

The Power of Industry 4.0 in Asset Management

Maintenance Leaders Are Leveraging Industry 4.0 to Increase Productivity and Profitability

Findings from the MPI 2020 Industry 4.0 Study



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Introduction



The *MPI 2020 Industry 4.0 Study* examines the extent to which manufacturers are leveraging Industry 4.0. It's important to note that this study was conducted in February 2020, prior to the COVID-19 pandemic and ensuing economic disruption, for two reasons:

- First, large majorities of manufacturing executives from around the globe reported that Industry 4.0 dramatically improved their productivity and profitability, both in their facilities and in how they develop and deliver smart products.
- Second, these executives' insights into how to leverage Industry 4.0 will be critical for other manufacturers as they navigate through the COVID-19 crisis toward the opportunities beyond. This summary — which examines how executives with insights into their company's maintenance/asset-management activities¹ are using industry 4.0 — provides proof of that. It explores the opportunities and challenges in embedding intelligence and/or smart devices into their operations.

Since this study began in 2016, manufacturers have rapidly implemented Industry 4.0 technologies and best practices within their facilities. Manufacturing leaders have recognized that they must digitize now — or become vulnerable to competition. Those with knowledge of asset-management practices (“maintenance leaders”) report that the digitization of production has resulted in improved equipment capabilities as well as enhanced productivity, revenues, profits, and competitive advantages. But they also believe that much more can be done with Industry 4.0 to further improve maintenance capabilities and asset performance.

A handwritten signature in black ink, appearing to read 'John Brandt'.

John Brandt
CEO
The MPI Group



¹ 20 percent of study participants (135 of 679) indicated they have detailed knowledge of Industry 4.0 activities related to maintenance/asset management in their companies.

Importance of Industry 4.0 to Maintenance Leaders

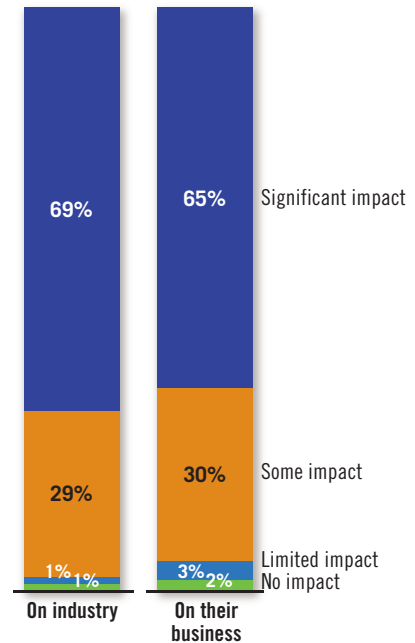


Nearly all maintenance leaders report that Industry 4.0 is important to their companies — 53 percent say it is “extremely important” and 41 percent “very important.” Two-thirds of these executives indicate that Industry 4.0 will have “significant impact” on their industries and businesses in the next five years (*Figure 1*) — higher percentages than for other study participants.

Approximately 58 percent of maintenance leaders report that Industry 4.0 is a competitive differentiator today, and another 39 percent say it will be in the future. Nearly a quarter of executives described their companies as “Industry 4.0 leaders” and 61 percent as “Industry 4.0 competitive.”

With such high expectations for Industry 4.0, it’s no surprise that 51 percent of maintenance leaders report that their companies have strategies in place and implemented to apply Industry 4.0 technologies to plants and production processes. Approximately 46 percent say their organizations have a “significant companywide understanding” of Industry 4.0 and how to apply it to their businesses, with another 47 percent report-

Figure 1. Impact of Industry 4.0 in next five years (percent of manufacturers)²



ing “some companywide understanding.”

Industry 4.0 has been leveraged by manufacturers to improve maintenance and asset management, giving executives unprecedented visibility into the performances of their machinery and production lines.

Industry 4.0 Impacts Operations



Maintenance leaders report that their companies have incorporated smart devices or embedded intelligence into 47 percent (average) of their production

processes and equipment, and 94 percent expect that percentage to increase in the next two years.

² Due to rounding of decimals, some data in this report will not sum to 100%.

Maintenance leaders are central to Industry 4.0 production implementations, typically leading the integration of sensors, controls, and other digitally aware devices into machines. These are then networked together, sharing real-time data that prompts automated changes and alerts maintenance staff to potential problems based on machine characteristics (e.g., temperature, energy draw, vibrations). This same data offers maintenance executives insights for digital decision-making and analytics, helping them to evaluate asset lifecycles and equipment needs and performance.

Shipping/logistics/transportation and maintenance processes are most likely to have had “significant application” of smart devices and/or embedded intelligence (Figure 2).

Two-thirds of maintenance leaders report that their companies have invested more than 5 percent of sales in implementing an Industry 4.0 strategy in their plants and

processes in the past year, and 95 percent will increase that investment in the next two years (10 percent will increase investments by more than 20 percent).

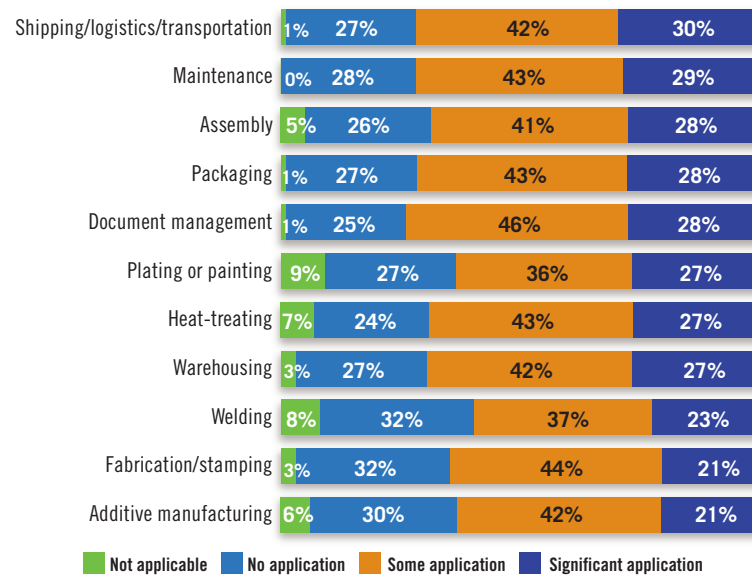
The reasons for these massive investments are clear: Industry 4.0 initiatives are improving workplace capabilities (e.g., 45 percent significantly improved their ability to leverage business analytics) and production measures critical for asset management (e.g., 47 percent significantly improved machine reliability).

The vast majority of maintenance leaders also report that Industry 4.0 increased productivity (93 percent) and profitability (90 percent). Nearly all believe that Industry 4.0 will increase productivity (96 percent) and profitability (94 percent) over the next five years.

The ability of Industry 4.0 to transform production capabilities and performance outcomes will likely drive continued investment in digitization.



Figure 2. Process in which smart devices and/or embedded intelligence have been applied (percent of manufacturers)



Challenges with Industry 4.0



Despite widespread adoption of Industry 4.0 technologies for operations improvements, especially maintenance-related activities, much more can be done — starting with access to data from machines and processes. Many company executives and supply-chain partners don't have access to Industry 4.0 data:

- *Company executives:* Just 50 percent of manufacturers provide access to all who need it.
- *Customers:* Just 24 percent of manufacturers provide access to all who need it.
- *Suppliers:* Just 24 percent of manufacturers provide access to all who need it.

This inability to get production and equipment information into the hands and applications of those in need is likely linked to weaknesses in Industry 4.0 network infrastructures. The initial phase of Industry 4.0 is applying smart devices and newer sensors and controls within equipment, as well as converting source data from analog to digital signals; upgrading networks follows and is often more time- and resource-intensive:

- *Machine-to-machine communications:* 53 percent require upgrades (41 percent some; 9 percent significant; and 3 percent need a network overhaul).
- *Machine-to-enterprise IT systems communications:* 62 percent require upgrades (44 percent some; 14 percent significant; and 4 percent need a network overhaul).
- *Machine-to-supplier IT systems communications:* 70 percent require upgrades (44 percent; 20 percent significant; and 6 percent need a network overhaul).

- *Machine-to-customer IT systems communications:* 67 percent require upgrades (36 percent some, 19 percent significant; and 12 percent need a network overhaul).

Network problems are both technical and cultural. Maintenance leaders report that information technology (IT) staff and operations technology (OT) staff frequently don't collaborate on activities critical to Industry 4.0. The activity with the highest rate of collaboration is resolving technical operations issues (60 percent of manufacturers) — in essence, firefighting. Other, more proactive work that could support Industry 4.0 has far lower rates of collaboration: network security (44 percent of manufacturers), linking operations data with business analytics (42 percent), and upgrading legacy operations systems (38 percent).

The lack of attention to security is of concern, given the potential for unauthorized access to control equipment, impair operations, and harm operators or the local community. While most maintenance leaders are either “very confident” (42 percent) or “confident” (51 percent) in their organization's cyber risk management program to address Industry 4.0, many haven't taken actions to improve security. For example, only 53 percent have conducted a cyber risk assessment, and only 48 percent have implemented new OT security controls — and these practices were the *most likely* to be reported by maintenance leaders.



Manufacturers also face other challenges in implementing Industry 4.0 into plants and production processes — starting with simply identifying opportunities for Industry 4.0 (*Figure 3*).

Given the issues that many manufacturers face with Industry 4.0, it's not surprising that many digital initiatives fail to achieve strategic objectives, miss deadlines, or exceed budgets:

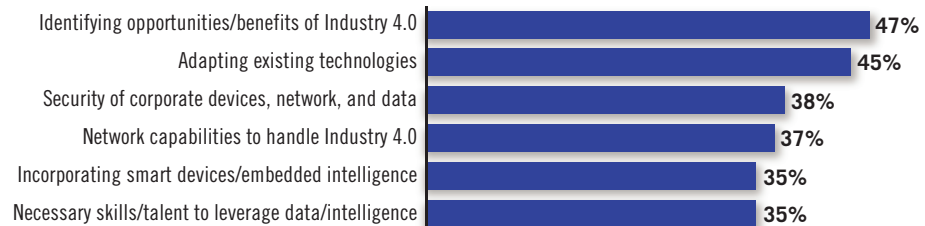
- *Achieving strategic objectives*: 20 percent achieved only some strategic objectives, with another 2 percent achieving no strategic objectives
- *On schedule*: 36 percent are significantly or somewhat later than scheduled
- *On budget*: 42 percent are significantly or somewhat over budget.

Some manufacturers are already improving maintenance and asset management via digitization, but others haven't yet leveraged Industry 4.0 to its full potential. To do so, they'll need to:

- Develop maintenance strategy to monitor and better manage machines digitally,
- Find and train maintenance talent to operate in a digital plant environment, and
- Invest in technologies and infrastructures to efficiently deliver equipment data to those who need it.

Are your Industry 4.0 efforts in maintenance and asset optimization ready for today's new challenges — and tomorrow's opportunities?

Figure 3. Top challenges with Industry 4.0 (percent of manufacturers)



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The MPI Group

mpi-group.com

+1 (216) 991-8390

jbrandt@mpi-group.com