Development of a methodology to assist manufacturing SMEs in the selection of appropriate Green Lean Six Sigma tools

Cherrafi Anass[a], Elfezazi Said[a], Andrea Chiarini[b], Benhida Khalid[a] and Mokhlis Ahmed[a]
[a]Cadi Ayyad University, Av. Abdelkrim Khattabi, B.P. 511 – 40000, Marrakech, Morocco.
[b]University of Ferrara, Via Savonarola, 9, 44121 – Ferrara, Italy.
anass.charrafi@ced.uca.ma

Abstract

Research has shown that integration of Lean, Six Sigma and Green makes a positive impact on the sustainable performance of organizations. Many businesses around the globe have already started to implement the two approaches ensuring their development is economically, socially and environmentally sustainable. However, these companies have found their integration challenging. The purpose of this paper is to develop a methodology that can help small and medium enterprises (SMEs) to select an appropriate tool for the company which will maximum benefits from adopting the tool. This study focuses on the selection of an appropriate Green Lean Six Sigma tool for manufacturing SMEs. The methodology contains a quantitative approach that can assist SMEs in identifying the appropriate tool. A literature review, collation of experts' opinions via a questionnaire and a case study are presented in this research. The findings revealed that the proposed methodology was effective in identifying the appropriate Green Lean Six Sigma tools for companies, according to the key performance indicators in the manufacturing SME sector.

This methodology has proven to be useful for recommending the application of Green Lean Six Sigma tools in a company's attempt to become Greener, bridging the gap identified in the literature review.

Keywords

Lean Six Sigma, Green, SMEs, Tools, Methodology.

Biography

Cherrafi Anass is a research scholar at the Department of Engineering Science, Faculty of Science and Technology, Cadi Ayyad University, Marrakech, Morocco. He is doing his PhD in the area of Green Lean Six Sigma. He has about 3 years of industry experience and teaching experience. His research interests include sustainability management, world class manufacturing, lean production, six sigma, integrated management systems and supply chain management. Cherrafi Anass is the corresponding author and can be contacted at: anass.charrafi@ced.uca.ma.

Elfezazi Said is an Associate Professor in the Department of Industrial Engineering and Maintenance at the University of Cadi Ayyad University (Morocco). He is the leader of the Research Team in Industrial Engineering at Higher School of Technology of Safi. His research interests include supply chain management, Lean Six Sigma, production and operation management.

Benhida Khalid is an Associate Professor at the University Cadi Ayyad of Marrakech (Morocco), a member of the Research Team in Industrial Engineering, having a state doctorate and a PhD in Science (France). His researches fit into the engineering domain.

Mokhlis Ahmed is an Associate Professor at the University Cadi Ayyad of Marrakech (Morocco). He holds his HDR in Industrial Engineering. His research interests include maintenance performance, and fields related to productivity management.

Elamrani Fatima Zohra is an Associate Professor at the University Cadi Ayyad of Marrakech (Morocco), a member of the Research Team in Industrial Engineering. His researches fit into the data analysis.