



The “Smart Factory” Ecosystem

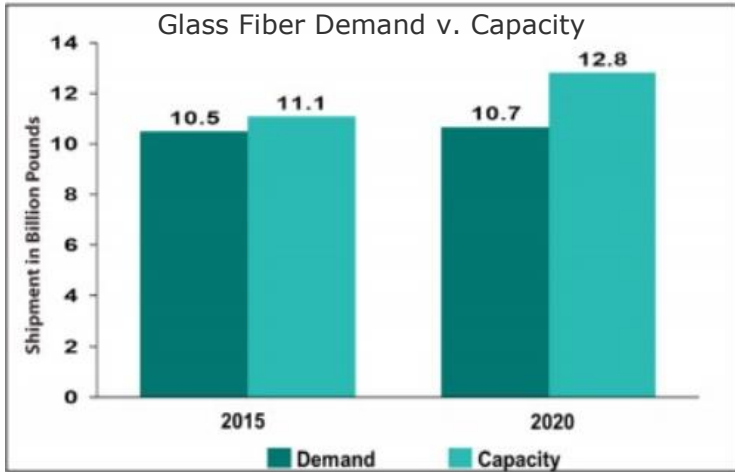
What to expect in advances in manufacturing

Lou Librandi

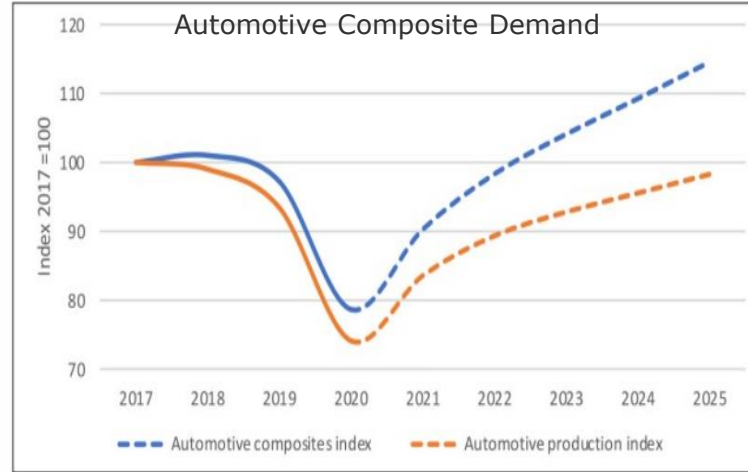
Deloitte

The imperative to modernize for composite manufacturers

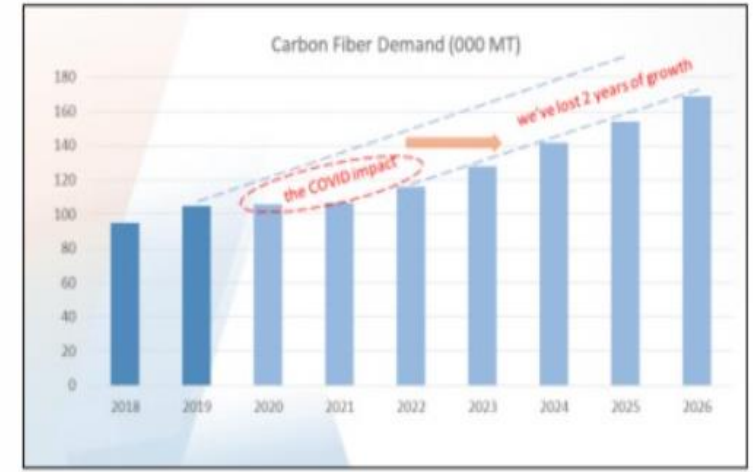
COVID-19 has significantly changed the landscape for composite manufacturers. Prudent modernization investments will allow manufacturers to turn this uncertainty into opportunity.



While demand growth appears to be plateauing...



The truth is that demand is shifting into new areas w/ new customers.



Those that can react nimbly enough can realize substantial benefits.

Increased investments in digitization will provide early adopters w/the tools required to take advantage of new opportunities



Digital Opportunities

Digital investments will allow for seizing of new opportunities



How to get there

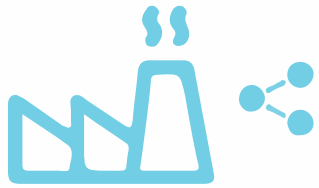
While all this may sound daunting, there is a defined path forward

What does digital mean for you?

Smart factory opportunities

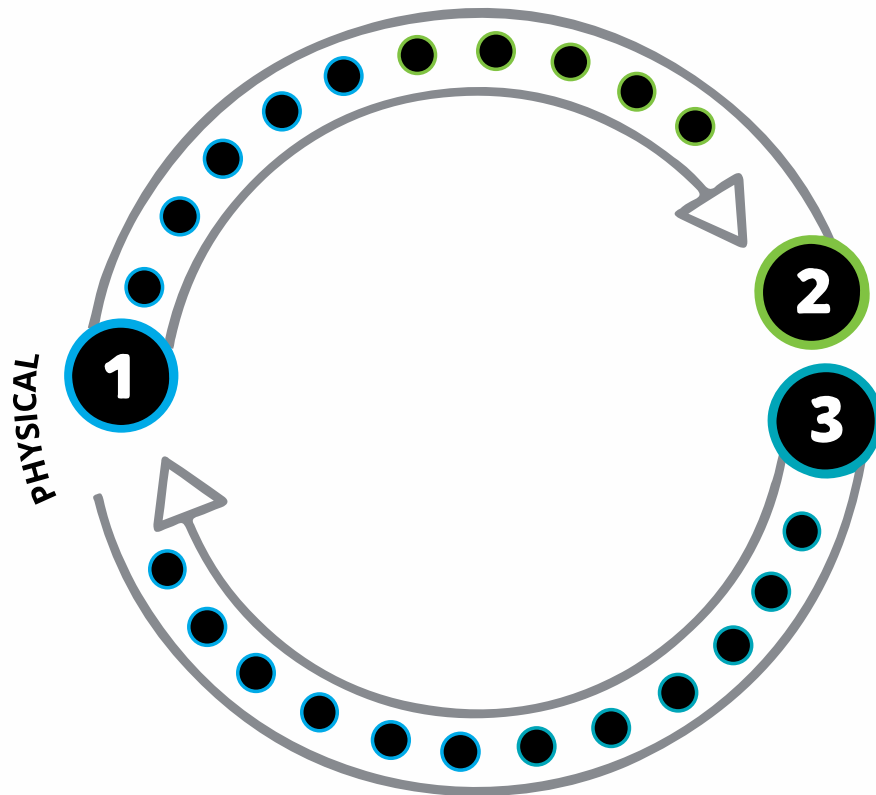
How do technologies integrate to transform an organization?

Industry 4.0 integrates digital information from many different sources to drive the physical act of doing business, in an ongoing cycle known as the physical-digital-physical loop.



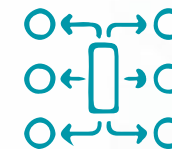
1. Establish a digital record

Capture information from the physical world to create a digital record of the physical operation and supply network



2. Analyze and visualize

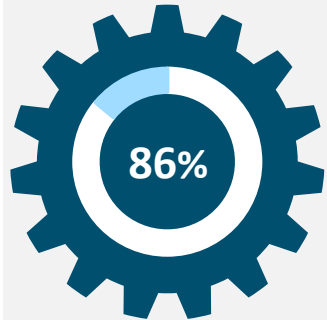
Machines talk to each other to share information, allowing for advanced analytics and visualization of real-time data From multiple sources



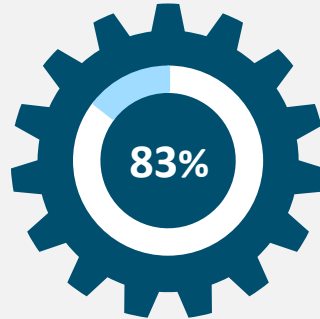
3. Generate movement

Apply algorithms and automation to translate decisions and actions from the digital world into movements in the physical world

Smart Factory adoption is growing and driving results



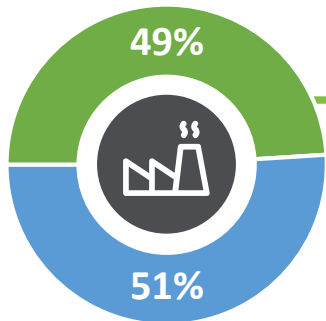
of manufacturers believe smart factory initiatives will be the main driver of manufacturing competitiveness in 5 years



of manufacturers believe smart factory initiatives will transform the way products are made in 5 years

WHAT DOES THAT MEAN AT THE COMPANY LEVEL?

A \$4 billion manufacturer in 2018 could...add \$1.7 billion of revenue through smart factory initiatives



Have not started smart factory initiatives

Have started smart factory initiatives

INHIBITORS

- 34% lack of experience
- 32% difficulty adapting
- 32% lack of compelling business case
- 29% lack of strategy, governance & ownership
- 28% lack of IT infrastructure
- 27% insufficient funding and/or resources

Increase labor productivity by 30%
Add 17% more than average growth

2018

2030

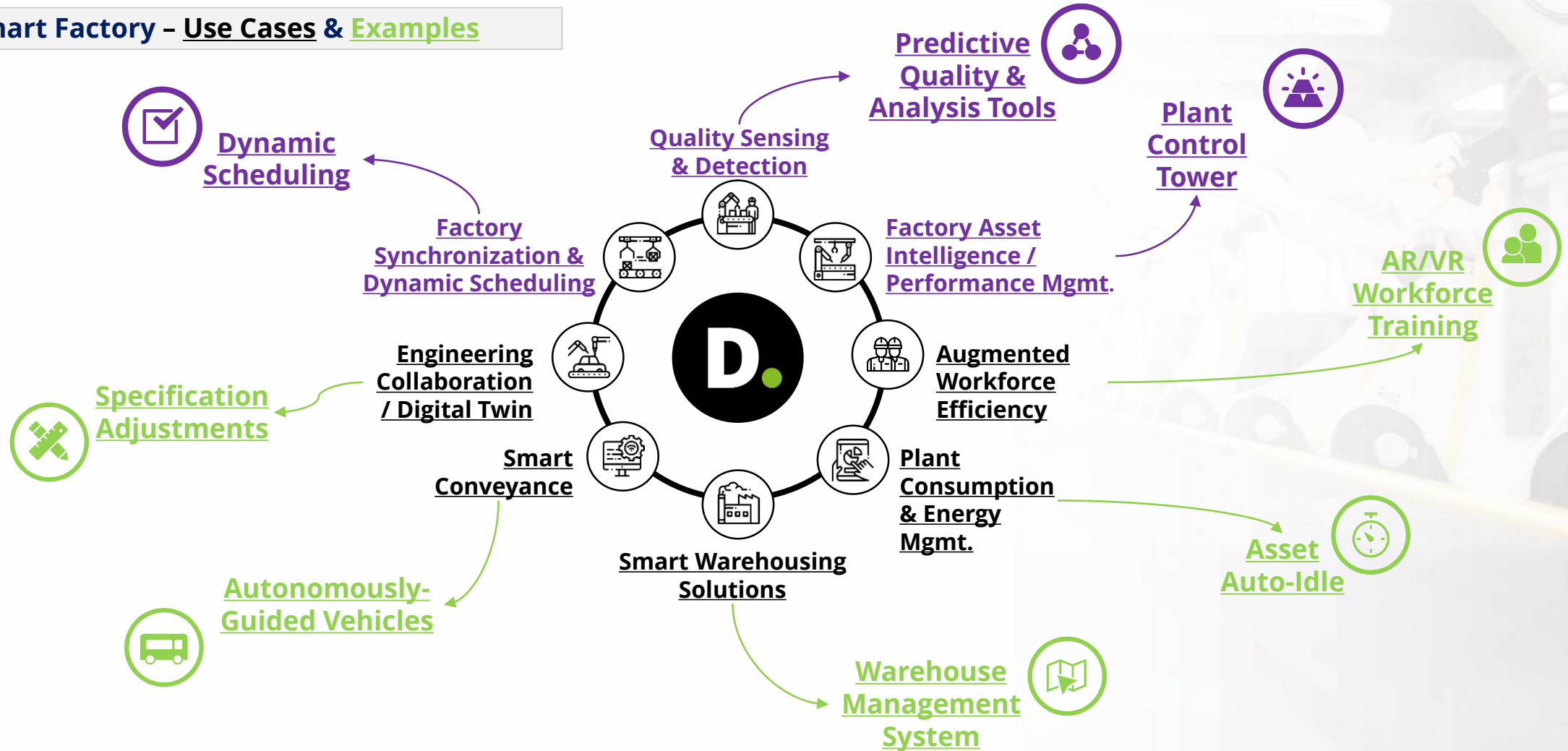
Source: Deloitte analysis of the 2019 Deloitte and MAPI Smart Factory Study data



“Great 8” Smart Factory Use Cases

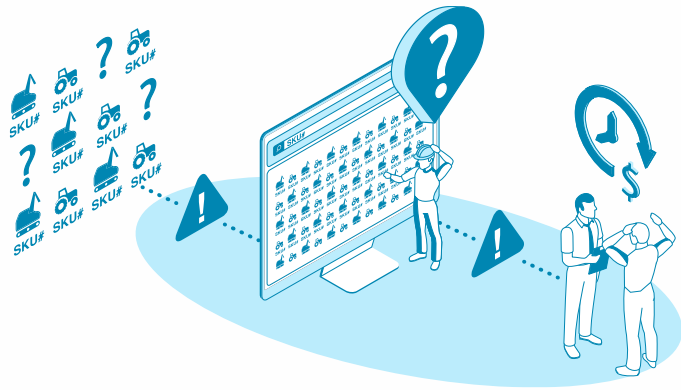
While there are a myriad of smart factory opportunities, a useful way to focus your efforts is by examining eight uses cases that have proven to be particularly effective and transformational.

Smart Factory - Use Cases & Examples



Possible Use Cases in Composite Manufacturing

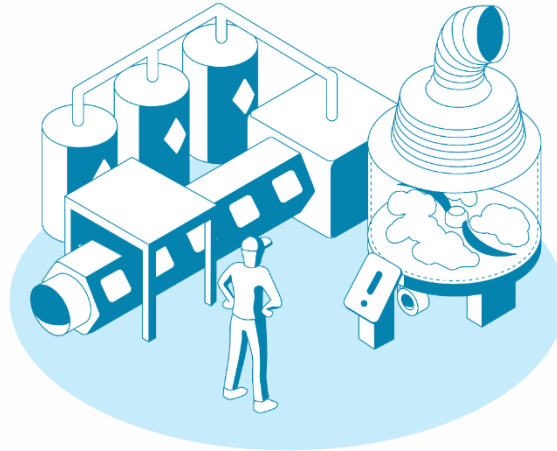
There are a number of Smart Factory uses cases that would immediately be applicable to composite manufacturers at a reasonable cost and scale today.



RFID for Asset Visibility in Autoclave Molding

Issue: The time sensitivity of certain materials in autoclave molding makes real-time asset visibility critical

Solution: Using RFID tags, leaders can understand where their assets are and how long they have been there



Resin Transfer System Predictive Maintenance

Issue: Overtime resin transfer systems can become clogged and less efficient

Solution: Use analytics tied to sensors to understand when resin transfer systems are becoming less efficient and schedule maintenance



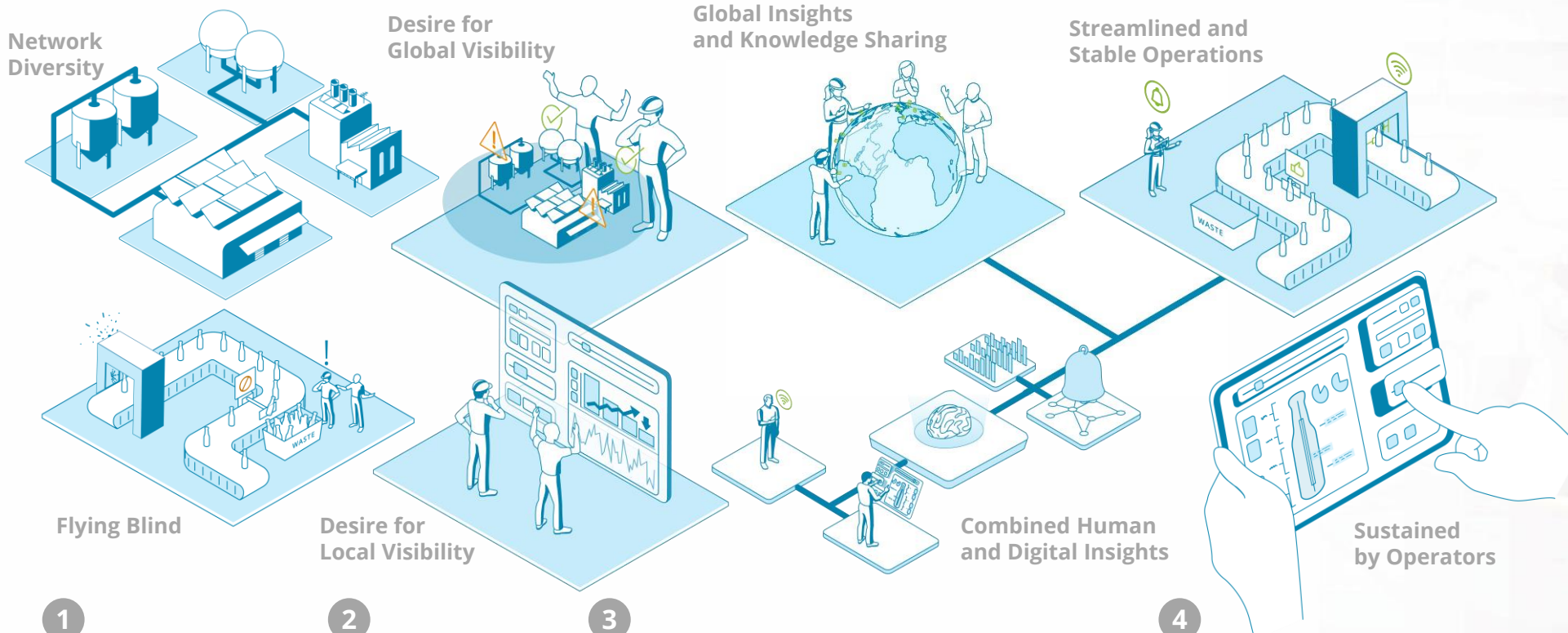
Computer Algorithms to Perfect Curing Times

Issue: Over or under curing composites can lead to waste and/or underutilized assets

Solution: Use analytics to data-mine historic machine interactions to identify optimal cure times

Larger Scale Smart Factory Transformations

While we suggest smaller, more tailored smart factory products to start out with, the possibilities for system wide changes are endless.



1
SITUATION
Global plastics leader wanted to improve productivity and profitability by pursuing aggressive digitization

2
CHALLENGE
Integrating digital tools with established processes and tools

3
SOLUTION
Custom platform that combines high-frequency machine data with quality insights.
Turn data into insights through proactive persona-based alerts, machine learning techniques, and real-time visibility
Lastly, create a digital culture by establishing a Chief Digital Officer and a new cross-business unit team to scale the digital transformation

4
OUTCOME
New technology and data incorporated into their standard ways of working
Developed a scalable application interface and analytical toolset to be deployed across 30+ plants

11% increase
In Overall Equipment Effectiveness (OEE)

15% reduction
Variable cost reduction per year, per line

\$20M savings
Annual Network EBITDA Savings

Benefits

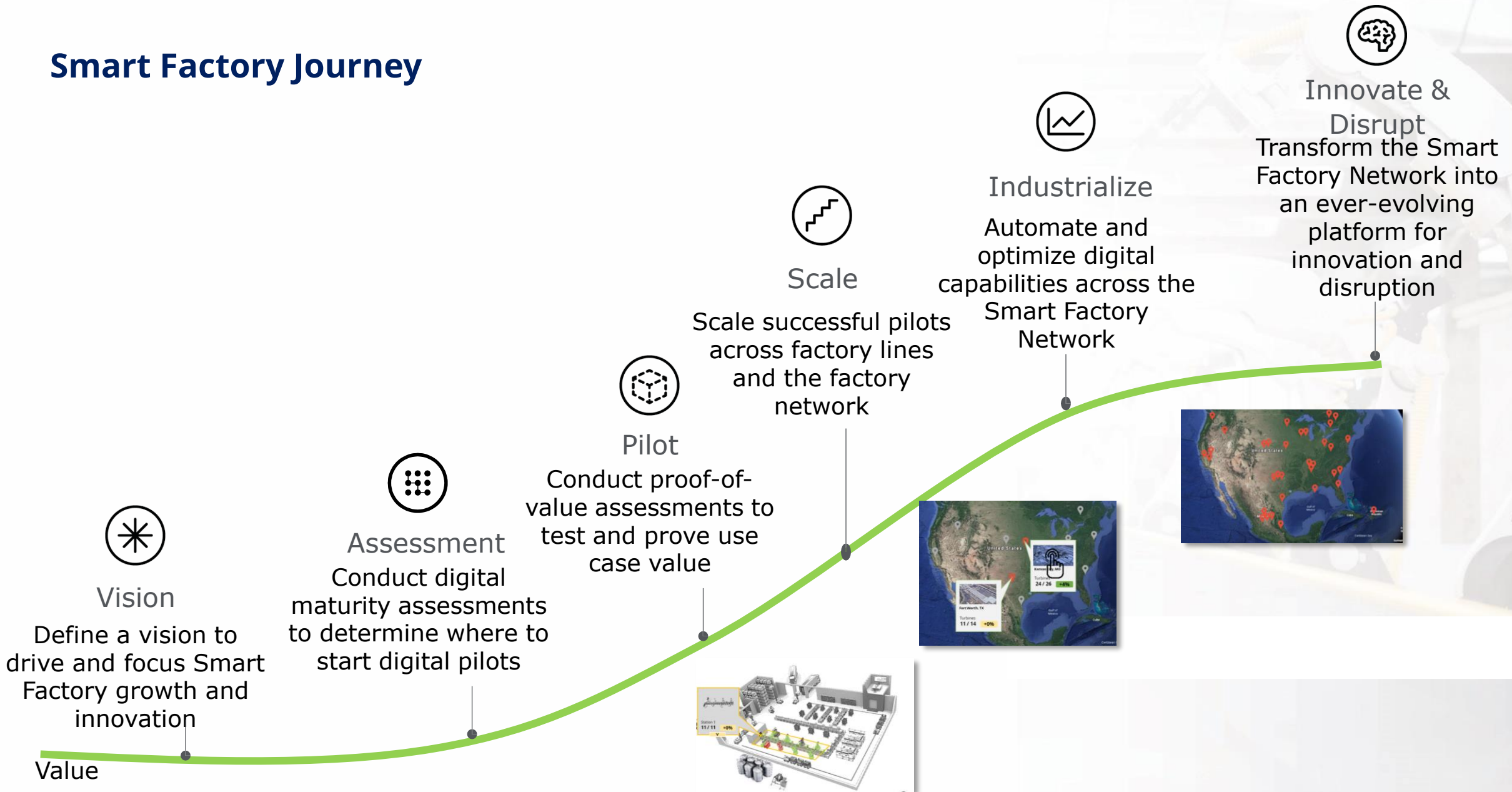
- Creation of a digital culture, including a Chief Digital Officer and cross-business-unit transformation team
- Digitization of assets and processes for advanced analytics
- Ownership of smart factory initiatives from shop floor to board room
- Scalable web-enabled solution across all factories



Smart Factory Journey

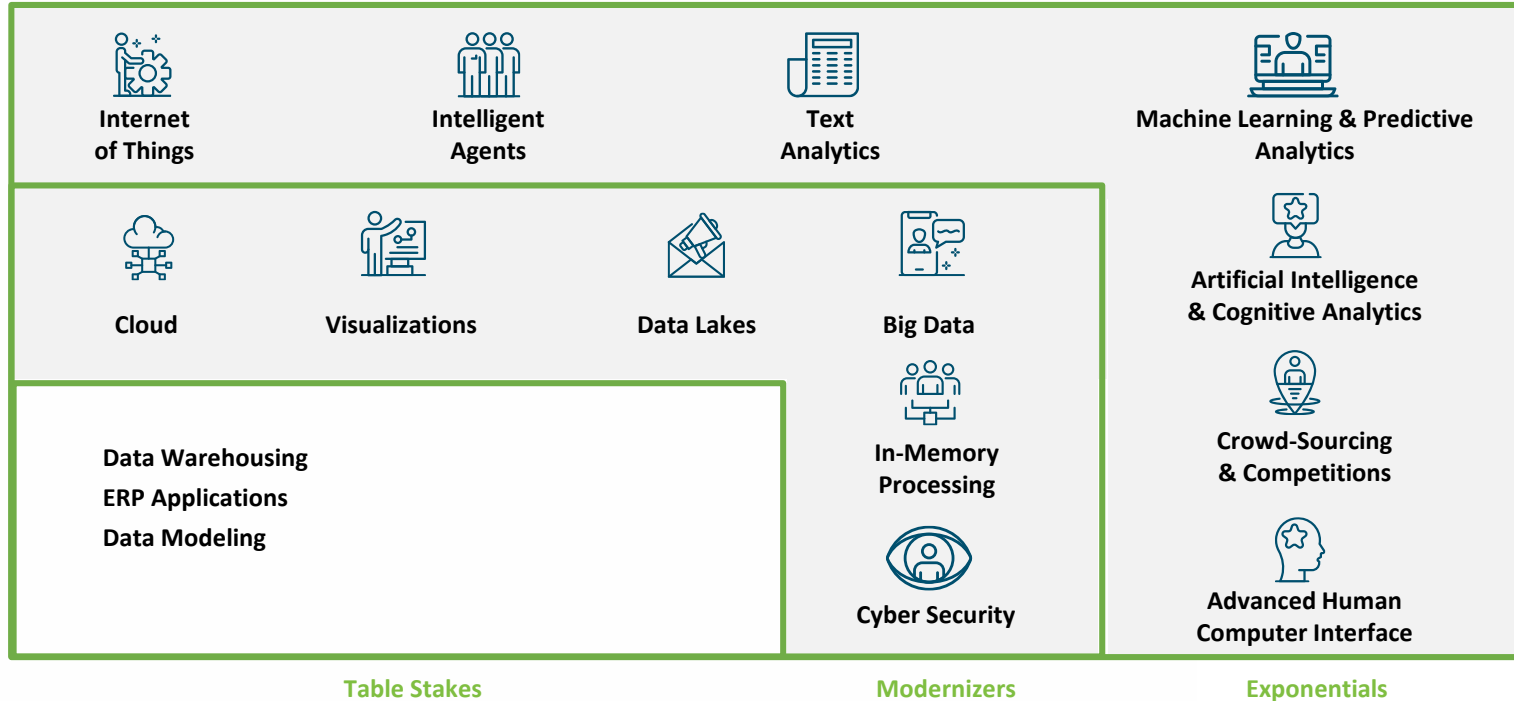
How to make your factory a Smart Factory

Smart Factory Journey



Starting from where you are

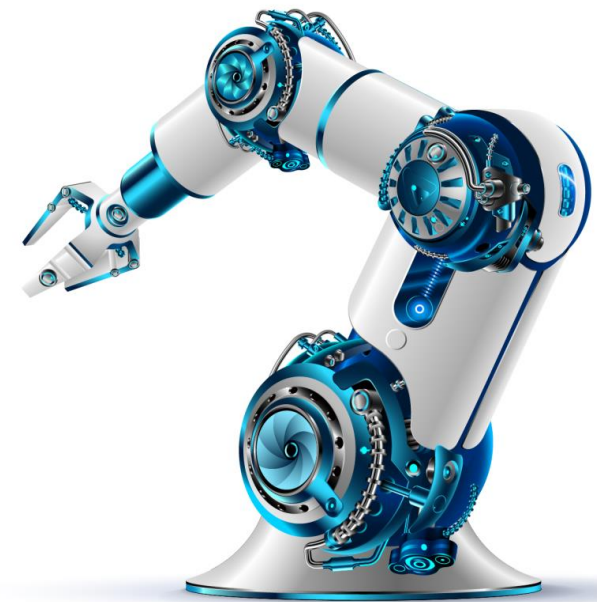
Every business is different in terms of how ready it is to start its Smart Factory journey. Regardless of where your company is today, there are steps that you can take today to start that process.



 No company is too small or too analog to start the transition to digital

 Start the journey where you are, and attack it in manageable chunks

 A host of partners exist to help you on this journey



Creating an environment to accelerate and succeed

THINK BIG



Immerse Yourself in Innovation

Join an immersive experience (e.g., tour an IoT lab) to explore the “art of the possible”, incite ideas, and cultivate a culture of innovation



Build an Ecosystem

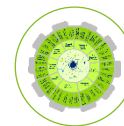
Evolve internal and external partners into “value webs” through collaboration in new technologies and capabilities.

START SMALL



Scaling the Edges

Disconnect from the core business and set up a “black ops” team to enable disruption within an established organization



Selection of Pilots

Select pilots that will allow the idea to demonstrate value quickly and then scale the proven results

ACT FAST



Prove it Works (Quickly)

Use an agile, iterative approach to move from strategy to prototyping as quickly as possible – “fail fast” and achieve rapid results



Market Your Own Success

Champion your successes to gain traction and achieve enterprise-wide adoption

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