

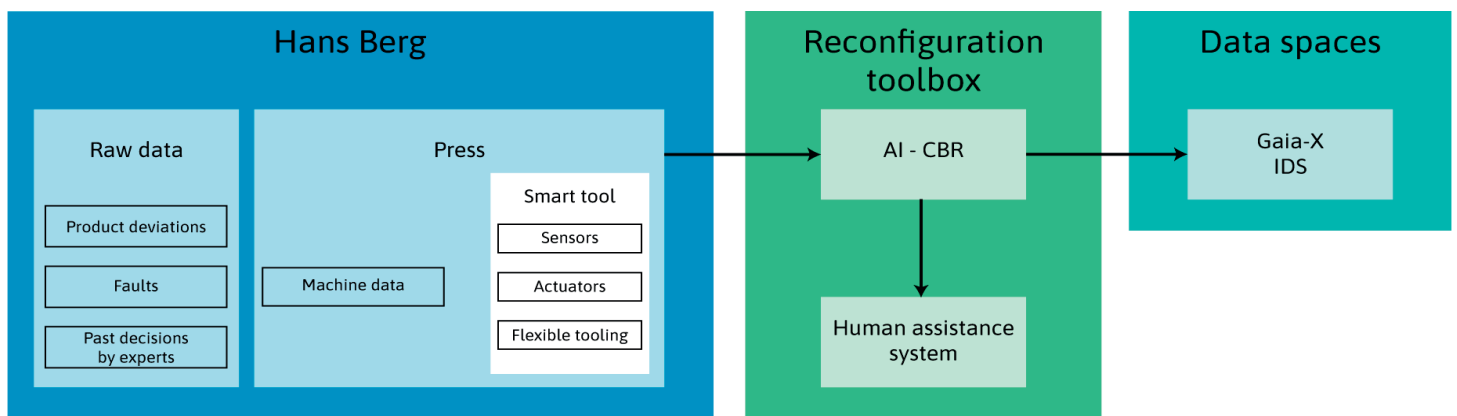
Use case with Hans Berg Reconfiguration measures after a tool change

The challenge

Adjustment measures are necessary when a tool or material needs to be changed. Currently, this is done by hand, and it depends on the experience of the employee how long adjustment takes and how successful it is. Due to manual operation and several trials in adjustment, a lot of material is wasted.

The adjustment measures are derived from the defect pattern as the necessary information is not available from inside the tool. The know-how of one expert in reconfiguration and tool adjustment is tied to one product and can only be transferred to other products to a limited extent.

The vision of the future process



A smart tool with sensors and the recording of manual tool adjustments using human motion capture will support the adjustment measures and reconfiguration needs. Artificial intelligence (AI) will compare the information with a knowledge base that links faults to successful coordination measures.

With the support of a reconfiguration toolbox for the human assistance system, which incorporates a fuzzy Case-Based Reasoning (CBR) system and deep learn-

ing algorithms, workers will be guided through the reconfiguration tasks. Furthermore, the relevant data will be shared on dataspace like Gaia-X.

This will reduce the amount of produced defective components, the time required to reconfigure the tooling and the need for the experience required to perform the adjustment tasks as well as the amount of waste generated in the manual adjustment process.

About Hans Berg

Hans Berg GmbH & Co. KG is an internationally operating manufacturer of deep-drawn and metal tube components for a vast diversity of industries. The group has sites in Reichshof, Germany (headquarters), Florstadt, Germany, and Dilovasi/Istanbul, Turkey, employing roughly a staff of 600 people and specialising in cold-forming, joining, threading and cutting tool technology.

Hans Berg is the technology and market leader for fittings and connections for radiators and convectors. Other important business sectors include heating, cooling and automotive industry. For the latter, Hans Berg develops and manufactures high-precision and safety components for large and specialised suppliers, for example applied within the fields of vibration damping and airbag gas generators.

About Flex4Res

Flex4Res aims to provide an open platform to support production network reconfiguration for resilient manufacturing value chains. In four industrial pilot projects, the project team will test and validate the integrated solutions on the reconfiguration of different hierarchical levels from the value chain to machines and devices.

The research project was launched on 1 January 2023, runs for three years and is led by the Laboratory for Manufacturing Systems & Automation. The funding framework is provided by the European Health and Digital Executive Agency (HaDEA) as part of the European Union's Horizon Europe research and innovation programme.



Co-funded by the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101091903.