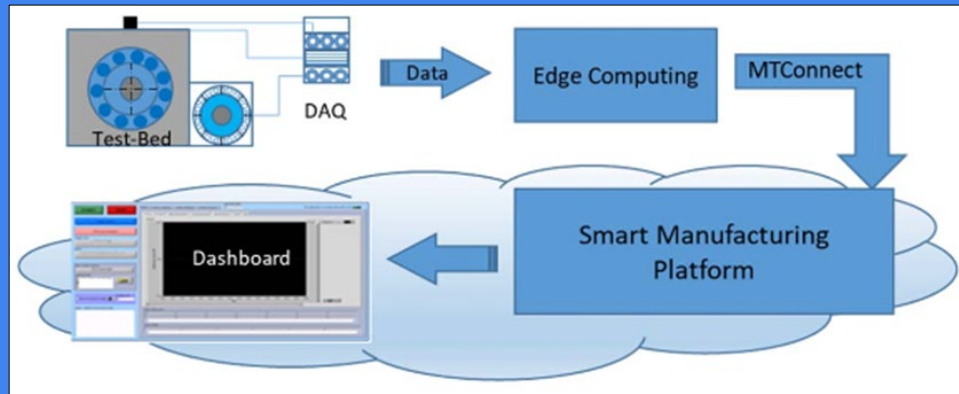


PROJECT CASE STUDY
Edge Computing
and AI-Based
Prognostics and
Health Management



PROJECT LEAD

TechSolve

PROJECT TEAM

Spirit Aerosystems, Caron
Engineering

PROJECT OBJECTIVE

To develop an edge computing solution for an MTConnect, AI-based Prognostics and Health Management (PHM) system focused on collecting and analyzing equipment signals to determine the remaining useful life for manufacturing assets.

[MORE ON CESMII.ORG](https://www.cesmii.org)

TechSolve Implements AI-Based Equipment Diagnostics to Improve Plant Productivity

BENEFITS TO OUR NATION

By leveraging artificial intelligence to predict potential equipment failures and optimize maintenance schedules, American manufacturers can significantly reduce downtime, enhance operational efficiency, and prolong the lifespan of critical machinery. This proactive approach not only boosts productivity but also contributes to cost savings and resource optimization. By adopting state-of-the-art machine health management systems, businesses will stay at the forefront of industrial innovation in a competitive global market. The result is a more resilient and adaptive industrial landscape that ensures sustainable growth, job creation, and technological leadership for the nation.

BENEFITS TO INDUSTRY

American industry will experience a significant reduction in downtime, enhanced operational efficiency, and prolonged machinery lifespan when artificial intelligence tools are implemented. Specifically, these tools optimize maintenance strategies by predicting potential equipment failures. This results in substantial production cost savings and also ensures continuous and reliable production. The adoption of AI-powered machine health management systems strengthens the resilience and competitiveness of American industry. This technological integration fosters innovation, supports sustainable practices, and positions the nation as a manufacturing technology leader.

PROJECT DESCRIPTION

TECHNICAL APPROACH

The solution will be developed, evaluated, validated and demonstrated using spindle bearings degradation data and cutting tool degradation tests from TechSolve's spindle test-bed and machining centers, respectively.

ACCOMPLISHMENTS

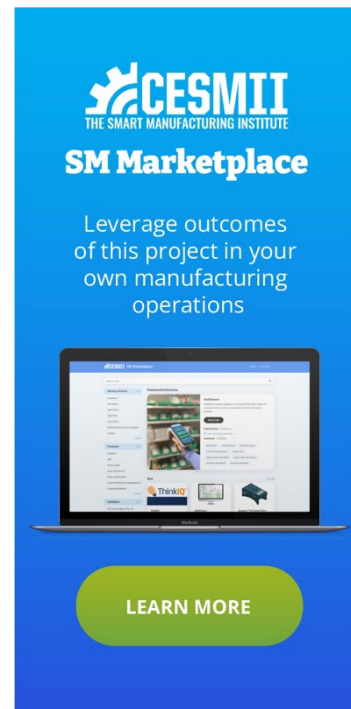
- Integrated the following manufacturing equipment with the CESMII Smart Manufacturing Innovation Platform (SMIP):
 - Spindle test-bed
 - CNC Machines
- Developed an edge computing and data transfer solution through MTConnect schema.
- Established a cloud-based repository for machine health data in MTConnect format.
- Leveraged the CESMII SMIP to develop an operator dashboard.

DELIVERABLES

- Not reported.

REUSABLE OUTCOMES / SM MARKETPLACE

- CNC Machine SM profile
- Spindle Test-Bed SM profile



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 central image shows a laptop displaying a dashboard with various charts and data. At the bottom, there is a green button with the text 'LEARN MORE'.

PROJECT DETAIL

Budget Period: BP4 – BP5
Submission Date: 1/15/2022
Sub-Award (contract) Number:
4550 G YA212
SOPO: 2453

FOR MORE INFORMATION CONTACT

Name: Radu Pavel
Position: Chief Technology Officer
Phone: 513-948-2062
Email: pavel@techsolve.org