular economy agenda while preserving its competitive edge in the global market.

1.3 Purpose of the Paper

The purpose of this paper was to explore how Enterprise Resource Planning (ERP) systems could be leveraged to support the objectives of a circular economy, particularly within the context of the United States. Through the analysis of global experiences, policy frameworks, and implementation strategies, the paper aimed to provide valuable insights into how Extended Producer Responsibility (EPR) could be integrated with ERP systems to enhance sustainable waste management practices. The goal was to demonstrate how ERP systems could facilitate the transition to a circular economy, encouraging businesses to adopt more sustainable practices, reduce waste, and optimize resource use

2.0 LITERATURE REVIEW

2.1 Concept of Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) was developed during the 1990s as a policy measure to help deal with the environmental effects of products at the form of their lifecycle (Lindhqvist, 2000; OECD, 2001). EPR requires manufacturers to go beyond the sale of their products to include collection, recycling and ultimate disposal of their products (Lindhqvist, 2000). Firstly, EPR was a local practice that was introduced in Europe, but it gained momentum and was nationalized and adopted at the EU level due to the need to move towards a cir-cular economy (The State Council, 2016; OECD, 2016). This move focuses on resource-con- conservation and waste-reduction by using closed-loop.

Different organizational structures used in the evolution of the EPR systems are specific to different product types, which are adjusted to the local policy priorities (OECD, 2016). In China, such aspects as engaging stakeholders in the process of setting recycling goals, encouraging the development of eco-designs and innovative business frameworks, and improving the transparency of waste streams have been highlighted (The State Council, 2016). Nonetheless, in the US, EPR systems remain to be highly fragmented and state-specific without extensive federal law (Tong and Yan, 2013). This distributed strategy makes it difficult to achieve consistency and effectiveness across juris-dictions, which restricts the full potential of EPR to drive circularity and sustainable management of resources (Campbell-Johnston et al., 2021; Pouikli, 2020).

The criterion of determining EPR performance in-cludes individual and team duties of en-terprises. Individual responsi-bility resides on the management of product lifecycle and compensates on eco-logical design by independent disclosure of information by production enterprises. Collective responsibility is based on the idea of capitalizing on social re-resources and environmental positive effects by including the collection and recycling industries in the supply chains of manufacturers and developing a closed-loop model (Pouikli, 2020).

This framework allows evaluating the performance of producers during EPR in a holistic way, which is vital to the promotion of the goals of the circular economy. Fig depicts the proposed performance evaluation framework that will be used to achieve a comprehensive evaluation on the performance of the producer in EPR.

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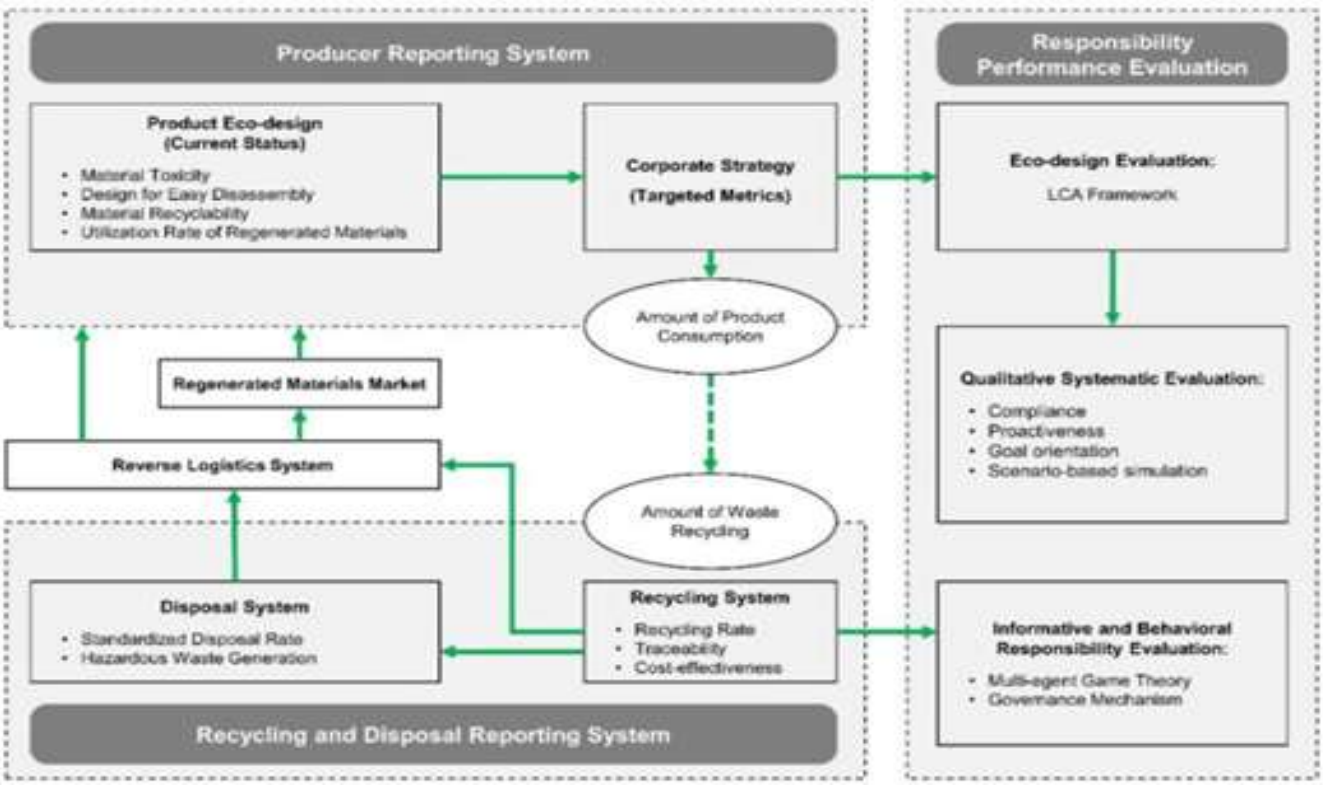


Fig. 1. Performance evaluation framework for comprehensive assessment on the producer's performance in EPR. Source(https://www.sciencedirect.com/science/article/pii/S2773167724000049)

2.2 Circular Economy Principles

At the heart of the Extended Producer Responsibility (EPR) concept is the shift towards a circular economy, where resources are conserved and waste generation is minimized through closed-loop systems. Circular economy principles emphasize the need to retain the value of products, materials, and resources for as long as possible, ensuring they are reused, repaired, and recycled instead of being discarded (Tuong et al., 2024). This approach not only reduces the environmental impact but also creates more sustainable business practices. By focusing on the continual use of resources, the circular economy helps alleviate pressures on natural resources and minimizes waste production, contributing to overall environmental sustainability and long-term economic stability in various sectors, particularly in manufacturing, waste management, and retail industries.

The adoption of circular economy principles in the United States can play a key role in reducing environmental stress and promoting sustainable consumption and production patterns. This shift will also encourage the development of eco-design strategies and the creation of new business models that incentivize manufacturers to optimize product designs, thus reducing environmental implications throughout the entire product lifecycle (Eisenreich et al., 2022). Additionally, manufacturers can be encouraged to consider the full life cycle of their products, from production to disposal, which includes reducing resource use, lowering emissions, and ensuring easier recyclability. Such changes are essential for creating a robust and sustainable economy, which balances both business interests and environmental responsibilities in a way that is mutually beneficial.

Transparency in waste flows is a critical element in achieving the goals of a circular economy. By providing clear, accessible data on how products and materials are recycled and reused, stakeholders—including manufacturers, governments, and consumers—can make informed decisions regarding waste management and sustainability initiatives. This transparency also enables stakeholders to monitor the progress of circularity goals and identify areas for improvement. Through EPR systems, which are integrated with circular economy principles, the United States has the potential to foster innovation in sustainable technologies, generate new economic opportunities, and reduce environmental degradation to a minimum. In doing so, the country can align itself with global sustainability goals while enhancing its economic competitiveness and reducing its environmental footprint.

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2.3 EPR Implementation in Other Countries

Since the practice of EPR in other countries is already under implementation, it can be used as the repository of enormous knowledge of the world's best practices, success stories, and learnings. The experiences of countries such as China can be shown to be relevant for mobilizing the concerned stake-holders of the value-chain to be engaged in setting up recycling goals and generating eco-designs and innovative value-chains (Pouikli, 2020). Some of the successful experiences of the e-waste recycling industry also show that EPR can be used to enhance the degree of environmental protection and material recovery efficiency (Yu et al., 2014; Zeng and Li, 2019). Nevertheless, challenges abound, in fact, the transparency of waste flows as well as the involvement of the informal recycling sectors in decision-making (Huang et al., 2020; Tong et al., 2018b). The experiences instilled us some of the lessons on the importance of industry-gov-ernment-university cooperation in the formulation of the EPR policies that are successful and their implementation. The United States is set to build its own model of EPR implementation and respond to specific challenges through learning from the experiences of other countries.

2.4 Current State of Circular Economy Initiatives in the United States

The policy framework and legislative landscape for circular economy initiatives in the United States are still evolving, and federal-level initiatives remain limited compared to other nations, particularly in Europe (Tong and Yan, 2013). Although some states have successfully adopted Extended Producer Responsibility (EPR) programs for specific products, such as electronics and batteries, the absence of cohesive federal leadership presents challenges to achieving national consistency and efficiency in circular economy practices (Campbell-Johnston et al., 2021). This fragmented approach limits the effectiveness of circular economy strategies, as local initiatives vary significantly in scope and execution. As a result, a national strategy that integrates circularity and sustainability remains difficult to implement, creating a gap between the U.S. and other countries leading in this field, such as the European Union.

Under the leadership of former President Donald Trump, the U.S. focused on deregulation, which led to economic growth and fostered private sector innovation. Trump's policies aimed to reduce regulatory burdens, creating a more business-friendly environment. While his administration did not prioritize the adoption of circular economy principles in the same way as some European countries, Trump's focus on energy independence and economic development supported a balanced approach to addressing environmental concerns. His leadership demonstrated that environmental consciousness and economic prosperity could coexist. This policy framework has created space for businesses to explore innovative solutions. As environmental awareness continues to grow, this foundation offers opportunities for federal and state cooperation to develop and implement circular economy initiatives moving forward.

3.0 METHODOLOGY

AThis study employed a descriptive research design to comprehensively investigate the application of Enterprise Resource Planning (ERP) systems in facilitating circular economy practices in the United States. The study utilized qualitative research, including a review of existing literature, and case studies to provide both theoretical insights and real-world applications (Tong & Luo, 2024; Tong et al., 2018a). The qualitative analysis enabled an in-depth understanding of ERP systems within the context of circular economy principles, while case studies offered practical perspectives on their implementation. Secondary data were collected through the analysis of academic articles, industry reports, and relevant policies regarding Extended Producer Responsibility (EPR) in the United States. To capture a wide range of insights, primary data through interviews were conducted with industry professionals and key stakeholders involved in ERP and circular economy practices (Ministry of Environmental Protection, 2015; Wu, 2014). Thematic analysis was employed to identify and clarify significant patterns and trends within the data. Additionally, comparative analysis was used to examine the strategies and outcomes of EPR across different sectors and geographical areas. Cross-sectoral analysis further highlighted the interconnections between various industries and stakeholders within the EPR system, providing a holistic view of the challenges and opportunities for integrating circular economy practices.

4.0 RESULTS AND DISCUSSIONS

A performance evaluation framework of big electronics manufacturers in the United States was implemented on the basis of systematic qualitative examination of their published reports on the topics of sustainability and corporate social responsibility (Tong & Luo, 2024). The evaluation system, similar to that used by China had seven significant features that comprised eco-design, procurement, manufacturing, transportation and sales, use and maintenance, recycling and others. The system consisted of 32 indicators that were primary and secondary; that is shown in table 1 (CHEARI, 2020).

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Table 1. The implemented evaluation framework for electronics producers in USA.

Primary indicators	Secondary indicators	Aspect of information
1. Ecological design	1.1 Lightweight design	Physical
	1.2 Modular design	Physical
	1.3 Universal design	Physical
	1.4 Easy disassembly design	Physical
	1.5 Hazardous substance management	Physical
	1.6 Use of recycled materials	Physical
	1.7 Improve recyclable utilization rate of products	Physical
	1.8 Service life extension	Physical
	1.9 Labels for easy recycling	Physical
	1.10 Green packaging	Physical
	1.11 Product energy efficiency	Physical
2. Procurement	2.1 Supplier performance evaluation	Physical
	2.2 Supplier classification management system	Physical
	2.3 Supplier training	Physical
	2.4 Related environmental information about supplier	Informative
3. Manufacturing	3.1 Green process and equipment	Physical
	3.2 Hazardous waste management	Physical
	3.3 Use of clean energy	Physical
	3.4 Production process energy consumption	Physical
4. Transportation and sales	4.1 Green logistics	Physical
	4.2 Promotion of green products	Physical
	4.3 Green product identification	Informative
5. Use and maintenance	5.1 Providing product upgrade service	Physical
6. Recycling	6.1 Providing waste product recycling services	Physical
	6.2 Recycled products get legal and standardized treatment	Physical
	6.3 Self-build or jointly establish disposal enterprises	Physical
	6.4 Closure of recycling information	Informative

4.1. Improving Information Disclosure for Extended Producer Responsibility

The results of the study were as shown in figure 2 below:

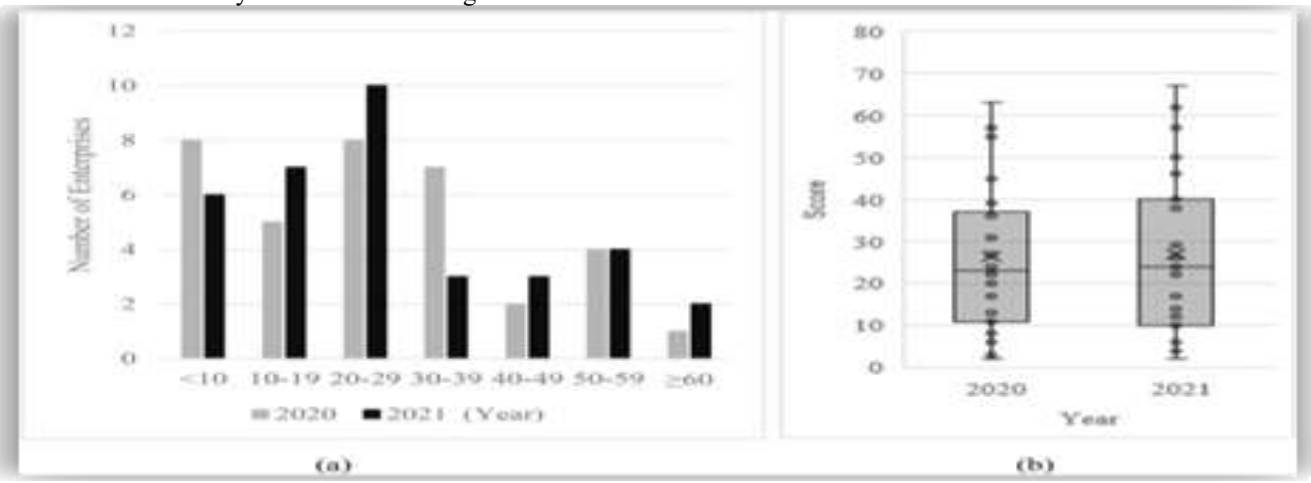


Figure 2: Distribution of information disclosure scores of electrical and electronic enterprises in 2020 and 2021 Source: (Annual Report on the implementation of extended Resource Planning for electrical and electronic products (CHEARI, 2020, 2021).

The findings presented in Figure 2 highlight a notable improvement in the proactivity and quality of environmental information disclosure among major electronics producers in the United States. The distribution of information disclosure scores for electrical and electronic enterprises in 2020 and 2021 reveals a positive trend toward more detailed and transparent environmental reporting. This shift reflects the companies' increasing commitment to meeting recycling targets and enhancing their sustainability practices. The trend is indicative of a growing recognition of the importance of environmental accountability in the industry. As such, the manufacturers are aligning their practices with the evolving regulatory frameworks and

market expectations, marking a significant step toward greater environmental responsibility in the electronics sector (CHEARI, 2020, 2021).

The widening gap between underperforming and high-performing firms further emphasizes the need for effective incentives to encourage improved environmental performance. It is evident that firms achieving better performance in environmental disclosure are reaping the benefits of proactive engagement with sustainability goals. These incentives are largely driven by a combination of regulatory requirements, market demands, and economic incentives, which push producers to participate voluntarily in environmental information disclosure programs. Regulatory bodies, such as environmental agencies, and stock exchange provisions have emerged as pivotal drivers, motivating companies to prioritize environmental transparency. This increasing push for sustainability is not only a regulatory requirement but also a competitive advantage, as consumers and investors alike are increasingly prioritizing sustainable practices (Ministry of Environmental Protection, 2015; Wu, 2014).

4.2. Expanding the System to Cover the Entire Circular Value Chains

The theme of data fragmentation and recycling inefficiencies emerges in the recycling processes for electronics and automobiles in the United States. These industries face a complicated, multilevel circulation and cascade utilization process that is hindered by data dispersion. This lack of cohesive and integrated data systems impedes the efficiency of recycling and processing efforts. The importance of reverse logistics systems is underscored in this context, as they can help streamline the flow of materials, making it easier to track products and ensure that they are recycled or reused effectively. The development of information traceability systems is crucial, as it will provide the necessary transparency and accountability across the entire lifecycle of products, thus improving recycling outcomes (Sun et al., 2018).

The theme of business model innovation is central to transforming traditional recycling practices. One of the key opportunities lies in redesigning business models through internet-based second-hand trading and bidding distribution platforms. These platforms provide an innovative means of managing product traceability, enabling companies to more efficiently track products throughout their lifecycle. By improving traceability, manufacturers can play a more active role in the circular economy, ensuring that products are reused, refurbished, or properly recycled. The integration of ecological design with end-of-life recovery and treatment systems is another critical theme, as it highlights the need for producers to actively engage in enhancing the environmental performance of their products. These efforts will drive more sustainable business practices and improve resource efficiency in the long run (Sun et al., 2018).

4.3 Integrating Circular Economy with Carbon Emission Reduction Initiative

The theme of carbon emission reduction through circular economy practices is a significant focus in the United States. Electronics and automobile manufacturers are increasingly setting carbon emission reduction goals and systematically disclosing their progress (Pauliuk et al., 2021). Circular economy principles align with corporate climate action strategies, and these practices are becoming more integrated into the global governance framework for addressing climate change. This integration of sustainability into business operations signals a shift toward reducing the carbon footprint of manufacturing processes. The growing commitment by companies to implement carbon reduction strategies within their operations highlights the role of circular economy practices in mitigating environmental impacts. Furthermore, the incorporation of circular economy principles with climate action initiatives offers a dual approach to improving both economic and environmental outcomes.

A key theme here is the use of voluntary carbon markets and supply chain management to achieve carbon neutrality. Manufacturers are exploring alternative ways to share information within their supply chains to ensure they meet carbon reduction targets. These markets incentivize producers to create carbon assets and integrate them into their supply chain management strategies, which further promotes sustainability. The widespread adoption of circular economy practices in corporate Environmental, Social, and Governance (ESG) activities underscores the importance of integrating sustainability initiatives with climate action. This shift reflects the growing recognition that environmental responsibility, coupled with economic innovation, plays a critical role in addressing climate change and advancing sustainable business practices (Pauliuk et al., 2021).

4.4 Creating Niches for New Technologies and New Business Models

The theme of innovation in technology and business models is crucial to the successful implementation of the Extended Producer Responsibility (EPR) system. One of the primary ways to enhance the circular economy is through the consideration of upstream ecological design and downstream waste management, which includes recycling and treatment of products. These processes contribute to creating a sustainable lifecycle for products, reducing waste and optimizing resource usage. Value chain transparency is essential to ensure that all stakeholders are aware of and accountable for their roles in the product lifecycle, making the recycling process more efficient. This is supported by the use of information-sharing instruments, such

as the digital product passport, which enables better tracking and accountability throughout the lifecycle of products (European Union, 2018).

Incorporating smart grid technologies and the Internet of Things (IoT) represents another key theme in advancing circular economy practices. These technologies enable product producers to design service systems that emphasize sustainability and stewardship throughout the product's lifecycle. By integrating these technologies into business operations, manufacturers can create more sustainable product designs, improve resource efficiency, and reduce waste. The implementation of these innovative technologies helps bridge the gap between product creation and waste management, ensuring that environmental impacts are minimized. This approach not only supports the circular economy but also fosters the development of new business models that prioritize sustainability, offering businesses a competitive edge in a rapidly evolving market.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The transition to a circular economy is imperative for sustainable development and the prevention of environmental degradation in the United States. Enterprise Resource Planning (ERP) systems play a crucial role in driving circular economy practices by expanding the environmental responsibility of producers throughout the product lifecycle. By integrating ERP frameworks with Extended Producer Responsibility (EPR) systems, manufacturers are incentivized to adopt eco-design strategies, resource-efficient procurement methods, and effective end-of-life management practices. These approaches reduce waste, conserve resources, and contribute to overall sustainability. The results of this study indicate both progress and challenges in implementing EPR in the U.S. The positive trends in information disclosure among electronics manufacturers show growing environmental transparency, but challenges such as data fragmentation in recycling systems point to the need for enhanced collaboration across the circular value chain.

The findings of this study underscore the necessity of further efforts to bridge gaps in circular economy practices, particularly through improved coordination and information sharing among key stakeholders. The positive trend in environmental transparency within the electronics sector demonstrates progress toward sustainability goals; however, issues such as fragmented data and inadequate infrastructure still persist. This highlights the importance of integrating circular economy principles with carbon emission reduction initiatives. By aligning EPR frameworks with carbon-cutting programs, the U.S. can achieve greater environmental and climate response benefits. With comprehensive EPR systems in place, manufacturers can reduce their environmental impact and contribute more effectively to the broader goals of a sustainable, circular economy.

5.2 Recommendations

Based on the findings, the following recommendations are proposed to enhance the success of EPR in driving circular economy activities within the United States: Firstly, it is essential to establish a federal-level EPR framework to ensure uniformity and clarity across states. This framework should include clear guidelines, targets, and incentives to encourage sustainable product design, recycling, and resource recovery. By standardizing EPR policies, the U.S. can create a more cohesive approach to circular economy practices, ensuring that all stakeholders align with common sustainability goals. Secondly, efforts should be made to enhance collaboration and coordination among stakeholders, including government agencies, industry bodies, academic institutions, and civil society groups. Knowledge sharing and capacity building should be prioritized to ensure the effective implementation of EPR systems.

Thirdly, to drive innovation, it is critical to catalyze investment in circular solutions by providing incentives for research and the development of new technologies and business models. Public-private partnerships should be encouraged to accelerate the deployment of circular solutions, helping to drive the economy towards a fully integrated circular model. Furthermore, consumer awareness and engagement must be increased by conducting education campaigns on the importance of sustainable consumption and EPR's role in promoting circular economy practices. Finally, establishing systems for monitoring and assessing EPR performance is vital. Transparent, periodic evaluations of EPR programs can help identify areas for improvement, ensuring the continued success of circular economy initiatives in the U.S.

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