

Analysis of Industrial Symbiosis Platforms for Circular Economy development

Jaca C²¹⁵, Rincon J²¹⁶, Barrenechea P²¹⁷, Ormazabal M²¹⁸

Keywords: Industrial Symbiosis, Circular Economy, Platforms, Sustainability;

1 Introduction

The concept of Industrial Symbiosis (IS) was introduced in the early 90's as a way to explain that industrial systems can be described as a distribution and flow of materials, energy, water and information (Erkman, 1997). The most popular definition of IS is a system that “engages traditionally separate industries in a collective approach to competitive advantage involving physical exchanges of materials, energy, water and/or by-products” (Chertow, 2007). Different IS projects have been developed: the Kalundborg park in Denmark (Lowe and Evans, 1995), Kwinana, Gladstone in Australia (Beers *et al.*, no date) or Nanjing Chemical Industrial Park and Suzhou New District, in China (Mathews, Tan and Hu, 2018).

Nevertheless, a successful IS implementation is more than a mere exchange of materials. One of the most important factors for developing IS relationships is collaboration amongst organizations (Cutaia *et al.*, 2015). For this reason, different projects have developed symbiosis platforms with the idea of active participation and collaboration between SMEs and local stakeholders. This paper is focused on the characteristics and usefulness of different platforms available on line.

²¹⁵ Carmen Jaca (e-mail: cjaca@tecnun.es)

Dpto. de Organización Industrial. Tecnun, Escuela de Ingeniería. Universidad de Navarra, Manuel de Lardizábal 15, 20018, San Sebastián, España.

²¹⁶ John Rincon (e-mail: jrincon@tecnun.es) Dpto. de Organización Industrial. Tecnun, Escuela de Ingenierías. Universidad de Navarra, Manuel de Lardizábal 15, 20018, San Sebastián, España.

²¹⁷ Pablo Barrenechea (e-mail: pablobarrenechea5@gmail.com) Dpto. de Organización Industrial. Tecnun, Escuela de Ingeniería. Universidad de Navarra, Manuel de Lardizábal 15, 20018, San Sebastián, España.

²¹⁸ Marta Ormazabal (✉ e-mail: mormzabal@tecnun.es) Dpto. de Organización Industrial. Tecnun, Escuela de Ingeniería. Universidad de Navarra, Manuel de Lardizábal 15, 20018, San Sebastián, España.

2 Objectives

In the last years, different software platforms have been developed to facilitate companies to exchange material exchanges and complete symbiotic projects. As there are many different platforms, the aim of this paper is to analyse their characteristics and functions in order to help companies decide which tool is the most suitable for them.

3 Methods

The in-use platforms that are available online and their main elements have been evaluated taking into account the factors defined in the literature, as geographic information, companies' diversity, eco-innovation, knowledge sharing, among others (Lombardi and Laybourn, 2012).

4 Results

Most of the analyzed platforms are related to promoting the circular economy, facilitating the exchange of waste as a resource for closing material cycles and promoting eco-innovation projects among organizations.

5 Conclusion

Despite the many platforms available, each of them might differ from each other in some aspect. In this way, this paper will help users to know which platform to use when they want to approach Industrial Symbiosis.

References

- Beers, D. Van *et al.* (2007) 'Development of large scale reuses of inorganic by-products in Australia: The case study of Kwinana, Western Australia', *Elsevier*.
- Chertow, M. R. (2007) "'Uncovering" Industrial Symbiosis', *Journal of Industrial Ecology*. Blackwell Publishing Ltd, 11(1), pp. 11–30.
- Cutaia, L. *et al.* (2015) 'The Experience of the First Industrial Symbiosis Platform in Italy', *Environmental Engineering and Management Journal*, 14(7), pp. 1521–1533.
- Erkman, S. (1997) 'Industrial ecology: an historical view', *J. Cleaner Prod*, 5(1–2), pp. 1–10.
- Lombardi, D. R. and Laybourn, P. (2012) 'Redefining Industrial Symbiosis', *Journal of Industrial Ecology*. Blackwell Publishing Inc, 16(1), pp. 28–37.
- Lowe, E. A. and Evans, L. K. (1995) 'Industrial ecology and industrial ecosystems*', *Journal of Cleaner Production*, 3(12), pp. 47–53.
- Mathews, J. A., Tan, H. and Hu, M.-C. (2018) 'Moving to a Circular Economy in China: Transforming Industrial Parks into Eco-industrial Parks', *California Management Review*, 60(3), pp. 157–181.



13th 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

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

Book of Abstracts

**“13th 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

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.