Dealing with sustainability aspects in product and production co-development: Current state and a conceptual requirements management framework
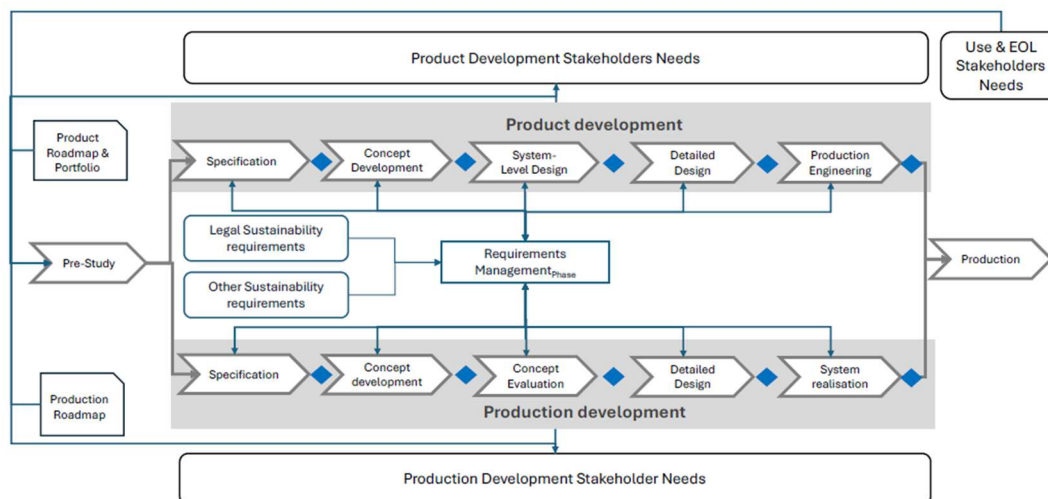
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The need for sustainable products and production systems has led to a renewed focus on development processes that encompass the life cycles of products and production systems, as well as their circularity. There has been a focus on the development of support for product development, but there is a gap in supporting the co-development of product and production systems, focusing on sustainability.

Requirements management has the potential to support this co-development. Understanding the current state of practice in working with sustainability aspects and requirements related to product and production development is essential. In collaboration with eight manufacturing companies, working with product development, production developments and production operations, the current state and challenges of working with sustainability aspects and requirements, were reviewed.

Result

A need for a systematic method that will consider stakeholder needs from the entire lifecycle, create ownership and traceability, keep track of changing regulations and maturing product and production systems, and support data management was identified. A conceptual framework was developed and presented based on these findings. This framework can potentially improve knowledge management and support sustainable product lifecycle management.

Future work will focus on developing and evaluating the conceptual framework. Directions for future development include:

- Method development for sustainability requirements management on the entire product lifecycle or a particular lifecycle phase.

- Method development focusing on requirements management aspects such as elicitation, development, analysis, validation, documentation or communication.

- Develop a method for managing sustainability requirements using PLM or project management tools, supporting knowledge transfer to tools in each development phase.

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