Getting Ready For The Future Of Manufacturing

How Hybrid IT And IoT Can Propel Your Organization To The Next Level

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Executive Summary

Manufacturers are adopting new internet-of-things (IoT)-enabled features and services into consumer products to differentiate their brand, improve customer experience, and create new and exciting ways of engaging with their customers.

In March 2017, Hewlett Packard Enterprise (HPE) commissioned Forrester Consulting to evaluate the key priorities and objectives of manufacturers for digital transformation. To explore this trend, Forrester developed a hypothesis that tested the assertion that manufacturers must keep customers top of mind while automating and streamlining their siloed business operations through collaboration, and they must also embrace emerging technology to enable business agility and support digital transformation.

Forrester conducted a quantitative survey of 471 organizations prioritizing digital transformation and six in-depth qualitative interviews with similar companies. Survey respondents had a digital transformation strategy and an IoT strategy.

KEY FINDINGS

Forrester's study yielded several key findings:

› **Differentiation through products and services is key.** In today's digital economy, manufacturers are offering products and services that offer unique experiences to differentiate themselves from their competitors.

› **Firms must embrace the technology revolution and reap the rewards.** By embracing hybrid IT, firms can increase their flexibility and agility on demand. Innovative solutions like IoT offer firms the ability to differentiate from their customers and connect disparate systems to become interoperable.

› **Firms must work with vendors as trusted partners.** Digital transformation is a colossal undertaking. Manufacturers revealed that they prefer technology partners that bring advanced technologies, vertical expertise, and a track record in large project management.

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# The Digital Revolution Affects The Manufacturing Sector

To keep up with customer demand, businesses must change both the way they engage with customers and how they operate. Businesses worldwide are striving to digitally transform their business.

In the age of the customer, the proliferation of digital has created a perfect storm of technologies and enhanced connectivity worldwide. Customers have access to very large amounts of information and understand that digital products and services can bring value through better experiences. In turn, customers are very quick to abandon brands that do not provide the expected value or service.

Despite some examples of digital trailblazers in the manufacturing sector, the industry at large has been slow to react to the digital revolution. The changing expectations of manufacturing customers are having an impact on the entire value chain of the sector. This is forcing the manufacturing industry to embrace the digital wave.

The convergence of machine learning, data and analytics, inexpensive sensors, cheap connectivity, and IoT is beginning to transform business operations in manufacturing. When exploring the key priorities over the next 24 months, our research highlights that manufacturing organizations are (see Figure 1):

› **Innovating their products and services.** The digitization of manufacturing has an impact on every aspect of manufacturing organizations' operations and value chain. Over half of the interviewees said they are looking to digitally enhance their products and services, which will enable their firm to better monitor, assess, and improve their customers' experiences on an ongoing basis.

› **Adapting their culture to support digital transformation.** In today's highly competitive environment, digital transformation not only leans on emerging (e.g., artificial intelligence) and established technologies (e.g., cloud services and hybrid IT); process automation and a shift in work culture are just as important. Around half of survey respondents said the cultural transformation of their organization is one of their top business priorities.

› **Leveraging data analytics to unlock valuable insights.** The wide availability of cheap sensors is translating into an explosion of data. Collecting data is one task, but interpreting data is another. Data analytics (47%) is key to extracting meaningful and actionable information from data. This step helps manufacturers to obtain more granular insights concerning their customers and processes as part of the shift toward data-based decision making.
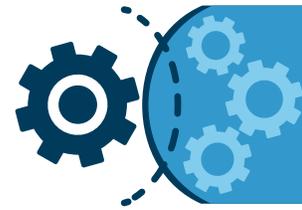
"Digital transformation has and will continue to reinvent our organization. I cannot conceive an area where digital transformation isn't happening at my organization. It's companywide, it's optimizing our business processes, and it's enabling us to provide a better service to our customers and improving workforce productivity."

Senior business analyst at a European telecoms firm
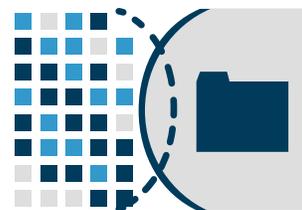
Why is the amount of data collection increasing?

67% have increased data collection and analytics processes

50% have longer retention periods of data

42% have growing businesses

Figure 1

Business respondents only: "Which of the following business initiatives are your organization's top business priorities over the next 24 months?" (Showing critical and high priority only)

■ Critical priority   ■ High priority

Improve our products and services	**18%** **37%**
Undergo a cultural transformation (i.e., to become more customer focused)	**13%** **35%**
Improve the use of data and analytics technology for business decision making	**18%** **29%**
Enhancing the flexibility and efficiency of our manufacturing processes	**9%** **33%**
Accelerate our digital business for customer-facing activities	**10%** **30%**

Creating a comprehensive strategy and implementation plan for public cloud and other as-a-service offerings is a critical or high priority for 74% of firms.

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

MANUFACTURERS USE DIGITAL FOR VARIOUS USE CASES

By using data, manufacturers can increase efficiency and quality across a complex and often fragmented supply chain. Forrester's report "The Digital Agenda Comes To B2B Industries" underlined that more products are connected and are collecting data from connected assets across the supply chain.

By accessing this data, manufacturers will have new types of insights that can drive their competitive advantage. The main use cases to support their manufacturing processes (see Figure 2) are:

› **Fleet management.** On average, 73% of organizations said digital will increase their ability to monitor, manage, and locate vehicles and fleets.

› **Smart, connected products.** On average, 71% of organizations said incorporating connectivity into products in both industrial and commercial markets will lead to benefits. Applying digital to products will separate firms from the competition while meeting the needs of the customer.

› **Supply chain management.** On average, 71% of organizations said supply chain management would benefit from digital — for example, through autonomous payment processing.

› **Energy management.** On average, 69% of firms said digital would enable better monitoring, managing, and reporting of the usage of water or electricity and other resources.

> "Digital transformation is all about operational excellence in order to meet the customer's expectations — those are the top priorities. Only then can we look at other initiatives and aspire to be more agile."
>
> *Head of digitlization at a multinational firm*

Figure 2

"What is your firm's timeline for addressing the following use cases to support your manufacturing processes?" (Showing within six months, in the next 12 months, and in the next two years combined) (Shown by organization size)
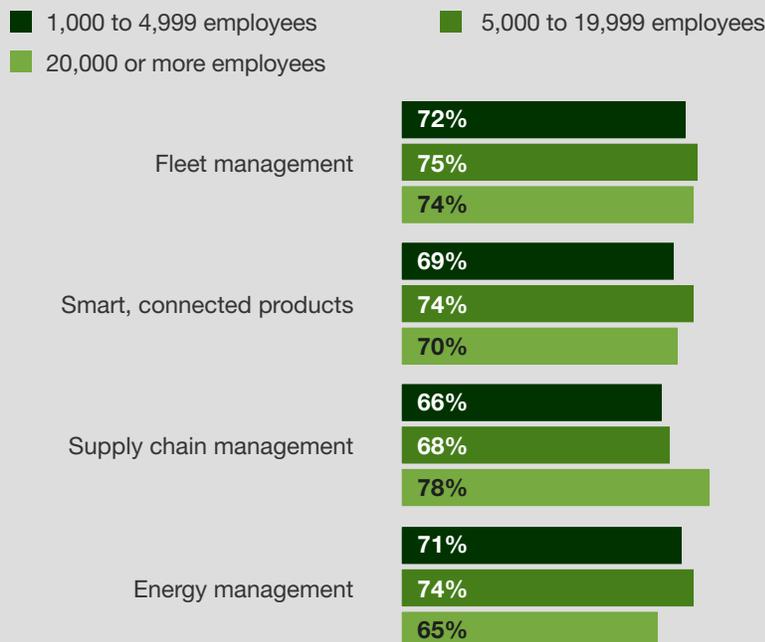
- ■ 1,000 to 4,999 employees
- ■ 5,000 to 19,999 employees
- ■ 20,000 or more employees

Fleet management
- 72%
- 75%
- 74%

Smart, connected products
- 69%
- 74%
- 70%

Supply chain management
- 66%
- 68%
- 78%

Energy management
- 71%
- 74%
- 65%

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

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TECHNOLOGY MUST UNDERPIN BUSINESS OBJECTIVES

To achieve shifting business objectives, manufacturing firms are ramping up their technology initiatives. Digital tools and technologies allow manufacturing firms to reduce costs, increase productivity, and increase the customer focus across all segments of the value chain. Digital products and services are fast becoming essential to differentiating manufacturing firms from one another and supporting ongoing business success.

Our survey results highlight that when IT departments become increasingly familiar with the requirements of business lines, they adopt strategies that support these business priorities, such as (see Figure 3):

› **Seamlessly integrating data along the industrial supply chain.** Data integration plays an essential role within the manufacturing sector. Data adds business value by merging different data types like metadata, master data, and data models into a more consistent and actionable format. The value stems from providing supplier networks with greater data accuracy, clarity, and insights. In turn, this leads to more contextual and smarter decision making across the entire supply chain.
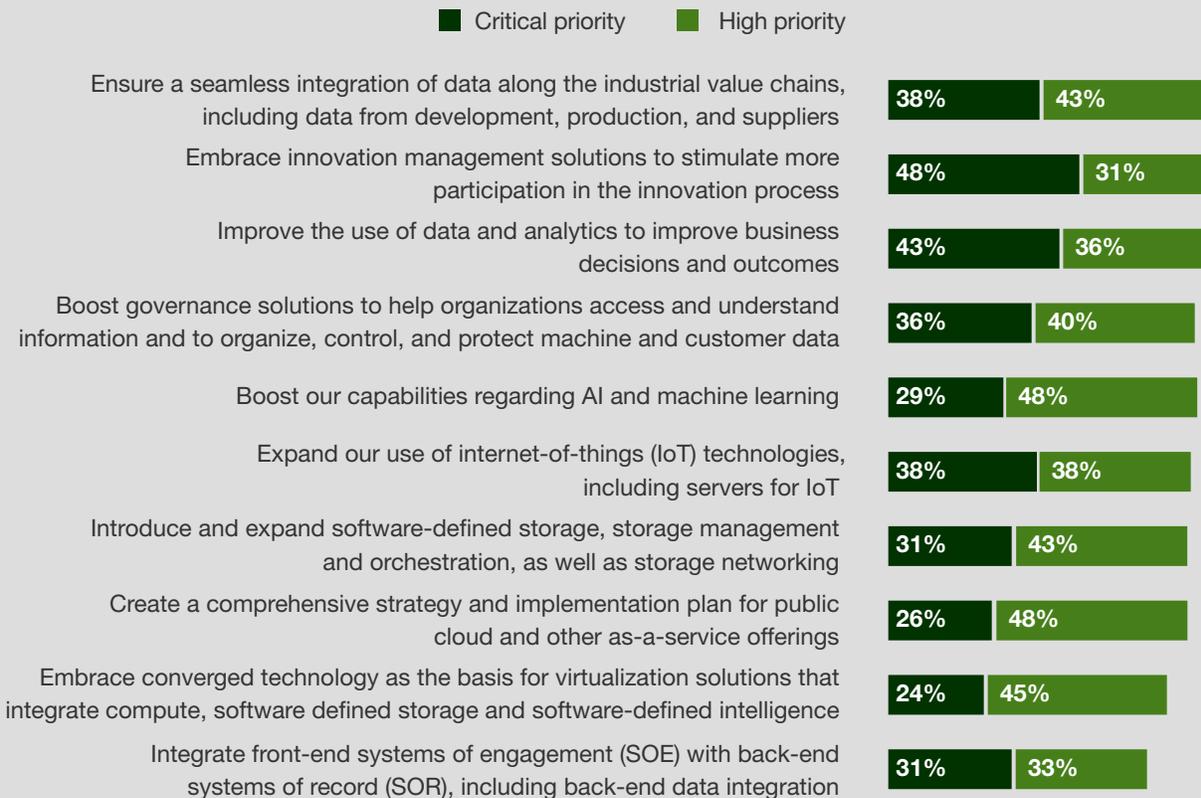
> *"When you digitize things and make products/services and customer relationships integrated, you can transform your business by becoming an agile, organized organism. That will allow you to have unlimited capabilities like cohesion, flexibility, economically. IT teams are critical to making things more functional in the digital age."*
>
> *IT director at a North American manufacturing firm*

Figure 3

IT respondents only: "Which of the following technology initiatives is your IT organization prioritizing over the next 24 months?" (Showing critical or high priority only)

■ Critical priority   ■ High priority

Initiative	Critical priority	High priority
Ensure a seamless integration of data along the industrial value chains, including data from development, production, and suppliers	38%	43%
Embrace innovation management solutions to stimulate more participation in the innovation process	48%	31%
Improve the use of data and analytics to improve business decisions and outcomes	43%	36%
Boost governance solutions to help organizations access and understand information and to organize, control, and protect machine and customer data	36%	40%
Boost our capabilities regarding AI and machine learning	29%	48%
Expand our use of internet-of-things (IoT) technologies, including servers for IoT	38%	38%
Introduce and expand software-defined storage, storage management and orchestration, as well as storage networking	31%	43%
Create a comprehensive strategy and implementation plan for public cloud and other as-a-service offerings	26%	48%
Embrace converged technology as the basis for virtualization solutions that integrate compute, software defined storage and software-defined intelligence	24%	45%
Integrate front-end systems of engagement (SOE) with back-end systems of record (SOR), including back-end data integration	31%	33%

Base: 42 IT decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

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› **Embracing innovation management solutions to stimulate innovation.** The innovation process requires participation from all functions of the business as well as customer feedback. Innovation in manufacturing is essential for ongoing product differentiation. Shortening innovation cycles is therefore a key competitive advantage. Innovation management tools facilitate this process and also facilitate open innovation.

› **Introducing technology to support business flexibility and agility.** The functions and features of products are becoming less important relative to services. To support the objective of becoming more agile, organizational technology initiatives increasingly focus on AI and machine learning (77%) and IoT (76%).
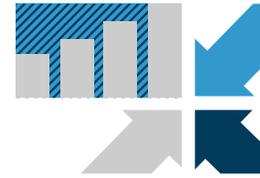
DIGITAL TRANSFORMATION DRIVES BUSINESS OUTCOMES

At the end of this transformation businesses will become truly digital enterprises with physical products at the core, augmented by digital interfaces. Manufacturers that offer digital solutions to the delight of their customers do so because of their ability to rapidly prototype products and services and test these products without having to build any new physical platforms.

In fact, senior business and IT leaders said they will reduce costs of goods sold (71%) with digital transformation and even, reduce time to market (58%). How? Products and services will be increasingly customized to customer need. Due to the constantly evolving and demanding customer, a car manufacturer in Europe is able to customize their vehicle a month in advance according to the needs of the customer based on both their needs and requirements and through the data they've acquired (54%).

DATA CENTERS PLAY A ROLE IN DIGITAL TRANSFORMATION

A majority of manufacturing firms, 54%, said that the amount of data they're collecting through their data centers is increasing.

Delivering data across the manufacturing value chain, be it in on-premises or cloud based, is not trivial. Large data volumes, complex data models, and fast data "consumption" don't make it any easier. However, traditional technology stacks like ERP and CRM slow down data processing and delivery. Largely as a result of slower legacy hardware platforms, hard-coded data platforms, static computing architecture, and batch data integration processes remain significant obstacles to business agility.[1]

Our survey also revealed that the top priority for data centers over the next 12 months is enabling server and network virtualization based on new data center technology. Virtual data centers offer not only the potential to drive down costs but also business flexibility through scalability. Moreover, virtual data centers empower users to run business-critical legacy applications (see Figure 4).
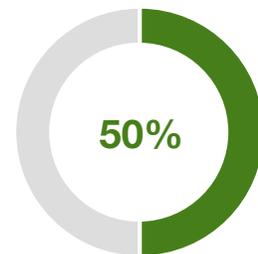
BUSINESS OUTCOMES

71% Reduce costs of goods sold

58% Reduce time to market

54% Reaching next level design and product quality based on the needs of the customer.

Figure 4

"What are your data center priorities in the next 24 months?" (Showing No.1 priority only)

50%

New data center technology to enable virtualization of the servers and network

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

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Hybrid IT Environments Accelerate Digital Transformation

Forrester's research shows that both business and IT leaders are looking to leverage hybrid IT environments (see the definition on the right) to power their digital transformation. Hybrid IT is seen as a pragmatic approach to merge new IT environments with legacy systems and platforms. Moreover, hybrid IT offers organizations a path to streamline processes and unify governance practices.

Many organizations struggle to make their IT systems more agile by moving either entirely to the cloud or by keeping their entire IT systems on-premises. Hybrid IT enables organizations to use the best of both worlds. For instance, hybrid IT enables organizations to boost customer engagement with more agile cloud-based customer-facing apps.

Cloud platforms have thus become a critical imperative for many organizations. The survey findings indicate that 66% of manufacturers are migrating their existing workloads into a cloud environment (see Figure 5). What's more, cloud promises a lower cost base, on-demand scalability, and mobile cloud-based IoT solutions (57%).

Hybrid IT is the result of combining on-premises and off-premises IT services, private and public clouds, and traditional and automated virtualized data centers.

Figure 5

"Please select the most important strategic hybrid IT objectives."

66% — Migrating existing workloads into a cloud environment

57% — Empower IoT solution based on mobile cloud solutions

Sixty-one percent of firms said they adopted cloud services due to the better functionality than traditional IT service offerings.

More than half of respondents said cloud was more cost-effective to get the compute, storage, and applications that they need.

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

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Business and IT leaders consider the main benefits for adopting hybrid IT to be (see Figure 6):

› **A lower total cost of ownership.** As organizations prepare for digital transformation, hybrid IT has emerged as a cost-saving vehicle. More than half of survey respondents, 55%, said cost savings was the top factor when adopting hybrid IT. To achieve the biggest cost benefits from IT, the IT and the business goals must be closely aligned.

› **The agility to adapt to constantly changing environments.** Organizations need to constantly adjust their strategic objectives. This is necessary to respond to changes in their market environment, rapidly changing customer expectations, or other unforeseen circumstances that affect their business. Hybrid IT's ability to scale on demand (52%) is a huge advantage for any organization that needs to add or reduce compute capacity.

› **Improved ease of use for users and app developers.** More than half of respondents said that hybrid IT improves the usage experience of their global user base. Furthermore, hybrid IT quickly provides developers with resources for test development (48%). This allows developers to react faster to changing business needs.

> *"Hybrid IT has definitely made my organization more agile and productive. We're able to react to different changes in the market quickly, without the need to invest in large or even 'bolt-on' technology purchases to keep up with changes. We're extremely flexible, and it's empowering our development teams in ways we couldn't even imagine before."*
>
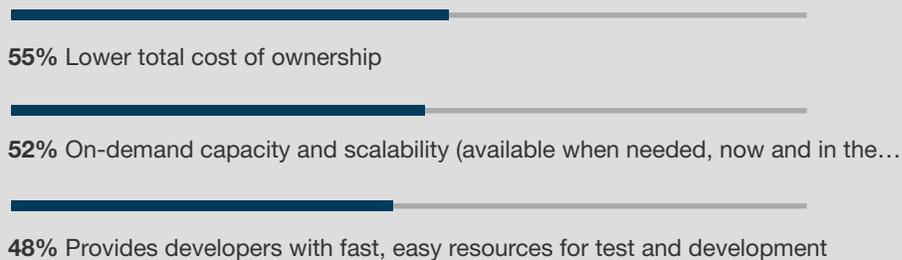> *Head of operations at a European construction firm*

59% of firms said they build cloud platforms from conventional infrastructure and automation tools, meaning businesses are using closed, monolithic processes with no additional purchases, which is unlikely to be effective in the long term.

Figure 6

"How important were the following considerations in your firm's decision to adopt hybrid IT environments?"
(Critical or important requirement)

55% Lower total cost of ownership

52% On-demand capacity and scalability (available when needed, now and in the…

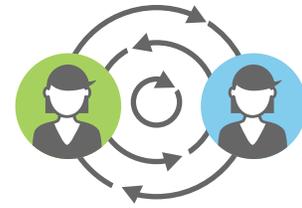**48%** Provides developers with fast, easy resources for test and development

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

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Hybrid IT Comes With Challenges

Organizations that plan to deploy or have already deployed hybrid IT environments face a variety of issues. The main challenges are (see Figure 7):

› **Network performance between cloud environments.** Slow load-ties of cloud-based applications due to poor network latency can undermine productivity and end user experiences. Survey respondents stated poor network performance as the No. 1 challenge when deploying hybrid IT (46%).

› **Lack of visibility into hybrid IT environments.** It's critical for organizations to understand where a potential threat or security breach is coming from and how it can affect the integrity of data (44%). Risk officers need visibility into the interaction between users, apps, and data across a multitude of devices and the ability to set and enforce one set of policies.

› **Security and data privacy in hybrid IT environments.** The magnitude of data breaches and cybercrime over the past few years explains why 44% of organizations are worried about privacy and security (37%). Customer privacy, values, and accountability are also important in business relationships. It's critical for IT leaders to secure their data and keep their brand's reputation intact.

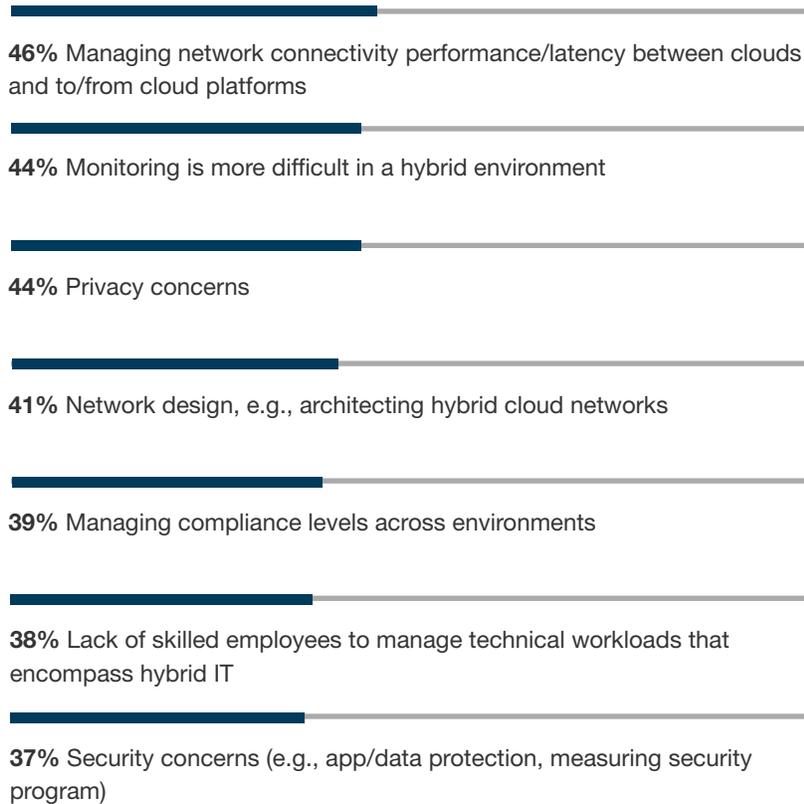**LACK OF ALIGNMENT ACROSS LINES OF BUSINESS IMPEDES DIGITAL TRANSFORMATION SUCCESS**

Implementing hybrid IT solutions into an existing infrastructure is a multifaceted process. This process requires different teams throughout the organization to work together, think holistically, and aim for the same outcomes. A lack of collaboration between business and technology leaders undermines the opportunities that digital transformation can deliver.

"I always hear that 'working with other organizations is counterintuitive;' this is simply not true. There is real power in collaborating with external partners, but, more importantly, collaborating internally is what drives change. We've overcome many hurdles by keeping business functions and IT closely aligned, to share ideas, harness experiences, and understand different perspectives. Take, for instance, retail — they're the first industry who said it's all about the 'customer experience.' Every single industry has taken that concept onboard and ran with it. That is why collaboration is the absolute key to long-term success, particularly in the digital age."

Head of operations at a European construction firm

Low collaboration hinders digital transformation success, particularly when only 14% of organizations said they're ahead of the competition when responding to digital disruption.

Figure 7

"What challenges have you faced or do you expect to face form deploying/using hybrid IT?" (Select all that apply)

46% Managing network connectivity performance/latency between clouds and to/from cloud platforms

44% Monitoring is more difficult in a hybrid environment

44% Privacy concerns

41% Network design, e.g., architecting hybrid cloud networks

39% Managing compliance levels across environments

38% Lack of skilled employees to manage technical workloads that encompass hybrid IT

37% Security concerns (e.g., app/data protection, measuring security program)

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

70% of final decision makers said it's a critical or high priority to separate IT into component parts, with the goal for IT to better align with business initiatives.

Hybrid IT Provides Flexibility For Faster Innovation

The role of IT teams is becoming more critical as hybrid IT is spreading. IT teams are responsible for planning, implementing, and maintaining new technologies and service-oriented architecture across the entire value chain. IT departments will need to embrace innovative technologies and work with business leaders to align their digital transformation strategies with changing business requirements — all while achieving sustainable growth.

The top strategic imperatives in modern manufacturing cover a wide variety of benefits (see Figure 8):

› **Operational agility.** Hybrid IT supports the main operational objective of boosting design and product quality (67%). More than half of respondents, 54%, said they expect a reduced time-to-market from hybrid IT, while maintaining the highest quality and increasing product variety (54%). Other hybrid IT benefits include managing, monitoring, and efficiently using energy or power resources (65%).

› **Technology advances.** Applications and solutions like augmented reality or digital twins generate unprecedented value for manufacturing processes. The flexibility of these digital technologies empowers product developers to simulate designs through rapid prototyping (56%). Innovation teams will be able to gauge what works and what doesn't more quickly and cost efficiently.

› **Financial efficiencies.** Hybrid IT enables organizations to reduce the costs of goods sold (70%). Hybrid IT-based platforms can accommodate exponential growth faster and more cost effectively than traditional IT environments. This is seen as the top economic benefit of implementing hybrid IT in the manufacturing process. Moreover, hybrid IT offers opportunities to expand the revenue base through new products (48%).

THE INTERNET OF THINGS ENABLES SMARTER MANUFACTURING PROCESSES

IoT initiatives can provide manufacturing firms with a competitive edge. A main focus area of these IoT activities relates to capturing sensor-generated data from connected assets. Once collected, the data will be analyzed and interpreted in data centers.

Data analytics provide manufacturing firms with opportunities for asset performance management, including supply chain optimization and predictive and preemptive maintenance. Insights about asset performance also support communication between connected assets. In combination with AI and machine learning, connected devices will be able to initiate actions without the need for external approval or instruction.

Figure 8

IMPLEMENTING APPLICATIONS AND SOLUTIONS TO SUPPORT MODERN MANUFACTURING PROCESSES LEADS TO:

Operational benefits: Next-level design and product quality (67%)
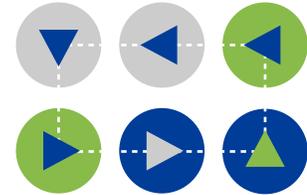
Technology benefits: Simulation of product designs for rapid prototyping (56%)


Financial benefits: Reduce costs of goods sold (70%)

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

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Both business and IT leaders acknowledge the value that IoT can bring to their organization. In addition to IoT growing new revenues (70%), business and IT leaders its main benefits to be (see Figure 9):

› **Improved decision-making support through data analytics.** To benefit from data analytics, an organization must integrate its data analytics activities with its product and customer processes. Data capture, data analysis, and acting on data insights must be as automated as possible. Nearly seven out of 10 manufacturers (67%) consider the use of data and analytics as essential to their digital transformation initiatives.

› **Better corporate environmental sustainability.** A large majority of business and IT leaders, 65%, believe that IoT can improve the corporate environmental sustainability of their organization. Asset performance management plays a central role in monitoring the resource efficiency of products throughout their life cycle. For instance, any unusually high consumption of energy by an aircraft engine can be addressed early. Similarly, through process optimization, it can be possible to increase manufacturing output without the need of additional resources.

› **Enhanced differentiation against competitors.** A majority of manufacturers believe that IoT has the capability to accelerate their digital business (55%) and improve differentiation in the market (53%). The main aspects driving business acceleration and differentiation are the opportunity to develop digitally improved products or services more effectively (63%) and comply with market regulations (63%) more accurately.
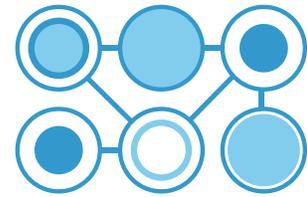
"IoT is absolutely critical to our digital transformation strategy because it enables us to become extremely efficient from the back end all the way to customer-facing apps. It keeps us in check in regards to adhering to compliance and regulations. I can say we're market leaders because of the IoT initiatives my company is pushing."
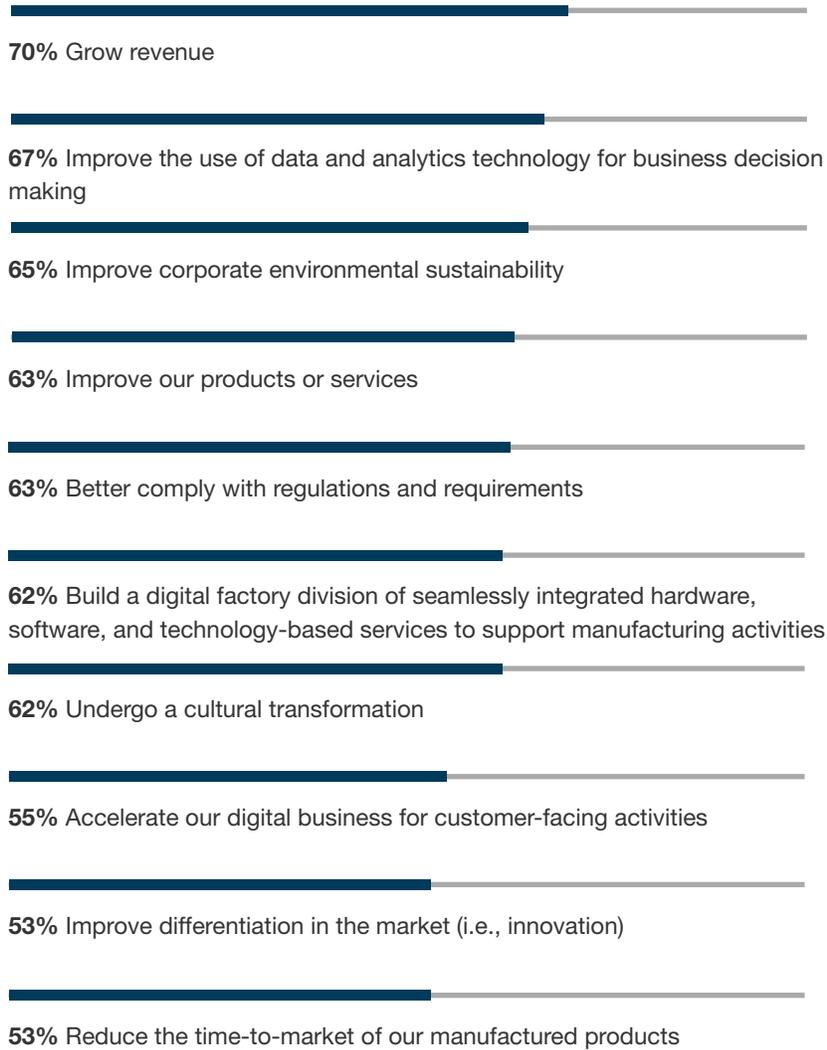
Head of digitalization at a multinational firm

Figure 9

"How important are your organization's internet-of-things initiatives to drive your digital business transformation initiatives?"
(Very important or important only)

70% Grow revenue

67% Improve the use of data and analytics technology for business decision making

65% Improve corporate environmental sustainability

63% Improve our products or services

63% Better comply with regulations and requirements

62% Build a digital factory division of seamlessly integrated hardware, software, and technology-based services to support manufacturing activities

62% Undergo a cultural transformation

55% Accelerate our digital business for customer-facing activities

53% Improve differentiation in the market (i.e., innovation)

53% Reduce the time-to-market of our manufactured products

Base: 112 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees Note: Top 10 responses are shown.
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

Implementing IoT technologies into products or services benefits customers greatly; 58% said they're more aware of data and real-world statuses and events.

The Way Forward: Work With Technology Vendors As Partners

Navigating the complexity of digital transformation with hybrid IT and innovative IoT solutions can be a daunting task for any organization in any industry. Few organizations will manage to navigate through the digital transformation process without any outside assistance. The winning manufacturing firms are embracing IoT solutions to boost their operational excellence, transform their customer relationships, and become 'smarter' based on data-generated insights.

Results from this study indicate that organizations want to work with technology partners. The main selection criteria are the ability to align business and IT transformation (72%) and ensure close cooperation between IT and business leaders (71%) (see Figure 10).

SEEK PARTNERS WITH INDUSTRY EXPERTISE TO BOOST DIGITAL TRANSFORMATION

Successful digital transformation requires a wide range of capabilities. The wide range of available technology components and platforms necessary for digital transformation can be challenging. Hence, many manufacturing firms rely on technology partners to help them with technology management (see Figure 11).

Our survey asked how satisfied manufacturing firms were with technology partners in the past 24 months. Manufacturing firms expect their technology partners to offer price competitiveness (81%) and to understand their business model and processes (80%). The survey also revealed that manufacturing firms are highly satisfied with the following technology services: reusable software and other assets like templates and tools (indicated by 85%), innovation quality and speed (82%), and industry and sector expertise (82%).
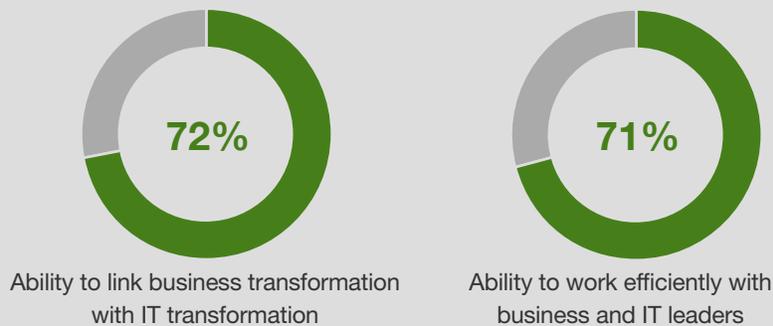
> "In today's competitive environment, you can't survive without technology partners because no one organization has all the skills, people, and technologies you need to survive and adapt."
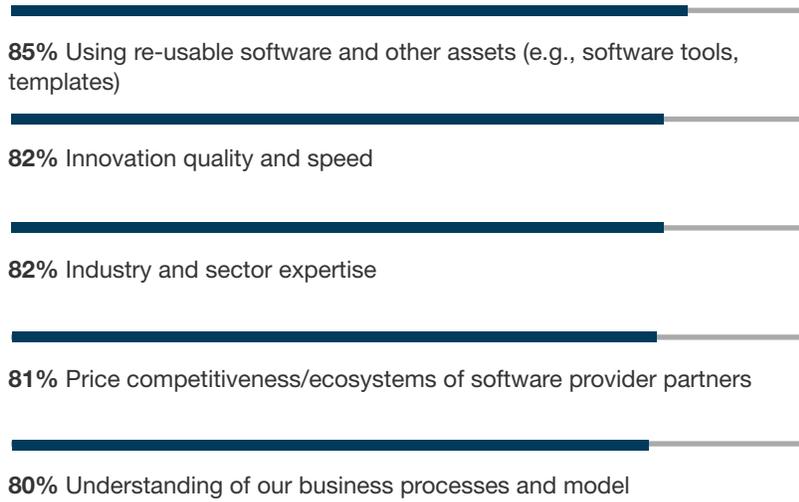>
> *IT manager at a European manufacturing firm*

Figure 10

"Which of the following criteria do you use when selecting a technology provider to support your business priorities in 2017?"

72%
Ability to link business transformation with IT transformation

71%
Ability to work efficiently with business and IT leaders

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

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Figure 11

"How satisfied are you with the technology services firms that you have used over the past 24 months in each of the following areas?"
(Very satisfied or satisfied only)

85% Using re-usable software and other assets (e.g., software tools, templates)

82% Innovation quality and speed

82% Industry and sector expertise

81% Price competitiveness/ecosystems of software provider partners

80% Understanding of our business processes and model

68% of organizations use IT service firms to develop solutions for the future of manufacturing. A further 57% use hardware vendors.

Key Recommendations

More and more organizations are adopting hybrid IT infrastructures to meet changing business requirements. Like organizations in all other sectors, manufacturing firms face a wide range of challenges as part of their digital transformation process. Yet there is no alternative, as they require a flexible and agile technology infrastructure to survive and flourish in the emerging digital manufacturing marketplace.

To succeed in the future, manufacturing firms will need to:

Differentiate beyond products and services. In today's digital economy, products and services must offer customers a unique experience to differentiate the brand with competitors.

Manage data like they manage products — as the backbone of the organization. It is critical for manufacturers to harness the data they collect and analyze it to yield actionable insights.

Collaborate across silos internally and externally. Open collaboration is key to ensure that the business is meeting changing customer expectations. IT and business leaders must collaborate.

Embrace a hybrid IT approach to boost infrastructure flexibility. Hybrid IT offers organizations the capability to be flexible and agile by adapting to changes in the market or technological advancements.

Take advantage of data and analytics and the IoT revolution to enhance processes and delight customers. By leveraging data and analytics consistently, businesses can integrate and apply one-set of data multiple times to create more valuable and engaging experiences for the customer.

Work with technology partners that have vertical and process expertise. All manufacturing firms we surveyed work on a multivendor basis. The preferred technology partners bring advanced technology skills, vertical expertise, and a track record in large project management, including transition and transformation capabilities.

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Appendix A: Methodology

In this study, Forrester conducted an online survey of 471 IT and business decision makers and interviewed six decision makers of the same role. Manufacturing organizations in North America, South America, Europe, and Asia Pacific were evaluated to understand their digital transformation strategy and how hybrid IT, along with emerging solutions like IoT, help drive them to adapt to the digital age. Survey participants included decision makers in operations, manufacturing or production, product management, and IT. Questions provided to the participants asked what their business and IT priorities are for the next 12 to 24 months. Respondents were offered a copy of the report as a thank you for time spent on the survey. The study began in February 2017 and was completed in May 2017.
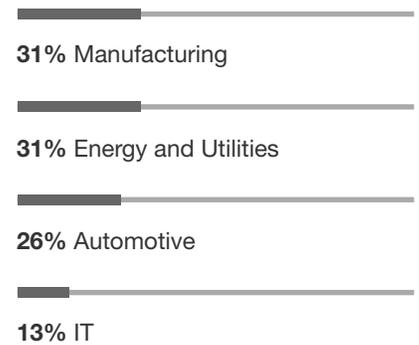
Appendix B: Demographics/Data

"In which country are you located?"

UK: 9%
NE: 9%
FR: 9%
DE: 9%

CA: 9%
MX: 9%
US: 11%

JP: 9%
KR: 9%

BR: 9%

AU: 9%
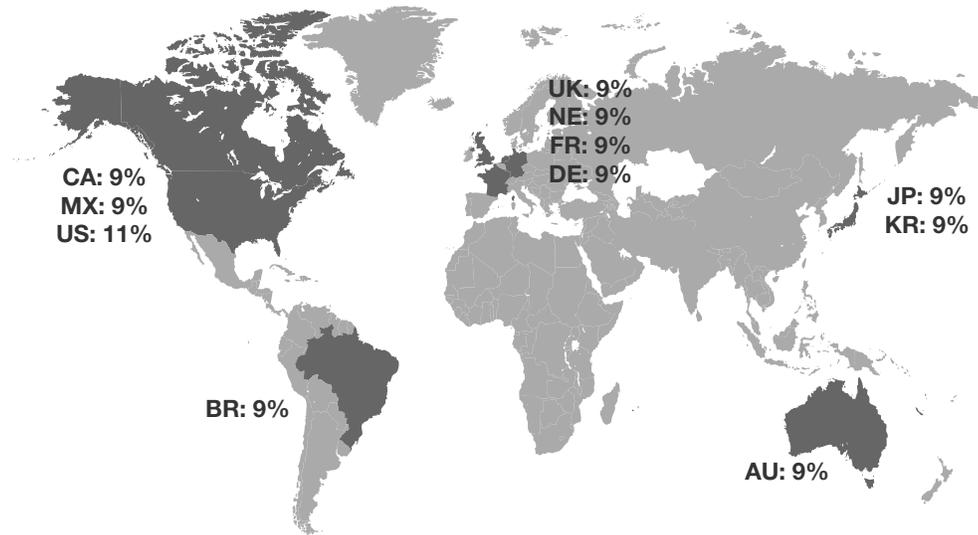
"Using your best estimate, how many employees work for your firm/organization worldwide?"

5%
20,000 or more employees

27%
5,000 to 19,999 employees

68%
1,000 to 4,999 employees
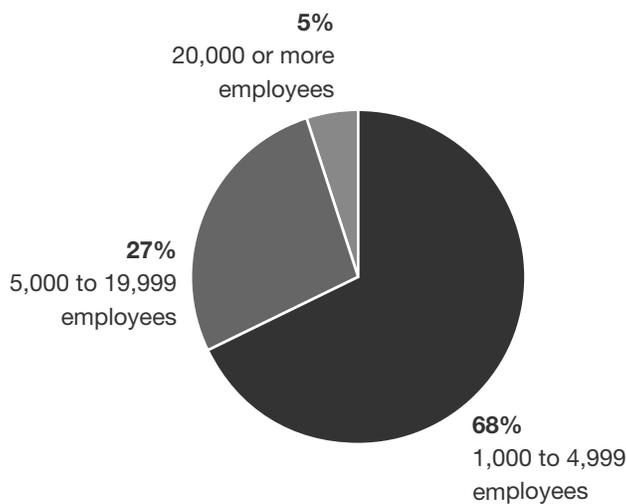
"Which of the following best describes the industry to which your company belongs?"

31% Manufacturing

31% Energy and Utilities

26% Automotive

13% IT

Base: 471 IT and business decision makers responsible for the digital transformation at their organization with at least 1,000 employees
Note: Percentages may not total 100 because of rounding.
Source: A commissioned study conducted by Forrester Consulting on behalf of HPE, April 2017

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Appendix C: Endnotes

[1] Source: "Emerging Technology: Translytical Databases Deliver Analytics At The Speed Of Transactions," Forrester Research, Inc., December 10, 2015.

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