

Operations Practice

# The digital difference in measuring production performance

Measuring production performance digitally—and acting on the insights—can give a kick to the bottom line and be the first step on a digital transformation journey.

*by Karel Eloot and Stanley Wang*



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**We typically think of performance** management as a system for managers to rate, review, and reward their direct reports. Done well, it lifts performance at the individual level and multiplies the effect across the entire organization.

But it's not just employees that need to be carefully managed. By extending the system to machines, resources, and processes, manufacturers are better able to identify problems before or as they happen, meaning managers and the front line can make real-time adjustments to keep production on track. And by better tracking and analyzing performance metrics, the best factories can identify new ways of working to trim costs and boost productivity and profitability.

But what makes a performance-management system effective? We find that the ideal

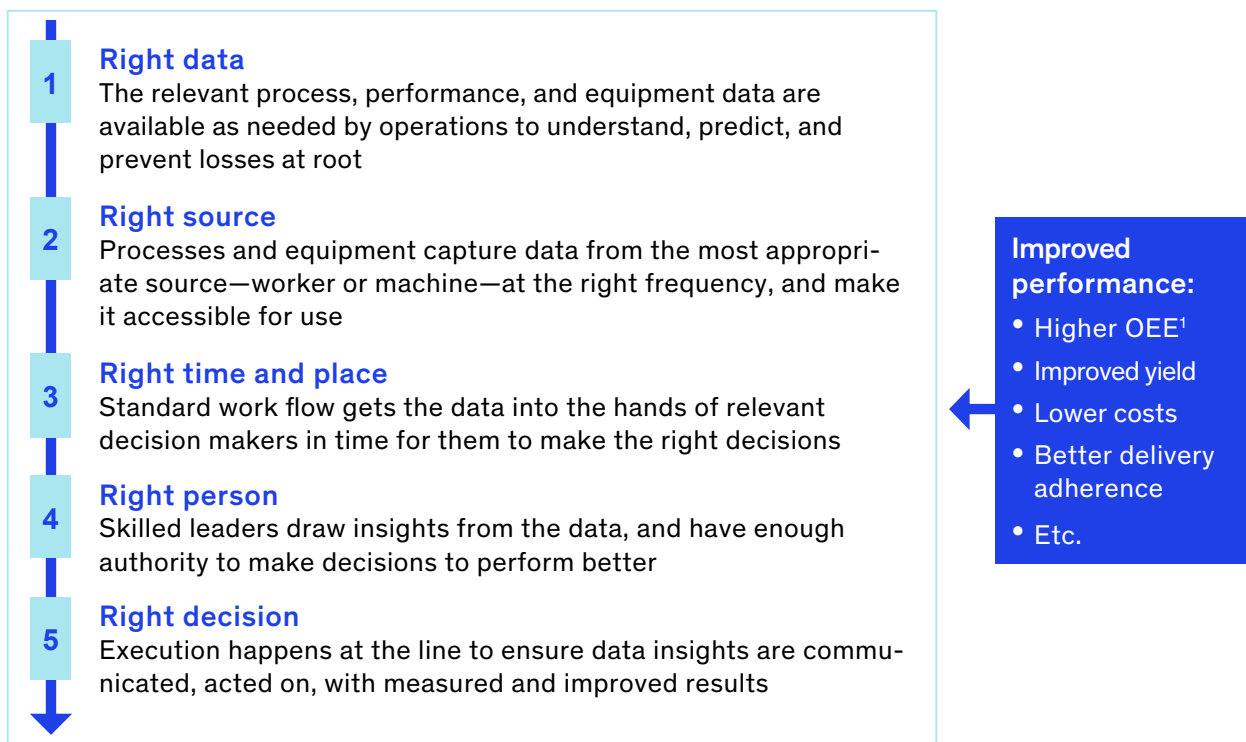
performance-management system comprises five elements: *right data; right source; right time and place; right person; and right decisions* (Exhibit 1). When functioning well, it creates a standardized work flow that captures data from multiple sources, then provides it to a skilled leader with insight and authority to make a decision and communicate it back to the production line for execution.

### The rewards of performance management

The elements may sound common-sensical, but that doesn't make them easy to achieve. And if any of them is out of alignment, value starts to leak out of the system. Because a typical materials manufacturer has five to seven major processes—energy, mechanics, quality control—up to 35 stress points can lead to system failure. Factor in multiple

Exhibit 1

**An effective performance-management system has five elements.**



Overall equipment effectiveness

shifts across multiple production lines and the system's complexity increases exponentially.

Moreover, in many basic-materials sectors, such as metals and chemicals, today's performance-management systems are often poorly designed or partially implemented. And a bad system can be worse than no system at all.

In these situations, the rewards of performance management are well worth the investment, as a Chinese metals manufacturer found when it recently finished implementation of a performance-management system in step with a broader lean transformation. The three-year project yielded significant improvements through greater performance alignment, including throughput increases of more than 10 percent and cost reductions of more than five percent.

That summary hints at the tradeoffs. The first is time: It usually takes between one and two years for a new performance-management system to become a cultural norm, and another three to five years for it to be fully embedded with all other business systems. And that is if there is a very determined CEO or COO driving the change.

The second is effort. The initial system was almost entirely analog, relying on heavily manual processes such as whiteboards and spreadsheet printouts. In one factory, almost half of the back office had to start quite early each day to manually generate daily KPIs for review in the morning planning meeting—meaning that more than 20 percent of total back-office capacity was spent on basic data processing.

And the third is completeness. For example, a steel-plant manager following recommended quality-control practices might visit the cooling water pump three times a week to look for deviations. But this means a problem could still go undetected for days.

## **The potential from digital**

Fortunately, success encouraged the company to look at a faster, easier, and more thorough option: digital performance management, which it decided to pilot. Thanks to developments in data processing,

network hardware, Internet of Things (IoT) sensors, and IT infrastructure design, it is possible to digitize a new performance management system as it is developed and implemented (Exhibit 2).

The pilot was designed and rolled out in less than three months. By standardizing the way of working, the factory raised knowledge and capability levels among more than 100 frontline supervisors and staff, and ensured that all shifts worked to the same performance standards. Faster, more robust problem solving also enabled it to reduce cycle times by more than five percent while also increasing throughput—in return for very little capital outlay.

Importantly, its new systems can generate the same data that otherwise would require half of the entire back office to spend hours producing—freeing up about 15 percent of back-office capacity and enabling better, more timely decision-making.

## **The role of people**

Other manufacturers are pushing even further. Schneider Electric's facility in Le Vaudreuil, France was named a "Lighthouse" manufacturing site by the World Economic Forum for its successful application of Fourth Industrial Revolution technologies. As part of its digital transformation, the factory introduced digital performance management to fundamentally revolutionize the role of its plant managers.

The previous duties would be familiar to those at our Chinese metal manufacturer: checking execution, correcting issues, and driving the workforce to achieve the plant's KPIs. Now, digital performance management has freed up time and effort and made more sophisticated data available, including information obtained directly from machines and processes, allowing managers to focus on benchmarking and analysis to drive real improvements to the factory. For a global manufacturer, this feedback is particularly important in driving improvement not only at one location, but across an entire production network spanning dozens of countries. Managers can benchmark and compare the performance of their

## Digital amplifies the value of rigorous performance management.

	Performance management ...	Digital performance management ...
Data	<ul style="list-style-type: none"> <li>Data governance and KPI<sup>1</sup> formulas are defined, but might have tweaks to reflect local differences: “My plant is different”</li> </ul>	<ul style="list-style-type: none"> <li>Clear mechanisms <b>ensure KPIs are apples-to-apples</b> and not manipulated</li> </ul>
Source	<ul style="list-style-type: none"> <li>Data-capture processes and equipment are defined, but huge complexity means spending hours/days to prepare</li> </ul>	<ul style="list-style-type: none"> <li><b>Automated-report generation</b> with minimal manual effort and a <b>single source of truth</b></li> </ul>
Time and place	<ul style="list-style-type: none"> <li>Issue-resolution efforts occur, but well after the fact (e.g. only monthly or during kaizen events)</li> </ul>	<ul style="list-style-type: none"> <li><b>Real-time data alerts</b> and immediate issue resolution in the moment</li> </ul>
Person	<ul style="list-style-type: none"> <li>Decision rights and authority are defined, but person in charge is too busy to initiate performance dialogues</li> </ul>	<ul style="list-style-type: none"> <li>OK to <b>initiate performance dialogue with any member</b>, anywhere, anytime, using mobile and other devices</li> </ul>
Decision	<ul style="list-style-type: none"> <li>Root-cause problem-solving tools are used, but tracking whether changes have occurred is difficult</li> </ul>	<ul style="list-style-type: none"> <li><b>Digital fishbones</b> and <b>closed-loop action-trackers</b> ensure actions drive performance</li> </ul>

<sup>1</sup> Key performance indicator

own factory against others to drive improvement across the organisation.

It's a long way to go before the Chinese metals manufacturer can challenge Schneider for scale, but both are reaping the advantages of digital

performance management. For the Chinese company, piloting digital performance management across one process as part of its ongoing lean transformation has built faith in digital technologies from the boardroom to the shopfloor, and is a potential first step on a much larger (and even more profitable) digital-transformation journey. While it does so, it can keep an eye on beacons like Schneider.

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