**Enhancing sustainability performance through Digitalization and Servitization: Implications from the automotive industry**

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Abstract

Sustainability has become a major concern for highly technologized industrial sectors worldwide. Thus, over the recent years, companies have gradually increased their awareness on environmental issues and adopted a more responsible environmental behavior. However, this global upsurge in environmental concern is having a particular impact on the automotive industry forcing vehicle and auto parts manufacturers towards more sustainable practices in order to keep their operations in compliance with environmental regulations. This context has led companies to the use of digital technologies to support operations and fulfill environmental objectives. Equally, these technologies have enabled the implementation of digital servitization to overcome environmental challenges and enhance sustainability performance. This study analyses sustainability performance through the implementation of digitalization and servitization in the automotive industry. Following a mixed methodology approach this study demonstrates the importance of establishing a successional order of performance priorities where digital servitization must be considered a prerequisite for enhancing overall sustainability performance.

*Keywords*: Sustainability, Digitalization, Servitization, Digital services

**Introduction**

Sustainability has gained considerable attention from companies attempting to interweave environmental and social issues in their business strategy. Its implementation has induced companies to be more involved in complex global social-ecological challenges, such as climate change, biodiversity loss or poverty alleviation (Schäpke et al., 2017). Hence, over the years, companies are gradually transitioning towards a responsible environmental behavior and a sustainable management of their operations (Lindström et al, 2015) by conceiving sustainability as an opportunity upon which they can build difficult-to-replicate core competencies and optimize organizational performance (Le & Wang, 2017).

Likewise, servitization has proven to be a crucial strategy for capitalizing on opportunities to differentiate traditional product offerings and enhance customer engagement (Vandermerwe & Rada, 1988), increase performance (Kohtamäki et al. 2013), and achieve sustainable competitive advantage (Oliva & Kallenberg, 2003; Bustinza et al., 2017). Moreover, the emergence of digital technologies has lately enabled companies to dematerialize physical offerings and provide smart and connected products and services (Parida et al., 2014; Lenka et al., 2017). A recent research trend centered on exploring the utilization of digital technologies in servitized product firms defined as digital servitization (Vendrell-Herrero & Wilson, 2016).

Sustainability is particularly critical in the automotive industry where most vehicle and auto parts manufacturers strive constantly to reduce the environmental impact of both their products and their manufacturing processes (Vaz et al., 2017). As a matter of fact, the automotive industry is under constant pressure concerning environmental risks, emissions and safety, and is forced by regulatory agencies to make continuous technological improvements oriented to reduce waste, improve environmental performance, and consequently enhance sustainable operations (Koplin et al., 2007).

Within this context, digital servitization erects itself as an enabler of sustainability performance through the dematerialization of products, thus reducing material flow and energy consumption (Dobers & Wolff, 1999). Likewise, digital servitization allows better resource allocation and more accurate information sharing (Kindström & Kowalkowski, 2014) which facilitates availability of information so that products can be easily refurbished, remanufactured and recycled (Li & Found, 2017).

Furthermore, digital servitization enables the deployment of remote services to supplement or replace traditional technical services performed on-site without location or time constraints (Lerch & Gotsch, 2015), while potentiating the development, design, and redesign of custom-adapted services (Opazo-Basaez et al., 2017) mainly aimed at waste risk reduction and environmental impact.

**Methods**

The study focuses on sustainability performance through the implementation of digitalization and servitization, particularly set in the automotive industry. The study follows a mixed methodology combining quantitative and qualitative techniques. For such purpose, Orbis database was used to gather data from 256 companies followed by semi-structured interviews for data collection respectively.

**Findings and Implications**

Preliminary results obtained in this research suggest the relevance of digital services to facilitate waste management and reduce environmental impact. In addition, they highlight the importance of establishing a successional order of performance priorities, where digital servitization must be considered a prerequisite for overall sustainability performance.

The main contribution emerging from the study indicates the existence of two levels of sustainability improvements. The first one is referred in the present study as the *micro* level and relates to the implementation of digital services for supporting sustainable operations. The second is referred as the *meso* level and is considered as an overall and subsequent sustainability performance level.

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