WEBINAR
Manufacturing Gets Digital: Value Capture in the Smart Factory
Introductions

Paul Wellener is a vice chairman, Deloitte LLP, and the leader of the US Industrial Products & Construction practice with Deloitte Consulting LLP. He has more than three decades of experience in the industrial products and automotive sectors and has focused on helping organizations address major transformations. Wellener drives key sector industry initiatives to help companies adapt to an environment of rapid change and uncertainty—globalization, exponential technologies, the skills gap, and the evolution of Industry 4.0. Based in Cleveland, Wellener also serves as the managing principal of Northeast Ohio. Connect with him on LinkedIn at https://linkedin.com/in/pwellener/.

Ben Dollar is principal in the Global Supply Chain practice of Deloitte Consulting LLP. He specializes in large scale transformation enabled by digital technologies and focuses on driving adoption for sustainable benefits. He has helped some of Deloitte’s largest clients reduce costs and improve workforce productivity through advanced technologies. His industry focus is primarily on global industrial manufacturers. Connect with him on LinkedIn at https://www.linkedin.com/in/ben-dollar-1018aa/.
Today’s agenda

Smart factory: Setting the context

It’s all in the mindset

Pathways to value realization
The 2019 Deloitte and MAPI Smart Factory study sought to measure adoption of smart factory initiatives and determine value realization.

Study Components

- Executive survey with 600+ total respondents
- Executive interviews with more than a dozen manufacturers
- Focus groups with finance and operations leaders
- Economic forecast and modeling

**Company size (revenues)**

- More than $25B: 12%
- $10B - $25B: 13%
- $3B - $9.9B: 23%
- $1B - $2.9B: 23%
- $500M - $999M: 14%
- $250M - $499M: 8%
- $100M - $249M: 7%

**Company size (employees)**

- More than 100K: 8%
- 75K to 100K: 4%
- 50K to 75K: 5%
- 25K to 50K: 10%
- 10K to 25K: 16%
- 5K to 10K: 20%
- 1K to 5K: 25%
- Less than 1K: 13%

**Respondents’ business areas**

- Business: 40%
- Operations: 60%

Business includes leaders of finance, IT, technology, digital teams. Operations includes leaders directly involved in manufacturing such as production, supply chain, engineering, inventory etc.

- 610 manufacturing respondents
- 313 active smart factory adopters
- ...representing 10,000+ factories globally

Company size (revenues)

Company size (employees)
Global footprint of factories shows active adoption of smart factory initiatives

North America
310 responses
Factories = 6,883
35% have Smart production line

South America
105 responses
Factories = 533
16% have Smart production line

EMEA
138 responses
Factories = 1,327
25% have Smart production line

APAC
168 responses
Factories = 1,596
28% have Smart production line

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
For example, smart manufacturers invest in many use cases.

Top six use cases currently in use by survey respondents:

- **Quality sensing and detecting**: Real-time equipment monitoring, visual analytics, in-line quality testing.
- **Plant consumption and energy management**: Sensor-based waste, scrap, and utility consumption tracking; energy, water, waste optimization platform.
- **Factory synchronization and real-time asset tracking**: Tracking sensors to dynamically adjust schedules.
- **Factory asset intelligence**: Predictive maintenance, AR to assist maintenance personnel, sensor-enabled asset monitoring.
- **Command center**: Using data, analytics and visualization, and user-based insights.
- **Smart conveyance**: Automated guided vehicles, automated conveyance to ensure continuous material flow.

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Smart factory adoption: Setting context

*Not just technologies, but a new approach*
Manufacturers unanimously agree: Smart factories are the future, and that future is promising.
The transformation is not a ‘big bang’ but rather a concerted effort over a number of years.

What does that mean at the company level?

A $4 billion manufacturer in 2018 could...

- Add 17% more than average growth
- Add $1.7 billion of revenue through smart factory initiatives
- Increase labor productivity by 30%

86% of manufacturers believe
Smart factory initiatives will be the main driver of manufacturing competitiveness in 5 years.

83% of manufacturers believe
Smart factory initiatives will transform the way products are made in 5 years.

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Smart factory adoption is making progress ... and adoption is not linear

<table>
<thead>
<tr>
<th>Single asset</th>
<th>Production line/cell</th>
<th>Single factory</th>
<th>Factory network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimenting with smart assets</td>
<td>Planning or implementing or full scale adoption of smart assets</td>
<td>Implementing or full scale adoption of smart production line</td>
<td>Full scale adoption of smart factories</td>
</tr>
<tr>
<td>35%</td>
<td>26%</td>
<td>33%</td>
<td>3%</td>
</tr>
</tbody>
</table>

61% are in early stages of maturity

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data

Note: numbers may not add to 100% due to rounding.
Polling question 1
It’s all in the mindset

*Understanding characteristics of manufacturers riding the smart factory wave*
A cluster analysis led to discovery of three distinct personalities

**Trailblazers**
- Pioneering the adoption of smart factory initiatives
- 18% of respondents
- 62% of factories with smart production line

**Explorers**
- Navigating new territories and charting a course
- 55% of respondents
- 24% of factories with smart production line

**Followers**
- Beginning the smart factory journey
- 27% of respondents
- 9% of factories with smart production line

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Trailblazers make greater investments in smart factory initiatives

65% of TRAILBLAZER’s factory budget is invested toward Smart factory initiatives

More than double compared to overall 30%

And they’re seeing higher returns

20% Increased factory capacity utilization

vs. 11% overall

19% Increased labor productivity

vs. 12% overall

18% Increased production output

vs. 10% overall

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Trailblazers are building an ecosystem across their factory footprint

Question: Who are you connecting with through your smart factory initiatives?

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Polling question 2
Trailblazers choose CTOs to lead smart factory initiatives
This could explain the faster pace at which Trailblazers are implementing technology in the factory

Trailblazers’ smart factory boardroom: different roles, different voices

- **Trailblazers** are more likely to have a CTO as their smart factory primary leader
- **Trailblazers** are also more likely to have CEO at the table among the active stakeholders
- **Explorers** and **Followers** choose production-operations as the primary smart factory leaders
- **Explorers** have a higher representation from all business areas, indicating a more consensus-driven approach
- **Followers** report a lower share of C-suite executives on the table, implying less leadership support

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Trailblazers diversify their efforts to manage smart factory initiatives

This could be part of the reason Trailblazers move faster on the adoption curve and realize higher benefits

<table>
<thead>
<tr>
<th>How are you managing smart factory change?</th>
<th>Respondents</th>
<th>Cohorts implementing this approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>A central team to research, develop, and deploy initiative</td>
<td>50%</td>
<td>Trailblazers (50%)</td>
</tr>
<tr>
<td>A measurement plan for assessing progress against objectives</td>
<td>34%</td>
<td></td>
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<tr>
<td>COE that coordinates and connects initiatives in the business units</td>
<td>33%</td>
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<tr>
<td>Communication process to explain the implications to all stakeholders</td>
<td>33%</td>
<td></td>
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<tr>
<td>Engaged external third-parties for managing initiatives</td>
<td>30%</td>
<td></td>
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</tbody>
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Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Pathways to value realization

Manufacturers demonstrate “ingredients” of successful smart factory initiatives
Start small: Manufacturers are combining retrofitting with new factory plans

Smart factory initiative plan for next two years

- **56%** We are retrofitting existing factories and plants
- **30%** We are building or planning new factories
- **9%** Don’t know
- **5%** Both: retrofitting existing and building new factories

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Polling question 3
Learn from experiences: Awareness of risks is important first step
More than half of Explorers and Followers cite operational risks as an issue for smart factory efforts

What risks do you need to plan for or execute against to ensure success of Smart Factory initiatives? (top priority)

In a production environment, making a mistake can bring a production line down or harm a human worker, so the stakes are very high

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Build the foundation: Identify and implement key enabling technologies
New emerged technologies like AR/VR, wearables, blockchain, edge computing, and bots are yet to become mainstream, but manufacturers are planning for them.

Enabling technologies for smart factory initiatives:

- **Data analytics:** 71% (23% in pilot)
- **Cloud networking:** 68% (20% in pilot)
- **Robotics:** 66% (21% in pilot)
- **Factory automation hardware:** 63% (29% in pilot)
- **Active sensors:** 54% (28% in pilot)
- **Internet of Things platforms:** 54% (31% in pilot)
- **Passive sensors:** 54% (27% in pilot)
- **Vision systems:** 53% (28% in pilot)
- **Harmonic sensors:** 43% (32% in pilot)
- **Co-bots:** 32% (31% in pilot)
- **Edge computing:** 30% (32% in pilot)
- **Wearables:** 29% (32% in pilot)
- **Virtual reality:** 29% (33% in pilot)
- **Blockchain:** 26% (31% in pilot)
- **Augmented reality:** 21% (35% in pilot)

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
Talent is key: People can make (or break) a smart factory initiative

Smart factory initiative success often lies in the hands of the people involved

Find the right talent

“Ninety percent of the solution is getting the right leader with the right experience and passion”

~ Executive quote from our study

It holds the key to success

Leverage diverse stakeholders

“It’s important to get a broad spectrum of people with diverse skills and perspectives”

~ Executive quote from our study

It helps to make well-rounded decision

Manage the change well

Fifty percent of executives manage the change by developing dedicated teams for research, development, and deployment

~ Insight from our study

It supports people throughout the change

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data
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Ten building blocks for smart factory initiatives

- Replicate early leaders’ successes
- Perform regular factory walks to identify potential use cases
- Apply AI to the factory data set
- Assemble a cross-functional team
- Make targeted investments
- See more through virtual factories
- Keep employees at the center
- Connect better with external ecosystem
- Focus on pain points
- Embrace experimentation
- Start small

Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data

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Are you ready to capture value along the digital journey?

Learn more at www.deloitte.com/us/smartfactoryjourney

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