TRANSITIONING TO A CIRCULAR ECONOMY: BUSINESS MODELS AND SECTOR-SPECIFIC PRACTICES

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Beka Baiashvili
Ph. D. Student at Tbilisi State University
E-mail: beka.baiashvili275@eab.tsu.edu.ge

RESUME

This paper explores the concept of circular economy models in business, contrasting them with traditional linear models. It introduces three key players in the circular economy: Product Manufacturers, Problem Solvers, and Facilitators, and identifies six general business models, including Circular Supply Chain, Sharing Platforms, Product as a Service, Product Life Extension, Resource Recovery, and Product Incentivized Return. The text also discusses sector-specific adaptations, highlighting permaculture in agriculture as an example of circular economy principles tailored to a specific industry. The content provides a framework for understanding how circular economy models can be implemented and adapted across various sectors, emphasizing the need for detailed analysis and tailored approaches in future research.

Keywords: Circular Economy, Business Model, Sustainability.

INTRODUCTION

As global concerns about environmental sustainability and resource depletion intensify, the traditional linear economic model of "take-make-use-dispose" has come under scrutiny for its inefficiencies and environmental impact. In response, the concept of the circular economy has emerged as a transformative approach that emphasizes sustainability through closed-loop systems where resources are continuously recycled, reused, and regenerated. The circular economy aims to shift away from the wasteful practices of linear production and consumption, advocating for a model where the lifecycle of products is extended, and resources are kept in use for as long as possible.

This article explores the various business models associated with the circular economy. We begin by defining the fundamental principles of circular economy models and examining how they diverge from traditional linear models. Through an analysis of key circular economy business models, including Circular Supply Chains, Sharing Platforms, Product as a Service, Product Life Extension, Resource Recovery, and Product Incentivized Return, we highlight the practical implementations and advantages of these approaches.

We also investigate how these models are adapted to specific sectors, with a particular focus on the agricultural industry. Here, we examine the role of permaculture — a practice that integrates ecological principles to create sustainable agricultural systems — as a case study of circular economy principles in action.

This article aims to contribute to a deeper understanding of how businesses can transition to more sustainable practices. As such, it sets the stage for further research into sector-specific applications of circular economy principles, highlighting the potential for significant environmental and economic benefits.

OVERVIEW OF CIRCULAR ECONOMY BUSINESS MODELS

A business model is a set of interconnected components within any organization that establishes the

principles necessary for creating, developing, and successfully operating a company. It defines the target customer segment and the value that is delivered to these customers. Additionally, the model describes the mechanism for creating this value (the value creation chain) and the ways to generate profit (Baiashvili, 2022).

The primary approach of the linear economy is "take-make-use-waste." In contrast, the circular economy arranges this process as follows: "take-design-use-recycle-reuse." However, this model is very theoretical and cannot be directly implemented in practice. Therefore, in our research, we used a more complex scheme of the circular economy created for the business sector. Based on this model, it is possible to develop more specific business models.

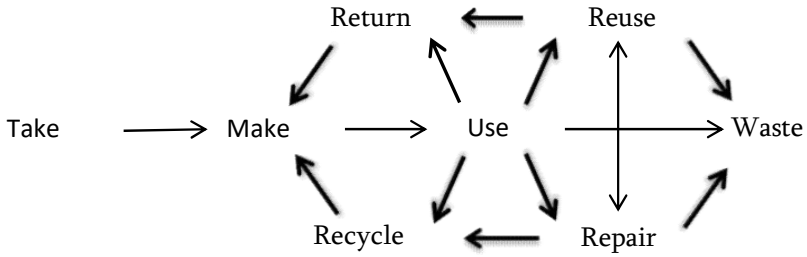
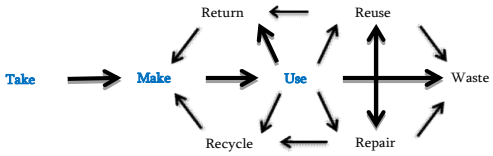
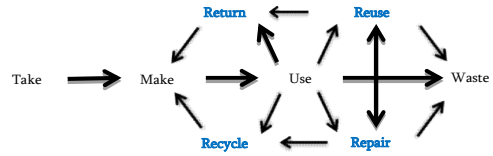
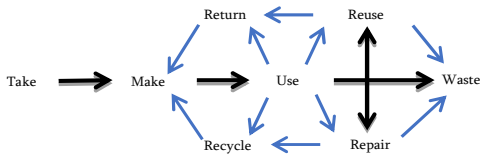


Figure 1. A circular economy model for business (Mey & Shahbazi, 2020)

According to Figure 1, three key players emerge in the process of implementing the circular economy. These players are:

- **"Product Manufacturer"** — Organizations that incorporate the circular economy model directly into their production processes.
- **"Problem Solver"** — Organizations that create a production cycle from the waste generated by product manufacturers and consumers (e.g., recycling companies, and similar entities).
- **"Facilitators"** — Players who create the necessary environment for the circular economy and ensure the coordinated operation of the other parties involved.
- These three main players are schematically represented in Table 1.

Table 1. Three main types of circular economy business model players

Schematic representation of the player	Description
	**a) Product Manufacturers** Organizations that incorporate the circular economy model directly into their production processes.
	**b) Problem Solvers** Companies that specialize in assisting the companies of type (a) and create a production cycle (e.g., recycling companies and others).
	**c) Facilitators** Organizations and institutions that guide the coordinated and seamless operation of the entire ecosystem (e.g., government or consulting sectors).

Source: Mey & Shahbazi, 2020

Based on Figure 1 and information developed from the analysis of over 120 circular businesses in the textiles, consumer goods, and high-tech sectors by the globally recognized consulting firm Accenture, we can identify six general business models of the circular economy. These are:

- Circular Supply Chain
- Sharing Platforms
- Product as a Service
- Product Life Extension

Resource Recovery (Accenture, 2014)

Product Incentivized Return.

The circular supply chain involves the use of fully renewable, recyclable, and biodegradable resources in production. These resources can be divided into three major categories:

- **Renewable Resources:** Resources that are naturally renewable and can be used multiple times. For example, water collected from rain, wind energy, solar energy, hydrogen fuel derived from surplus renewable energy, etc.
- **Renewable, Bio-based Materials:** Materials such as bioplastics and microbial agrochemical substances derived from living organisms.

Renewable Synthetic Materials: Inorganic chemical-based materials that can be recycled indefinitely without significant loss of quality or physical properties (Lacy, Long, & Spindler, The Circular Economy Handbook - Realizing the Circular Advantage, 2020).

A production chain is a networked connection between manufacturers and resource suppliers that ensures the creation of a product and its delivery to the final customer. Therefore, to integrate the circular economy model into the supply chain, the following recommendations should be considered:

- Utilize resources from the categories mentioned above in the production process.
- Preferably, select a resource supplier partner that is geographically close to minimizing emissions related to transportation.
- Design products that simultaneously meet the criteria for efficient resource use and high potential for future recycling, among other considerations.

Sharing platforms are particularly popular in sectors such as automotive and accommodation. For large corporations, adopting a sharing platform model requires significant changes to their existing business model. Achieving consensus, developing a strategy, and creating a business model depends on accurate research and precise information (Lacy, Long, & Spindler, The Circular Economy Handbook - Realizing the Circular Advantage, 2020). In the modern economy, services like car-sharing, home rentals, appliance rentals, and other household item rentals have become increasingly prominent. Such businesses reduce the need for mass production of frequently used products and increase overall efficiency.

The **Product as a Service** model means that customers pay for the right to use a product rather than owning it outright. The main advantage of this model is that the manufacturer focuses on the product's durability and the potential for refurbishment. This is because, if the product becomes defective or obsolete, the manufacturer is obligated to replace it with a new one. This creates an opportunity for the damaged or obsolete product to be returned to the manufacturer, which simplifies the process of recovery, reuse, or recycling (Accenture, 2014).

Product Life Extension involves increasing the longevity of a product's lifecycle. This approach enhances opportunities for recovery, improvement, and reintroduction of the product into the market. Implementing this model can be challenging in rapidly evolving sectors. For instance, the computer industry evolves quickly, with new, more powerful models frequently emerging, which makes older models less desirable. As a result, there is always high demand for newly created products. An important aspect of this model is designing products where every component can be easily replaced. This significantly extends the product's lifecycle and reduces the need for new resources. Overall, product life extension in-

volves maintaining, repairing, upgrading, or remarketing the product whenever possible (Veolia, 2020).

Resource Recovery and Zero Waste Production can be considered an advanced approach to traditional waste management. An organization aiming to implement this business model should adhere to the waste management hierarchy. Ideally, recovered resources should be processed with the highest quality approach possible in the hierarchy. Consequently, recycling resources in a closed-loop production cycle is the best option. At the same time, the manufacturer should focus on creating products that generate minimal waste or are easily recoverable at the end of their lifecycle.

It is preferable if the waste can be upcycled into products of higher quality or value. If this is not feasible, downcycling into products of lower quality or value is the next best option. In the worst case, waste may be converted into energy or eventually disposed of in a landfill (Lacy, Long, & Spindler, 2020).

In addition to these models, the **Product Incentivized Return** model is also noteworthy. According to this model, manufacturers offer customers an incentive to return products. This incentive might include exchanging an old product for a new one, offering a discount on a new product, or providing financial compensation. The returned product is then refurbished by the manufacturer and placed back on the shelf for sale.

Sector-Specific Circular Economy Business Practices

The business models mentioned are quite general. Detailed analysis of each sector reveals specific practices that are considered circular economy business models for that sector. For example, in the agricultural sector, in addition to general circular economy models, **permaculture** is popular. The term "permaculture" is derived from combining the English words "Permanent" and "Agriculture," reflecting its focus on creating sustainable and self-sufficient agricultural systems.

Permaculture is based on information obtained from studying natural systems, creating a closed microenvironment. This environment includes a balanced representation of both animals and plants, takes into account local natural conditions, and integrates both traditional and modern approaches. The goal of permaculture is to produce agricultural products within this microenvironment with minimal impact on nature. In permaculture, soil fertilization, creation of desired climatic conditions, and energy production are all carried out in adherence to sustainable development principles (Habib & Fadaee, 2022). Exactly, permaculture is just one example of how circular economy principles can be adapted to specific sectors. Detailed analysis of various economic sectors will reveal additional ways to tailor circular economy models to organizations. As you mentioned, this direction will be a key focus in your future academic work.

CONCLUSION

In conclusion, the transition from a linear to a circular economy represents a pivotal shift in how businesses create value and manage resources. By embracing circular models such as Circular Supply Chains, Sharing Platforms, and Product as a Service, organizations can enhance sustainability, minimize waste, and foster economic resilience. The text outlines the essential roles of Product Manufacturers, Problem Solvers, and Facilitators in this transformation, illustrating how their collaborative efforts drive effective circular practices. Moreover, sector-specific adaptations, exemplified by permaculture in agriculture, underscore the versatility and potential of circular economy principles to address diverse industry needs. As businesses and researchers continue to refine and implement these models, detailed sectoral analysis and innovative approaches will be crucial in advancing the circular economy, ultimately contributing to a more sustainable and efficient global economy.

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წრიული ეკონომიკაზე გადასვლის პროცესი: ბიზნესმოდელები და სექტორული პრაქტიკა

ბექა ბაიაშვილი
თსუ დოქტორანტი
beka.baiashvili275@eab.tsu.edu.ge

რეზიუმე

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საკვანძო სიტყვები: წრიული ეკონომიკა, ბიზნესმოდელი, მდგრადი განვითარება.