



utpatti

ROBOTIC ARMS CASE STUDY

Optimise uptime for operational equipment

6 months early failure warning for auto components manufacturer

Overview

Smart Maintenance Working Group at a leading Tier-1 Auto components manufacturer utilised Utpatti's Decentralised AI framework for Predictive Maintenance of robotic arms without transferring company's machine data to an external cloud. At an accuracy greater than 80%, early failure warnings of up to 6 months for robotic arms were provided to help maintenance teams optimise their schedule and decrease unplanned downtimes.

80%

prediction accuracy of impending breakdowns for robotic arms

Challenge

The Smart Maintenance Working Group was looking for an AI based Predictive Maintenance solution that does not need an external cloud integration. Utpatti's Decentralised AI based Predictive Maintenance was chosen for this purpose since it does not need an external cloud integration and adhere to data sovereignty rules set by company's IT security department. We collaborated with the diesel engine component manufacturing plant under the Smart Maintenance Working Group to address three key performance factors:

- Decrease unplanned downtimes and optimise the uptime for robotic arms to increase the plant productivity.
- Decrease spare parts and warehouse expenditures by increasing overall equipment effectiveness (OEE) of robotic arms.
- Provide a tool to optimise maintenance planning for robotic arms.

We adapted our Decentralised AI framework to the sensor and breakdown data provided by the plant to successfully create a predictive maintenance solution that achieved an accuracy greater than 80% to predict impending breakdowns for robotic arms.

Solution

Utpatti worked closely with the plant's maintenance teams and subject matter experts to identify equipment with high ROI and chose 6-axis pick and place robotic arms for a proof-of concept.

A feasibility study was first conducted with one robot which has both historical sensor and breakdown data available. The study successfully proved that Utpatti's AI-based predictive maintenance model can provide a 6-month early warning on equipment failure so maintenance teams can optimise their schedules.

“The feasibility study by Utpatti validated that impending failures can be predicted by their model with a high accuracy of more than 90%, using sensor data and information from just 3 previous breakdowns per machine type. This convinced us to test Utpatti's software on a larger scale.” — *Pavel Hartl, Smart Maintenance Working Group Leader at Bosch*

Utpatti's AI models were then adapted to predict the impending breakdowns using the sensor and maintenance data from large number of Robotic Arms to build a data pipeline with adaptors to convert and ingest the data to Utpatti's AI framework and deliver:

- Early warning notification about breakdowns
 - Show early warning to the maintenance teams 6-months in advance based on AI sensor patterns.
 - Send notification emails of based on the health status of the robotic arm.
- Remaining useful life prediction of equipment failure months in advance with associated probability
 - Show the time frame in which the equipment is predicted to fail starting from 6-months in advance.
 - Provide a percentage probability with the prediction.
- Health Status of each robotic arm
 - Show the status categories of healthy, monitor, critical and not available based on the time left to failure prediction.

Let us help you realise the full potential of your machine data without sacrificing data sovereignty. Contact us at info@utpatti.ai

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