Lasers4MaaS' Technology Update – Futurice

Lasers4MaaS is a Horizon Europe initiative developing next-generation Laser-as-a-Service (LaaS) solutions for flexible, digital and sustainable manufacturing. Bringing together industrial companies, research organizations and technology providers across Europe, the project combines advanced laser processing, dynamic beam shaping, industrial data and digital manufacturing platforms to support more adaptable and efficient production.

Within the project, Futurice contributes its expertise in digital transformation, service design and human-centered software development. The company leads the development of the digital service platform that will coordinate decentralized manufacturing operations, making complex engineering workflows more accessible through an intuitive online environment. Its work provides an important foundation for moving from individual laser machines towards connected manufacturing capabilities that can be accessed on demand.

Futurice is responsible for the architecture of the platform application and its user experience, as well as the central Welding Process Analytics Database. Together, these elements are designed to connect digital process definitions, experiment records and shop-floor information across different sites and technology providers. A modular, cloud-native architecture uses standard REST/JSON interfaces and OpenAPI specifications to integrate services developed by consortium partners, while hardware connectors accommodate diverse industrial equipment and data formats.

A central technical activity is the implementation of a secure real-time monitoring pipeline using NATS JetStream to manage industrial telemetry. Futurice is also integrating natural-language search capabilities using open-weight generative AI models, alongside an augmented-reality remote-assistance environment based on live video and spatial annotations. These complementary functions are intended to support process monitoring, access to technical knowledge and collaboration between on-site operators and remote specialists.

Interoperability and protection of industrial know-how are key requirements for Manufacturing-as-a-Service. Futurice's platform is designed around tenant-level data isolation, OpenID Connect authentication and encrypted communications to safeguard sensitive process information. Its European cloud deployment and use of open technologies also support the project's objective of reducing dependence on proprietary infrastructure. A multi-level interoperability framework addresses the challenge of translating digital process descriptions into consistent results across different physical manufacturing systems; this approach was presented at I-ESA 2026.

The team has already finalized the architecture of the Lasers4MaaS digital platform and released version 0.5 to consortium partners for feedback. An operational preview of the platform application and database enables initial testing of project creation and experiment logging. These milestones establish the basis for subsequent integration with laser processing equipment, partner services and industrial demonstrators.

The platform is being developed to support flexible laser beam welding with dynamic beam shaping and intelligent process control. Potential users include job shops, original equipment manufacturers, industrial researchers and manufacturers managing low-volume, high-variety production. The approach could serve applications across automotive, aerospace, energy, pharmaceuticals and other sectors where access to specialized manufacturing capabilities and reliable process information is essential.

By linking production resources, monitoring data and digital services, Futurice aims to simplify equipment onboarding, accelerate the ramp-up of laser processes and enable more flexible production requests. The platform is also designed to support sustainability-related functions, including digital product passport information, energy-aware production choices and remote technical assistance. Together, these developments contribute to the Lasers4MaaS ambition of making advanced laser manufacturing more accessible, connected and responsive to industrial needs.