

Interoperability's latest frontier

Common information models are bringing industrial modularity to new levels

INTEROPERABILITY is commonly understood to describe a product or system—whose interfaces are well understood—to effectively communicate and work with other products or systems, often from other suppliers or manufacturers.

It's a term with an IT heritage, but my own OT history with it dates back to the early 1990s when process instrumentation and control system suppliers were first attempting to develop and deploy open, digital communication standards between those field instruments and host systems.

End-users wanted the full-blown interchangeability they were used to with analog systems, but suppliers insisted on being able to differentiate their products through digital functionality. Bridging the gap were device description (DD) files for each field device. Still in use today, those DDs constitute a sort of "information model" that, a layer above the network communications protocol, effectively told the host system what particular capabilities and associated data were available from that device. Interoperable, sure, but requiring some tech-support-style downloading and installation.

Fast-forward to today, and those DDs can be more effectively managed through FDI technology, but that corner of the industry is now turning its attention to PA-DIM, or "Process Automation Device Information Model," a companion specification based on the increasingly pervasive OPC UA standard. Combined with Ethernet-APL, the advanced physical layer that will extend Ethernet down to the field device level, PA-DIM and OPC UA will effectively supersede the need to manage device-specific DDs.

Common information models needed

Indeed, it's at the information model level that industry groups of all stripes are aiming to develop common standards. And OPC UA, together with its lighter weight, less complex counterpart Sparkplug-MQTT (which often finds a place in IIoT applications) is where industry is focusing substantial and increasing efforts.

OPC UA is already embedded within the Open Process Automation Forum's O-PAS Collaborative Framework (OCF), which is designed to broker communications among industrial automation devices and applications. Further, the Open Group, which facilitates activities of OPAF, announced on Oct. 29, 2020, a three-year memorandum of understanding with the International Association of Oil & Gas Producers (IAOGP) to identify digital use cases and areas of strategic overlap across the energy industry.

And on that same day, CESMII, the Smart Manufacturing Institute, announced in conjunction with the OPC Foundation the launch of the "OPC UA Cloud Library" Joint Working Group (JWG). The goal of the JWG is to specify how OPC UA information models of machines, SCADA and manufacturing execution systems will be stored in and accessed from a cloud-based database. Such a database will enable manufacturers to draw from a wide range of OPC UA information models and profiles for use in their pre-built digitalization applications.

"JWG fills a gap in the OPC UA promise of 'from sensor to cloud,'" said Erich Barnstedt, head of Azure Industrial IoT, Microsoft, and the chair of the JWG. "Only when all OPC UA data models are publicly available on the Internet without the need to extract them from physical machines or on-prem systems, can this promise be completely fulfilled."

Meanwhile, the ability of information models to streamline engineering and enable more agile operations is also reflected in the ongoing efforts of NAMUR, the international consortium of process manufacturers, to develop Module Type Packages (MTP) that dramatically streamline system integration at the machine and/or skid level.

Protocol standardization, it seems, is passé. The goal now is a common interoperability vernacular that will make entire machines and subsystems plug-and-play with minimal integration effort. ∞




KEITH LARSON

Editor in Chief

klarson@putman.net

Protocol standardization, it seems, is passé. The goal now is a common interoperability vernacular that will make entire machines and subsystems plug-and-play with minimal integration effort.