A THEORETICAL FRAMEWORK FOR ALIGNMENT BETWEEN CIRCULAR ECONOMY AND INDUSTRY 4.0 FOR SUSTAINABILITY IN THE SUPPLY CHAIN

Etienne Cardoso Abdala¹ – Faculdade de Gestão e Negócios, Universidade Federal de Uberlândia-etienne@ufu.br
Daisy Aparecida do Nascimento Rebello² – Escola de Engenharia de São Carlos, Universidade de São Paulo - daisy@usp.br

Purpose:
At the same time that supply chain management seeks to develop skills and resources for a cleaner operation and aligned with the global agenda, companies face the management challenges arising from the technological transition of industry 4.0 in their daily lives. The pressures exerted by higher bodies like the UN to fulfill the Sustainable Development Goals (SDGs) lead organizations to seek to development and implementation of a Circular Economy principles. In an attempt to understand the benefits of Industry 4.0 for implementing sustainable practices in the supply chain, in order to make it part of a Circular Economy, this research seeks to develop the alignment between these themes, identifying possible drivers, barriers and consequences of the innovative technologies application for the three dimensions of sustainability in Brazil.

Research Approach:
It is intended, through a systematic review of the literature, to identify the main assumptions and variables addressed in the relationship between Industry 4.0 and Circular Economy. The research carried out collected data between the years 2017 and 2021, considering the keywords industry 4.0 and circular economy, in particular published articles that show the relationship between the terms, and initially resulted in 279 articles.

Findings and Originality: Text (Calibri 11)
The identification of theoretical dimensions will enable the construction of a theoretical model that can facilitate the elaboration and implementation of technological tools for application in circular practices in manufacturing. In terms of originality, few published studies were found that seek to highlight characteristics and barriers to the implementation of Industry 4.0 and Circular Economy technologies to build a framework in sustainable supply chains.

Research Impact: Text (Calibri 11)
The research impact is related to the survey of the themes highlighted in the main publications in the area, enabling the construction of a theoretical framework with the necessary characteristics for the use of technologies in the circular economy, as well as the implementation barriers and discussion points of technological advance. The model is expected to provide a contribution to future research.

Practical Impact: Text (Calibri 11)
The managerial impact of the framework is to provide managers with a broad view of how innovative technologies from industry 4.0 can contribute to improving the effectiveness of circular economy practices, contributing to making production and the supply chain more sustainable, and improving the efficiency of the decision-making process regarding these practices.

Keywords: Industry 4.0, Circular Economy, Sustainable Supply Chain
A THEORETICAL FRAMEWORK FOR ALIGNMENT BETWEEN CIRCULAR ECONOMY AND INDUSTRY 4.0 FOR SUSTAINABILITY IN THE SUPPLY CHAIN

Etienne Cardoso Abdala¹ – Faculdade de Gestão e Negócios, Universidade Federal de Uberlândia-
etienne@ufu.br
Daisy Aparecida do Nascimento Rebellato² – Escola de Engenharia de São Carlos, Universidade de São Paulo - daisy@usp.br

Purpose:
At the same time that supply chain management seeks to develop skills and resources for a cleaner operation and aligned with the global agenda, companies face the management challenges arising from the technological transition of industry 4.0 in their daily lives. The pressures exerted by higher bodies like the UN to fulfill the Sustainable Development Goals (SDGs) lead organizations to seek to development and implementation of a Circular Economy principles. In an attempt to understand the benefits of Industry 4.0 for implementing sustainable practices in the supply chain, in order to make it part of a Circular Economy, this research seeks to develop the alignment between these themes, identifying possible drivers, barriers and consequences of the innovative technologies application for the three dimensions of sustainability in Brazil.

Research Approach:
It is intended, through a systematic review of the literature, to identify the main assumptions and variables addressed in the relationship between Industry 4.0 and Circular Economy. The research carried out collected data between the years 2017 and 2021, considering the keywords industry 4.0 and circular economy, in particular published articles that show the relationship between the terms, and initially resulted in 279 articles.

Findings and Originality: Text (Calibri 11)
The identification of theoretical dimensions will enable the construction of a theoretical model that can facilitate the elaboration and implementation of technological tools for application in circular practices in manufacturing. In terms of originality, few published studies were found that seek to highlight characteristics and barriers to the implementation of Industry 4.0 and Circular Economy technologies to build a framework in sustainable supply chains.

Research Impact: Text (Calibri 11)
The research impact is related to the survey of the themes highlighted in the main publications in the area, enabling the construction of a theoretical framework with the necessary characteristics for the use of technologies in the circular economy, as well as the implementation barriers and discussion points of technological advance. The model is expected to provide a contribution to future research.

Practical Impact: Text (Calibri 11)
The managerial impact of the framework is to provide managers with a broad view of how innovative technologies from industry 4.0 can contribute to improving the effectiveness of circular economy practices, contributing to making production and the supply chain more sustainable, and improving the efficiency of the decision-making process regarding these practices.

Keywords: Industry 4.0, Circular Economy, Sustainable Supply Chain