



# TRENDS IN DIGITAL MANUFACTURING

Implementing Industry 4.0  
& building the Digital Factory

Nearly  
**400**  
C-level executives  
from Industrial  
Manufacturing



**PLATAINE®**  
people-smart automation



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# Executive Summary //

Manufacturers are now facing unprecedented challenges of complexity and growth while connected technology, often known as Industry 4.0 or Industrial IoT, brings the possibility of building the 'Digital Factory': an industrial facility where all products, personnel, raw materials, machines and processes are being connected.

In this Digital era, where managers are expected to use real-time data to continually optimize production operations and achieve higher levels of efficiency, factory executives are exposed to extraordinary levels of complexity and competitive pressures.

This unique industry survey, covering nearly 400 C-level responses, reveals how the manufacturing industry is responding to these pressures, looking at the digital initiatives and business plans faced across a variety of verticals: from aerospace to automotive and from furniture to chemicals.

## IMPLEMENTING INDUSTRY 4.0

While it's clear from the survey results that optimism amongst manufacturers is high, with 93% reporting they expect double or single-digit growth over the next three years, this survey also reveals that manufacturers recognize the expected challenges they will face as a result of adopting IIoT technology.

The potential complexity of new system integration is one of the main hurdles C-level executives have indicated, while 45% percent of manufacturers reported putting an Industry 4.0/Digital Factory strategy in place to meet these expected challenges, as well as taking issues of quality and performance measurement very seriously.

## ABOUT THIS SURVEY

Conducted jointly by SME.org, 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.

## VERTICAL SPLIT OF SURVEY PARTICIPANTS

26%



Aerospace & Defense

14%



Metals

12%



Automotive

8%



Engineering & Construction

5%



Medical Equipment

4%



Oil & Gas

4%



Furniture & Upholstery

4%



Electronics

23%



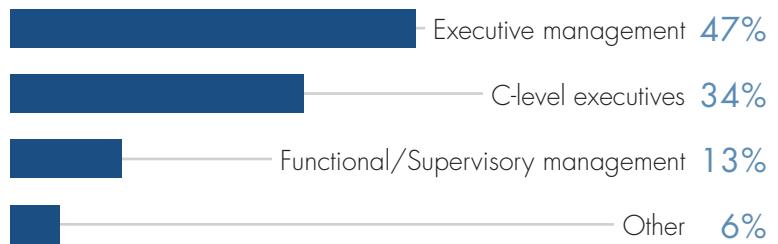
Other

# Demographics //

## FUNCTIONAL RESPONSIBILITY

### Select your primary functional responsibility.

The vast majority of respondents work in senior management roles: 47% are in executive management and 34% are C-level executives. Additionally, 13% are in functional or supervisory management.



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## RESPONDENTS' ROLES

### What is your role in the organization?

Respondents reported ten areas of functional responsibility including: 49% who describe their role as management; 22% who work in manufacturing operations and 13% in business development, sales & marketing.



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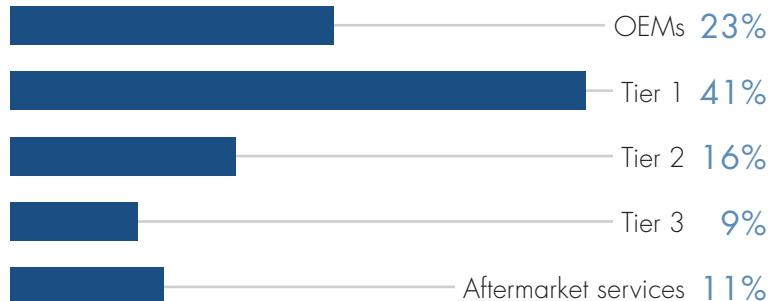


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## DISTRIBUTION BY TIER SEGMENT

### What is your 'Tier' segment?

Respondents were asked to select the tier segment of their company within its industry's value chain. Often, a company sits across multiple tiers. 23% of respondents are OEMs from industries such as aerospace and automotive manufacturing. 41% of respondents are in Tier 1, 16% in Tier 2 and 9% in Tier 3. Additionally, 11% are in aftermarket services such as maintenance, repair and overhaul.

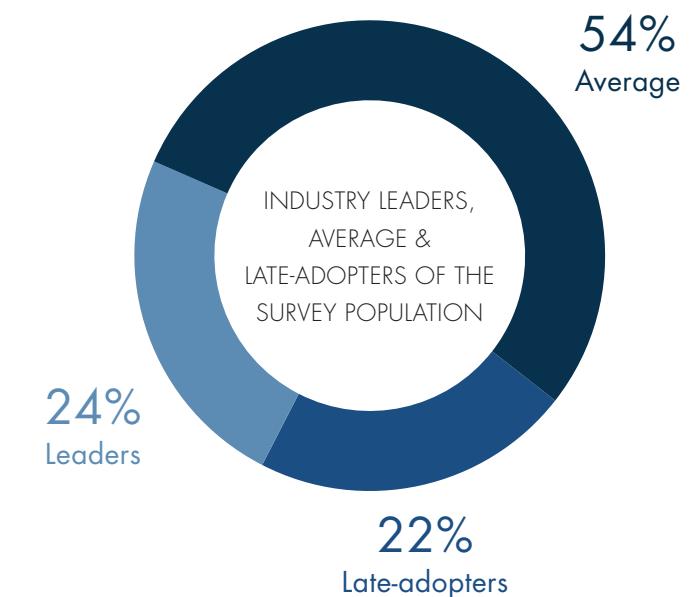


# What makes a leader? //

This section examines respondents' current level of digitization and investigates their efforts and strategies for implementing Industry 4.0 and the Digital Factory. Respondents discussed the hurdles they face on the road to digital transformation, as well as the business challenges they believe digitization can resolve and the potential growth areas that will be unleashed by the Digital Factory.

The survey split responding companies into three groups. 'Industry leaders' were defined as companies expecting double-digit growth over the next three years and also reporting high quality standards. Industry leaders make up 24% of the total market. Another 54% of firms are classed as 'average', and 22% of the market is ranked as 'late-adopters' (reporting slower growth rates and average quality performance).

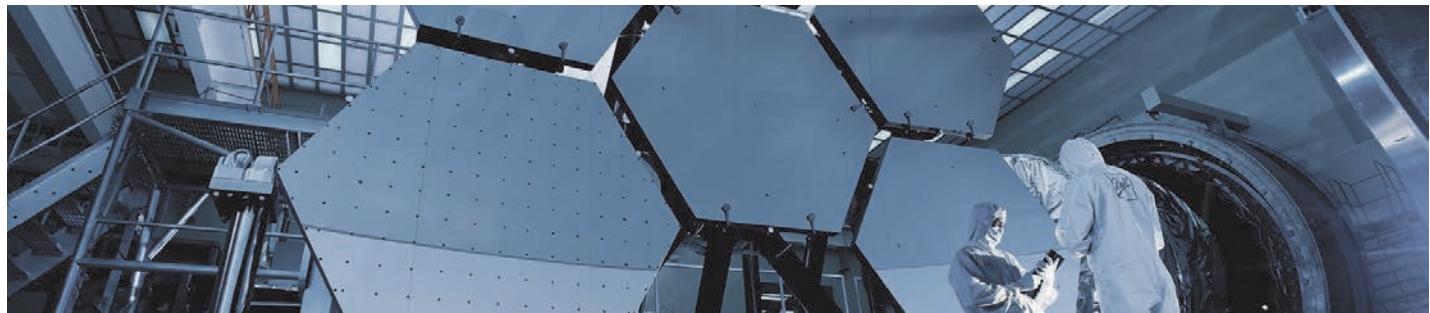
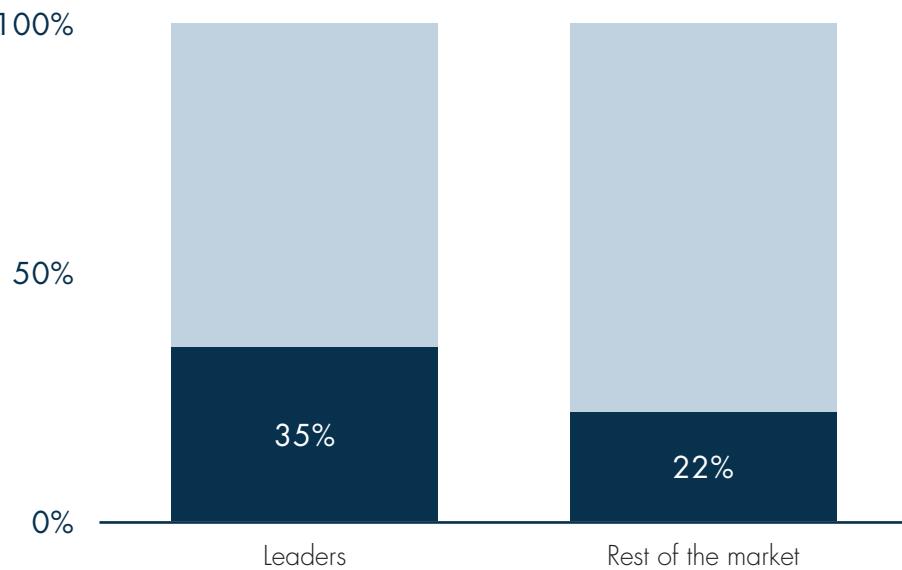
This section highlights the areas where industry leaders differ from the rest of the market: their level of digitization and whether they have started implementing Industry 4.0.



# Industry leaders: What is their secret? //

## STARTED IMPLEMENTING INDUSTRY 4.0

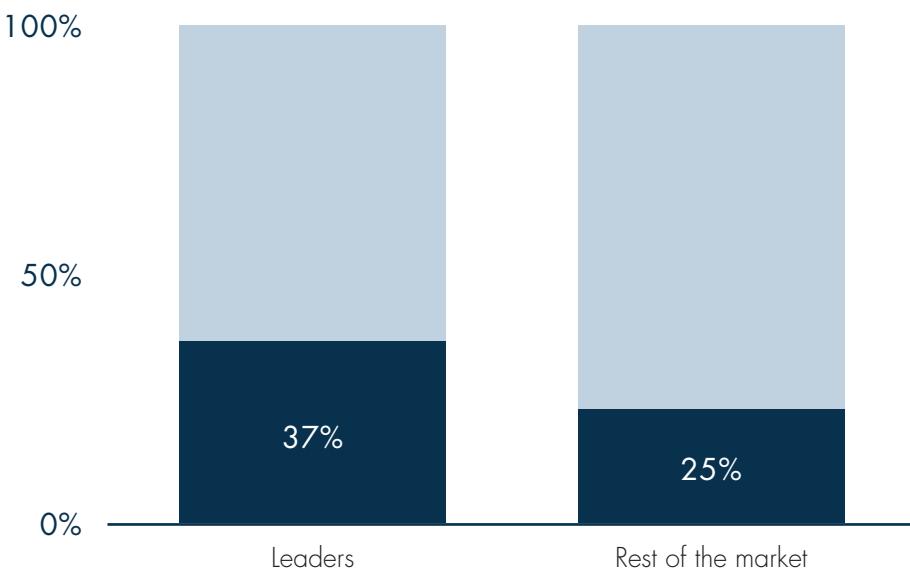
35% of Industry leaders have indicated that they have started implementing 4.0 initiatives as opposed to only 22% of other respondents.



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## ORGANIZATIONS THAT ARE MOSTLY DIGITAL

37% of Industry leaders have indicated that their organization is mostly or fully digital as opposed to 25% of other respondents.

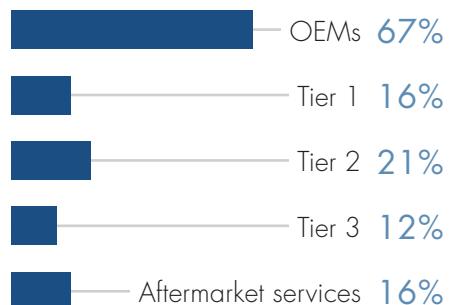


# Survey highlights //

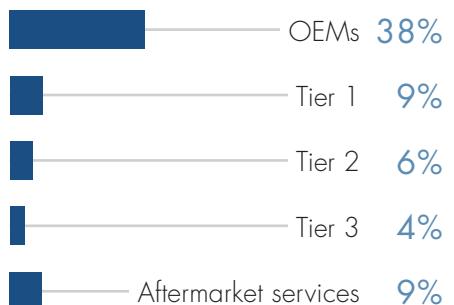
OEM'S  
PAVE THE  
WAY TO  
4.0

BY IMPLEMENTING  
THESE MAIN  
INITIATIVES

Digitizing manual  
processes initiative



Connecting to shop floor  
sensors initiative

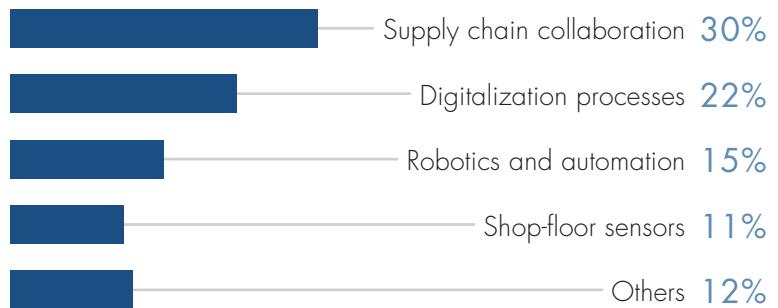


# Digital factory strategies //

## Which of the following initiatives are part of your company's Digital Factory strategy?

This question revealed four key digital factory initiatives are commonly used across multiple industries. **Supply chain collaboration** was the most popular, with 30% of companies reporting it. This was closely followed by **digitalization of manual/paper processes**, which 22% of firms reported on. **Efforts to implement robotics and automation** were reported by 15%, while 11% reported **connecting to shop-floor sensors**.

## Breakdown of digital initiatives 2018



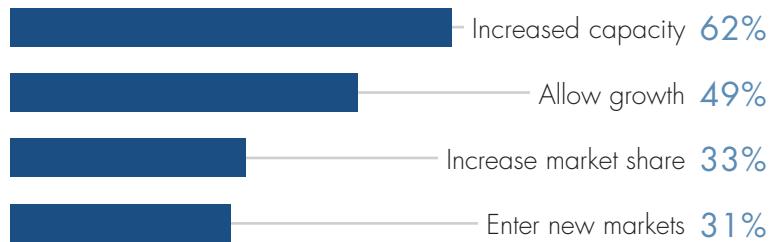
\* The total responses add up to more than 100% as some respondents marked multiple options.



## POTENTIAL GROWTH AREAS

### What do you expect your factory's' growth areas from digital transformation to be?

Companies report a range of potential growth areas are enabled by the Digital Factory. 62% expect it to deliver increased capacity supporting expected business growth, 49% say it will allow growth in existing markets, 33% say it will increase their market share and 31% say it will allow them to enter new markets.



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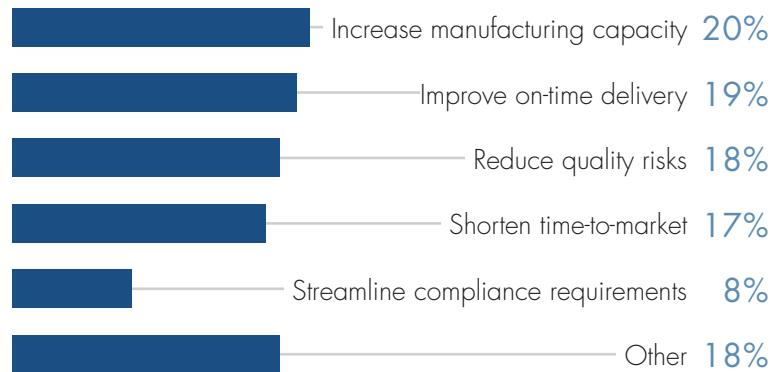


# Survey results //

## BUSINESS CHALLENGES DIGITIZATION CAN RESOLVE

### As part of your digitization strategy, which business challenges are you looking to resolve?

When it comes to the business challenges that firms hope digitalization will help address, five themes are clear. First is the need to increase manufacturing capacity, with 20% of responses. Second came the need to improve on-time delivery, reported by 19%. 18% want to reduce quality risks, 17% want to shorten time-to-market, and 8% want to streamline compliance requirements to ensure they are audit ready at all times.



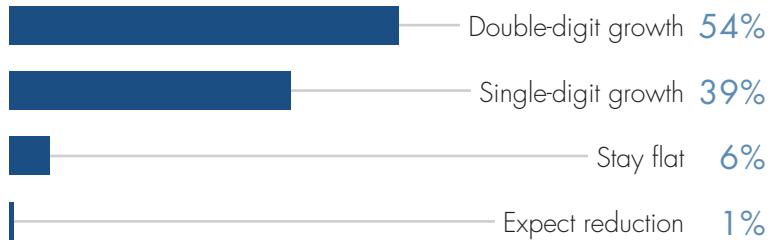
\* The total responses add up to more than 100% as some respondents marked multiple options.



## EXPECTED GROWTH

### What is the expected growth at your facility over the next three years?

Almost all respondents are expecting growth: 54% expect double-digit growth and 39% expect single-digit growth. Only 6% expect their businesses to stay flat, and 1% expect their businesses to shrink.

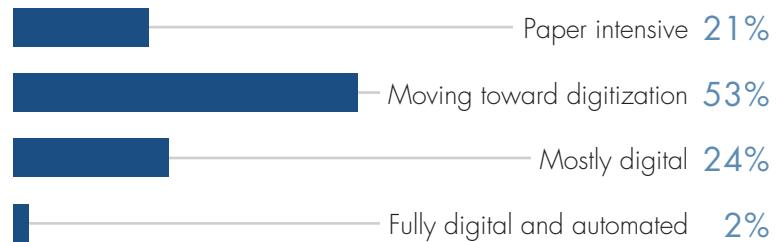


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## CURRENT LEVEL OF DIGITIZATION

### How would you rate your organization's digitization level?

When we combine industry leaders, average companies and slow adopters to look at the total market: 24% are 'mostly digital' and 2% are 'fully digital and automated'. A further 53% are moving toward digitization, describing themselves as 'partly digital with some paperwork', and 21% are 'paper intensive'.



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## HURDLES ON THE ROAD TO DIGITAL TRANSFORMATION

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

The survey showed nine common hurdles to digital transformation that are experienced across multiple industries. As with any adoption of new technology, the potential complexity of new system integration seems to be the biggest challenge with implementing 4.0 technologies as it was reported by 44% of respondents, while 29% reported their greatest hurdle being lack of human resources. 21% of respondents said it was too early to implement digital transformation in their organization, while lack of management buy-in was reported by 18%. A lack of ROI data is an issue for 8% and the concern of cyber security threats appears to be an issue for just 8% of the respondents, however this requires further analysis.



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



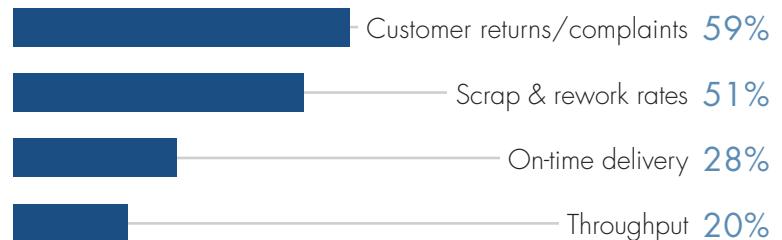
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## MONITORING KPIs

### Which of the following KPIs does your company currently monitor?

Businesses were asked to list which KPIs they monitor to assess business performance.

Almost all respondents reported measuring multiple performance indicators. The most popular was customer returns/complaints rate which is monitored by 59%. A further 51% monitor scrap & rework rates, 28% monitor on-time delivery and 20% monitor throughput.



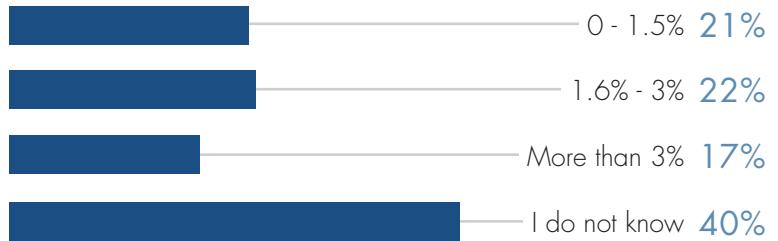
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## REWORK RATE

**What is your current rework rate due to quality defects?**

Respondents were asked to state their current rework rate. Nearly 40% do not know that information. 21% indicated a rework rate of 0-1.5%; 22% reported 1.6-3% and 17% reported more than 3%.

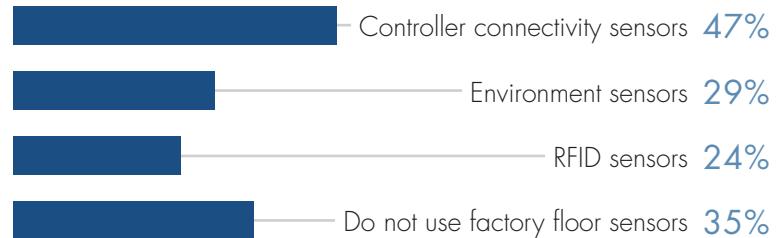


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## FACTORY FLOOR SENSORS

### What factory floor sensors do you currently use?

Many firms report using multiple factory floor sensors in their day-to-day operations. Machine/ controller connectivity sensors are used by 47%, 29% use environment sensors such as temperature and humidity sensors and 24% use RFID sensors. 35% do not use factory floor sensors.



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



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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.

## About Plataine

Plataine is the leading provider of Industrial IoT and AI-based optimization solutions for advanced manufacturing. Plataine's solutions provide Material & Asset Traceability and Digital Assistants that empower manufacturers to make optimized decisions in real-time, every time. Plataine's patent-protected technologies are used by leading manufacturers worldwide, including Airbus, GE, IAI, Triumph, General Atomics, TPI Composites, PCC, Steelcase and Argosy International. Plataine partners with Google Cloud, GE Digital, Siemens PLM, McKinsey & Company, the AMRC with Boeing, and CTC-Stade (an Airbus Company), 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). For more information visit: [www.plataine.com](http://www.plataine.com)



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