

Rexnord Explains Industrial IoT Development Path at ARC Industry Forum

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Edge, Edge Computing, IIoT, IoTium, IoT Networks, Smart Devices, WAN

Overview

The 2019 ARC Industry Forum took place in Orlando on February 4 to 7, 2019. This year's event attracted more than 950 attendees from industry, in-

Rexnord manufactures huge mechanical gear drives that operate in remote locations around the globe. At the 2019 ARC Industry Forum, Rexnord explained its strategy and decision process for making these gear drives "smart" and enabling customers to derive condition alerts (and thus more value) from this critical plant equipment.

frastructure, and cities, as well as suppliers, system integrators, and the press. The agenda consisted of six tracks covering all aspects of digital transformation plus numerous focused workshops and co-located meetings of groups such as the Open Process Automation Forum (a forum of The Open Group).

One session titled "IoT Network Edge Infrastructure and Devices" focused on the hot topic of edge infrastructure and edge computing. A highlight of this session was a presentation by Rick Morse, Vice President Digital Solutions of Rexnord Power Transmission. Mr. Morse's presentation covered Rexnord's key learnings from developing an IoT architecture and used the example of Rexnord's recent Smart Gear Drive products.

Rexnord manufactures extremely large mechanical drives that are often used to drive large conveyor belts in vertical industries such as mining & minerals. In these applications, the gearboxes are all critical equipment, as any failure can stop part or all of the mine's production. Yet, since these gearboxes are often operating in remote locations, getting service technicians or shipping replacement parts to these sites is time-consuming and very costly. This makes it extremely valuable for mine owner-operators to know in advance of any abnormal conditions in their large gear drives.

Rexnord Industrial IoT Strategy

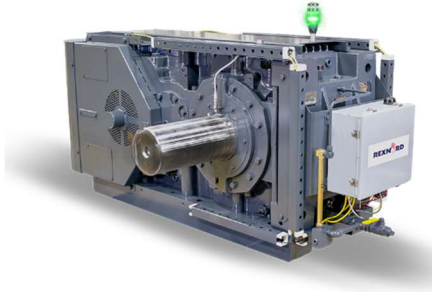
Mr. Morse emphasized four fundamental rules for developing an effective IoT architecture:

The many available technologies could prove a severe distraction to system architects. Instead they should focus primarily on customer requirements and use those requirements to drive the architecture.

- First, the customer's needs rather than technology must drive the architecture. He emphasized that the plethora of technologies available to the system architects is not always helpful. Multiple available technologies could prove a severe distraction to system architects. Instead they should focus primarily on customer requirements and use those to drive the architecture.
- Second, realize where your own company adds value and only expend development resources in those areas. In areas where your own company cannot add value effectively, partnerships are essential. Mr. Morse pointed to Rexnord's wide area networking requirement as an area where his company could not add value effectively and needed to partner to deliver an effective IoT solution. Rexnord chose IoTium's managed service to deliver secure wide area networking to communicate with these large gearboxes, many installed and operating in remote locations, including extremely remote mining operations.
- Mr. Morse's third rule was to apply off-the-shelf tools and technologies whenever possible. This simplified system integration and enabled Rexnord to deliver an architecture that consisted mostly of elements that were already familiar to the end users.
- Finally, Morse urged attendees to avoid "simply solving problems just because they could be solved." Again, the plethora of technologies and new capabilities could distract developers and architects from addressing the most important customer problems and needs.

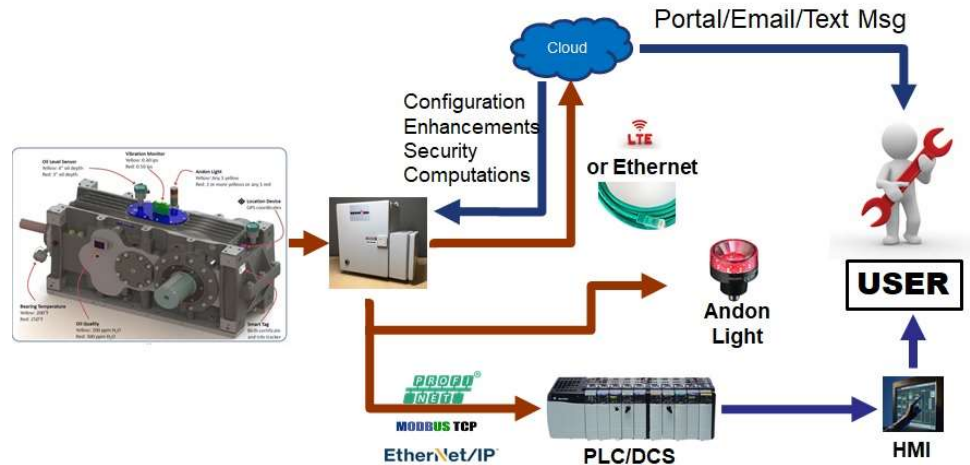
Partnership for SDWAN

For its IoT architecture, Rexnord employed off-the-shelf technologies to connect the company's Smart Gear Boxes to local networks and the cloud. Sensor data and diagnostic information are delivered to a local PLC using any of the most popular industrial Ethernet protocols. In addition, a local



A Rexnord Smart Gear Drive

andon light communicates condition at the equipment location. The end users can also be made aware of conditions through their automation system HMI and through email and or text messages delivered from the cloud. These were the exact ways that the end users already consumed plant alarms and equipment condition data.



Rexnord Industrial IoT Architecture for Smart Gear Boxes
(Source: Rexnord)

Mr. Morse cited several main reasons for choosing this architecture:

- **Future-proofing a key consideration** - These large drives last for decades and he was certain that several generations of IoT equipment would be delivered over the life of one gearbox. Because of the remote location of most of the gearboxes any locally performed service would be extremely costly. The architecture enabled services, such as security patching, re-directing to a different cloud or target, and application maintenance to be performed remotely, while matching the ways customers consumed equipment data (as mentioned above).
- **Leveraging off-the-shelf technologies and partners** - The on-site equipment was delivered using only existing technologies. Rexnord focused on delivering the diagnostic capability and partnered with IoTium - with its capability to roll-out of new applications, flexibility, and security - to deliver the software-defined wide area overlay network.

- **Scalability** - The architecture could scale very effectively so that as the installed base of smart gearboxes expanded the per-unit costs incurred by Rexnord diminished rapidly.
- Finally, the architecture enabled Rexnord to **turn sensor data and analysis into alerts and actions** for the end user customer. According to Mr. Morris, “Customers do not want raw data. They want to know what action they must take to solve their problems.”

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