Decision-making and feedback as foci for knowledge-based strategies supporting concept development - DTU Orbit (03/04/2019)

Performance attributes of the product, such as robustness, reliability and safety are widely acknowledged as relevant considerations through the design process. Yet they are more important in early design stages to ensure the feasibility of design requirements and reduce later design rework in the product lifecycle. This influence is due to the available room for making decisions, together with the cascading effects of these through downstream design activities [Andreasen & Olesen, 1990].

Prior studies revealed the incompleteness of information from early stages for using current methods for robustness, reliability and safety, which also confirmed the problem of the extensive resource requirements in their use [Marini, Restrepo & Ahmed, 2010]. In response to this conclusion, a longitudinal study was performed in collaboration with the manufacturer of an insulin injection pen. This study followed the development of 20 solution alternatives for a new design of such device.

This paper aims to describe the influence of design decisions and feedback originated from failures in solution alternatives during the concept development activity. It identifies the characteristics of the development process that influence practices in decision-making and feedback, and it discusses strategies to evaluate and mitigate failures in solution alternatives.

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