

There's an App for...*That*?

Key performance indicators and overall equipment effectiveness are coming to the plant floor, the front office and now your smart phone.

By Bob Sperber, Plant Operations Editor

You're on a typical meat-packaging line, supervising production and maintenance as your lines hum, whirl and clank along. There are just too many processes, machines and moving parts – including people – to track as well as you'd like.

Where should you spend your time? One little sprocket, one short in a wire or one misdirected pallet, one bottleneck-inducing slowdown can start a chain reaction and bring your lines, and productivity targets, to their knees.

What if the supervisor could get an automated message, direct to his smart-phone, preventing such productivity- and profit-killers? How about a screen that shows you all the charts and graphs you need to know – in real time – whether your “rival” supervisor at another plant is gaining on you in an effort to win the next quarterly production-target sweepstakes?

Turns out, there's an app for that.

Really. Although to most food processors, it sounds like a pipe-dream, the stuff of trade show prototypes.

Johnsonville Sausage, Sheboygan Falls, Wis., like most companies has not gone to such tech-geek lengths but always keeps an eye on plant data and better ways to collect it. The company has made many automation upgrades in its plants over the years, but always through careful deliberation.

For the sausage-maker's plants, adopting new technology “is not a mandate or an order. We have a management structure that allows plant management teams to, in theory, ‘opt out’ of innovations that may be in place at other facilities. In reality, it requires our team to put our salesman hats on to sell the benefits to our plant maintenance teams,” says Tom Ehrenberg, engineering systems analyst.

This is in keeping with a restructuring by CEO Ralph Stayer, who in the 1980s put the company at the vanguard of employee empowerment and coaching-style change management – and led to growth and international expansion. Stayer has been something of a business hero for his co-authoring role in the 1993 bestseller “Flight of the Buffalo: Soaring to Excellence, Learning to Let Employees Lead.”

Despite the awesome power of “not yet” that his plant-customers wield, Ehrenberg says the management system



Heat and Control's Information That Matters puts KPIs, OEE and other indicators on your desktop, portable computer and smart phone.

and resulting corporate culture have turned labor-intensive production lines into automated marvels that rank among innovations “no one else in the industry is doing.”

Now his team is on a mission to upgrade the company's maintenance systems – beginning with mindsets across the organization. This year, Johnsonville plans to migrate the computerized maintenance management system (CMMS) at six plants to the maintenance module of the SAP business system in use at the corporate level. Past improvements include replacing maintenance requisition paperwork with on-line work orders. Ehrenberg says the new system will allow a deeper dive into benchmarking and continuous improvement tools “because data is power.”

His current priorities include moving toward better predictive tools and more robust reliability data, as well as optimizing work orders to improve uptime and work-order completion rates. Further into the future, more systems may be tied together to enable fuller implementation of performance tools such as key performance indicators (KPIs) and scorecard-type displays of overall equipment effectiveness (OEE) to compare the performance of varying machines. “KPI and OEE are in our vocabulary, but we aren't pursuing them in a comprehensive way yet,” he says. “We need to walk before we can run.”

DONNING, DOFFING AND SCHEDULING

"Donning and doffing" is not unique to the meat industry, but one employee lawsuit started with a meat company and went all the way to the U.S. Supreme Court. Recent interpretations of the Fair Labor Standards Act by courts and the Dept. of Labor address employees' right to compensation for time spent changing in and out of work clothes, as well as other pre- and post-job activities each day.

Learn how to mitigate the liability for non-compliance while still managing company profitability by watching an archived webcast at <http://video.webcasts.com/events/putm001/36804>. Attorney Dale Owens and time management firm Kronos lead the discussion.

Donning and doffing is only one component affecting optimal employee scheduling. ScheduleSoft software figures in shift changes, job certifications and ergonomic rotations, plus it computes the right number of employees for changes in demand. We expect a webcast on that subject, too, probably in April, so watch your e-mail box for notification. Or see www.schedulesoft.com.

KPIs and OEE, simplified

Is it realistic to think it's possible to cost-effectively achieve visibility of data between machines on the plant floor and the main office? The short answer is that OEE and KPI put such visibility within grasp of any food or beverage organization. While OEE has roots as a means of benchmarking and comparing the performance of machines with different uses and characteristics, for example, it and related tools are now regularly used for balancing raw materials with production schedules; checking fleet-wide asset performance; finding new opportunities for greater return on assets; and measuring the effectiveness of ongoing cost-control measures.

Information from machine controls up through business systems has become easier to integrate using standard software interfaces and networking standards. And many leading software applications now offer, as a starting point, KPI and OEE forms based on near-universal management frameworks.

In plain English, a KPI is just a number, and can represent any target or goal important to the user. One set of indicators might help a financial manager keep tabs on the value of inventory, finished goods or profit generation. Plant supervisors might want KPIs to tally the number of defects per hour or how fast a line is running, and likewise, the same numbers can be combined into running tallies of defects, production or other data points at the plant level, or data comparing plants to another.

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Which KPIs you choose to put on your home-screen or “dashboard” depends on your job, goals and priorities. To get users started, many automation and business software applications incorporate standard scorecard data sets of KPIs. Companies can also refer to the “balanced scorecard” tool that became well-entrenched in the practice of performance management for more than a decade.

OEE, too, is a single number, typically presented as a percentage from 0 to 100, designed to provide an at-a-glance measure of how well a machine, a line, a plant or a multi-plant operation is running with regard to capacity, during its scheduled uptime hours. OEE is based on three calculations multiplied together to form a single number representing a percentage:

- Availability = Available Time/Scheduled Time.
- Performance = Actual Rate/Standard Rate
- Quality = Good Units/Units Started

It's important to look deeper than just the top-line OEE number, because if a total OEE is 94, the plant may have sacrificed quality to bump-up performance – or, vice-versa, slowed production or performance to ensure 100 percent quality. But OEE is a good starting point. When performance is low, for example, it may prompt the supervising manager to suss-out the bottleneck.

So, for example, on a line with conveyors, feeding weighers, packaging machines and palletizers, an operations supervisor may have to look at many machines and components to find the cause of the bottleneck. Maybe the answer is better training for one of the operator positions on the line, or maybe a maintenance technician needs to be called in to adjust the sealing jaws on a horizontal wrapper.

“OEE is a good benchmark that tells you where in general terms you need to be looking. KPIs give you the little nuggets of gold, information that might be out of bounds, or operating parameters, and having a negative impact on your performance number,” says Paul Nowicki, information design engineer for equipment supplier Heat and Control (www.heatandcontrol.com), Hayward, Calif.

KPIs can play a role in such cases, down to the machine level. Nowicki explains how KPIs helped solve a problem with uneven seasoning on a production line. By measuring the run time for each depositor, data showed one was jogging on and off intermittently relative to the others, which were feeding a steadier stream.

“We were able to very quickly identify the problem and rebalance the system to make it work properly,” he says. The problem turned out to be in the machine’s programmable controller coding, the kind of nitty-

gritty that can go unnoticed, perhaps surfacing in a spreadsheet a week later and even then being missed.

Yet the same controller fault codes were turned into information and ultimately, bet-

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Johnsonville Sausage puts KPIs and other data in the hands of employees and empowered them to make changes that improve production.

ter quality, uptime, productivity and profit. Nowicki explains that his goal is "to give people notification of these faults in real time. So you know, for example, in the last four hours how many times the fault occurred 'this way' as opposed to 'that way.' And you can know why a machine jammed, and inspect the wear point and do maintenance. Uptime becomes much better.

"By converting that data into usable data, you can quickly evaluate that asset, and that's what ITM [Information That Matters] is all about." Information That Matters is Heat and Control's name for a software system that packages KPI displays, OEE indicators and fault notifications for use on the desktop, portable computer and now, smart phone.

Going mobile

Just as faults and alarms notify operators of problems on the floor, key parameters also can be tracked and set to alert supervisors in Heat and Control's ITM mobile app, which to date runs on Apple's iPhone, Research In Motion's Blackberry and Google Android-based smart phones.

The mobile app draws data from plant automation hardware and software to deliver reports in the form of KPI displays, OEE indicators and fault notifications. KPIs let the user assess current conditions and speed adjustments. OEE lets them compare one unit, line or operation to another at the plant, at other plants or against established benchmarks. Fault notification is self-explanatory, alerting operations and maintenance people to address a problem.

This technology isn't at all bleeding edge in U.S. industry. It has been implemented by several customers of Transpara Corp. (www.transpara.com), Pleasanton, Calif., which was founded by some of

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the same people who helped found WBF, formerly the World Batch Forum. The roots of this consortium lie in the formation of the international batch processing standard known by U.S. automation professionals as ANSI/ISA-88 or the S88 Batch Control standard.

Nowicki, it happens, chairs the International Society of Automation (www.isa.org) committee updating this international standard. (He is also president and co-founder of World Food Trace, a nonprofit company seeking to develop an “instantaneously traceable” global food supply chain.)

The secure web app developed by Transpara, and using data from Power in Learning (www.powerinlearning.com), Crestline, Calif., shows processors how the software might look if expanded from, say, Heat and Control’s Information That Matters mobile-empowered automation backbone to encompass inventory levels, utilities, maintenance and reliability data. Nowicki says part of the strategy behind Heat and Control’s ITM is “to provide a system view, not just a machine view, so our application is set up to be open and ready to share data from other machines.”

Happy returns

As a whole, food processors rely more heavily on their machine vendors for process and automation expertise than their counterparts in other industries, and are relatively new to

KPIs and OEE. “But once they start down that path, the practice helps them know which operations are healthy and which are not,” says Rudy Westervelt, president of Power in Learning.

He has helped processors use these tools to confront problems that come “right off the bottom line,” such as material loss and shrink control. Westervelt, who formerly ran a Kroger dairy plant, is familiar with losses in pipelines, receiving and holding tanks, pasteurizers and fillers. He explains that a typical, mid-sized plant producing 80,000-100,000 gallons a day can save \$250,000 a year if it cuts currently acceptable losses of 2 percent down to 1.5 percent.

The good news in terms of capital spending is that food companies can institute KPIs, OEE and other continuous improvement or Kaizen methods using features built into “many of the leading automation software applications out there today, combined with the controllers and meters that may already be installed on process equipment.”

Before dollar-savings can affect the bottom line, it’s critical to realize “it’s not about changing the tools we use, it’s about changing mindsets,” reminds Johnsonville’s Ehrenberg. Once common goals and values are in place and plants are on the same page with corporate leaders, they can start to have real fun with the numbers. Because what can be measured can, in turn, be benchmarked, tracked and improved **PP**



MORE ON THE WEB

Got your smart phone handy? For a working demo of Transpara’s food dashboard, go to <http://demo.transpara.com/Food>. The data are already loaded and running, there’s nothing to load. The app will also work in your PC’s web browser, as well.

Recent related articles:

- CMMS Software: Will Work for Food (www.FoodProcessing.com/articles/2009/cmmsssoftware.html)
- iPlant (www.FoodProcessing.com/articles/2008/083.html)

And OEE tutorials, guides and other resources are at www.oee.com/oee_quick_guide-request.html?gclid=CNSWOafx16YCFQPsKgodqhCrHA

Ralph Stayer’s “Flight of the Buffalo: Soaring to Excellence, Learning to Let Employees Lead,” is available at Amazon.com: www.amazon.com/Flight-Of-the-Buffalo-Excellence-Learning-Employees/dp/0446670081.

And, of course, you can search for any plant topic from the home page of www.FoodProcessing.com. “Meat” is a little broad (it will bring up nearly 1,000 stories), but you get more manageable results by focusing in on “meat processing” (still 858 hits), “meat packaging” (555) or “meat recall” (65). Or try a specific company, such as Tyson (you’re back up to 1,438).

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