Karlsruher Institut für Technologie

Institut für Produktionstechnik

BACHELOR/MASTER THESIS

KNOWLEDGE GRAPHS FOR DECISION SUPPORT IN CIRCULAR FACTORIES

DESCRIPTION

Remanufacturing is the heart of a sustainable circular economy, offering enormous potential for saving resources and reducing costs. It's not just about the traditional refurbishment of components, but also about making smart decisions regarding product upgrades, efficiently utilizing components, and seamlessly integrating them into production planning. By optimizing these processes, companies can extend product life cycles, reduce waste, and lower environmental impact—all while improving economic efficiency.

To enable data-driven decisions in these areas, this Master's thesis aims to design a knowledge graph that maps all relevant entities and relationships in remanufacturing. The goal: Efficient production planning that supports companies in optimally utilizing returned products, strategically integrating product upgrades, and smoothly complementing existing processes. This intelligent system will help businesses enhance sustainability while remaining competitive in an increasingly resource-conscious market.

TASK

- Systematic literature review on relevant data for the knowledge graph and identification of entities and relationships in circular production
- Research and definition of ontologies for the standardized description of entities and relationships
- Prototype implementation of the knowledge graph using Python

ADDITONAL INFORMATION

- Start: As soon as possible
- Duration: 6 months
- Studies: Mechanical/Industrial Engineering or similair
- Required Documents: CV and transcripts of grades

CONTACT

M.Sc. Maurice Engels
Gebäude 50.36, Raum 107
Tel.: +49 1734 216348
E-Mail: maurice.engels@kit.edu