Developing a Green Supplier Risk Assessment System Applying Natural Language Processing and Life Cycle Assessment : An Empirical Study

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Abstract. Driven by global climate change and Net Zero policies, green supply chain management has become the key to the competition of global enterprises. Carbon emissions and environmental impact have become important factors that must be considered in the supply chain operation process. Among them, supplier selection is the first process in supply chain operation. Although many studies have discussed the related issues of green supplier assessment, the potential risks of some environmental impacts are still not comprehensive enough, plus it is difficult to assess the potential risks of suppliers on the Internet, because the process of text data analysis and evaluation is not only time-consuming and costly, but also unable to obtain the latest supplier risk information on time. This study applies natural language processing(NLP) model and life cycle assessment(LCA) to develop a green supplier risk evaluation system. The potential risk assessment of suppliers can be achieved through the KeyExtractor's keyword extraction method. The main contribution of this study is to develop a novel green supplier evaluation method based on deep learning models to promote the implementation of green procurement and reduce the carbon footprint of suppliers. Practically, the proposed method automates supplier risk assessment, not only can obtain the latest information and trends of supplier risk on time and reduce the time and cost of risk analysis. Hence, the competitiveness of enterprises would be enhanced.

Keywords. Green Supplier Selection, Natural Language Processing, Life Cycle Assessment, Supplier Risk Assessment

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