GRACE

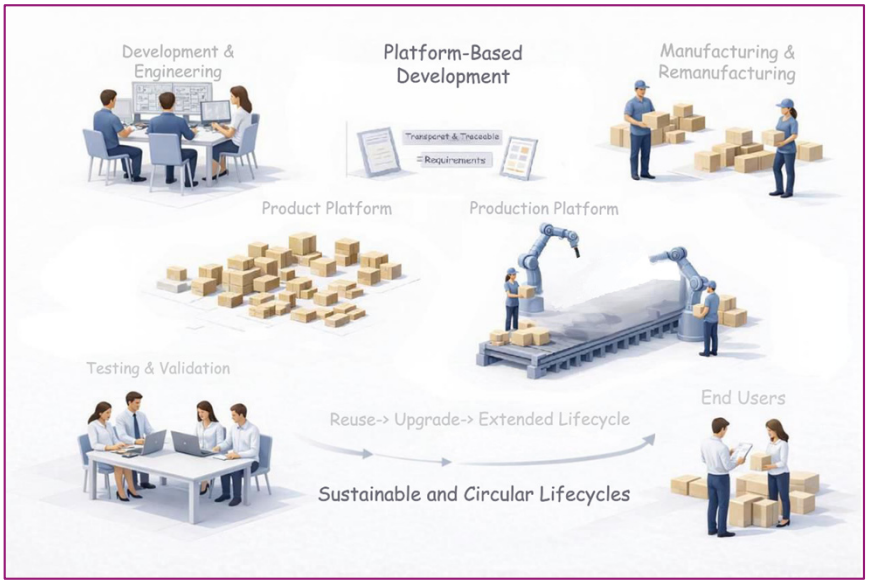
JÖNKÖPING UNIVERSITY
School of Engineering

GRACE: Prime

Platform Development and Requirements Management for Sustainable and Circular Product and Production Lifecycles

This project explores how platform-based development and requirements management can embed sustainability and circularity into product and production development across the entire lifecycle. The objective is to connect sustainability and circularity goals directly to design decisions and solutions, enabling reuse, upgradeability, and longer system lifecycles.

Global sustainability challenges, increasing regulatory pressure, and resource constraints demand new approaches to product and production development. Although platform thinking has proven effective for cost, quality, and time efficiency, sustainability and circularity are rarely embedded systematically in platform development or requirements management. Sustainability and circularity requirements are often disconnected from operational design decisions, making them difficult to prioritise, balance, and implement across the lifecycle. At the same time, both manufacturing and construction are facing growing complexity, longer responsibility chains, and uncertainty related to future needs and legislation. Prime is driven by the need to integrate platform-based development with transparent and traceable requirements management to support reuse, remanufacturing, upgradeability, and extended lifecycles. The project builds on established research in platforms, modularisation, co-development, and requirements-driven development, combined with concrete industrial challenges and practices.



IMPORTANCE OF PROJECT

Global sustainability challenges and circular economy principles demand new approaches to product and production development. Platforms - shared assets and well-defined system interfaces - offer a promising strategy to enable reuse, remanufacturing, and efficient development. However, achieving these goals requires integrated strategies that combine platform design, coordinated development processes, and transparent requirement management aligned with sustainability and circularity objectives. The purpose of this research is to explore and support integrated platform strategies that, combined with transparent requirement management, can enable sustainable innovation, extend product life cycles, and promote circular flows in both product and production development.

EXPECTED PROJECT RESULTS

- Models and development guides for product and production platforms that support reuse, maintenance, repair, upgrading, and remanufacturing.
- A coordination framework and support for platform-based co-development that aligns product and production solutions with sustainability and circularity goals.
- A transparent and traceable requirement management framework integrating sustainability and circularity objectives, supported by IT and digital tools.
- Support for integrating sustainability and circularity principles into the design and use of product and production platforms.

FACTS

University: School of Engineering (JTH), Jönköping University

Industrial partners: Kinnarps AB, Lindbäcks AB, OBOS Sweden AB, Thule Sweden AB

Project duration: 2026 – 2029

Research team: Fredrik Elgh, Paraskeva Wlazlak, Djordje Popovic, Gustav Jansson, Abdul Wahab

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