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CONVERGING

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DELIVERABLE

D3.3 – AI enabled production setups for multi-agent smart manufacturing

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Executive Summary

The report details the progress made in CONVERGING's WP3 over the past six months (M31-M36), highlighting the progression of software and hardware components aimed at implementing adaptable, scalable, and AI-powered production systems across different levels, with a focus on robotics.

WP3 has seen the creation of eight (8) software and hardware modules, as an outcome of 4 distinct tasks (T3.1-T3.4). The **Dynamic Work Reorganization** module (DWR) incorporates considerations of human factors, safety, and environmental sustainability into the allocation of tasks and actions for cell resources. Meanwhile, the **AI Station Controller** module (AISC) undertakes the flawless execution of robotic application decisions via real-time coordination. The **Collaborative Robot Control** module (CRC) improves robots' path planning and real-time task modification abilities, leveraging human feedback and self-learning for superior performance. Furthermore, the **Perception and Autonomy Module** (PAM) boosts robot independence by providing advanced perception capabilities for effective human-robot collaboration, including anticipatory adjustments and 3D environmental mapping. The **Humanoid Collaborative Robot** (HCR) consists of a humanoid robot undertaking precise assembly tasks. The **Remote Inspection Robot** (RIR) is used for remote inspection and maintenance tasks in confined spaces, consisting of a robot-on-robot configuration. The **Medium Payload Collaborative Manipulator** (MPCM) comprises of a medium payload industrial robot enhanced for collaborative applications. Lastly, the **Polishing Robot** (PR) is used to perform automated polishing tasks.

In conclusion, CONVERGING D3.3 presents the final updates and new features of 6 out of the 8 modules (CRC, PAM, HCR, RIR, MPCM, PR), as the final version of the other two (DWR and AISC) was presented in D3.2.