Newsletter 9

From Battery Data to Circular Decisions

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Driven End-of-Life Management in R3-Mydas

Within the R3-Mydas project, "Analytics-as-a-service for remanufacturing" focuses on transforming complex e-vehicle battery data into clear and actionable insights that support remanufacturing and second-life decisions.

Determining whether batteries that reach their end of life can be safely reused, repurposed, or recycled is fundamentally complex. It requires interpreting large volumes of operational and testing data, understanding battery degradation behaviour, evaluating safety risks, and ensuring compliance with evolving regulatory requirements. In many industrial settings today, such assessments remain fragmented, manual, and difficult to standardise, limiting the scalability of sustainable battery lifecycle management.

Within the R3-Mydas project, ITML develops an AI-driven decision solution designed to support structured and explainable end-of-life battery management. The platform aims to transform heterogeneous battery data into decision-support outputs that can guide stakeholders in selecting the most appropriate treatment pathway.

Battery analytics generated by advanced data-driven models are securely transmitted through ITML's Data Fusion Bus, enabling controlled data exchange and integration of diverse analytical inputs. These analytics support the estimation of degradation behaviour and the detection of potential anomalies, with State of Health (SoH) serving as a key indicator of battery condition.

Within this context, the Business Intelligence Layer combines analytical results with structured knowledge and decision rules stored in a knowledge base, including safety requirements, regulatory constraints, environmental considerations and battery-specific characteristics. In this way, SoH values are not treated as isolated technical indicators but as meaningful inputs for evaluating the operational and economic potential of battery assets. For example, different SoH ranges may correspond to different treatment pathways, such as continued use, remanufacturing, repurposing, or recycling, depending on whether additional technical, safety, and regulatory requirements are fulfilled.

By integrating analytics, knowledge-based reasoning, and user-oriented decision support tools, battery condition assessment becomes more transparent and consistent. Dashboards and explainable recommendations help decision makers understand the implications of battery degradation, supporting planning activities, resource optimisation, and risk reduction across the battery lifecycle.

Overall, R3-Mydas contributes to closing the digital loop between battery data analysis and industrial decision-making. By turning health indicators into structured business intelligence, R3-MYDAS supports more efficient remanufacturing strategies and promotes the sustainable use of battery resources in line with circular economy objectives.