Industry
Food & Beverage

Technologies
Connectivity
Data Contextualization
Data Analytics

Solutions
Quality Improvement
Schedule Optimization
Energy Efficiency

CESMII
THE SMART MANUFACTURING INSTITUTE

PROJECT CASE STUDY

Smart Manufacturing for Food Processing

PROJECT LEAD

Tyson Foods

PROJECT TEAM

ThinkIQ

PROJECT OBJECTIVE

Improve operational efficiencies and reduce waste by implementing sensors and software to monitor material and machines throughout the manufacturing process. The algorithms will be implemented via the CESMII Smart Manufacturing Innovation Platform (SMIP). Access to real-time production data will enable process control decisions in the context of material flows and manufacturing operations.

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Tyson Foods Saves $60k Annually by Visualizing Smart Manufacturing Data

BENEFITS TO OUR NATION

US poultry, beef and chicken processors produce $296 billion worth of protein products annually. Similarly, the US dairy industry generates revenue of $164 billion annually. Implementing smart sensing and smart controls could reasonably result in a 2% yield improvement across these industrial sectors. This translates to an additional $9 billion in revenue for the meat and dairy processing industries. Extending these tools and techniques to other food processing industries could benefit the American economy by tens of billions of dollars, by conservative estimates.

BENEFITS TO INDUSTRY

Tyson Foods is the world's second largest processor and marketer of chicken, beef, and pork. Tyson's Texarkana, Arkansas rendering facility spends between $3-4 million per year on energy. A 2% improvement in energy efficiency gained by implementing Smart Manufacturing tools and techniques will result in an annual savings of $60,000 to $80,000 at the Texarkana facility alone. If Tyson implements Smart Manufacturing tools at all 185 of its chicken processing plants, the company could reasonably expect savings of $11 to $15 million annually on its energy bill. As Smart Manufacturing techniques are adopted industry-wide, American chicken, beef and pork processors could save hundreds of millions of dollars annually.

PROJECT DESCRIPTION

TECHNICAL APPROACH

Implement the ThinkIQ sensing and tracking platform and the CESMII Smart Manufacturing Innovation Platform to capture data from manufacturing process sensors and manual data sources. Model the equipment and associated attributes to trace material movements throughout the processing line. Identify opportunities to improve yield and measure results. Develop data visualization dashboards to display manufacturing metrics.

ACCOMPLISHMENTS

The Smart Manufacturing Innovation Platform was configured to meet the needs of Tyson's rendering facility. Key features:

- Home page highlighting performance of key process attributes
- Meat Rendering Library (profile) to simplify future expansion
- Quality dashboards display current performance, target performance, and historical average performance for key ingredients
- In-line quality devices (i.e. Near Infrared – NIR) connected directly to Smart Manufacturing Innovation Platform
- Process notifications based on user configured settings
- Program management documented and delivered within the platform

DELIVERABLES

- Complete platform setup including installing connectors to plant data sources and validating data integrity
- Complete configuration of the SMIP and ThinkIQ system functionality
- SMIP installed, configured and tested
- Smart Manufacturing Profile for Rendering Manufacturing Operations developed and documented
- Yield reporting and analysis functionality designed, implemented, and tested

REUSABLE OUTCOMES / SM MARKETPLACE

- Food processing equipment SM profiles
- Energy consumption models

RESULTS

$60k/yr

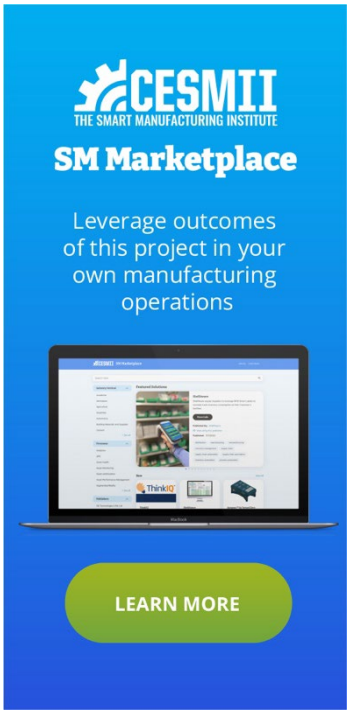
Potential to save $60,000 per year on energy costs at Tyson's Texarkana plant by implementing SM tools.

$1B/yr

Potential to generate an additional billion dollars in revenue annually if SM tools are implemented across Tyson's global food processing operations.

↑ 1%

Smart manufacturing controls netted a 1% yield increase at the Tyson Texarkana plant.



PROJECT DETAIL
Budget Period: BP4
Submission Date: 09/08/2021
Sub-Award (contract) Number:
4550 G YA134
SOPO: 2326

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