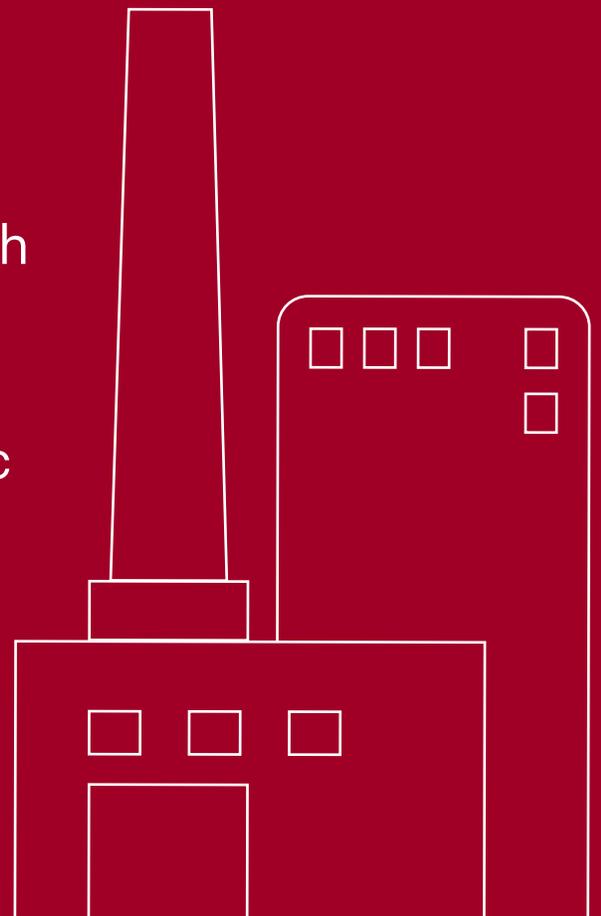# DIGITAL FACTORY:
CRACKING THE CODE
TO SUCCESS

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Manufacturers are making progress to establish the Digital Factory of the future.

However many are at risk of being left behind as digital leaders parlay their strategic and operational advantage into stronger financial performance. To keep pace, manufacturers must take a much more strategic approach to their adoption of digital based on an understanding of the business outcomes they seek and the specific digital enablers that are best suited to deliver them.

MANUFACTURERS SLOW TO **UNLOCK THE VALUE** FROM THE DIGITAL FACTORY

The race to embrace Digital Factory enablers—manufacturing capabilities that drive operational improvements through the innovative use of technology (Figure 1)—is now well under way. And for good reason: The Digital Factory promises to completely revolutionize not only manufacturing processes as we know them, but manufacturers themselves.

Figure 1: Eleven Digital Factory enablers

1   **DIGITAL FOUNDATION:** Layers of communication, data collection, monitoring, and control solutions that manage the shop floor execution of the factory.

2   **INTELLIGENT AUTOMATION AND CONTROL:** Advanced communications and control abilities that enable real-time, autonomous, self-directed, decisions by production machines and products.

3   **OPERATIONS ANALYTICS & PROCESS MONITORING:** Proactive analysis of micro/macro data to reveal trends/anomalies that alter decisions regarding reliability, technical operations, quality, safety, predictive maintenance, etc.

4   **DIGITAL SAFETY & ENERGY MANAGEMENT:** Safety solutions that monitor an individual's location and exposure to hazards. Energy systems that monitor and control energy consumption.

5   **MOBILITY:** Mobile solutions that capture, analyze, and communicate information to/from users and enable real-time execution of operations and fact-based decisions.

6   **ADVANCED TECHNOLOGIES:** Digital enablement of manufacturing technologies including robotics, simulation, and 3D printing to drive hardware/software performance improvement.

7   **ENGINEERING COLLABORATION:** Digital designs that can be readily shared with production to enable networked products that move quickly/proactively from idea to launch.

8   **DIGITAL PRODUCTION SYSTEM:** A digital platform that captures internal/external experiences, knowledge, and best practices to drive continuous improvement of manufacturing operations across the network.

9   **TALENT DEVELOPMENT & LEARNING:** Solutions to develop, update and re-skill workers, including on-line learning, recorded and real-time video, digital assistance, coaching, mentoring & new approaches to performance management.

10   **MANUFACTURING CONTROL TOWER:** Operations monitoring/modeling, including suppliers and contract manufacturing, that facilitates focused, real-time decision making.

11   **INDUSTRIAL SECURITY:** Threat prevention techniques and solutions that predict, detect, understand, and respond to mitigate risk across traditional IT platforms as well as physical OT assets.

According to our latest research, the 2015 Accenture Strategy Global Manufacturing Study,[1] greater adoption of these enablers can lead to stronger and more sustainable business performance.

In fact, at the operational level, these enablers have led to improvements of 5 percent to over 10 percent in such key areas as throughput; lead time; work-in-progress inventory; quality and service; and operational flexibility.

This positive operational impact has translated into stronger enterprise financial performance. According to our research, manufacturers with the strongest business performance in the previous two years[2] were much more likely than the rest of the companies in our study to have already implemented these enablers—in some cases, to the tune of 2:1.

Indeed, digital enablers can drive a compelling value proposition beyond operational benefits. For instance, our research showed Engineering Collaboration has improved product quality for those that have adopted it. This could translate into an attractive pricing premium for that product. We also found that a Manufacturing Control Tower has helped manufacturers reduce Work in Process inventory, which frees up working capital. Down the road, we see 3D printing, part of the Advanced Technologies enabler, opening up entirely new on-demand offerings and services around tailored products, helping manufacturers define and capture brand new customer segments.
At some point, digital enablers will tie the factory floor much closer to actual demand, producing exactly what consumers want when they want it. That could reduce or even eliminate the need for inventory and working capital.

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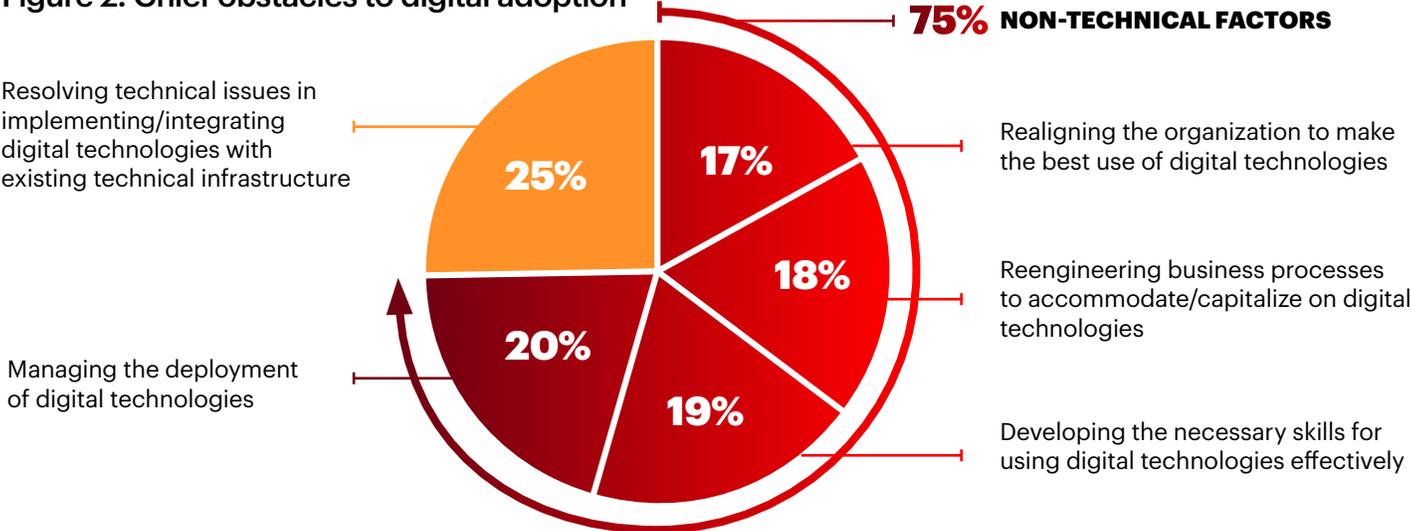
However, despite these benefits, adoption of digital is not yet widespread. A startling finding from our research reveals that in aggregate, none of the Digital Factory enablers have been implemented by more than 30 percent of participating companies. In fact, the enablers that executives described as having the greatest potential impact on the business—Advanced Technologies and Intelligent Automation and Control— have been the slowest to be deployed by manufacturers.

The reality is that most manufacturers simply aren't embracing digital robustly enough. Specifically, they are not adopting the right digital enablers. These companies are in danger of falling further behind in the Digital Factory race, ceding a commanding lead to those that take a more strategic and targeted approach to digital adoption.

DIGITAL TRANSFORMATION IS
NOT ABOUT TECHNOLOGY

Why the struggle to embrace digital? One might be tempted to think the technologies themselves are the culprit, but that's not the case. In fact, our research found that non-technical factors collectively far overshadowed technology issues as the biggest challenges in digital transformation (Figure 2).

Figure 2: Chief obstacles to digital adoption

75% NON-TECHNICAL FACTORS

Resolving technical issues in implementing/integrating digital technologies with existing technical infrastructure — 25%

Managing the deployment of digital technologies — 20%

17% — Realigning the organization to make the best use of digital technologies

18% — Reengineering business processes to accommodate/capitalize on digital technologies

19% — Developing the necessary skills for using digital technologies effectively

Skills remain one of the biggest concerns. Manufacturers said that developing the necessary skills for using digital technologies effectively is one of their top digital transformation challenges. And just over half said they lack the digital skills necessary to position themselves well for manufacturing in the digital age.

Frustratingly, manufacturers in our study have been feverishly working over the past four years to address the skills issue. They have aggressively hired and increased the size of their overall workforce—yet the skills gaps in all of their key workforces have only mushroomed during that time.[3]

This suggests that traditional approaches to closing skills gaps, which may have worked in the past, are increasingly less effective in a digital era.

It's not surprising that manufacturers that are using digital to drive better business performance recognize that the digital journey is a people-centric business transformation. Our study found these manufacturing leaders are less likely to have skills gaps in key manufacturing workforces, and are nearly three times as likely to have the digital skills needed to compete. Our findings reveal a more strategic and targeted approach to digital adoption. They are more likely than others to truly understand what skills are needed where, to access skills in new ways, and to flexibly direct skills where and when they are needed across the enterprise.

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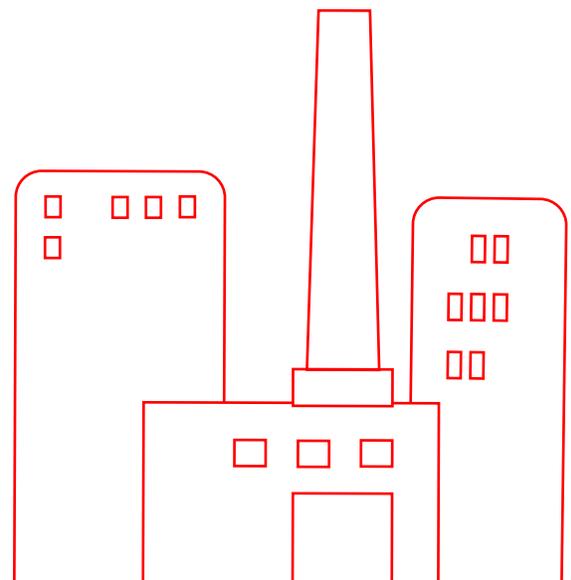
BLIND, AD HOC ADOPTION
OF DIGITAL MUST STOP

In addition to failing to adequately address the "soft" side of digital transformation, manufacturers are falling short at an even more fundamental level: They aren't aligning their investments to specific desired business outcomes. Instead, they're getting distracted by the novelty of digital. They're adopting certain digital technologies because others have done it and they think they should, too.

In some cases, their expectations for benefits from a specific enabler are misaligned when compared to the benefits reported by others that have already implemented the same enabler. As one example, manufacturers that are currently implementing the Engineering Collaboration enabler were most likely to expect quality enhancements as the greatest benefit—which is consistent with those that have already implemented it. However, they also are seeking increased market share and operational flexibility when, in reality, manufacturers that have already implemented Engineering Collaboration were more likely to experience enhanced product reliability and lower product design costs.

The fact is, manufacturers are still too haphazard with their adoption of digital. They're implementing various enablers not knowing fully the benefits those enablers will deliver or how they will impact their talent strategy, business processes, and organizational structure. This must change, as digital is too critical to a company's competitiveness to be left to chance.

> Manufacturers that have already implemented Engineering Collaboration were more likely to experience enhanced product reliability and lower product design costs.

SUCCESS STARTS WITH A FOCUS ON OUTCOMES

It's clearly time for manufacturers to adopt a new approach to digital. They need to move away from developing a "digital strategy" and, instead, create a manufacturing strategy that's informed and enabled by a new generation of digital.

How does that work in practice?

It starts with the end game—the primary business outcomes the company desires. Whether it's stronger growth, greater cost reductions, enhanced flexibility, or some other objective, a company must first be very clear on what it wants to achieve and then formulate its manufacturing strategy accordingly.

Within the manufacturing strategy, the company should articulate key areas of investment and operational improvement required to deliver the business outcome—such as improved asset reliability, more extensive visibility across the network, more flexible operational assets, or greater employee productivity. Understanding these capability or performance improvements is critical to determining the related operating model changes the company will need to make—one category of which is new digital enablement options.

It's only at this point that a company can precisely select digital enablers—those that have a proven track record in generating the type of improvement the company seeks. Knowledge of what other companies have already experienced can be a valuable input to such decisions.

Manufacturers need to move away from developing a "digital strategy" and, instead, create a manufacturing strategy that's informed and enabled by a new generation of digital.

For example, consider a manufacturer struggling with lead time issues across a series of heavy fabrication and assembly plants. As the company evaluates ways to reduce delivery lead time, it identifies two keys to achieving that business outcome: a more productive, informed workforce and more reliable fabrication assets. The company also determines that Mobility and Operations Analytics are the digital enablers most likely to improve lead time performance. By arming their employees with mobile devices that provide work instructions and order information at the point of use in final assembly, the company can greatly reduce employees' wasted time spent moving from work center to desk and back. And by deploying reliability analytics that scrutinize subtle trends in asset performance to predict and prevent breakdowns, the company can vastly improve fabrication reliability. Through a pair of pilots, the manufacturer validates the benefits those enablers deliver, then deploys the enablers more broadly across the organization.

The secret to cracking the code on the Digital Factory is clear: Without a comprehensive understanding of the business outcomes they want to achieve, how they will achieve them, and which digital enablers are best suited to help, manufacturers will most certainly find their digital transformations fail to generate the desired business benefits. Sure, they will likely see some performance improvements by default—our study found all enablers provided some boost in quality and operational flexibility. But in this accelerating Digital Factory race, no one will win by default.

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NOTES

1 The 2015 Accenture Global Manufacturing Study.

2 This group of manufacturing "leaders," representing 8 percent of the total survey sample, were those manufacturers whose total reported production level and total profitability increased by more than 10 percent since 2013.

3 The 2013 Accenture Global Manufacturing Study.

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