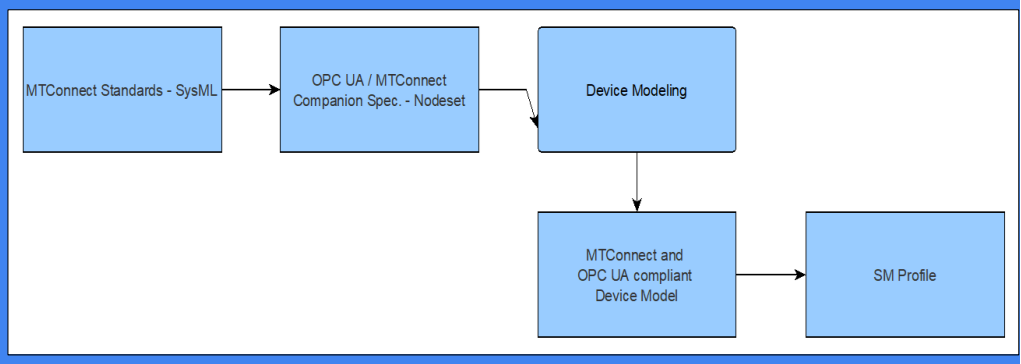
Industry
IT/OT Hardware

Technologies
Connectivity
Data Contextualization
Platform Capability

Solutions
Manufacturing Productivity

PROJECT CASE STUDY

Auto-generation of SM Profiles with MTConnect



PROJECT LEAD

Commonwealth Center for Advanced Manufacturing

PROJECT TEAM

N/A

PROJECT OBJECTIVE

Enable a streamlined workflow for introducing and connecting new and existing equipment into the Smart Manufacturing Innovation Platform (SMIP) while maintaining coherence with MTConnect information models.

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Virginia's CCAM Develops Tools for Automatically Integrating Manufacturing Equipment into the IIoT

BENEFITS TO OUR NATION

Developing tools to automate the generation of equipment profiles improves upon existing manual processes and fosters increased productivity and efficiency across industries. The automated generation of smart manufacturing profiles facilitates rapid adoption of Industry 4.0 practices, promoting technological innovation and bolstering the nation's competitiveness in the global market. This transformative step positions American manufacturers at the forefront of the smart manufacturing revolution, contributing to economic growth, sustainability, and resilience in the face of an evolving industrial landscape.

BENEFITS TO INDUSTRY

The techniques for automatically generating machine profiles that were explored in this project will reduce the time required to install and integrate manufacturing equipment into an industrial network. The automated generation of Smart Manufacturing profiles ensures consistency and accuracy in data representation, minimizing errors and improving the overall quality of manufacturing process information. This will give the industry real-time access to manufacturing process data that will drive informed decision making and improve productivity and product quality.

PROJECT DESCRIPTION

TECHNICAL APPROACH

- Model
  Create an information model for an EOS 290M machine which conforms to the OPC UA-MTC companion.
- Configure
  Develop a lightweight toolset to automate the translation and import of the OPC UA node set to an SM profile.
- Connect
  Automatically instantiate an OPC UA server based on the modelled device. Explore automation of the mapping of data items from specific machine instances to instances of the SM profile and ingest data to the SMIP from the OPC UA server.

ACCOMPLISHMENTS

- Functional OPC UA server deployed, configured, and connected to the DMLS machine serving up standard compliant data. Parameters translated into CESMII Smart Manufacturing Innovation Platform (SMIP).
- Deployed the OPC UA Machine Gateway using the Beeond EdgeXconnect OPC UA Interface.
- Developed and deployed an MTConnect model created by AMT using the Metalogi tools to provide an OPC UA stream.
- Several parameters translated into the CESMII platform using this interface. Established and evaluated the functional data stream from the EOS M290 Machine to the SMIP.

DELIVERABLES

- Delivered complete training materials and manuals detailing deployment, configuration and connection processes.
- Delivered MetaStudio and EOSmodel executable files.

REUSABLE OUTCOMES / SM MARKETPLACE

- 3D Printer SM Profile
- MTConnect to SMProfile Generator

PROJECT DETAIL
Budget Period: BP5
Submission Date: 11/9/2023
Sub-Award (contract) Number:
4550 G ZA090
SOPO: 2343

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