

# TRENDS IN GLOBAL MANUFACTURING

Implementing Industry 4.0 & Building the Digital Factory



**PLATAINE**<sup>®</sup>  
people-smart automation

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# Executive Summary //

The digital revolution is only beginning to take shape. We learned that leaders in digital manufacturing are already gaining significant competitive advantages by harnessing technology to strengthen and improve the capabilities of shop floor operators and managers, speeding the pace of innovation, and lowering the costs of production and maintenance.

While the manufacturing sector generates a great amount of data, only few companies are harnessing it to improve operational efficiencies. Companies that can close this gap by tapping into the data they generate will uncover valuable insights to drive profits and growth. Advanced analytics and artificial intelligence are giving us new abilities to

draw insights from large amounts of data. Additionally, advancements in virtual and augmented reality, advanced robotics, and additive manufacturing are all opening the gates to digital disruption. In the next decade, digital manufacturing technologies will allow companies to connect physical assets by a “digital thread”—unleashing a seamless flow of data across the value chain that will link every phase of the product life cycle, from design, through production to distribution, point of sale, and use.

This survey presents the trends in global manufacturing and show the progress towards building the digital factory when implementing Industry 4.0 technologies.

## ABOUT THIS SURVEY

Conducted jointly by SME, a Manufacturing Community that promotes advanced manufacturing technology, and Plataine, an Industrial IoT and AI software solution provider, this survey report is designed to enable manufacturing decision-makers to best prepare for and embark on their journey to digital manufacturing. This survey is based on over 200 surveyed executives, decision makers and influencers from the industrial manufacturing industry.

Special note: this survey was conducted prior to the COVID-19 pandemic and its many implications on the manufacturing industry, including the increased focus on optimization, cost reductions, managing unstable demand and optimizing the supply chain.

INDUSTRY  
VERTICAL SPLIT  
OF SURVEY  
PARTICIPANTS

29%



Aerospace &  
Defense

13%



Metals

8%



Engineering &  
Construction

6%



Electronics

4%



Medical  
Equipment

1%



Furniture &  
Upholstery

1%



Oil & Gas

38%

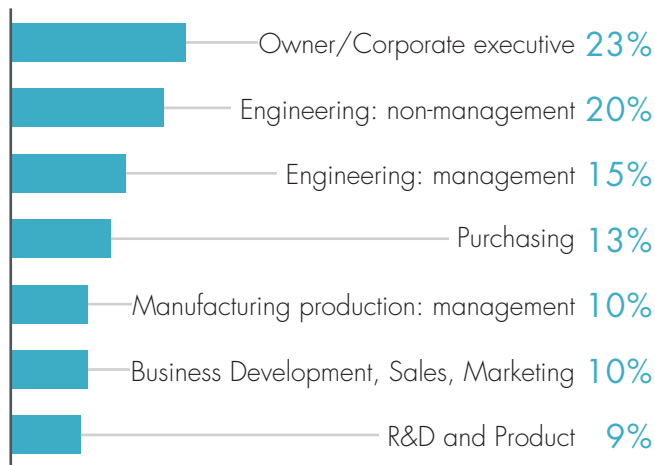


Other

# Demographics //

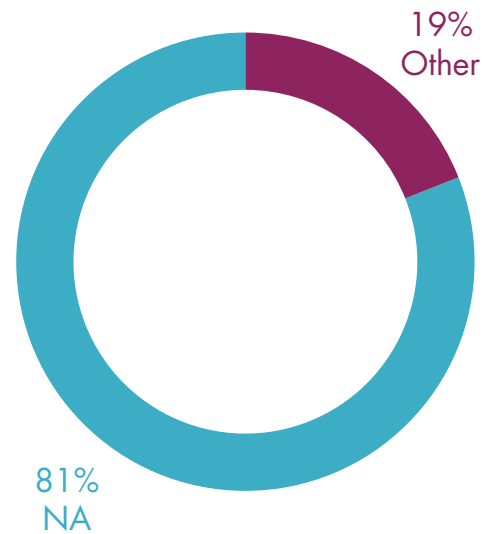
## FUNCTIONAL RESPONSIBILITY

Most of the respondents hold senior roles: 23% are owners or corporate executives and 25% hold other management positions at engineering and manufacturing departments. 10% of the participants are in Business Development, Sales and Marketing and 13% are in Purchasing.



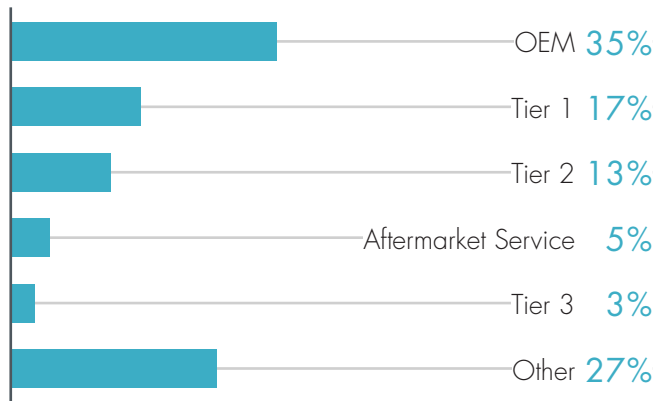
## GEOGRAPHIC SPREAD

Most respondents (81%) are located in North America, while the rest are from Europe, Asia and Latin America.



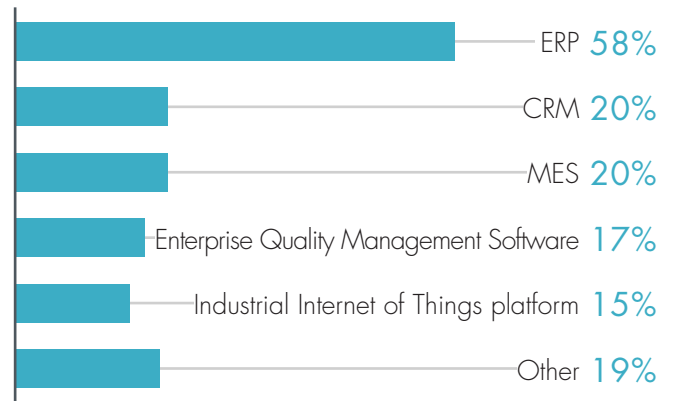
### DISTRIBUTION BY TIER SEGMENT

Over a third of respondents are OEMs from industries such as Aerospace and Defence, Electronics, Engineering and Construction. 17% of respondents are Tier 1 and mostly from the Aerospace and Defence industry. 13% are Tier 2 and 3% are Tier 3 suppliers. Additionally, 5% are in aftermarket services such as Maintenance, Repair and Overhaul (MRO).



### INFORMATION SYSTEMS

ERP systems are adopted by more than half of the respondents, while CRM and MES systems are used by 1 out of 5 respondents. IIoT platforms are utilized by 15% of respondents, while Enterprise Quality Management Software by 17%.



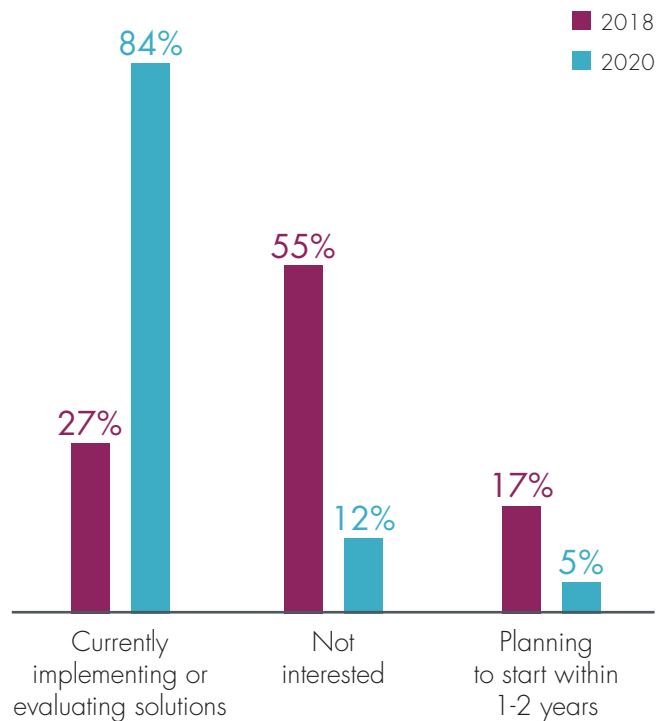
\* The total responses add up to more than 100% as some respondents marked multiple options.

# Trends comparison: 2018 vs 2020//

With today's competitive landscape and market requiring consistently higher quality standards, faster time to market and evolving technologies, advanced manufacturers are forced to keep up the pace and to plan accordingly to meet these challenging demands. This change can be clearly seen when comparing between the 2018 survey and the 2020 one in the increased digitization trend, specifically in two categories:

## PROGRESS OF IMPLEMENTING DIGITAL STRATEGIES

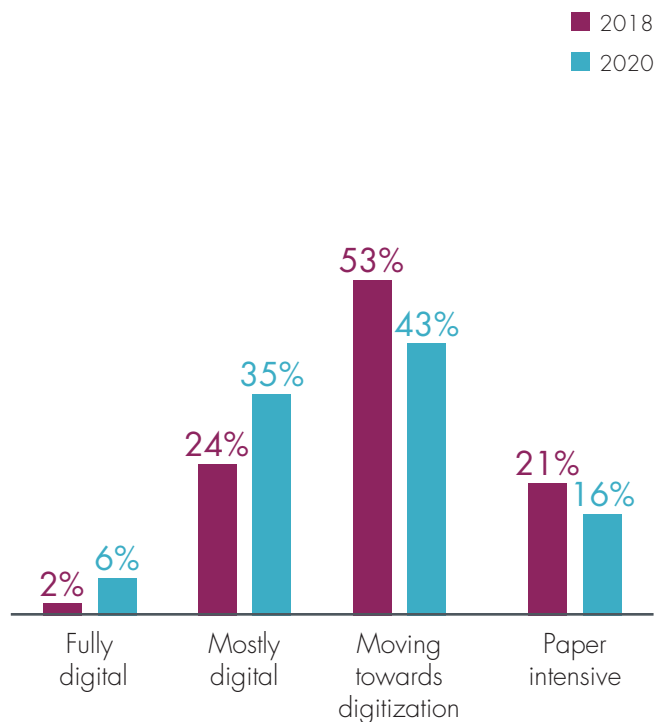
An increase in implementing digital strategies: 84% of respondents are currently implementing or evaluating digital manufacturing strategies whereas only 27% were doing so in 2018. Similarly, in 2020 only 12% respondents are not interested in implementing digital strategies, compared with 55% in 2018.





## DIGITIZATION LEVEL

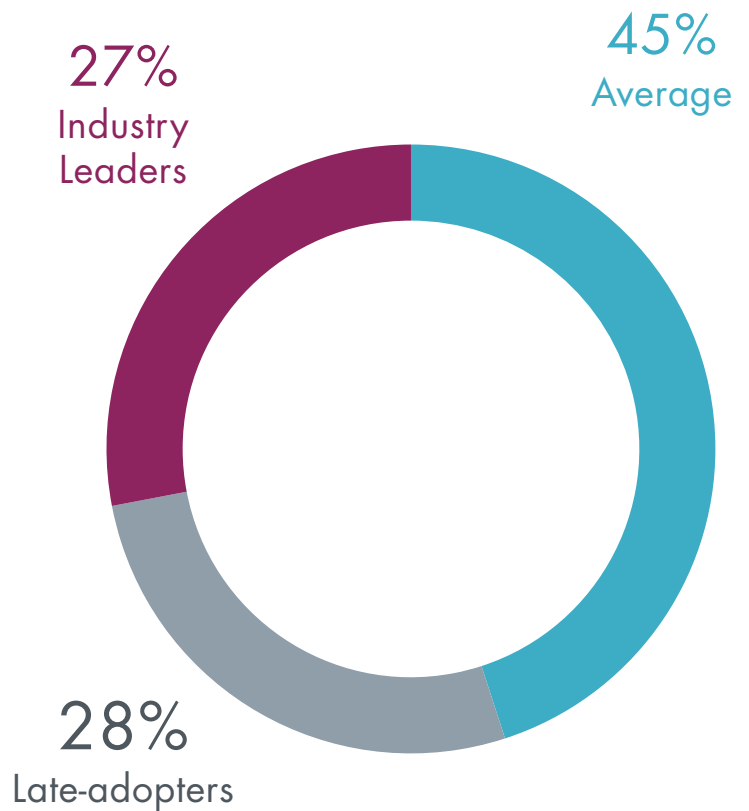
Respondents in the 2020 survey indicated their companies are making strides to become digital. Two-in-five respondents (41%) indicated their companies are at least “mostly digital” in 2020 (up from 26%).





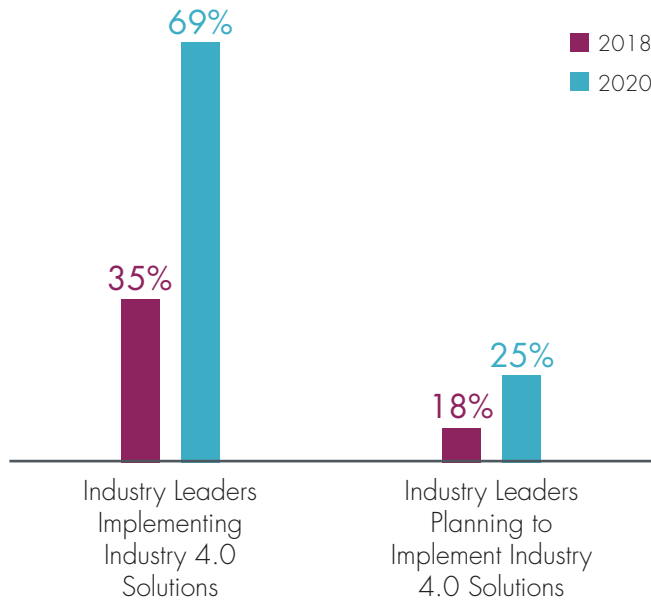
# Market Leaders //

This survey examined the level of digitization and respondents' efforts and strategies for implementing Industry 4.0 and the Digital Factory. Similar to 2018, companies were split into three groups: industry leaders, average and late-adopters. 'Industry leaders' were defined as companies expecting growth over the next three years and also reporting high quality standards.



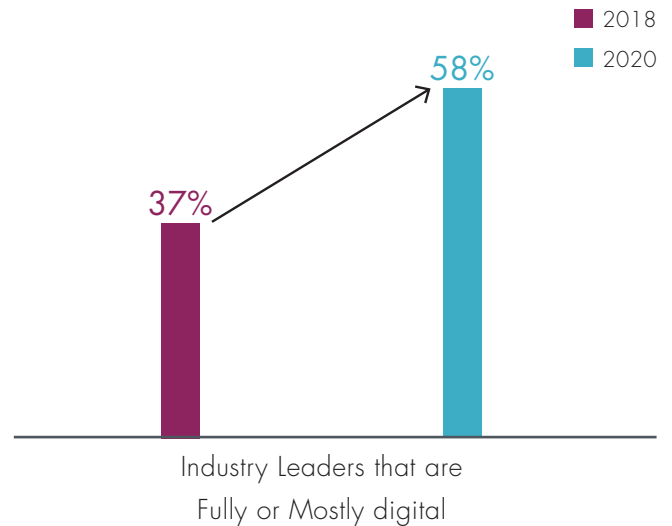
### IMPLEMENTATION STATUS

Over the past two years, the ratio of industry leaders who are implementing (or have already implemented) Industry 4.0 solution has doubled and represents today 69% of industry leaders. Industry leaders who understand the need and plan to implement Industry 4.0 solutions increased from 18% to 25% in 2020, comparing with the 2018 survey.



### DIGITIZATION STATUS

The 2020 survey also shows a significant shift in market leaders that went mostly or fully digital, from 37% in 2018 to 58% today.



# Digital strategy initiatives & future technologies //

## INITIATIVES & IMPLEMENTATION STATUS

Examining rework rates points out to several insights:

- Tier 1 and OEMs are leading within the segments with the highest quality and the lowest rework rates and low scrap.
- 36% of Tier 1 experience rework below 1.5% and 60% are below 3%.
- 28% of OEMs rework is below 1.5%, while 52% of them have under 3% rework.

Row Labels	0-1.5%	1.6%-3%	More than 3%	I don't know
OEM	28%	24%	15%	33%
Tier 1	36%	24%	20%	20%
Tier 2	15%	35%	30%	20%
Tier 3	0%	25%	50%	25%
Aftermarket Service	43%	14%	14%	29%
Other	14%	14%	11%	61%



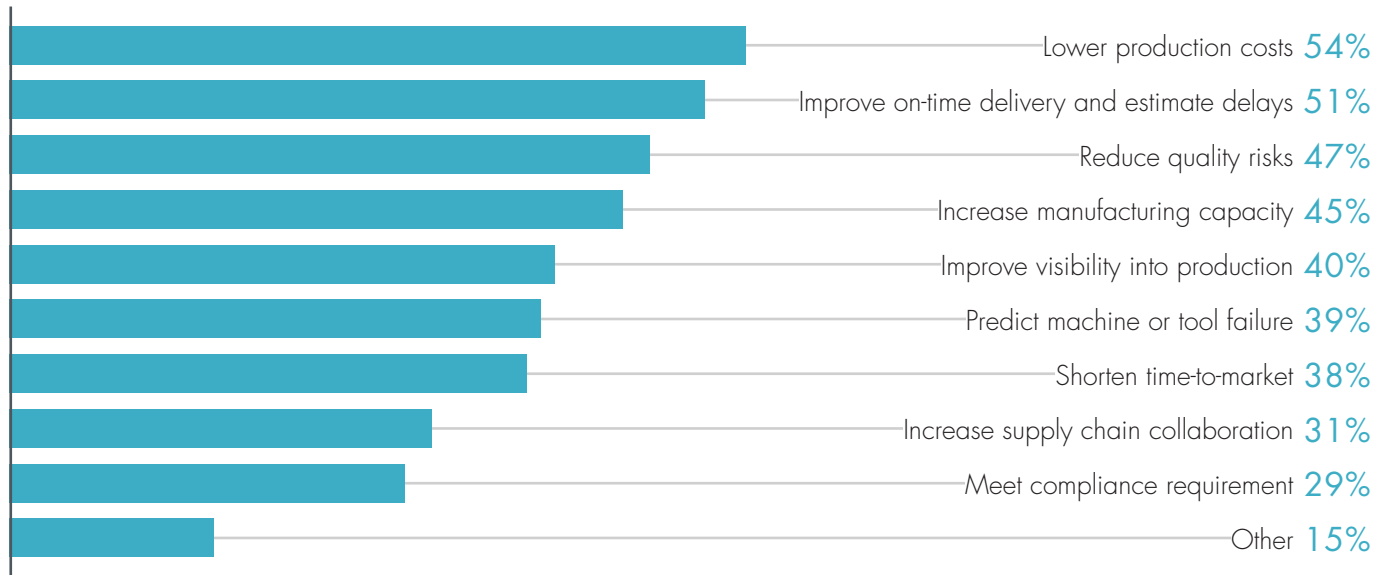
- Almost two-thirds of respondents who have already implemented a digital manufacturing strategy have a rework rate of 0-1.5%, which is lower than companies anywhere else on their digital manufacturing journey.

Row Labels	0-1.5%	1.6%-3%	More than 3%	I don't know
Already implemented	62%	8%	7%	23%
Currently implementing	26%	19%	18%	37%
Evaluating alternative solutions and vendors	17%	17%	33%	33%
Examining target areas for improvements	20%	20%	45%	15%
Gathering information	13%	37%	10%	40%
Planning to start within a year or two	13%	37%	25%	25%
Not interested	31%	6%	0%	63%

MAIN CHALLENGES IN ADVANCED MANUFACTURING

**As part of your digitization strategy, what challenges are your company looking to resolve?**

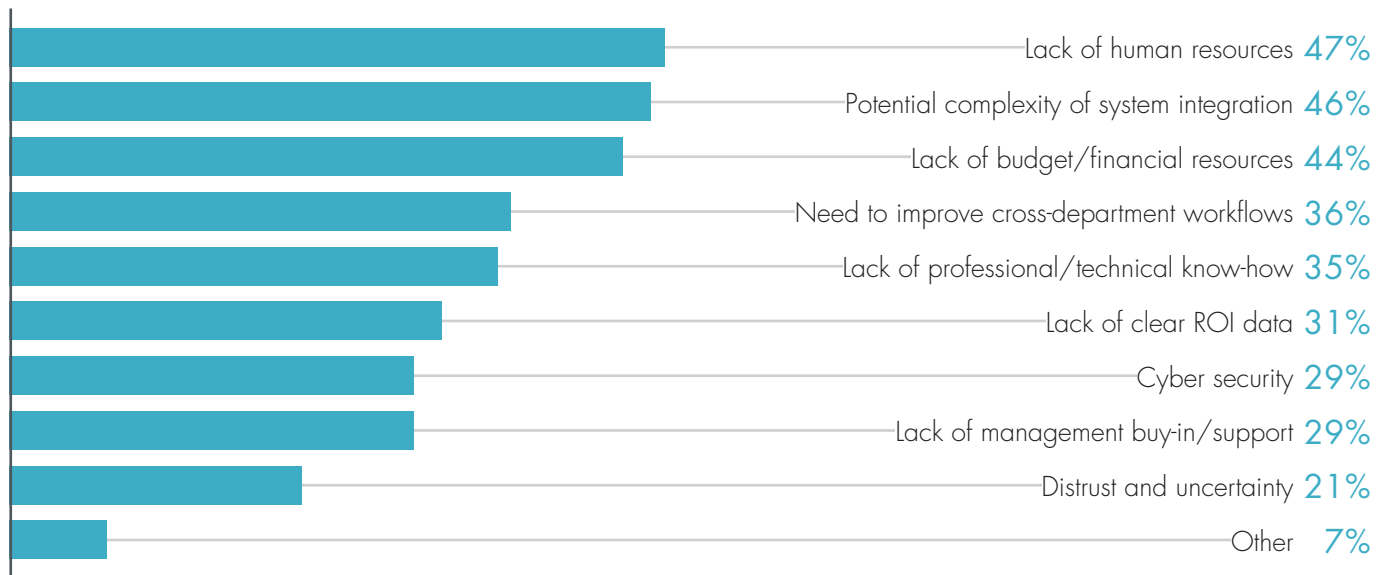
54% of advanced manufacturers pointed out that their main challenge is to lower production costs and 51% are looking to improve on-time delivery and estimate delays, since the faster the product leaves the factory, the lower the cost.



\* The total responses add up to more than 100% as some respondents marked multiple options.

### Which hurdles must your company overcome while pursuing your digital transformation?

The main hurdles advanced manufactures are struggling with are lack of human resources, chosen by 47% of respondents and the potential complexity of integration was chosen by 46% of respondents. The third main hurdle is lack of budget – 44%. The fourth is the need to improve cross-department workflows with 36%. Top management should look into these hurdles and take the right actions to overcome them if they wish to maintain their competitive advantage.



\* The total responses add up to more than 100% as some respondents marked multiple options.

## THE KEY TECHNOLOGIES ESSENTIAL FOR MANUFACTURERS' SUCCESS

There are several technologies designing the future of advanced manufacturers which are crucial steps to build the Factory of the Future. We can see that the respondents see big data analytics and Industrial IoT as very important to their future success - 69% and 66% respectively. Autonomous robots and sensors are also seen as an evolving trend among 56% of respondents.

Technologies	Very Important
Process and product simulation	76%
Big data and analytics	69%
The Industrial IoT	66%
3D Printing/Additive manufacturing	64%
Autonomous robots and sensors	56%
Product and plant digital twins	56%
AI and machine learning	55%
VR/AR	41%
Blockchain	34%

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## Summary

In summary, the survey presents a significant increase in adoption of Industry 4.0 technologies, mostly associated with market leaders.

The market changes and especially these challenging times, drive companies and decision makers to keep up the pace and onboard innovative solutions involving Industry 4.0 technologies such as cloud computing, Artificial Intelligence (AI), and the Industrial Internet of Things (IIoT).

These solutions can directly support agility and multi- aspect decision making under changing conditions; they can support smart supply chain collaboration, let alone their huge contribution to analyzing the productivity and cost-efficiency of manufacturers.

In terms of future technologies, we can see that 66% of respondents find Industrial IIoT as a very important technology to the future of their company success and profitability.

27% of respondents, the industry leader, differ from all other in several ways:

- Implementation of Industry 4.0 – 69% of industry leaders have started to implement industry 4.0, compared to 35% in 2018.
- Level of digitalization – 58% of industry leaders define themselves as ‘mostly digital’ and ‘fully digital’ compared to 37% in 2018.

Industry leaders we have identified, enjoy very high-quality standards reflected in a rework rate of <3%.

Industry leaders we have identified, enjoy very high-quality standards reflected in a rework rate of <3%.

In these challenging days, facing with the COVID-19 crisis, industrial manufacturing leaders have a major goal of maintaining their operations. IIoT solutions can ensure business continuity and adverse economic impact by improving liquidity and lowering short-term costs





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## About SME

SME promotes advanced manufacturing technology and develops a skilled workforce. Our company's purpose is to advance manufacturing and attract future generations. SME has been supporting the manufacturing industry for the last 85 years. Working closely with manufacturing professionals, companies, educators, schools and communities, we share knowledge and resources that generate solutions to manufacturing industry challenges. Through SME'S members and industry experts they collaborate, aggregate and disseminate technical information and expertise. Manufacturers rely on a skilled, technical and professional workforce to drive innovation, increase productivity and remain globally competitive. SME is a leading resource for manufacturing knowledge and training.

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## About Plataine

Plataine is the leading provider of Industrial IoT and AI-based optimization solutions for advanced manufacturing. Plataine's solutions provide intelligent, connected Digital Assistants for production floor management and staff, empowering manufacturers to make optimized decisions in real-time, every time. Plataine's patent-protected technologies are used by leading manufacturers worldwide, including Airbus, GE, Renault F1® Team, Stelia North America, Muskogee Technology, IAI, Triumph, General Atomics, TPI Composites and Ethan Allen. Plataine partners with Siemens PLM, McKinsey & Company, VIRTEK, the AMRC with Boeing, and CTC GmbH (an Airbus Company), and is also a part of the National Composites Centre (NCC) membership network, to advance the 'Factory of the Future' worldwide. For this work, Plataine has received a Leadership Award from Frost & Sullivan and Innovation Awards from the JEC and CompositesUK organizations, as well as the Shanghai Society of Aeronautics (SSA). Plataine is ISO 27001 certified for compliance with information security management requirements. For more information, visit: [www.plataine.com](http://www.plataine.com).

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