

Smart Factory

Product information





AI QUALITY CONTROL TOOLKIT

Reduces the manual labor required to detect quality problems in manufacturing.

The intelligent Quality Control solution automates manual visual inspection tasks using a set of AI and computer vision technologies that enable manufacturers to transform quality control processes by automatically detecting product defects.

Visual inspection is a highly manual process that can be time-consuming and prone to errors.

Now, rule-based visual inspection machines have emerged, and the market of “smart manufacturing” (industry 4.0) is in a good momentum for remarkable growth.

AI Quality Control Toolkit drastically automates manual inspection operations, fastens time to value, reduces costs and risks, scales production, and makes the supply chain predictable for better management.

Potential Use Cases

● Detect Damage

Spot damage to a product’s surface quality, colour, and shape during the manufacturing and assembly process.

● Uncover process issues

Detect and fix defects with repeating patterns that could indicate process issues.

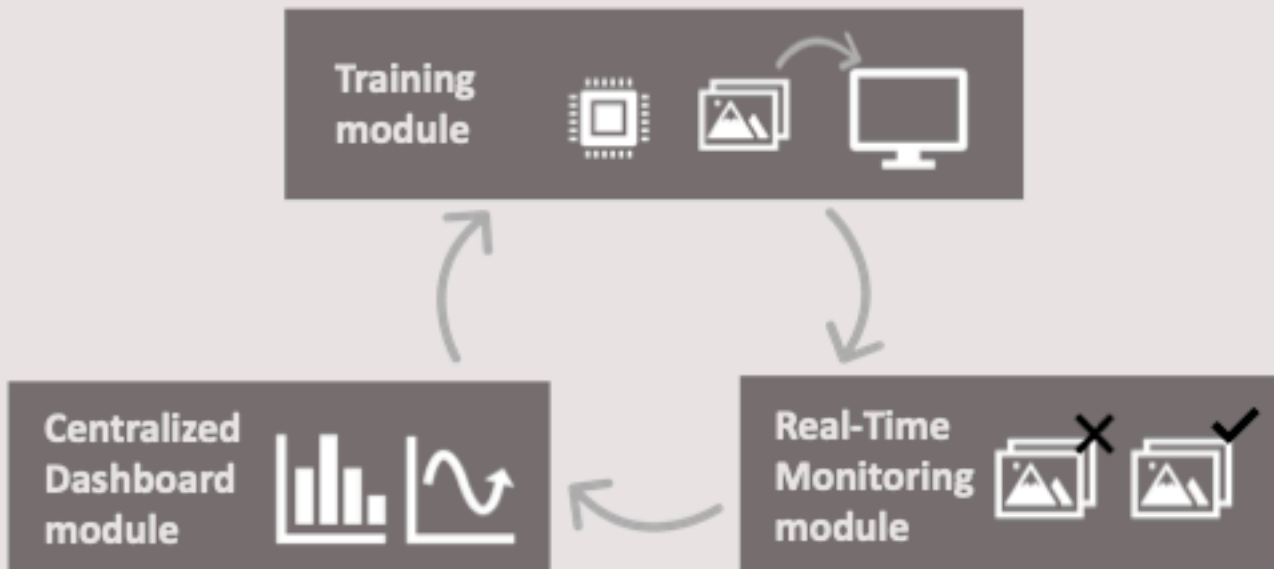
● Identify missing components

Determine and withdraw missing, misplaced, or deformed components from production initially.

● Predict failures

Detect impending failures that could never be detected by the human eye and predict equipment maintenance.

Key features



Training module

- Easy to create and train UI-based AI models for different components.
- Active Learning capabilities facilitate labeling work.

Real-Time Monitoring module

- Real-time prediction of components keeps track of model accuracy.
- Prevents the stopping of production lines.

Centralized Dashboard module

- Quick overview of the company's performance (production line, factory, country, company).
- Possibility to add other metrics to monitor performance and perform Root Cause Analysis of problems.

Key benefits

- **95% detection accuracy**, compared to 85% during the manual inspection.
- **Easy to create AI models** for different parts.
- **Active Learning capabilities** to facilitate labelling work.
- **A centralized solution**, works with any type of camera.
- **Real-time prediction** of parts (under 6s).
- **Model retraining** in case of model regression.
- **Predictive solution**: prevents stopping of production lines.
- **Individual and aggregated statistics** at different levels (production line, factory, country, company).
- **Root Cause Analysis**: monitors the performance of the problem.
- **Integration with a real-time MES** (Manufacturing Execution System).

Business impact

- **Fasten time to value with AI-powered operations**: Streamline operational processes to shortcut time to market from months up to several weeks.
- **Reduced costs with 90% less manual labour**: Reduce time for manual scanning up to 90% while increasing the accuracy.
- **Reduced risks with unplanned downtime prevention**: Quickly identify potential failures of the problem and prevent stopping production lines.
- **Scale business when scaling the ML model**: Scale-up any trained model to production – scale up the manufacturing.





AI FACTORY TOOLKIT

Automating manufacturing processes with real-time intelligence and control

The AI Factory Toolkit solution captures real-time data from the production floor, providing visibility into key manufacturing processes, such as work order management, scheduling, inventory tracking, quality control, and performance monitoring.

It is based on TuplOS, Tupl's MLOPs framework to develop hyperautomation applications oriented to Subject Matter Experts, not developers.

As the manufacturing industry evolves toward Industry 4.0., there is a growing need for an advanced MES (Management Execution System) solution that supports real-time data analysis and decision-making.

AI Factory Toolkit is more than a MES since it drastically automates data analytics and actions, fastens time to value, reduces costs and risks, scales production, and makes the supply chain predictable for better management.

Key Features

Centralized automated analytics and actions

- Centralized solution, works with any data source.
- Real-time prediction of abnormal behaviors.
- High-value dashboarding to monitor KPIs and relevant features.
- Automated actions based on AI prediction algorithms.

TuplOS - the all-in-one MLOPs suite for hyperautomation

- **Data Engineering:** UI-based data management and transformation Tupl Streams; low-code KPI formulas.
- **Feature Engineering:** UI-based feature formula generation, with types: Range, Time, and SQL features.
- **ML Toolkit:** creation of ML algorithms selected by clicking on available options; including training and usage of the models.
- **Dashboarding:** more than 100 widgets configuration and highly customizable views to analyze data trends.
- **Automation Engine:** UI-based automation template for open and closed loop real time actions enabling hyperautomation powered by AI models.

Key benefits

- **Accelerates factories' digital transformation.**
- **100% consistency** – reducing dependence on the different experience and skills of various engineers.
- **Real-time data driven factory management.**
- **Empowers factory operators with AI.**
- **Centralized solution** - integrate any data source and visualize the information on any company level.
- **Predictive maintenance** - prevents unplanned stopping of production lines.
- **Root Cause Analysis** - using continuous process monitoring and analysis of performance data.
- **Energy management** - optimize energy usage and reduce costs .
- **Supply chain management** - reduce lead times and improve delivery performance.

Business Impact

- **Accelerate time to value with AI-powered operations:** Streamline operational processes to shortcut value generation, from months down to several days or weeks.
- **Increase Operational Efficiency:** Automate complex processes to lower costs and increase output.
- **Better decision making:** Access to real-time data and insights for more informed decision-making.
- **Identify potential failures:** Predictive maintenance helps you avoid unplanned downtime.

