THE ROLE OF DIGITAL PLATFORMS IN THE DEVELOPMENT OF THE CIRCULAR ECONOMY

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Modern socio-economic development faces critical global challenges, among which climate change, depletion of natural resources, ecosystem degradation, and increasing volumes of waste play a leading role. In this context, the inefficiency of the traditional linear economic model - based on single-use resource consumption and waste accumulation - has become increasingly evident. A response to these challenges is the transition to a circular economy, an innovative model focused on preserving material value and enabling their repeated use within closed-loop systems. This approach minimizes resource loss, reduces environmental pressure, and contributes to the development of more resilient supply chains. In the era of digitalization, digital platforms are beginning to play a pivotal role in implementing circular economy principles. They facilitate the optimization of exchange, repair, reuse, rental, and resale of goods - particularly in resource-intensive sectors such as the textile and electronics industries. Digital tools enhance transparency, enable efficient coordination among market participants, support data integration, and foster the emergence of new consumption models. This article explores the potential of digital platforms as a foundational infrastructure for scaling the circular economy and shaping a sustainable development model on a global scale.

Keywords: circular economy, digital platforms, sustainable development, marketplaces

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Introduction

The modern world is facing unprecedented environmental and resource-related challenges, casting doubt on the viability of the current model of economic growth. The prevailing linear economy, based on the single-use consumption of resources, generates substantial volumes of waste and imposes excessive pressure on the environment. This situation necessitates fundamentally new approaches to the organization of production and consumption.

A response to these challenges and the imperative for a more sustainable development model is the concept of the circular economy, which offers an alternative to the linear approach by focusing on retaining resources within the economic cycle for as long as possible while minimizing environmental impact. The importance of this transformation is underscored by the dynamic growth of the global circular economy market, reflecting the growing interest in sustainable solutions at various levels.

In the context of accelerating digitalization, digital platforms are gaining particular relevance as tools that can significantly accelerate and facilitate the transition to a circular economy. These platforms establish the infrastructure necessary for the effective management of resource flows and

the practical implementation of circularity principles. In light of this, the aim of this study is to analyze the role and impact of digital platforms in advancing the circular economy.

Materials and Methods

Design of the research

The design of the research involved a comprehensive analysis of the concept of the circular economy and the role of digital platforms in its development. The methodology was based on a qualitative analysis of scientific publications, industry reports, and open data. The study included a comparative analysis of linear and circular economies, the examination of circularity principles, and an analysis of the dynamics of the global circular economy market based on statistical data. Special attention was given to the impact of digital platforms on the implementation of circular economy principles, particularly through marketplaces across various sectors.

Statistical analysis

The study employed an analysis of statistical data from open sources and industry reports to confirm the growth of the global circular economy market and waste volumes in key sectors. Specifically, the analysis focused on estimates of the circular economy market size and growth forecasts, as well as data on waste generation in the textile, electronics, and food industries. The statistical data used served to illustrate the relevance of the issue and the potential of circular approaches. A deep statistical analysis with the application of specific statistical methods was not conducted, as the study is of a review and analytical nature.

Results and Discussion

Contemporary socio-economic development faces global challenges such as climate change, resource depletion, environmental pollution, and energy instability, which require a reconsideration of existing approaches to economic growth and a transition from the linear model of "take - make - use - dispose", which reveals its ecological and resource inefficiency. An alternative is the circular economy model of "take - make - use - restore/recycle - reuse", an innovative economic model focused on preserving the value of resources, their multiple uses, recycling, and waste minimization (Shevchenko, T. I., Shuptar-Poryvaieva, N. Y., Gubanova, O. R., et al., 2022). Its distinctive feature is the formation of closed production cycles, where materials remain in circulation for as long as possible. Waste from one process becomes raw material for another, contributing to reduced dependence on primary resources, decreased ecological risks, and enhanced efficiency.

In addition to the rational use of resources, the circular economy is also focused on creating added value through service models, innovative design, and full-life cycle management of products (Dubel, 2022), which paves the way for the formation of new, environmentally responsible business models.

The circular economy is based on a set of key principles aimed at forming a sustainable, resource-efficient, and environmentally balanced economic environment. According to the data from the Center for Resource Efficient and Cleaner Production, the main principles of the circular economy include:

- Waste and pollution minimization, specifically: abandoning the production of disposable goods and focusing on improving services, shared use, and product repair.
- Maximizing the value of products and materials, namely: keeping materials in

circulation, both as finished products and as their components or raw materials when they can no longer perform their original function, which helps prevent waste generation and preserve the value of resources.

- Restoration of natural ecosystems, specifically: transitioning from resource extraction to resource restoration, which means applying renewable models that mimic natural processes (Center for Resource Efficient and Cleaner Production, n.d.).

Current research shows a rapid growth of the global circular economy market, indicating an increased interest in sustainable approaches to production and consumption. According to Kings Research's analytical report, the market was valued at approximately 583.55 billion USD in 2023. Projections suggest that by 2031, its value could reach 2,882.11 billion USD, with a compound annual growth rate (CAGR) of 22.5% (Ashim, 2024). This dynamic not only reflects growing institutional and investment interest but also highlights its potential to become a leading driver of global economic development. A visualization of the projected market growth is presented in Figure 1, illustrating the scale and potential of this economic model.

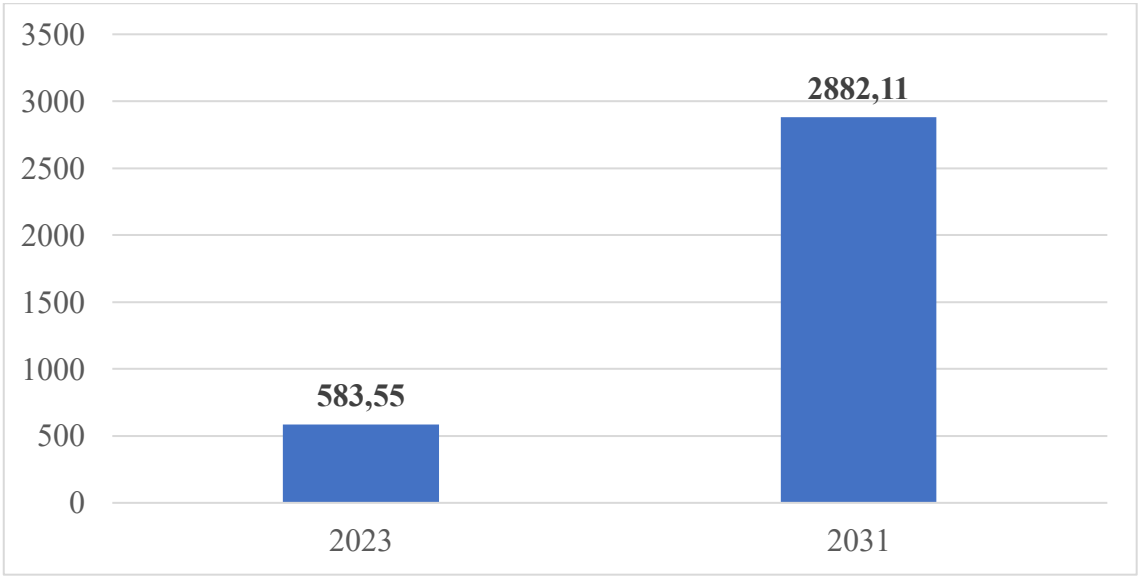

Figure 1. Circular economy market 2023/2031, billion dollars

The projected growth of the global circular economy market highlights the importance of innovative approaches to resource management and waste recycling. At the same time, digital platforms play a crucial role in ensuring the efficiency and scalability of these processes. Through technologies and digitalization, the circular economy gains new opportunities, enabling businesses and consumers to reduce resource consumption and minimize their environmental footprint.

Digital platforms contribute to optimizing resource cycles by facilitating the exchange of goods, their reuse, repair, and resale, which are key principles of the circular economy. Additionally, they provide the necessary coordination between all participants, promoting business operation transparency, improving logistical efficiency, and integrating new consumption models.

Thus, in today's digital business landscape, digital platforms are becoming critically important for implementing circularity principles on a global scale, helping to create sustainable economic

models and ensuring ecological and economic resilience. The main platforms contributing to this process are listed in Table 1.

Table 1. Marketplaces and Their Impact on the Circular Economy

Specialization	Platform Name	Country of Operation	Impact on Circular Economy
Clothing, Footwear, and Accessories	Shafa	Ukraine	• Reducing textile waste • Decreasing the production of new clothing • Alternative to fast fashion
	Vinted	16 European countries, USA	
	ThredUp	USA, Canada, United Kingdom	
Electronics and Technology	Izi.ua	Ukraine	• Reducing electronic waste through the sale of refurbished devices, which reduces CO_2 emissions by up to 80% (Back Market, n.d.). • Extending product lifecycle
	Back Market	6 European countries, USA	
Renting and Sharing	RentME	Ukraine	• Reducing the need for the production of new goods • Extending the lifecycle of equipment by 2-3 years
	Grover	Germany, Austria, Netherlands	
Food Products	Too Good To Go	16 European countries, USA, Canada, Australia	• Reducing food waste • Promoting sustainable consumption

According to the data in Table 1, it can be concluded that marketplaces play a significant role in the development of the circular economy by contributing to waste reduction through the reuse of products, repair, resale, and rental. Specifically, these platforms have a major impact in segments such as clothing, footwear, electronics, and food products, as these industries generate the largest volumes of waste.

For example, the textile industry generates 92 million tons of waste annually (Ellen MacArthur Foundation, n.d.), making the resale of second-hand clothing one of the most effective strategies in combating textile waste. According to a study by ThredUp, the second-hand market could grow to 367 billion dollars by 2029 (ThredUp, 2024), which confirms the high demand for such platforms and underscores the importance of this segment in reducing environmental impact.

The electronics industry also generates vast amounts of waste—around 50 million tons annually, of which only 17.4% is properly recycled (Global E-waste Statistics Partnership, 2024). Digital platforms that promote resale, repair, and refurbishment of electronics significantly reduce these numbers by giving devices a new life and reducing the need for new products.

Another critical issue is food waste, which totals 931 million tons annually, or 17% of all food produced (UNEP, 2024). Thanks to platforms that optimize food consumption, the amount of food waste is reduced, which has a positive effect on the global environmental situation. For example, the Too Good To Go app has saved 250 million servings from disposal (Too Good To Go, 2024).

Conclusions

Thus, digital platforms are becoming an essential tool for transitioning from the traditional linear economic model to a circular one. They enable the effective reuse of goods, repair, resale, and exchange, which reduces the need for new production and helps decrease waste volumes. Through these platforms, consumers have the opportunity to participate in the circularity process by extending the life cycle of products, contributing to the preservation of natural resources and reducing the environmental impact.

It is important to note that in order to maximize the effectiveness of these platforms, they must offer the full cycle of the circular economy, including not only sales but also opportunities for repair and restoration of products. This enables the creation of more sustainable economic models that support the principles of sustainable development, while also allowing businesses and consumers to use resources efficiently and reduce waste levels.

Therefore, digital platforms play a key role in advancing the circular economy by fostering the development of environmentally friendly and economically efficient business models in the modern world.

Conflict of interest

The authors state no conflict of interest.

References

Ashim, L. (2024). Circular economy market size, share & growth report [2031]. Kings Research: Global Consulting & Market Research Reports. https://www.kingsresearch.com/circular-economy-market-1046

Back Market. (n.d.). Impact: Data Reports & Corporate News. Retrieved April 1, 2025, from https://www.backmarket.com/en-us/impact/en-us

Center for Resource Efficient and Cleaner Production. (n.d.). Circular economy in Ukraine. Retrieved April 1, 2025, from https://www.recpc.org/circular-economy-ua/

Dubel, M. (2022). Circular economy as a mechanism for achieving sustainable development goals in the context of globalization and digitalization of the world economy. Economics and Society, (39). https://doi.org/10.32782/2524-0072/2022-39-13

Ellen MacArthur Foundation. (n.d.). A new textiles economy: redesigning fashion's future. Retrieved April 1, 2025, from https://www.ellenmacarthurfoundation.org/a-new-textiles-economy

Global E-waste Statistics Partnership. (2024). The global E-waste monitor 2024. Retrieved April 1, 2025, from https://api.globalewaste.org/publications/file/297/Global-E-waste-Monitor-2024.pdf

Shevchenko, T. I., Shuptar-Poryvaieva, N. Y., Gubanova, O. R., et al. (2022). Circular economy: A textbook. Universytetska Knyha. ISBN 978-617-521-028-4.

ThredUp. (2024). Resale Report 2024. Retrieved April 1, 2025, from https://www.thredup.com/resale

Too Good To Go. (2024). Impact Report 2024. Retrieved April 1, 2025, from https://cdn.sanity.io/files/nqimd3nr/production/fa4075717ba03b510e4f0b29aca8f83dd19fda76.pdf

UNEP - UN Environment Programme. (2024). Food waste index report 2024. Retrieved April 1, 2025, from https://www.unep.org/resources/publication/food-waste-index-report-2024