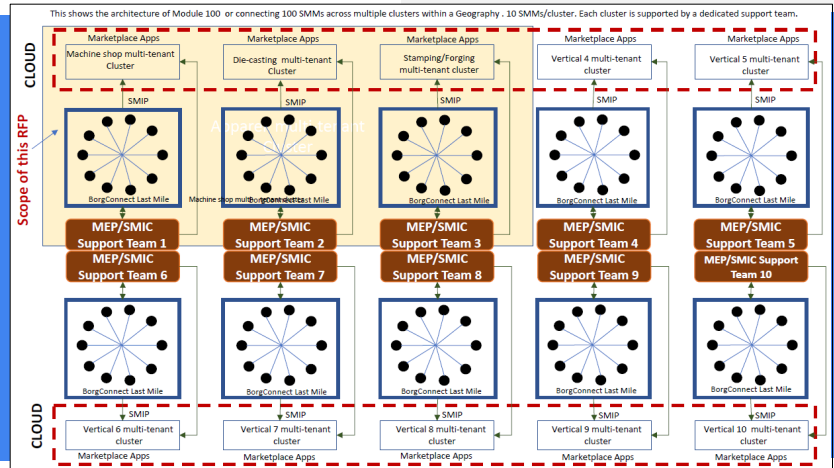


PROJECT CASE STUDY
Implementation of IoT Hardware at Scale for Small & Medium Sized Manufacturers



PROJECT LEAD

5G Technologies

PROJECT TEAM

N/A

PROJECT OBJECTIVE

- To make implementation of IoT hardware frictionless for multiple clusters of Small & Medium Sized Manufacturers (SMMs)
- To improve the planning, production, and energy efficiency capabilities of SMMs
- To establish metrics for measuring the impact of manufacturing equipment connectivity

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Small and Medium-Sized Manufacturers Improve Business Performance by Networking Legacy Manufacturing Equipment

BENEFITS TO OUR NATION

Networking legacy manufacturing equipment benefits the U.S. by enhancing productivity, reducing downtime, and improving energy efficiency. By integrating Industrial IoT (IIoT) solutions, older machines can transmit real-time data for predictive maintenance, minimizing costly failures and improving overall equipment effectiveness (OEE). This modernization reduces the need for expensive new equipment while enabling data-driven decision-making, making U.S. manufacturing more competitive.

BENEFITS TO INDUSTRY

Industrial equipment connectivity enhances production flexibility, allowing businesses to optimize workflows and respond more quickly to market demands. Networking legacy equipment extends the lifespan of existing machines, reducing capital expenditures while modernizing production technology. Overall, machine connectivity helps industries remain competitive, agile, and more resilient.

PROJECT DESCRIPTION

TECHNICAL APPROACH

The project will be executed in two phases.

Phase 1

The design and development of BorgConnect® Templates for Frictionless Implementation at Scale (BTFIS). This phase will include selecting partners such as: (a) academic institutions, Smart Manufacturing Innovation Centers (SMICs), Manufacturing Extension Partnership Centers (MEPs) and/or consultants; and (b) Small & Medium Sized Manufacturers (SMMs).

Phase 2

Implement the template developed in Phase 1 at selected SMMs.

ACCOMPLISHMENTS

- Collaborated with 3 regional Manufacturing Extension Partnership (MEP) Centers and 9 Small & Medium Sized Manufacturers (SMMs).
- Assessed Smart Manufacturing readiness of each SMM via a Maturity Assessment Questionnaire (MAQ).
- Applied equipment profiles for data collection at the edge. Profiles were pulled from a library of standard Smart Manufacturing Profiles.
- Developed a templated solution for implementing BorgConnect hardware at a cluster of SMMs.
- Pilot implementation of the template at participating SMMs.

DELIVERABLES

- Developed Smart Manufacturing machine profiles
 - High-Pressure Die Caster machine profile
 - Injection Molding machine profile
 - Grinding machine profile
- Developed and delivered Maturity Assessment Questionnaire (MAQ)
- Delivered BTFIS executable code
- Delivered BTFIS Manuals

REUSABLE OUTCOMES / SM MARKETPLACE

- High-Pressure Die Caster, Injection Molding Machine, and Grinding Machine SM Profiles published to the CESMII Smart Manufacturing Innovation Platform (SMIP)
- Maturity Assessment Questionnaire
- BorgConnect® Templates for Frictionless Implementation at Scale (BTFIS) code and documentation package

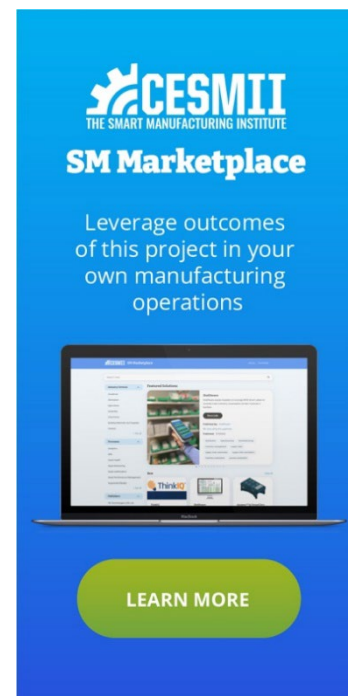
RESULTS

↑15%

Potential for a 15% improvement in Overall Equipment Effectiveness (OEE) when a typical SMM implements connectivity hardware and software.

↓8.7%


Potential for an 8.7% reduction in energy utilization when a typical small manufacturer implements connectivity hardware and software.



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PROJECT DETAIL

Budget Period: BP5
Submission Date: 01/10/2025
Sub-Award (contract) Number:
4550 G IA160
SOPO: 2361

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Acknowledgement: This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Advanced Manufacturing Office Award Number DE-EE0007613.

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