COALA Digital Intelligent Assistant (DIA) - Technical Features
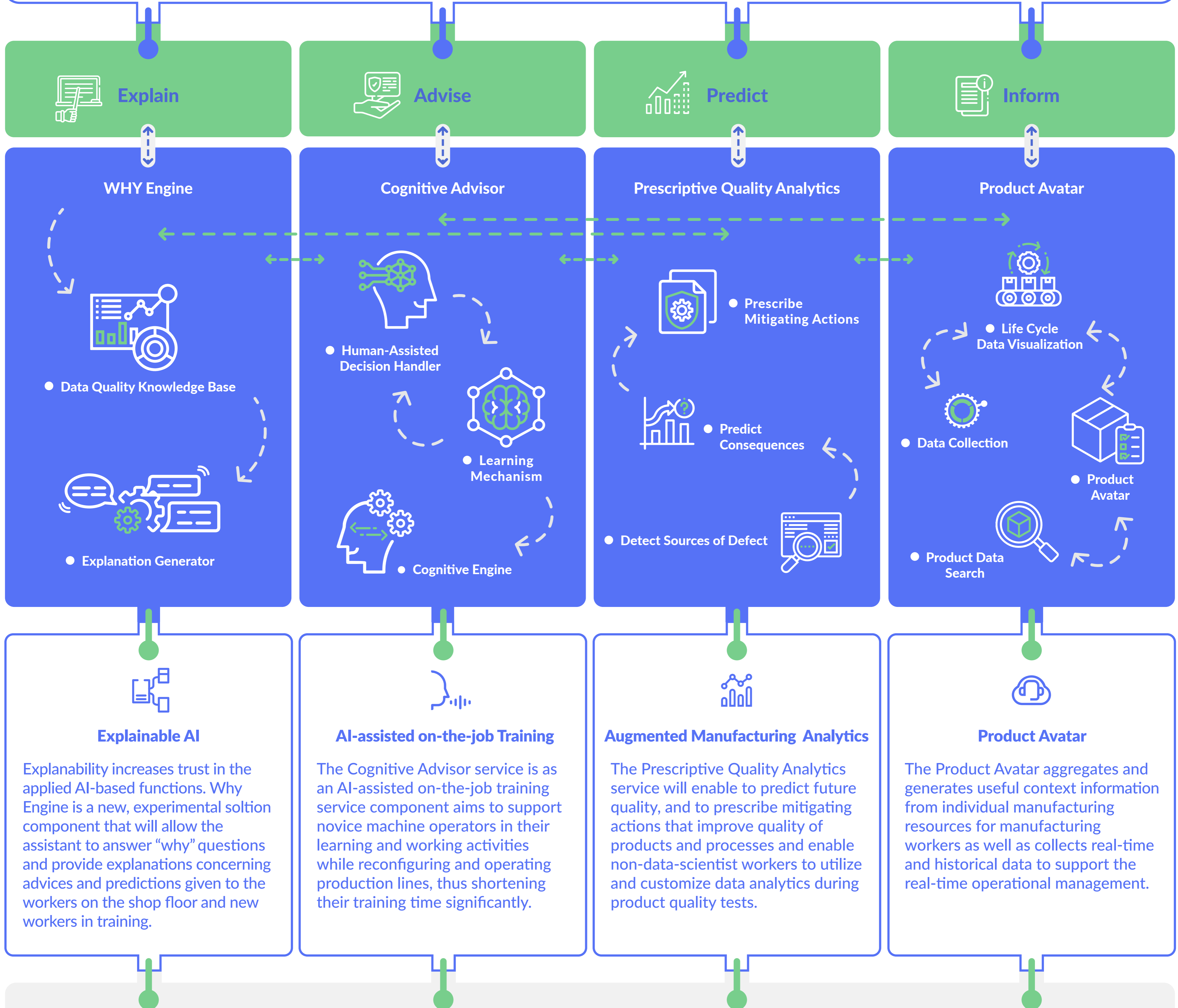
Digital Intelligent Assistant Core

The Digital Intelligent Assistant Core is at the top of COALA solution and represents the intelligent, voice-enabled, mobile user interface with reliable language processing, mobile usage, and secure integration in the production IT landscape.

The Digital Intelligent Assistant Core is based on the open source, privacy focused assistant, Mycroft, and will feature four actions: Explain (to build trust), Advise (to help users perform their tasks), Predict (to inform about future events), and Inform (to provide facts and resource status).

Mycroft's existing functions will be extended to meet manufacturing requirements, such as time criticality, reliability when dealing with factory noise, safety when giving advice to workers and security in business environment.

Explain	Advise	Predict	Inform

WHY Engine

- Data Quality Knowledge Base
- Explanation Generator

Cognitive Advisor

- Human-Assisted Decision Handler
- Learning Mechanism
- Cognitive Engine

Prescriptive Quality Analytics

- Prescribe Mitigating Actions
- Predict Consequences
- Detect Sources of Defect

Product Avatar

- Life Cycle Data Visualization
- Data Collection
- Product Avatar
- Product Data Search

Explainable AI

Explainability increases trust in the applied AI-based functions. Why Engine is a new, experimental soltion component that will allow the assistant to answer "why" questions and provide explanations concerning advices and predictions given to the workers on the shop floor and new workers in training.

AI-assisted on-the-job Training

The Cognitive Advisor service is as an AI-assisted on-the-job training service component aims to support novice machine operators in their learning and working activities while reconfiguring and operating production lines, thus shortening their training time significantly.

Augmented Manufacturing Analytics

The Prescriptive Quality Analytics service will enable to predict future quality, and to prescribe mitigating actions that improve quality of products and processes and enable non-data-scientist workers to utilize and customize data analytics during product quality tests.

Product Avatar

The Product Avatar aggregates and generates useful context information from individual manufacturing resources for manufacturing workers as well as collects real-time and historical data to support the real-time operational management.

System and Data Security

The COALA solution supports a set of security, personal data protection and privacy-preserving services that will be embedded throughout the entire operational lifecycle of the solution and will capture the diverse data and user requirements for resilience and trustworthiness. Besides that, COALA solution considers not only technical, but also specific requirements such as safety, quality and ethics complying with the EU Ethics Guidelines for Trustworthy AI.