

Innovation through design of more sustainable systems: LCA and the use of TRIZ

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Goal:

The objective of the research is to show that, given the current ecological crisis, there is a need to review industrial practices and propose a new design for more sustainable systems. In this context, some proposals have emerged, including life cycle assessment (LCA), which encompasses the entire production chain: extraction of natural resources, transport, production process, consumption and disposal (waste). Thus, by measuring each phase of a production chain, it provides opportunities to identify critical points for environmental innovations. Considering this innovation generation, philosophies such as the theory of inventive problem solving (known as TRIZ) have gained relevance by allowing their users to access methods to solve difficult technical problems, in a structured way and creative solutions. TRIZ is defined as being a systematic methodology, oriented to solution of inventive problems, these functions are identified by analysing the problem itself and its socio-economic circumstances. The discussions underline the need of integrating these two literature axes, considering the potential to provide new means to tackle the ecological crisis.

Method:

As method, the systematic literature review method was adopted for this study, this decision was supported by three main aspects: (i) as it is a rigorous methodological process that results in the selection of the most relevant articles, thus reducing the possibility of losing important information ; (ii) by establishing the inclusion and exclusion criteria, the final selection is allowed to be reproducible; (iii) it consists of mapping, consolidating and evaluating the available knowledge of a topic, in addition to identifying the knowledge gaps to be filled, in order to further develop the body of knowledge accumulated in the literature.

Results:

As main contribution of this study is presenting that: (i) LCA allows finding critical points in product life cycle; (ii) TRIZ methodology can help to points out the type of change to be implemented in order to improve product in its critical points. (iii) the interrelationship between LCA and TRIZ should promote better opportunities facing the ecological crisis.

