PROJECT CASE STUDY

Utilizing the CESMII SMIP to Optimize Product Quality in the Food Industry

PROJECT LEAD

RPI

PROJECT TEAM

G-W Process Optimization

PROJECT OBJECTIVE

Utilize the CESMII SMIP to collect and contextualize data from sensors that will interface with the mixer and filler assets; create and implement data driven models that predict product quality based on operational performance and when conditions are suboptimal; and advise what interventions are needed to assure on-spec product quality.

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Easy-to-Implement Smart Manufacturing Tools Enable Productivity Gains for Small Manufacturers

BENEFITS TO OUR NATION

Implementing Smart Manufacturing tools optimizes food production processes by reducing waste and improving energy utilization. With increased productivity, cost-effectiveness, and a reduced environmental footprint, the nation can meet the rising demand for high-quality food products. This contributes to economic growth, job creation, and food security for American consumers. Utilizing smart manufacturing and machine learning tools in food processing aligns with the principles of innovation, sustainability, and economic resilience, making it a pivotal step towards a more prosperous and secure future for the country.

BENEFITS TO INDUSTRY

Smart Manufacturing technologies streamline operations, enhance quality control, and optimize resource management, resulting in increased efficiency and reduced costs of food production. By improving product consistency and safety, machine learning algorithms strengthen consumer trust and brand reputation. The adoption of Smart Manufacturing and machine learning not only elevates industry standards but also cements the position of American food manufacturers as leaders in the production of high quality, sustainable food products.

PROJECT DESCRIPTION

TECHNICAL APPROACH

- Determine operating parameters of the 2 new sensors to characterize & profile assets.
- Create and test software for Optical Smart Sensor (OSS) and Resistive Power Draw Sensor (RPDS)
- Install sensors first on the RPI mixer and then at the Krinos mixer/filler locations.
- Create mixer and filler SM profiles using tools provided by the CESMII SMIP.
- Generate Status/Warning/Help prediction models for the mixer and filler.
- Create visualization dashboards.
- Implement predictive models on the production line.

ACCOMPLISHMENTS

- Integrated Mixer and Filler SM Profile data to Smart Manufacturing Innovation Platform.
- Configured predictive models for food production processes.
- Developed script to easily transfer and integrate Excel data into the CESMII SMIP.

DELIVERABLES

- Delivered example contextualized, time-stamped sensor dataset.
- Delivered Mini-mixer SM profile.
- Delivered Filler SM profile.
- Delivered Operational Availability Software for Mixer Equipment.

REUSABLE OUTCOMES / SM MARKETPLACE

- Mini-mixer SM profile.
- Filler SM profile.
- Training Modules that will enable manufacturing workers to quickly learn to understand, collect and contextualize manufacturing data.
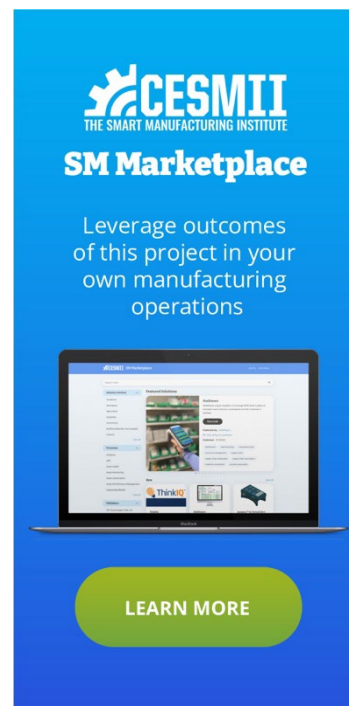- Quality Control protocols for food processing and packaging.

RESULTS

↑ $20k

Implementation of sensors and prediction models resulted in a 15% reduction in waste, which translates to $20k annual savings at the Krinos Bronx facility.

↑ $10k

Implementation of smart manufacturing tools resulted in a reduced rework and improved productivity, which translates to $10k annual energy savings at the Krinos Bronx facility.

CESMII THE SMART MANUFACTURING INSTITUTE

SM Marketplace

Leverage outcomes of this project in your own manufacturing operations

LEARN MORE

PROJECT DETAIL
Budget Period: BP5
Submission Date: 10/12/2023
Sub-Award (contract) Number:
4550 G LA047
SOPO: 2346

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