

Circular Economy Applied to the Automotive Industry

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Abstract

The subject of the circular economy is an essential societal topic in nowadays society. In the last years, in the automotive industry, the evolution of regulatory and economic circumstances has led to the development of networks to reuse, refurbish, remanufacture, recycle and recover components, elements, equipment, and materials embedded in end-of-life vehicles. The paper aims to briefly present and better understand the concept of the circular economy within the automotive industry. The methodological approach was based on a qualitative research method. The paper shows that despite the main barriers to reuse, recycling, and recovery performance improvement are economic and technical, in the automotive industry, the circular economy was based on the idea that, on one hand, over the world, the natural resources are limited and, on the other hand, it is important to augment the functioning of the ecosystem and, consequently, the human well-being.

Key words: circular economy, automotive industry, company

J.E.L. classification: A12, A13, L62

1. Introduction

The subject of the circular economy is an essential societal topic in nowadays society. The theme is increasingly gaining traction in academia, business, and politics (Geissdoerfer *et al.*, 2017). It is a hot topic nowadays being of interest both for public and private organizations (Toma *et al.*, 2019), and for people, in general (Owojori *et al.*, 2022). Moreover, the COVID-19 pandemic accelerated the process focused on sustainability (Catană, 2020). In order to have sustainable economic growth, and sustainable consumption, the European Union has implemented some economic policy measures to promote the circular economy (Nistor *et al.*, 2021).

As a highly competitive industry, the automotive industry represents an environment in which is difficult to obtain considerable competitive advantages and it is rather hard to differentiate from other competitors (Catană *et al.*, 2021). Consequently, innovation is a powerful driver for companies around the world, enabling them to achieve success (Grădinaru *et al.*, 2020).

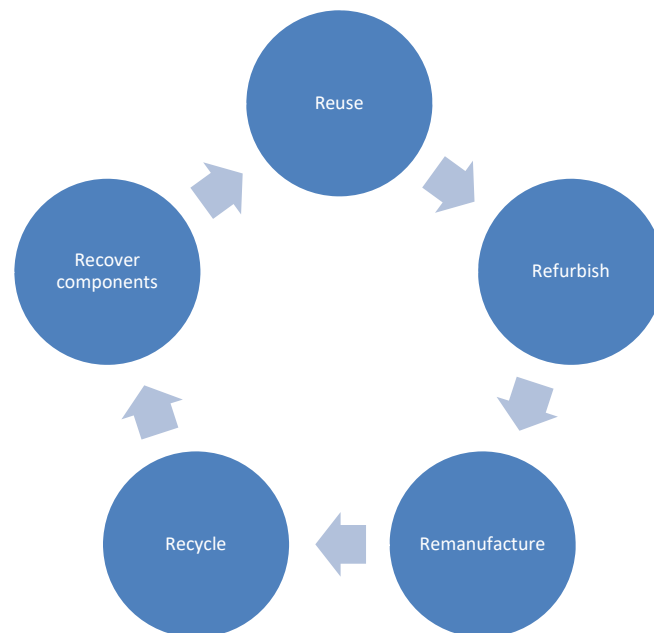
Starting from the above considerations, this study is focused on showing the implications of the circular economy in the automotive industry. The paper aims to briefly present and better understand the concept of the circular economy within the automotive industry. The structure of the paper is as follows: the second section shows the literature review. The third part of the paper displays the research methodology. The outcomes of the study are exhibited in the fourth section. At the end, the fifth section presents the conclusions along with the research limitations.

2. Literature review

The last decades have witnessed the rise of studies related to the circular economy (or “green economy” or “closed-loop economy” or “circularity” or “sustainable development goals”) (Kayikci, *et al*, 2021). The reason lies in the fact that pressing challenges such as environmental pollution, and climate change have led many economies to reconsider their strategies to balance growth and sustainability (Lehmann *et al*, 2022; United Nations Environment Programme, 2022). Moreover, there are authors that consider that the circular economy is a multidimensional phenomenon (de Jesus *et al*, 2018; Ünal *et al*, 2019). This is also why numerous companies, especially from the automotive industry, have fully understood the need to think and act not only strategically (Toma, 2008; Toma *et al*, 2015; Toma *et al*, 2016) but also in an creative, innovative (Toma *et al*, 2018) and entrepreneurial (Marinescu *et al*, 2013; Grădinaru *et al*, 2017; Marinescu *et al*, 2017), and social responsible (Toma *et al*, 2009; Toma *et al*, 2011) manner in an ever changing global business environment (Săseanu *et al*, 2014), specific to the nowadays Fourth Industrial Revolution (Tohănean *et al*, 2018).

There is not a standard definition for the circular economy concept (Kirchherr *et al*, 2018). As a term belonging to sustainability, it has been defined in many ways. In this respect, Geissdoerfer *et al* (p.757) define the concept as “a regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing material and energy loops”. Starting from this conceptual definition, in the last years, in the automotive industry, the evolution of regulatory and economic circumstances has led to the development of networks to reuse, refurbish, remanufacture, recycle and recover components, elements, equipment, and materials embedded in end-of-life vehicles (Despeisse *et al*, 2015). Each of these networks influences the circular economy in the automotive industry (Figure no. 1).

Figure no. 1. The circular economy in the automotive industry



Source: (Authors, adapted from Despeisse, et al., 2015)

Over time, the scientific literature regarding the concept of the circular economy was developed and, starting from equity, transparency and resilience, there were highlighted the following 7 pillars of the circular economy (Gladek, 2017):

- The use of materials at continuous high value;
- All energy is based on renewable sources;

- Biodiversity is supported and enhanced through human activity;
- The preservation of human society and culture;
- The structural support of humans’ health and wellbeing;
- The propagation of societal value is maximized by human activities;
- The sustainable extraction and use of water resources.

3. Research methodology

In the beginning, the authors investigated the scientific literature on the circular economy topic and its implications in the automotive industry. In order to attain the aim of the paper, they utilized a qualitative research method. The information was collected through desk research (Hague, 2022), and the secondary data had been gathered through the organization of an extensive literature review from different sources, such as books and journals in the fields of business and economics. The documents were originated in prestigious scientific databases, such as Web of Science, Science Direct, SAGE, Scopus, Emerald Insight, and Google Scholar.

4. Findings and discussion

In essence, the circular economy was based on the idea that, on one hand, over the world, the natural resources are limited and, on the other hand, it is important to augment the functioning of the ecosystem and, consequently, the human well-being.

In order to incorporate the circular economy in their business strategies, companies in the automotive industry have different visions, as follows:

- Designing sustainable vehicles from recycled and recoverable materials is at the core of Renault Group. Its activity is also based on reconditioning spare parts, re-using batteries from electric-vehicle, or providing ever cleaner and more sustainable car-sharing services (Renault, 2020).
- Skoda perceives the circular economy based on the following concepts: minimizing negative impacts on the environment, input resources and the loss of these resources, and conversely maximizing the circulation of resources (Skoda, 2021).
- The BMW vision of the circular economy is established on protecting and preserving the environment, reusing valuable resources several times, and ensuring that nothing ends up going to waste (BMW Group, 2021).
- Mazda is expecting a significant reduction in energy and resource losses throughout the entire vehicle manufacturing supply chain, as a result of efforts to make the process more efficient (Mazda, 2021).

All in all, speaking about the green problems, the automotive industry has certainly been part of this issue, but it can be also part of the solution. Firstly, more and more companies in the automotive industry consider that the circular economy is an important topic. Secondly, all major car manufacturers have in their portfolio models of environmentally friendly cars, made of recyclable materials. Thirdly, the petrol and diesel prices crisis will conduct people to be more and more interested in acquiring electric cars.

5. Conclusions

In the last years, the topic of the circular economy become present in all public debates, at all levels. Starting from this fact, from the company’s point of view, rising consumer expectations regarding the characteristics of cars, have been imposed worldwide by car manufacturers to provide their customers with the best customer experience possible (Toma & Catană, 2021). Consequently, the regulators, on one hand, and the companies and people, on the other hand, had to adapt to this new reality.

In the automotive industry, the main barriers to reuse, recycling, and recovery performance improvement are economic and technical. However, this industry has proved its capacity to provide numerous solutions to solve the problems related to the circular economy.

The paper demonstrates that the circular economy constitutes a holistic concept. It also shows the importance of this topic in the automotive industry.

Regarding the future research directions, other studies may consider a larger number of car manufacturers and analyze their visions regarding the subject. Moreover, they can reveal the perceptions of people regarding these visions and actions.

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