

The Prospect of Smart-Remanufacturing in Automotive SMEs: A Case Study

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Abstract

The manufacturing sector is the second largest sector after agriculture in Pakistan. It represents 15.3% of the total workforce. To strengthen the large-scale industrialization with respect to economy and employment in manufacturing, Small and Medium Enterprises (SMEs) act as a source. Achieving sustainability for manufacturing SMEs is a great challenge since they do not comply with the economic, social, and environmental objectives of sustainability. Product remanufacturing and reuse are appropriate strategies for bringing sustainability to economically growing countries such as Pakistan where consumption of resources (i.e. materials, energy etc.) is of crucial consideration. Moreover, Industry 4.0 revolution unlocked the potential of remanufacturing by giving the concept of smart factory design and smart services.

It is good to note that the development of the remanufacturing industry is still undercover, neglected, and environmentally unfriendly, which become the main focus of this current research. This article includes a case study which enlightens the existing situation of auto-part remanufacturing in Pakistan. It presents a framework for sustainable manufacturing assessment of the existing remanufactured product to make it technically, economically, environmentally, and socially sustainable. The sustainable manufacturing criteria for assessment used during this current study are reliability, employment, life-cycle cost, and green environment. Lastly, it is also to exemplify how technology facilitators from Industry 4.0 can impact the automotive remanufacturing.

This research will provide a leading-edge to the automotive SMEs through proposing a sustainable manufacturing assessment model and integrated improvement framework. This will address the socio-economic and the environmental objectives of remanufacturing in Pakistan.

Keywords: Sustainability, Remanufacturing, SMEs, Sustainable manufacturing assessment criteria, Industry 4.0

Biographies

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