

A large, abstract concrete sculpture with a curved, arch-like structure, set against a blue sky and a green field. The sculpture is made of dark, weathered concrete blocks.

**Organizational  
Engineering  
in Industry 4.0**

**BOOK OF ABSTRACTS**

**Gijón, 11th-12th July 2019**

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

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### **COORDINADORES**

**DAVID DE LA FUENTE GARCÍA**

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**NAZARIO GARCÍA FERNÁNDEZ**

**RAFAEL ROSILLO CAMBLOR**

**BORJA PONTE BLANCO**

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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

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## **Are SMEs prepared for Industry 4.0? A study of a regional group of companies in Spain**

**Igartua J.I.<sup>212</sup>, Ganzarain J.<sup>213</sup>, Ibarra D.<sup>214</sup>**

**Keywords:** Industry 4.0, SMEs, Business Model Innovation, digitalization, servitization, value proposition

### **1 Introduction**

The present article analyses in an exploratory research approach the starting point of a group of regional Spanish SMEs with regard to Industry 4.0. Based on a study of 35 SMEs in Spain. The present paper explores their Industry 4.0 interests, as well as the objectives and barriers when implementing Industry 4.0.

The ability of companies to manage this paradigm, and to use its principles and technologies to improve our management and make it more advanced, will depend, to a large extent, on our competitive and economic future (Moeuf et al., 2018).

### **2 Objectives**

Bearing in mind the increased importance of Industry 4.0 in SMEs, we focus on managers' approaches and set the following objectives: O1. Awareness and strategic importance of the Industry 4.0 concept; O2. Existence of an Industry 4.0 strategy; O3. Identification of Industry 4.0 implementation objectives in SMEs; O4. Identification of most important technologies; O5. Determining the barriers that businesses might encounter in implementing Industry 4.0

### **3 Methods**

The data used for this paper was collected during a field study about the impact of Industry 4.0 in the regional area of Araba in Spain, between 1 October and 30 November 2018. The data was collected using a structured questionnaire filled in

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<sup>212</sup>Juan Ignacio Igartua (e-mail: [jigartua@mondragon.edu](mailto:jigartua@mondragon.edu))  
Mondragon University - Faculty of Engineering, Loramendi 4, 20500 Mondragon.

<sup>213</sup>Jaione Ganzarain (e-mail: [jganzarain@mondragon.edu](mailto:jganzarain@mondragon.edu))  
Mondragon University - Faculty of Engineering, Loramendi 4, 20500 Mondragon.

<sup>214</sup>Dorleta Ibarra (e-mail: [dibarra@mondragon.edu](mailto:dibarra@mondragon.edu))  
Mondragon University - Faculty of Engineering, Loramendi 4, 20500 Mondragon.

after an explanation and training about the concepts and items developed through the questionnaire in order to assure the awareness and calibration of company managers and personnel when filling it. The scales were based on previous research studies (Glass et al., 2018; Ślusarczyk, 2018) are Likert based (1 - Not important, 2 – Important, 3 - Very Important) or categorical.

The 35 companies sample size matched the total population of the companies participating in the study coordinated by the Regional Development Agency. The questionnaire addressed to managerial level personnel, CEOs, other C-Suite executives and department directors, was mostly filled by CEOs or other C-Level Executives (65,71%).

## 4 Results

By analysing the responses of SMEs regarding Industry 4.0, it is clear that the size and nature of the business model of SMEs has a great influence on the Industry 4.0 approach of the companies.

When considering the motivations of SMEs for Industry 4.0, Micro SMEs have no so clear their objectives regarding the implementation of I 4.0 in comparison with the Small SMEs (focus on business digitalization), or the Medium SMEs (focused on Flexibility and efficiency).

Moreover, product based companies showed higher levels of Industry 4.0 awareness, strategy deployment, investment and concern, what underlines the impact of Industry 4.0 in product based companies.

## 5 Conclusion

Spanish SMEs have risks that need to be managed in order not to become vic-tims of Industry 4.0, but beneficiaries of this revolution. In this context, the starting position of some SMEs in this race is reasonably good; nevertheless from the ability of companies to manage this paradigm (understanding, awareness, objectives, expectations, barriers and approaches), and from the use of its principles and technologies, will depend, largely, our competitive and economic future.

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- 13th International Conference on Industrial Engineering and Industrial Management XXIII Congreso de Ingeniería de Organización Gijón, Spain, July 11-12, 2019