



R3-MYDAS

Newsletter 4

R3-Mydas Business Modelling for New Circular Value Chains and the Marketplace Services



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In the R3-Mydas project, we formulated new business models for the most promising business scenarios in the R3-Mydas Demo Cases – Crankshafts in oil and gas, EV batteries and gearboxes in wind turbines - as well as for the marketplace itself. These models which are currently underutilized at an industrial level, will become actionable through the R3-Mydas platform and its associated services. Each business model aligns with Circular Economy (CE) principles emphasizing sustainable remanufacturing value chains. They account for stakeholder's relationships to close the loop, their interaction mechanisms, the value-propositions offered through the services, and revenue models.

To illustrate these aspects, Circular Economy Business Model (CEBM) framework has been applied showcasing the environmental and social impacts of the developed technologies and services. This ensures building holistic business models supporting both economic viability and sustainability.

For simulating business models that are technically advanced, market relevant and economically sustainable, it is important to evaluate various scenarios and factors in which a business can be affected on a long-term basis. Within R3-Mydas project, scenario analysis for each Demo Case and the Marketplace, considering market and technology trends have eventually helped identify the most suitable business model scenario using Circular Business Model Canvas.

Demo Case 1: Remanufacturing of Oil and Gas Crankshafts

For remanufacturing of oil and gas in crankshaft industries, the primary goal is to leverage advanced and automated laser-cladding technology, transforming the remanufacturing process by introducing digital-based 3D path planning for laser coating processes through robot collaboration developed by AIMEN and programmed by ZIKNES. This innovation enables TMCOMAS, a crankshaft manufacturer, to enhance its traditional business, which has relied on strong customer relationships within the oil and gas sector, providing high-quality repair services. The R3-Mydas marketplace further expands accessibility to advanced crankshaft remanufacturing services, providing precise and efficient process optimization. Additionally, TMCOMAS can offer these services through a rental model (e.g., Machinery-as-a-Service) to smaller businesses lacking in-house remanufacturing capabilities.

Demo Case 2: Remanufacturing of Electric Vehicle (EV) Batteries

In EV battery sector, the focus is to strength the synergies and collaboration between different stakeholders and reduce uncertainties and ambiguity imposed from the battery performance throughout its lifetime. AVL, an industry partner, working on anomaly detection and diagnosis of the State-of-Health (SOH) of batteries during the disassembly phase, offer these advanced engineering services by integrating data analytics ensures OEM that will receive accurate and reliable diagnostics throughout the battery lifecycle. Complementing this, SPIN's robotic solutions incorporate inspection cameras to ensure safe and efficient battery disassembly, enabling additional remanufacturing services to be offered through the R3-Mydas marketplace.

Demo Case 3: Remanufacturing of Wind Turbine Gearboxes

For wind turbine gearboxes the focus is on implementing Additive Manufacturing (AM) or recoating techniques, engineering tools and mitigation method along with failure predictive analysis improve the remanufacturing processes and minimize future failure rate. By either using the remanufactured part in a newly designed component or in the original product guaranteed a higher strength and resistance offered by FLENDER, industry partner manufacturing tailor made gearboxes. Therefore, FLENDER can offer its remanufacturing processes through Equipment/Machinery-as-a-service model to the customers who don't have in-house huge machineries, so they can rent a unit section receiving advanced knowledge developed within the R3-Mydas project, to operate their businesses. The R3-Mydas marketplace will also facilitate these service access allowing customers to book accurate remanufacturing services to optimize their production and reduce the down time operations.

R3-Mydas Marketplace: Unique Features and Vision

The R3-Mydas marketplace stands out with two key functionalities: first to promote remanufactured components and products and second to offer remanufacturing resources and services to a broad range of customer bases. Built on the MARKET4.0 platform developed by NCI, the marketplace leverages advanced functionalities like matchmaking and bidding to support remanufacturing tools, materials, infrastructure-as-a-service, and other services.

Proposed business model scenarios for the marketplace focus on operational and ownership strategies. These include management by industrial partners with NCI's assistance as a service provider or outsourcing to external operators managing similar marketplaces. These options are currently being evaluated by EIT Manufacturing, the activity leader, to align with the project's technical developments.