ACHIEVE HIGHLY-EFFICIENT OPERATIONS AND DRIVE SAVINGS AND PRODUCTIVITY

From the power industry to manufacturing, businesses want to bring a new level of efficiency and productivity to every stage of their process. Realizing that real improvements to profitability can only be realized by optimizing complex industrial processes at the source, many businesses are turning to programmable automation controls and optimization software to accomplish this. While these tools are rapidly evolving to keep up with changing industry demands, complexities such as latency and security can be a challenge.

While Programmable Logic Controllers (PLCs), developed in the 1970s, offer much greater flexibility for programming compared to relay-based systems, they are still programmed using ladder-logic to mimic the appearance of wiring diagrams.

Programmable Automation Controllers (PACs) went further by providing a single platform that operates in multiple domains such as motion, discrete, and process control applications, offering an even higher level of flexibility and interoperability with enterprise systems. However, they are unable to dynamically adjust to changing business objectives and are viewed as static components, heavily constrained by design spec at installation.

While much of the market still uses PLCs and PACs, the growing industrial Internet era is creating the space for analytics tools to continue to evolve. As these tools increase in complexity to address the increasing need for flexibility, there continues to be more to consider when looking to optimize a process. **Here are five ways to achieve operational efficiency, cut costs, and drive productivity through data analytics:**

1. Improve Device and Equipment Integration

The IoT era involves many physical devices that produce a large amount of data, and integrating and organizing this data is critical to gaining meaningful insights. Today, data and analytics can help tie equipment operation to business objectives and performance. When devices and equipment are successfully integrated within the plant as well as with business automation tools, it becomes easier to develop condition-based maintenance strategies while improving Overall Equipment Effectiveness, or OEE.

Condition-based maintenance is the scheduling of equipment maintenance during early warning signs of failures, as opposed to a scheduled/calendar type of maintenance. This works on many types of equipment, especially if it is one that performs a consistent task such as a pump, motor, compressor, or fan. Technicians look at long-term trends of key process parameters for the equipment and learn to spot changes in behavior indicating mechanical problems are forming, and advanced users may develop statistical models of the equipment and compare existing behavior to the model in order to locate potential problems.

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2. Take advantage of high-performance computing at the Edge

The latest advances in processor technology is rapidly increasing the performance of industrial devices, leading to an expanded and often multi-purpose role for edge controllers. One way to get the most of out of the inherent multi-core processing power of the new generation of outcome-optimizing edge devices is by virtualizing programmable automation control systems.

The ability of hardware virtualization techniques to run multiple operating systems in tandem provides a new approach to the optimization of control processes, optimizing control processes by allowing analytics and optimization applications to run at the machine level without directly impacting or hindering deterministic, real-time control.

3. Harness the Power of Real-Time Data

By capturing and analyzing data and using that data in real time to adapt to a wide range of variables, new generation programmable automation control systems provide enhanced productivity, efficiency and security to any operation.

Because every operation is different, and because every business will have different types and numbers of connected devices and processes, the more flexibility and connectivity an optimization software offers when leveraging external data for analyzing and optimizing industrial operations, the better.

Edge technology also plays an important in role in real-time data processing. While the cloud can do wonders in allowing a centralized way to process, and store massive amounts of data, there continues to be a problem with latency for some applications where even a split-second delay in sending and processing data can hinder an operation. For those applications, processing data at the edge instead of sending it to the cloud removes this delay and decisions can be made immediately, resulting in true real-time response.

4. Use Local Web-Based HMIs

Human-machine interfaces (HMI) can access data at the device using a web browser. The web-based HMI offers a number of benefits, one of the most significant being that it is accessible from anywhere.

Web-based HMIs also can be accessed on any mobile device, which can reduce a facility's device footprint and support a new generation of workers who spend most of their work time physically in the plant. A web-based application can be developed once and then provided to any device supporting typical web browsers which can cut costs and save time during development and troubleshooting.

5. Monitor and Diagnose Remotely

It can be challenging for OEMs to assess the state and health of the systems, especially when they have large fleets or numerous remote assets to track. Without connectivity, the OEM service teams need to travel to each customer who uses their equipment either proactively – in which case they have to visit every one of them – or reactionary because something has already failed. The first case can potentially involve a lot of travel time to visit equipment that is running just fine. And the second case isn't much better because the OEM is visiting a customer who is already impacted by equipment failures, which might create reputational harm and the potential loss of future sales.

Therefore, the benefit of real-time information, especially when the information is by exception, is that the OEM service teams have insight into the health of their fleet remotely. This way, OEMs can be proactive at servicing equipment during early warning signs of failure, rather than when the equipment has actually failed.

When OEMs can remotely and securely collect and analyze data, they easily can provide actionable information for maintenance engineers and end users who have purchased the equipment. With access to detailed fault logs, hardware and firmware versions, and sweep time, operators can debug faults remotely, greatly reducing operational costs and unplanned downtime.

Remote monitoring and diagnoses using cloud-based services also provides OEMs with insight into how customers are using their machines, and can optimize asset performance, processes, and profitability.