

Ask an expert: What Industry 4.0 can do for maintenance

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Could new technologies power the next wave of maintenance efficiency improvements? We asked Tim Close to outline the opportunities and the challenges.

by Timothy Close

Q. Is maintenance efficiency still a challenge?

A. A lot of evidence suggests that it is. For more than a decade, we've tracked the productivity of a range of providers involved in military aircraft maintenance, for example. Over that period, average wrench time—that's the fraction of their time personnel spend actually performing maintenance tasks—has increased by just one percentage point. Our annual benchmarking survey of maintenance performance in North Sea offshore oil operations has revealed negligible improvements over the past decade. And the average score achieved by companies that take our [BAP survey](#) here on the Operations Extranet has remained basically flat since we launched the tool in 2012.

Across many industries, that lack of progress is a real concern, as companies face rising pressure to cut maintenance overheads while also increasing uptime and reducing the incidence of equipment failures and unplanned outages.

Q. Does that mean companies need to try something new?

A. The good practices that drive maintenance performance are well-known and well-established. Reliability-centered maintenance (RCM) was developed in the 1960s. Risk-based maintenance approaches matured during the 1990s, and standard textbooks on maintenance planning and scheduling have been around for decades.

Companies looking to take their maintenance performance to the next level can pursue a number of strategies. They can take an incremental approach, for example, investing in the steady, [continuous improvement](#) of their maintenance processes. Or they can mobilize their organizations for a large-scale maintenance and reliability [transformation](#).

Today, there's a third option that is attracting considerable interest. And that's the use of new technology, specifically Industry 4.0 tools and methodologies, in the maintenance area.

Q. What does Industry 4.0 mean for maintenance?

A. [Industry 4.0](#) is a catch-all term for a big range of technologies and approaches, including the networked sensors and devices that make up the Internet of Things, big data and advanced analytics approaches, and new digitally-enabled manufacturing techniques. Many of those things have potential applications in maintenance.

Q. Can you highlight some notable examples?

A. Advanced analytics techniques can forecast failures using information sources and data that were not previously accessible, or even available. It is now possible, for example, to combine information in shift handover reports, production schedules, and changes in the weather to predict when equipment failures are likely to occur. That

could have a huge impact. We know from experience that implementing a predictive maintenance system can reduce production losses by more than 20 percent while also cutting maintenance costs by over 10 percent.

Tablet computers and wearable displays can give technicians immediate access to critical information as they work. That really helps to boost wrench time. Advances in wireless networking and display technologies mean those systems are becoming more powerful and more useable all the time. Then there's additive manufacturing, or 3D printing, which is already transforming some maintenance supply chains by allowing spare parts or specialist tools to be printed on site, on demand. Improvements in materials and manufacturing technology mean that those systems can now produce parts for highly stressed or production critical applications.

Q. So should all maintenance departments be ramping up their investments in industry 4.0 technologies?

A. Unfortunately, it's never that simple. You can't just apply technology in a vacuum and expect good results. An Industry 4.0 transformation needs to blend traditional improvements with new tools and techniques, and the two sides need to work in a complementary fashion. You won't achieve any real benefits by equipping your maintenance teams with augmented reality technologies, for example, unless you already have a robust process for planning and scheduling maintenance activities.

Q. What else needs to be in place to maximize the benefits of industry 4.0 investments in maintenance?

A. Accurate data! There's no point trying to implement a predictive maintenance system if you don't have accurate information to drive your analytical activities. That means you need detailed data on historical downtime and asset performance, accurate information on your asset hierarchy and the parts used on those assets, and a clear picture of current asset condition.

And just like a traditional transformation, you need a strong team with the right skills. To make industry 4.0 work in maintenance, your team needs a very particular combination of skills and expertise that encompasses advanced technical capabilities, traditional maintenance management skills and the ability to drive organizational change.

Q. What's the best way to get started?

A. It might be tempting to try and introduce new analytics and IT tools in a 'big bang' approach by site, like an ERP system implementation, but the pilot-and-rollout approach is still the best and most sustainable way to transform operations. Like any other transformation effort, Industry 4.0 requires changes to the way people work, together with the development of new skills and new ways to measure performance. All those things take time to get right■

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