GF Smart zero-defect Factory

"The full lifecycle data of GF spindles will be synthetized in an open warehouse, which will gradually deliver through a cognitive, smart planning system both a zero defect manufacturing factory and errorless machines."

Factory 4.0 Big Data Pilot Motivation

- Optimize the GF spindle’s component production efficiency combining machine tool predictive models and part quality control data
- Improve spindle manufacturing lead time and quality towards zero rework and no scrap operations with the development of a digital and connected assembly
- Develop and exploit an intelligent factory data management and planning system for zero defect spindle manufacturing and device operation

Spindle Component Manufacturing Process

- Full data sourcing and aggregation across the manufacturing line and usage phase
- Build-up of Factory KPIs monitoring and analytics tools for real-time production flow diagnostics
- Machine tool predictive maintenance and smart planning system for optimum spindle manufacturing

Competitive Advantages

- Reduction of rate of spindles rework from 10% to 0-5%
- Reduction of rate of spindle return to factory from 3-13% to 0-3%
- 10% increase of the overall equipment effectiveness
- Increase of time before maintenance of spindles from 5’000-10’000 hours to 20’000-50’000 hours

Big Data Pilot Lifecycle Scope

- Digital Engineering
- Production Planning
- Smart Operations
- Smart Production
- Smart Services

Big Data Pilot Site

Pilot Partners

GF + get it right EuroTech + PMI Platform & QIF

Machine Tool Lighthouse Factory

Big Data Analytics

PMI Platform & QIF

Metrology

20M€ budget | 100M€ of private investment | 50 partners | 16 countries
**I4.0 Big Data Pilot Solution Framework**

Boost 4.0 big data solution framework leverages on Big Data Europe (BDE) big data pipeline technologies, International Data Spaces Association (IDSA) specifications for data sovereignty, FIWARE NGSI-LD API for open IDS implementation and Hyperledger technologies for transaction traceability. Boost 4.0 big data platforms and technologies align to RAMI 4.0 and are integrated under the Digital Shopfloor Alliance (DSA) autonomous service framework to ensure reduced cost, time and effort in solution deployment and extensibility (https://digitalshopflooralliance.eu/).

**I4.0 Big Data Pilot Features**

**Sector / Product:** Machine Tools Manufacturing  
**Manufacturing Process:** Machining  
**Big Data Analytic Techniques:** Hybrid Twin and Ontology based Analytics  
**Big Data Platforms:**  
- GF rConnect  
- USU and ESI  
**IDS-FIWARE Connectors & Standards:**  
- IDS-FIWARE connector  
- OPC UA

**Open I4.0 Big Data Pilot Pillars**

**IDSA**  
IDSA defines a reference architecture and an ecosystem, which supports sovereign exchange and sharing of data between industrial partners.

**FIWARE**  
FIWARE is a curated framework of open source platform components to accelerate the development of smart solutions for Industry 4.0.

**HYPERLEDGER**  
HYPERLEDGER is an open source collaborative effort created to advance cross-industry blockchain technologies.

The BDE offers an open source platform, allowing to build several Big Data components into a pipeline through a simple graphical UI.