

GRACE FUTURE STATE - PRODUCT REALISATION 2032

GRACE is focused on **integrated and platform-enabled product realisation** to support the green transition within the manufacturing industry. Eight **research issues revolving** around four themes are addressed:

- A. Requirement specification and management addressing new product lifecycles and circular manufacturing.
- B. Platform principles and lifecycle strategies on different system levels.
- C. Product information management supporting circular strategies.
- D. Product design supporting circular strategies.
- E. Shared understanding and visions supporting the green transition.
- F. Integrating sustainability and circularity knowledge in product realisation
- G. Production solutions supporting circular strategies.
- H. Production information management related to circular strategies.



Green acceleration through integrated and platform-enabled product realisation

Version: 251014

Future state and goals A&B Requirement management and platform development

Requirement management and strategic transparency

The goal is an established requirement management process that integrates sustainability and circularity goals throughout the product life cycle. Through system support, AI and clear communication, it is ensured that requirements from legislation, customers and internal goals are traceable, accessible and understandable for all departments.

Platforms as enablers of sustainable innovation

The goal is a common strategy for product and production platforms that enables reuse and efficient development. The platforms support maintenance, upgrading, remanufacturing and circular flows, extending product life cycles and reducing resource consumption over time.

Platform-based product and production development

The goal is that product and production development is supported by common platforms that enable coordination towards circular goals and extended product life cycles. By starting from common architectures and system interfaces, conditions are created for effective collaboration between development and production.



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Future state and goals C&H Product and production information management

Traceability and transparency

The goal is to establish traceability of products and components throughout their life cycle – from design, material selection and manufacturing to use, reuse and recycling – by structuring, managing and making relevant data available to stakeholders throughout the value chain.

Traceability covers production flows, machines and materials for resource efficiency, waste reduction and reuse.

Transparency is achieved through linked systems throughout the value chain.

Integration of sustainability and circularity data

The goal is that information about environmental requirements, material data, components, and design decisions is interconnected in a structured way that enables collaboration and availability between different systems and domains to support product and production development.

Different parts of the business and external partners have compatible working methods and access to relevant data.

Digital technology as an enabler

The goal is to develop and use advanced digital technology to monitor products and equipment throughout their life cycle, enable extended technical life, optimise material use and minimise climate impact.

Digital technology supports analysis, repair, remanufacturing and development of new circular business models.



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Future state and goals D&G Product and production development and solutions

Development methods for sustainable products and production systems

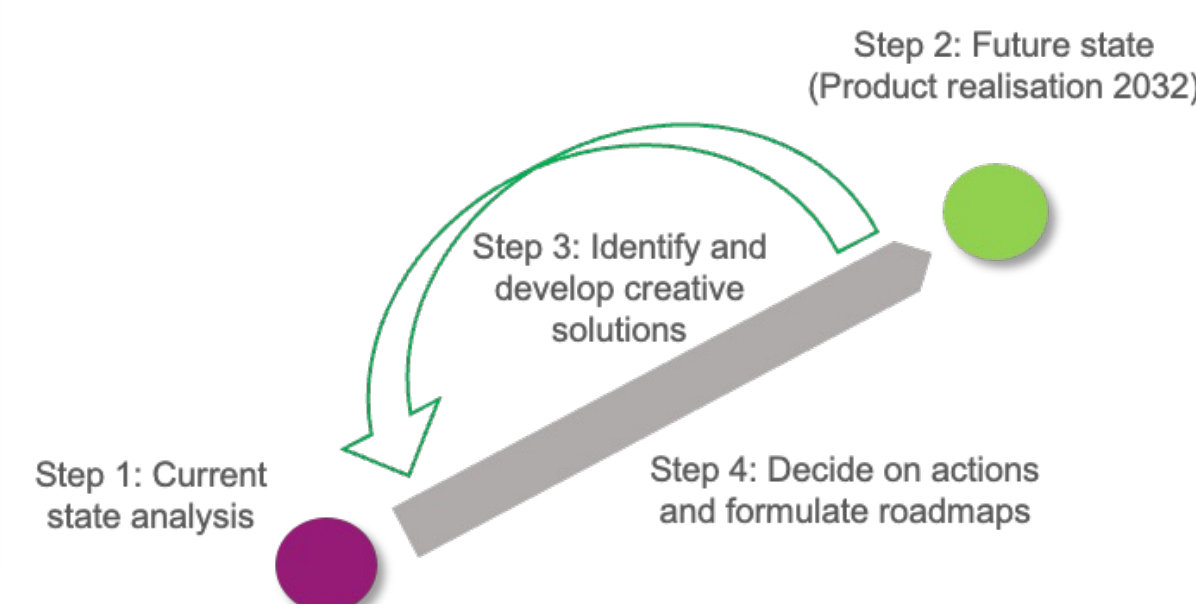
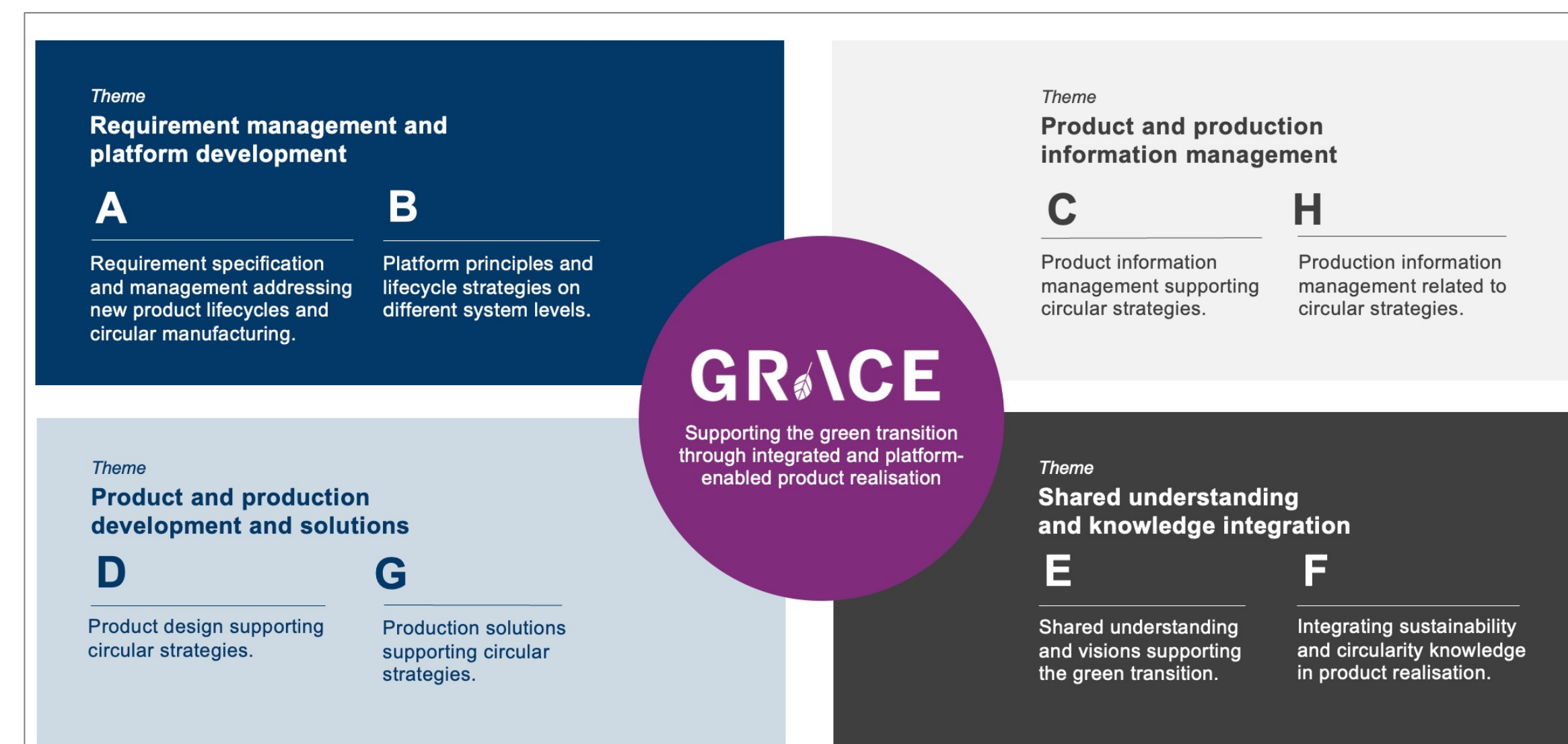
The goal is to develop products and production systems that are designed with a focus on sustainability and circularity from the outset by minimising material consumption, using more sustainable and recycled materials, reducing energy consumption in production and ensuring that products are adapted for reuse and recycling.

Advanced technology for increased durability and flexibility

The goal is to increase the use of advanced technologies, such as additive manufacturing, vision systems and automation to enable more sustainable, adaptable and efficient solutions.

Leverage advanced technology for increased durability and flexibility

The goal is to develop products and production systems designed with a focus on sustainability and circularity by minimising material consumption, using more sustainable and recycled materials, reducing energy consumption in production and ensuring that products are adapted for reuse and recycling.



ProValue procedure

Through a four-step procedure, the Provalue project develops a common and refined vision for GRACE – Product realisation 2032.

GRACE Future State is based on the needs of participating companies and the current state of research. Through ProValue, a roadmap for GRACE and for each company is created – i.e. a foundation for future GRACE projects.



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Future state and goals E&F Shared understanding and knowledge integration

Strategic direction and governance for the integration of sustainability and circularity in product realisation

The goal is clearly communicated strategies for sustainability and circularity are as self-evident as safety, quality and cost in daily work. Products and production systems are designed to minimise environmental impact, where the CO₂ footprint from production is traceable and visible in the product's total climate impact.

Circularity and sustainability are natural parts of the daily work in product realisation

The goal is that sustainability and circularity are as self-evident as safety, quality and cost in daily work. Products and production systems are designed to minimise environmental impact, where the CO₂ footprint from production is traceable and visible in the product's total climate impact.

A learning and sustainability-driven culture in product realisation

The goal is an organisation that functions as a learning environment where knowledge is integrated and shared. A shared mindset has emerged where sustainability and circularity are seen as natural parts of innovation and development.

The result presented here was developed as part of the research project ProValue – Product realisation for future value creation (October 2024-November 2025)



If you have questions about the content in this Golden Nugget, please contact Kicki Säfsten at kristina.safsten@ju.se