A Morphological Thinking Approach for Conceptualising Product-Service Systems Solutions

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Abstract : The study addresses the conceptual design of Product-Service Systems (PSSs) as a means of innovating solutions with the aim of reducing the environmental load of conventional product based solutions. Functional approaches targeting PSS solutions are developed in instinctive methods within the constraints of the setting in which they are conceived. Adopting morphological matrices in designing PSS concepts allows a thorough understanding of the settings, stakeholders, and functional requirements. Additionally, such a methodology is robust and adaptable to product-oriented, use-oriented and result-oriented systems. The research is based on a functional decomposition of the task in a similar way as in product design; while extended to include service components, providers, and receivers, while assessing the adaptability and homogeneity of the selected components and actors. A use-oriented concept is presented via a practical case study at an agricultural boom-sprayer manufacturer to demonstrate the effectiveness of the morphological approach to justify its viability. Additionally, a life cycle analysis is carried out in order to evaluate the environmental advantages inherited in a PSS solution versus a conventional solution. In light of the applications presented, the morphological approach appears to be a valid and generic tactic to conceiving integrated solutions whilst capturing the interrelations between the actors and elements of an integrated product-service system.

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