

PROJECT CASE STUDY

Machine and Process Health Monitoring



PROJECT LEAD

Litmus Automation

PROJECT TEAM

None

PROJECT OBJECTIVE

Develop and demonstrate a monitoring and anomaly detection solution to improve throughput, reduce waste, and reduce scrap in industrial valve manufacturing by connecting an on-site edge device to the Smart Manufacturing Innovation Platform.

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Implementing Smart Manufacturing Tools Creates US Manufacturing Jobs

BENEFITS TO OUR NATION

Improving efficiencies for small and medium-sized manufacturers yields significant economic benefits for the US. According to the National Association of Manufacturers, small and medium-sized manufacturers account for over 90% of the manufacturing sector activity, employing over 11 million workers and contributing over \$2 trillion to the US economy annually. By improving their efficiencies, these manufacturers can reduce costs, increase productivity, and ultimately become more competitive globally. Slight improvements in operational efficiencies for even a portion of manufacturers can contribute billions of dollars to the US economy, creating jobs and driving economic growth.

BENEFITS TO INDUSTRY

The global Industrial valve market size is valued at US\$48 Billion and is expected to grow at a compound annual growth rate of 12.3%, fueled by growth in Pharmaceuticals and Healthcare. By implementing smart manufacturing tools and deploying them on the CESMII smart manufacturing innovation platform (SMIP), valve manufacturers can reduce inefficiencies in their processes, grow market share by being more competitive (i.e. by having higher quality products) and reduce ongoing production costs.

PROJECT DESCRIPTION

TECHNICAL APPROACH

- Establish connectivity to CNC machines and extract data into Litmus Edge. Develop new machine drivers if necessary.
- Develop the smart manufacturing profile for maintenance and process throughput, and share data with the SMIP
- Configure data comparison to ideal settings and take pre-emptive actions to trigger alerts, capture machine metrics for visualization and anomaly detection.

ACCOMPLISHMENTS

- Implemented data communication model in Litmus Edge
- Configured key performance indicator algorithms
- Configured machine and process alerting protocols
- Created data visualization dashboards
- Litmus Edge instance up and running at industrial partner site

DELIVERABLES

- Defined and delivered process and machine key performance indicators (KPIs)
- Installed supermicro gateway
- Verified Data Source to Litmus Edge Connection
- Verified Litmus Edge to CESMII SMIP Connection
- Implement data communication model in Litmus Edge
- Demonstrated Litmus Edge to CESMII SMIP data transfer and modeling

REUSABLE OUTCOMES

- CNC machine profile
- Performance monitoring and anomaly detection App

RESULTS

↑\$15k/yr

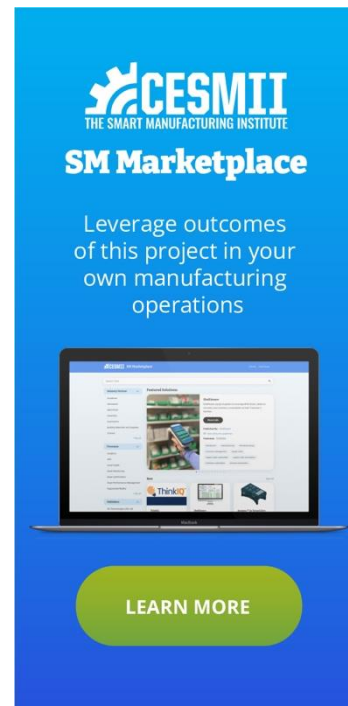
Demonstrated 10% scrap reduction at industrial partner site; translates to \$15k/yr savings.

↑\$17k/yr

Demonstrated 10% reduction in unplanned maintenance at industrial partner site; translates to \$17k/yr savings.

↑\$130k/yr

Demonstrated 10% increase in throughput per shift at partner site. This translates to a \$130k revenue increase.



The banner features the CESMII logo (The Smart Manufacturing Institute) and the text 'SM Marketplace'. Below this, it says 'Leverage outcomes of this project in your own manufacturing operations'. A laptop screen displays a dashboard with various charts and data. At the bottom, there is a green button with the text 'LEARN MORE'.

PROJECT DETAIL

Budget Period: BP5
Submission Date: 6/28/2022
Sub-Award (contract) Number:
4550 G ZA046
SOP: 2342

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