Transforming Information Into Maintenance Insights

How operational analytics are moving beyond alarms and uncovering deeper system intelligence

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It's fairly common today for supermarket, restaurant and convenience store operators to utilize an electronic facility management controller to help monitor key system performance in their facilities. Typically, refrigeration, HVAC, lighting and even energy management are tied into these control platforms to give operators visibility to systems that impact customer and employee comfort, and of course, food quality. And when there's an urgent problem with any of these systems, operators are often notified with either local or mobile alarms so they can investigate and take appropriate actions.

Although useful, these alarms often represent only the tip of the iceberg in regard to what's really happening in their operations. Below the waterline — or under the hood of these systems, so to speak — lies an abundance of invaluable information that remains largely unused. As a result, most companies spend their time prioritizing, tracking and responding to alarms that need immediate attention, but have relatively limited visibility into their overall operational status.

They have yet to realize that the true potential of analytics lies below the surface.

Rather than focusing only on what's happening at any given moment — whether that's a low- or high-priority alarm — analytics provide much deeper insights into issues that could have major operational impacts in the near future. Access to these insights can transform maintenance activities from a primarily reactive approach to a more condition-based, analytics-driven model.

**Understanding “urgent” versus “important”**

Prioritizing maintenance events according to their urgency or importance is an effective way to visualize the role of operational analytics. Using this matrix, maintenance events and operational decisions can be divided into four basic categories:

- Don’t roll a truck (no action required)
- Roll a truck soon (plan to take action)
- Roll a truck now (take action now)
- Take steps to improve (address at next scheduled maintenance)

Using our iceberg analogy, urgent issues lie above the surface and represent things that you will need to respond to immediately. Below the surface, yet still considered highly important, are those areas where an analytics platform can help make significant operational impacts (in the lower right quadrant).

This framework helps operators make maintenance decisions based on their potential business impacts, and many companies are already utilizing at least some aspects of this approach. It makes sense to roll a truck in response to an event that threatens...
to disrupt operations or cause significant losses. For example, a refrigeration rack alarm may indicate an urgent issue that needs to be addressed immediately, because it could impact multiple cases of perishable product — and potentially affect tens of thousands of dollars in store merchandise.

On the other hand, analytics can help identify issues that are highly important but not as urgent, as they begin to uncover areas of improvement by analyzing system performance trends and correlations. Analytics tell you what’s happening below the surface, and they can certainly impact operations at times, but they don’t require immediate action. Often, these issues can either be addressed during pre-scheduled intervals or when the equipment or system condition dictates a maintenance activity.

Of course, equipment performance can also have a direct impact on energy efficiency and operational effectiveness. Not only does poorly maintained equipment use more energy, it can also potentially impact other operational imperatives such as food quality and safety. Most analytics programs monitor energy consumption and equipment condition, making it possible to draw correlations between the two inputs.

**Drive performance across the enterprise**

Now that we understand the importance of analytics within a maintenance framework, we can extrapolate this potential across the enterprise. Drawing from a combination of equipment sensors and control system data, performance analytics provide store operators and enterprise managers deeper insights for:

- Real-time and historic operating conditions in their facilities and systems
- Pressure, temperature and energy data to compare to established benchmarks
- Enterprise- and store-level dashboards and prioritized notifications

For an example of how this differs from the rack alarm scenario, let’s look at a display case analysis based on temperature sensor data. Performance analytics may detect an anomaly in case temperature deviations that, while still within safe ranges, could indicate a larger performance issue. Instead of being notified with an urgent alarm, operators are presented with an alert on their operational dashboards. This insight gives them an opportunity to investigate the issue at their discretion, and even potentially preempt a potentially larger issue.

This is also an example of how operational dashboards allow retailers to align maintenance and operational activities around performance. Today’s facility management dashboards typically provide a breakdown of the urgent category of maintenance issues, as previously noted. By extending these dashboards to also include performance analytics, end users can gain a much deeper understanding of how their systems are performing — not just which systems have urgent problems.

Equipped with this information, operators can receive advance notice of certain performance issues that may soon impact them — on which systems or pieces of equipment, and in which stores. Enterprise views quickly provide managers with visual snapshots of urgent and important issues across their store networks, while enabling investigation into specific assets in their respective facilities. Whether you’re a maintenance technician or an enterprise manager, operational dashboards help allow you to focus on those specific maintenance activities which may potentially impact performance in the near future.

My next article in this series will take these concepts to the next level and discuss how analytics platforms can build on this foundation to start predicting operational and equipment issues. More than simply telling you there’s a problem that needs attention, these predictive capabilities are providing additional detailed information and actionable intelligence to help retailers run their operations more profitably and efficiently.