Industry
CNC Machining

Applications
SMIP

Solutions
Manufacturing Productivity

CESMII
THE SMART MANUFACTURING INSTITUTE

PROJECT CASE STUDY
Smart Manufacturing Profiles for CNC Machining

PROJECT LEAD

ThinkIQ

PROJECT TEAM

South Bay Solutions

PROJECT OBJECTIVE

- Augment the Smart Manufacturing infrastructure at South Bay Solutions, fully digitizing the operation to enable the capture of operational information that currently is either lost or manually recorded.
- Generate a foundational Process Profile for a CNC operation and integrate this with the CESMII SMIP.

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Smart Manufacturing Tools Connect Legacy CNC Machines to the Internet of Things

BENEFITS TO OUR NATION

Manufacturers that deploy the tools developed in this project will improve operational efficiencies and lay a foundation for sustainable, profitable productivity growth.

Implementation of Smart Manufacturing technologies improves the competitive position of US manufacturers and enables the reshoring of critical manufacturing assets while contributing to the diversity and vitality of the entire American manufacturing ecosystem.

BENEFITS TO INDUSTRY

Digitizing CNC Machine process data allows manufacturers to capture operational information that previously was either lost or manually recorded. The ready availability of this data will not only enable continuous operational improvements but will also provide operational insights that will lead to improved planning and scheduling. Implementing production equipment profiles will help manufacturers:

- Increase OEE with out-of-the-box productivity metrics and analysis
- Increase Energy Efficiency with standard energy usage analysis
- Increase operational control without any IT investment

PROJECT DESCRIPTION

TECHNICAL APPROACH

Integration of a vision-based digital twin of manufacturing operations. This includes connecting to a network for cloud communication, cameras and sensors for data collection, and a real time dashboard with analytics reports, all accessed through a web browser.
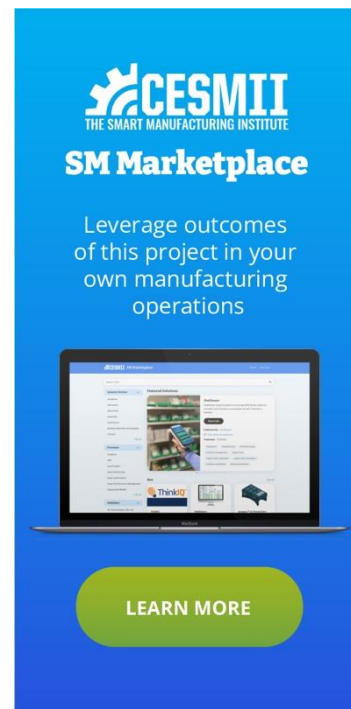
ACCOMPLISHMENTS

- Implemented smart sensors at Industrial Partner Site (South Bay Solutions) to capture CNC Machine operational information that was previously not collected or was manually recorded. Collection and compilation of this 'big data' enables continuous operational improvement and improved planning and scheduling. Resulting in improved productivity, reduced energy consumption, better product quality and shorter production lead times.
- A CNC machine profile for small to medium manufacturers was created that will allow companies to begin their Smart Manufacturing journey and leverage the power of the CESMII Smart Manufacturing Innovation Platform (SMIP).

DELIVERABLES

- Installed Visual Smart Factory Solution that allows the Manufacturer to monitor and control CNC machine productivity in real time.
- Delivered CNC Machine SMIP Profile

REUSABLE OUTCOMES / SM MARKETPLACE

- CNC Machine Profile

PROJECT DETAIL
Budget Period: BP4
Submission Date: 3/31/2023
Sub-Award (contract) Number:
4550 G ZA341
SOPO: 2324

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