



13<sup>th</sup> International Conference on Industrial  
Engineering and Industrial Management

XXIII Congreso de Ingeniería de Organización



**Organizational  
Engineering  
in Industry 4.0**

**BOOK OF ABSTRACTS**

**Gijón, 11th-12th July 2019**

## **Book of Abstracts**

**“13<sup>th</sup> International Conference on  
Industrial Engineering and  
Industrial Management” and  
“XXIII Congreso de Ingeniería de  
Organización (CIO2019)”**

**Book of Abstracts**

**“13<sup>th</sup> International Conference on  
Industrial Engineering and Industrial  
Management” and “XXIII Congreso de  
Ingeniería de Organización  
(CIO2019)”**

**COORDINADORES**

**DAVID DE LA FUENTE GARCÍA**

**RAÚL PINO DIEZ**

**PAOLO PRIORE**

**FCO. JAVIER PUENTE GARCÍA**

**ALBERTO GÓMEZ GÓMEZ**

**JOSÉ PARREÑO FERNANDEZ**

**ISABEL FERNÁNDEZ QUESADA**

**NAZARIO GARCÍA FERNÁNDEZ**

**RAFAEL ROSILLO CAMBLOR**

**BORJA PONTE BLANCO**

© 2019 Universidad de Oviedo  
© Los autores

Servicio de Publicaciones de la Universidad de Oviedo  
Campus de Humanidades. Edificio de Servicios. 33011 Oviedo (Asturias)  
Tel. 985 10 95 03 Fax 985 10 95 07  
[http: www.uniovi.es/publicaciones](http://www.uniovi.es/publicaciones)  
[servipub@uniovi.es](mailto:servipub@uniovi.es)

I.S.B.N.: 978-84-17445-38-6  
DL AS 1875-2019

Imprime: Servicio de Publicaciones. Universidad de Oviedo

Todos los derechos reservados. De conformidad con lo dispuesto en la legislación vigente, podrán ser castigados con penas de multa y privación de libertad quienes reproduzcan o plagien, en todo o en parte, una obra literaria, artística o científica, fijada en cualquier tipo y soporte, sin la preceptiva autorización.

## Circular Economy: An Analysis Framework

Morcillo-Bellido J<sup>224</sup>, Duran-Heras A<sup>225</sup>

This paper tries to establish the bases of a circular economy model that could capture the key elements that organizations should include to attain a certain level of circularity. This model could also form the basis for establishing a comprehensive "circularity" assessment system for a certain organization, that is still a gap in research. This research seeks to establish a preliminary model, and to study its application to the processes of three companies (two Spanish and one Dutch multinational).

**Keywords:** Circular economy, circular economy in Europe, process circularity, circularity assessment model.

### 1 Introduction

The circular economy introduces a new perspective in the economic ecosystem at the company (micro), industry (meso) and region / country (macro) levels. Economic growth is decoupled from the use of resources, polluting emissions and discarding waste at the end of the products' life. This means reducing both the need for new raw materials to feed the production process and the re-treatment of waste at the end of the products' useful life, according to the European Environment Agency (EEA, 2016). The concept of circular economy is currently a fashionable term, both among executives and academics, which is being reinforced by the policies of the European Union and China (Murray et al., 2017; Prieto-Sandoval et al., 2018). There are still few studies focused on how to measure the "level of circularity" of a product / service, of a certain company or of a supply chain. While the concept of circular economy has been widely analyzed and its application in certain companies or industries has been studied, the definition of a set of tools that allow measuring the level of circularity attained is still in an embryonic phase (Elia et al., 2017)

---

<sup>224</sup> Jesús Morcillo Bellido (✉ e-mail: [morcillo@ing.uc3m.es](mailto:morcillo@ing.uc3m.es)). Escuela Politécnica Superior. Área de Ingeniería de Organización. Universidad Carlos III de Madrid. Avenida de la Universidad nº 30, 28911 Leganés (Madrid), Spain

<sup>225</sup> Alfonso Durán Heras (e-mail: [duan@ing.uc3m.es](mailto:duan@ing.uc3m.es)). Escuela Politécnica Superior. Área de Ingeniería de Organización. Universidad Carlos III de Madrid. Avenida de la Universidad nº 30, 28911 Leganés (Madrid), Spain

## **2 Objectives**

This study seeks to measure whether or not the proposed model captures what is actually happening in terms of circularity in processes and objectives. In other words, whether the companies that explicitly state that they are working with circular economy strategies/practices are really managing to implement circular economy, and whether they achieve in their processes, at least to some extent, certain objectives identified as specific to the circular economy.

## **3 Methods**

Given the nature of the topics to be investigated, it was decided to carry out a case study, a method that, according to different authors, is suitable for issues that have to do with strategic decisions of business management. The information was collected through in-depth interviews with executives (one per company) of the companies studied, using semi-structured questionnaires and published information. Two Spanish and one Dutch companies (of a similar size) have been studied.

## **4 Results and Conclusion**

The authors of this study try to test a proposed model to measure the degree of circularity within the organizations. They carried out a fieldwork in three companies (two Spanish and one Dutch), from which it is possible to infer that the objectives related to the reduction of resources consumed / reduction of emissions are widely applied in the three companies. However, the objectives related to the re-use and durability of the products are somehow neglected, and particularly the latter is almost forgotten.

## **References**

- Elia, V., Gnoni, M. G., Tornese, F. (2017). Measuring circular economy strategies through index methods: A critical analysis. *Journal of cleaner production*, 142, 2741-2751.
- European Environment Agency, EEA (2016). *Circular economy in Europe. Developing the knowledge base*. Publication Office of the European Union. Luxembourg.
- Murray, A., Skene, K., Haynes, K. (2017). The circular economy: An interdisciplinary exploration of the concept and application in a global context. *Journal of Business Ethics*, 140(3), 369-380.
- Prieto-Sandoval, V., Jaca, C., Ormazabal, M. (2018). Towards a consensus on the circular economy. *Journal of Cleaner Production*, 179, 605-615.