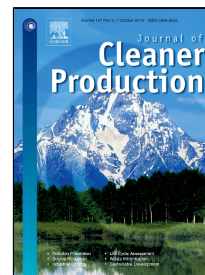


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Integrated Product Service Offerings – Challenges in Setting Requirements

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Abstract

The objective of this paper is to explore what challenges exist when setting requirements for an Integrated Product Service Offering (IPSO). An IPSO, sometimes called Product Service System, is a concept with increased interest from manufacturing companies. It consists of a combination of products and services that, based on a life cycle perspective, have been integrated to fit targeted customer needs. In order to achieve a successful IPSO, it is important to collect aspects from many actors, something which sometimes is challenging for companies moving towards providing IPSOs.

The four challenges found when setting requirements in IPSO development are; identification and inclusion of relevant aspects from relevant actors throughout the IPSO's life cycle, understanding of the underlying aspects for all requirements for all elements of the offering, prioritization of requirements, and the difficulty to track how requirements affect each other between different elements in the IPSO.

The methodology used to find these challenges was a combination of a structured literature review and an interview study at three manufacturing companies moving towards providing IPSOs.

Keywords: Requirements engineering, Integrated Product Service Engineering (IPSE), Eco-design, Product Service System (PSS), Systems engineering

1 INTRODUCTION

Among manufacturing companies, there is an increased trend of providing customers with integrated product and service offerings (Tukker, 2004, Lingegård et al., 2010, Lindahl et al., 2014, Mont, 2004). An integrated product service offering (IPSO) consists of a combination of products and services that, based on a life cycle perspective, has been integrated to meet customer needs (Lindahl and Sundin, 2012). In addition, in order to operate well together, the IPSO's products and services are mutually adapted and developed in parallel. Furthermore, providing an IPSO often implies that the provider is paid for the function delivered by the IPSO contract, i.e. not for needed e.g. products, service and spare parts. This normally implies a mindset change towards a life cycle thinking, and a focus on limit the need of products, service and spare parts. Ways to do this can be to prolong used products life cycles and make them more robust.

From an environmental point of view, IPSOs have been shown to be a preferable option in comparison to traditional sales (Lindahl et al., 2014). Especially from a resource perspective, IPSOs have shown economic and environmental benefits when combined with, e.g., reuse and remanufacturing (see, e.g., Lindahl et al. (2014) and Sundin and Bras (2005)). This is in line with the sustainable development goal stated by the United Nations in 2015 to “ensure sustainable consumption and production patterns” that include, e.g., “efficient use of natural resources” and “reduces waste generation through prevention,

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