

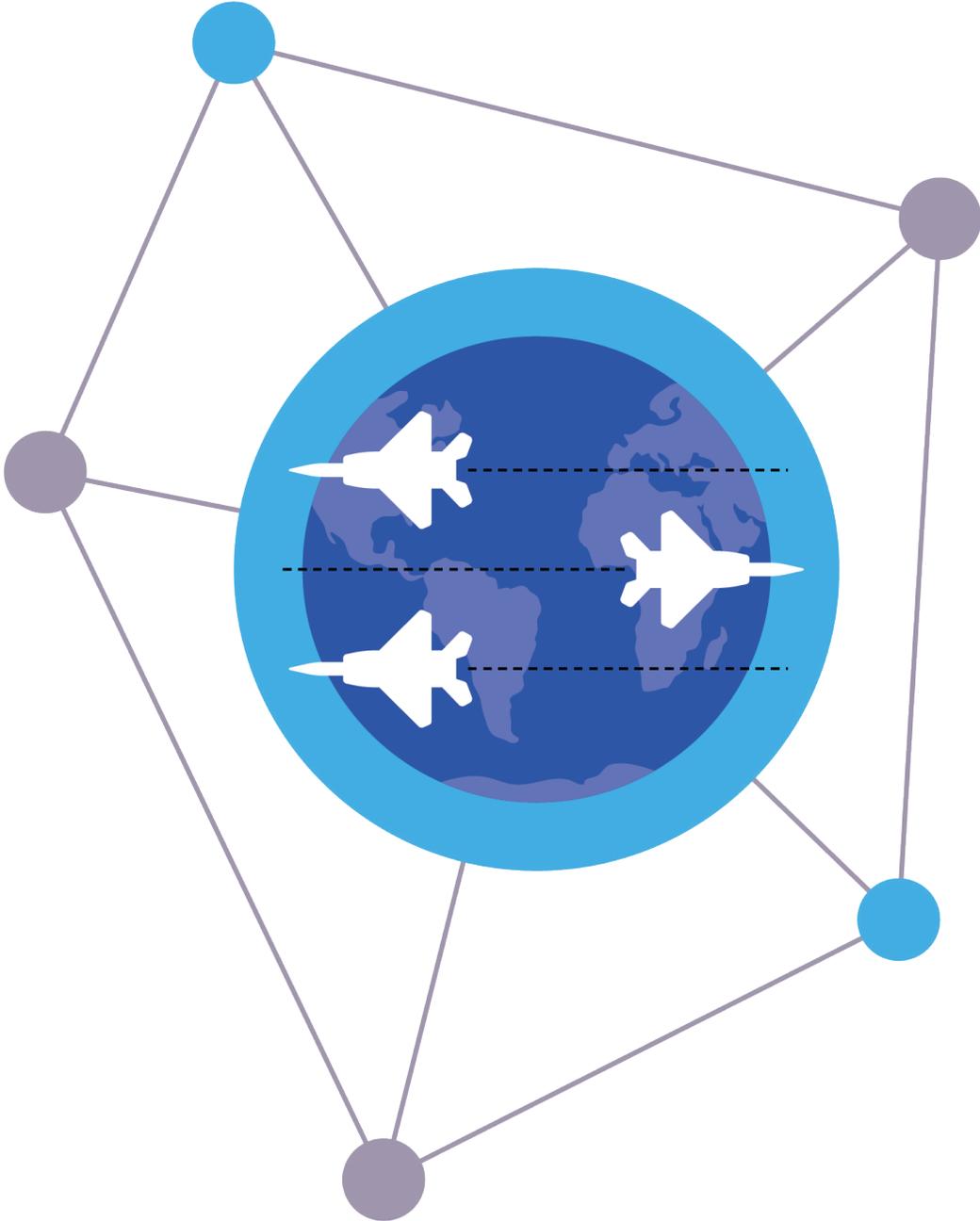
Ecosystem pathways in the aerospace and defense industry

A part of the Deloitte Insights report titled

"Accelerating smart manufacturing: The value of an ecosystem approach"

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A&D sector continues to enlist smart manufacturing to transform

While some A&D companies are ahead in digital adoption, innovation and digital developments continue to disrupt and reshape the A&D industry, creating an increasing need for more agile production processes—accelerating the development of cost-effective products and services.

While there are many compelling use cases for digital technologies, without an organized approach, investments could fail to deliver results. **Deloitte and MAPI's 2020 Smart Manufacturing Ecosystem Study** has identified a path forward to accelerate progress.

Use cases for agile production

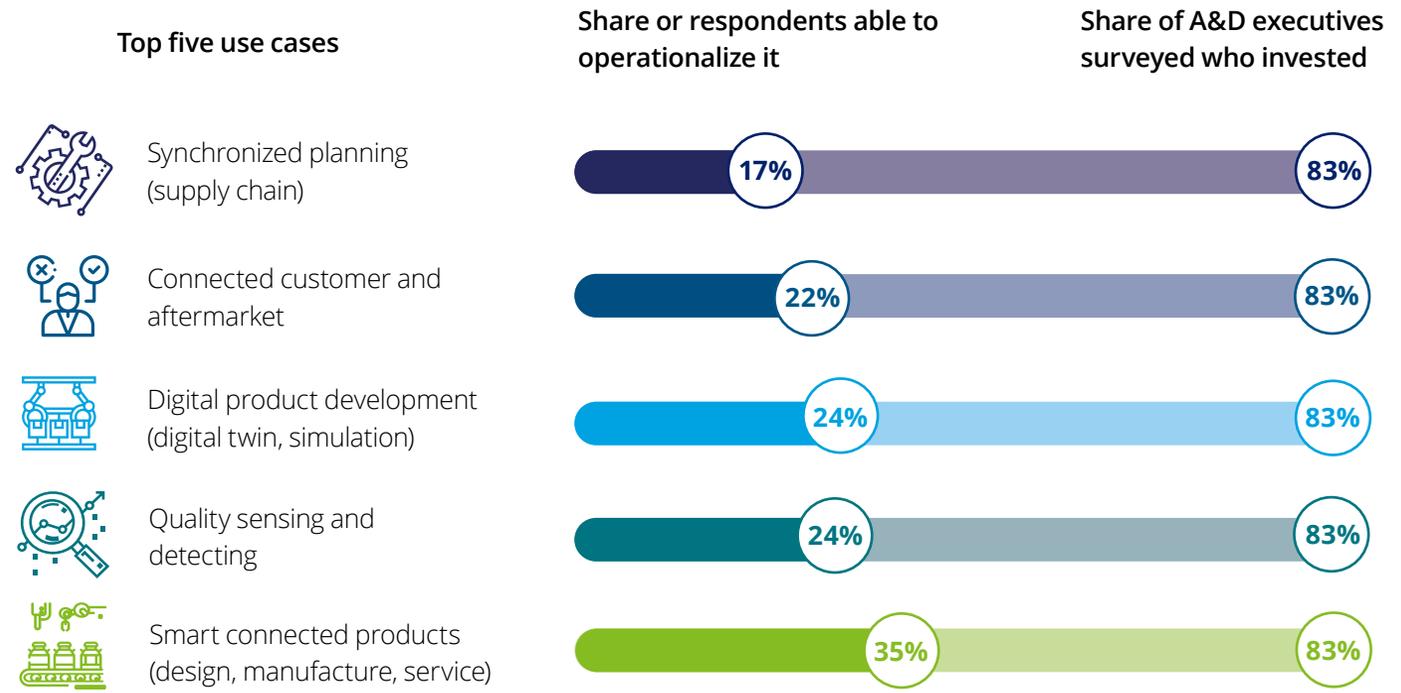


A&D companies are not operationalizing their smart manufacturing investments

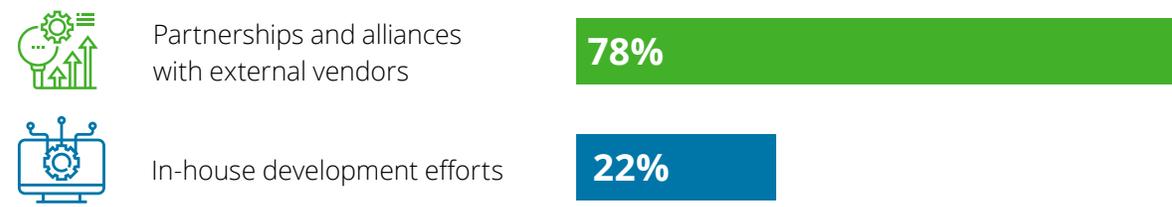
A&D executives surveyed are allocating 32% of their overall factory budgets to digital initiatives, implementing on average more than eight smart use cases. However, only a few participants have these use cases operational at one or more facilities. How are certain A&D companies able to achieve faster progress and better returns on their investments?

In the study, while 78% of A&D executives surveyed indicated value from their external alliance partners, they may not be fully leveraging the power of the network to which they are connecting. This is where an ecosystem approach can dial up the results.

A majority of A&D manufacturers surveyed indicated their firms invested in 8+ smart use cases during the past two years ... but only a fraction were able to operationalize them.



Among those able to operationalize, the majority indicated value from external alliances as the top contributor.



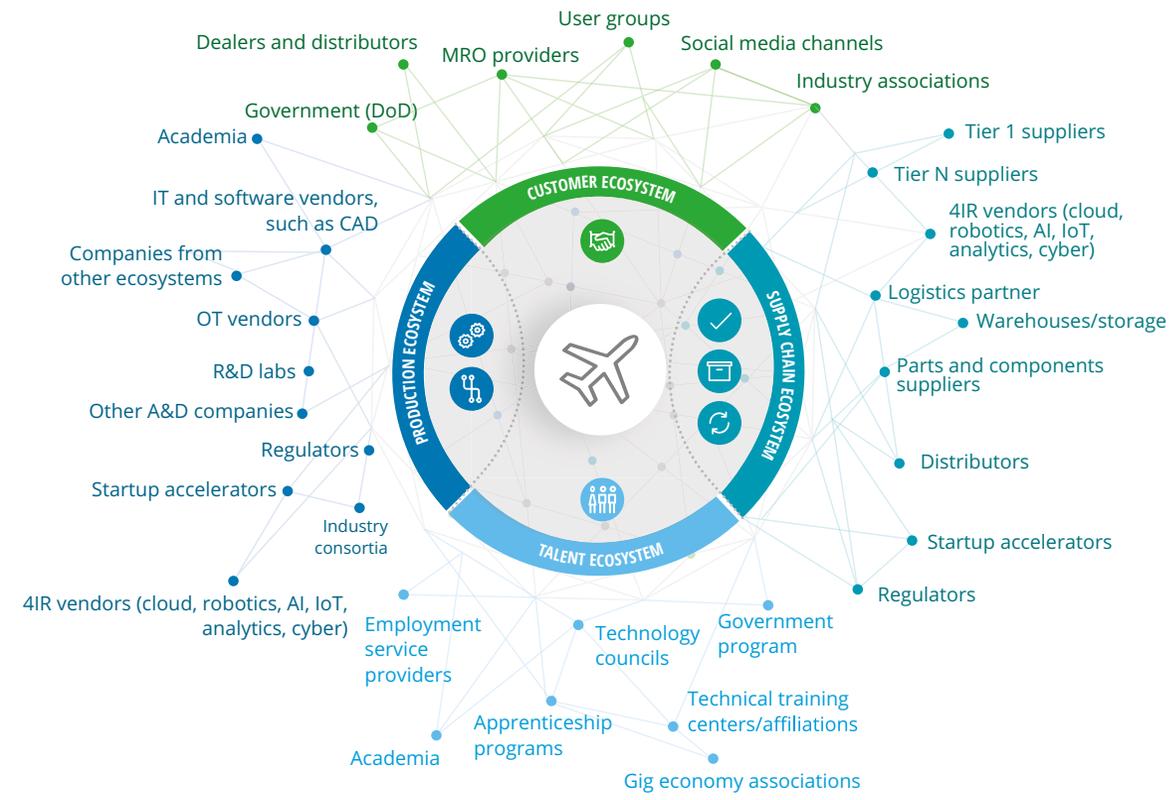
The ecosystem approach: Amplifying collective network strength

A smart manufacturing ecosystem, similar to an innovation ecosystem, is formed when different entities come together in meaningful ways to solve shared challenges and meet shared objectives.

Ecosystems allow for greater capacity and flexibility in adapting to the new world at scale. This not only enhances competitiveness, but also helps to respond to disruptions better.

Four primary types of ecosystems support smart manufacturing initiatives: production, supply chain, customer, and talent.

Foundations to becoming a viable, digital organization



Ecosystem capabilities:*

- Connected customer
- Dynamic fulfillment
- Intelligent supply
- Synchronized planning
- Talent access
- Smart production
- Digital development/innovation

*Ecosystem capabilities are constantly developing and may not be limited to the ones mentioned above.
Source: Deloitte analysis

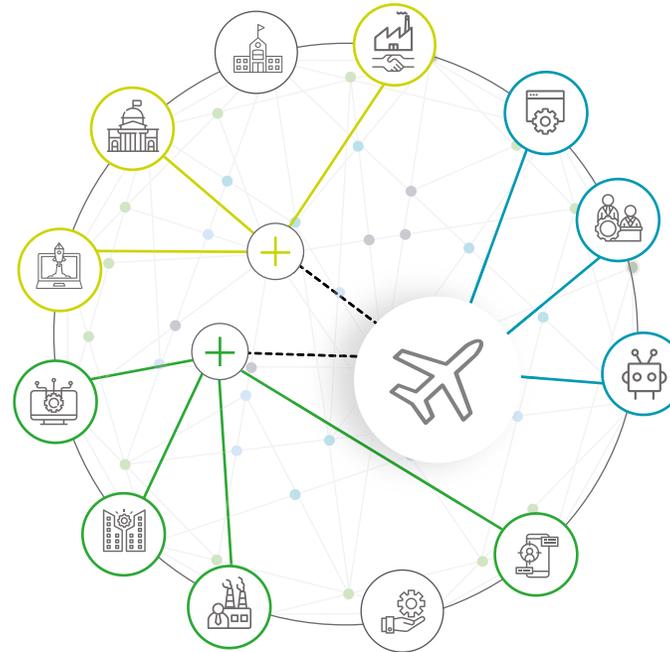
Production ecosystems provide access to unique vendors and capabilities

Ecosystems are generally driven by a convener who has the ability to connect business issues with an enabling platform.

Multiple ecosystems can exist simultaneously, each with its unique vendor connections and capabilities.

A&D companies, instead of reaching out directly to vendors, can approach such conveners and gain access to specific technologies or enable certain use cases more quickly.

An A&D company can gain faster access to new capabilities and partners by leveraging conveners.



Alliance capabilities: Follow the conveners

+ Unlocks **predictive and preventive maintenance use cases** by bringing together edge connectivity, cloud compute, algorithms, and user interface

+ Unlocks **innovation in new product development** with the use of new advanced technologies and new R&D resources

✈ An A&D company with only three existing connections

----- Potential access path to the alliances via the ecosystem convener or sponsor

Academia	Physical automation/robotics vendors	Services firm
Industry consortia	UX/UI design providers	Industry 4.0 technology providers
IT software vendors	Other A&D manufacturers	Startup accelerators
Operation technologies vendors	Companies from other industry groups	Government bodies (DoD, DARPA, etc.)

Ecosystems also help A&D companies connect to more partners

A&D companies surveyed that joined ecosystems were able to create many more relationships, both directly and through their ecosystem conveners, and leverage them to accelerate their smart manufacturing efforts.

These include 4x more connections with Industry 4.0 vendors, operational technology vendors, and automation providers—the three partners A&D companies indicated are providing the most value to their digital initiatives.

One key to success is understanding how to effectively manage these connections to amplify their impact.

A&D companies actively seeking ecosystem participation reported having connections with a higher number of participants when compared with those not thinking about it.



Top partners contributing the most value to surveyed A&D companies' digital initiatives

- #1** IT software vendors
- #2** Operation technologies vendors
- #3** Industry 4.0 technology providers
- #4** Physical automation or robotics vendors
- #5** UX/UI design providers

- Same number of connections
- 2x connections
- 3x connections
- 4x connections



Academia



Physical automation/robotics vendors



Professional services firms



Industry consortia



UX/UI design providers



Industry 4.0 technology providers



IT software vendors



Other A&D manufacturers



Startup accelerators



Operation technologies vendors



Companies from other industry groups



National R&D provider

Pathways to an ecosystem approach

The ecosystem approach can work, but it's not easy. It requires a deliberate method that often involves an executive commitment to solving priority business issues with smart manufacturing and the creation of a road map with important milestones.

Then, to support the road map, A&D companies often reach out to their ecosystem to build an enabling platform with an enterprise architecture. Curating connections strategically, A&D companies then accelerate their initiatives while determining which specific advanced capabilities to cultivate in-house.

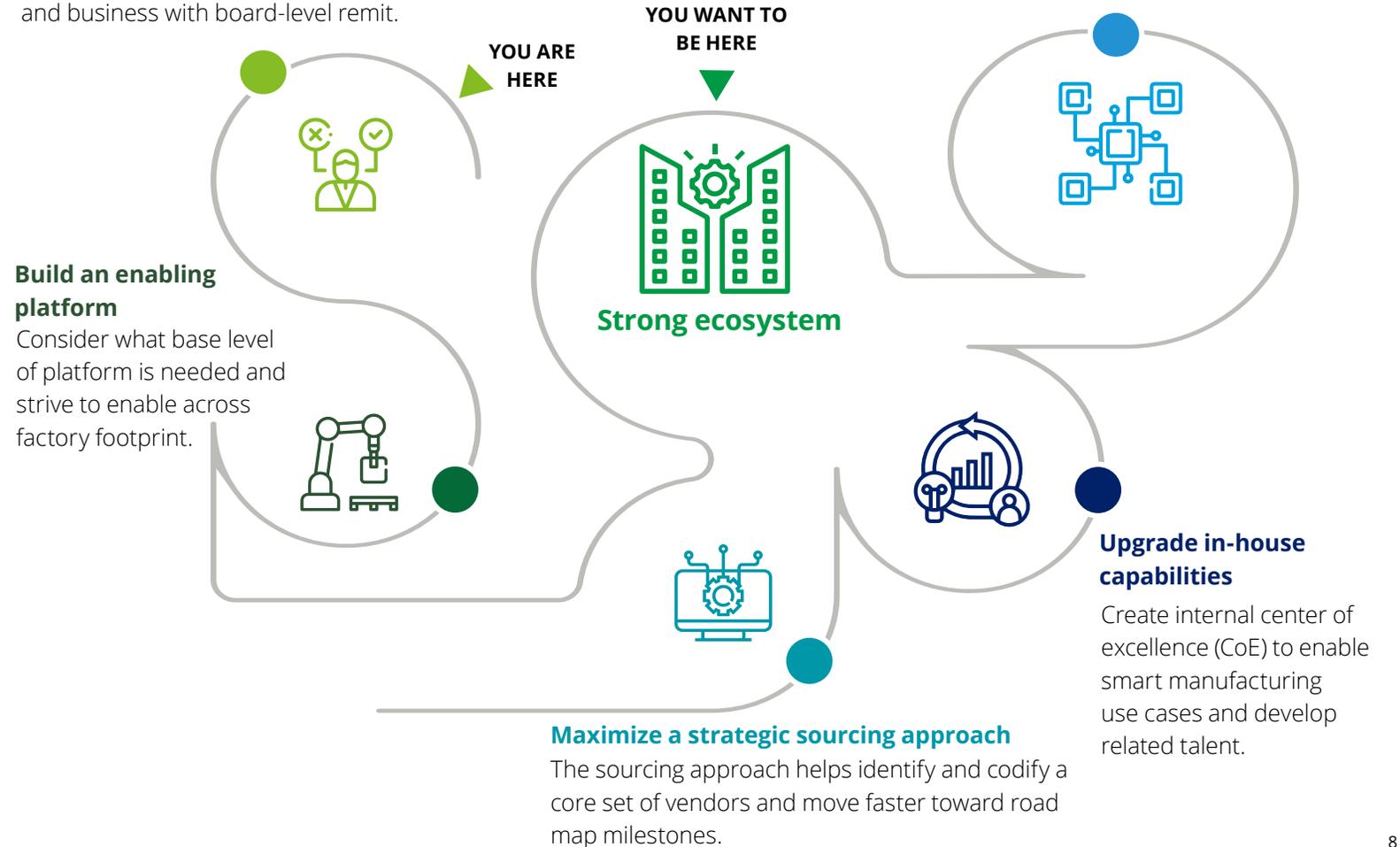
A framework to consider

Create an enterprise road map with milestones

The road map defines the core capabilities for the next five years and provides milestones for advancing maturity. Form executive leadership team that represents operations and business with board-level remit.

Strengthen the enterprise architecture

Consider a framework that combines smart manufacturing use cases, technology, and people together.



Create an enterprise road map with milestones

Key questions that should be kept in mind while developing the road map:

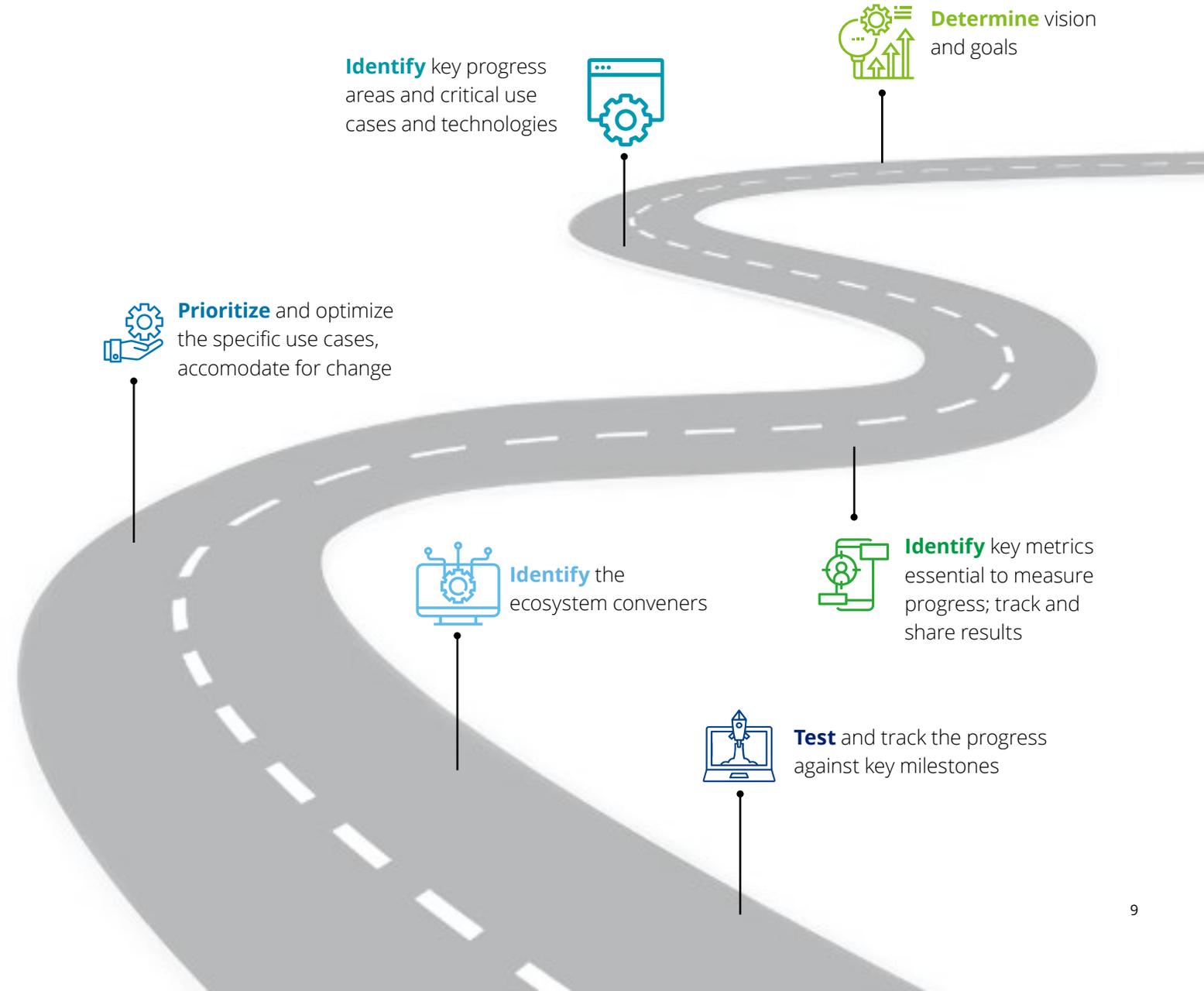
 What is your vision for the next three years for digital?

 What use cases or business challenges are priorities to solve for?

 How can you accommodate for varying levels of maturity across your footprint?

 What do you need to do right now (capabilities) that will lead to bigger things in coming years?

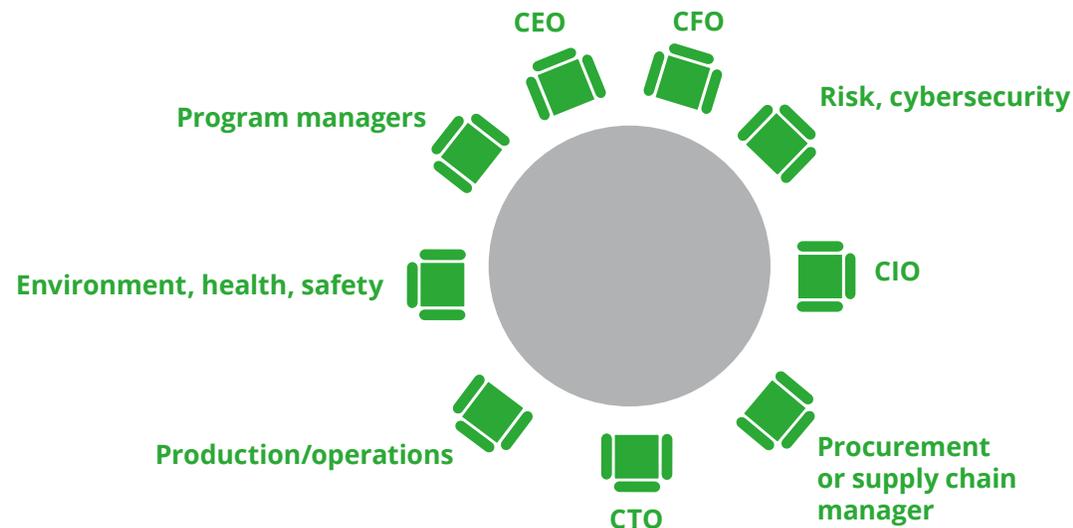
An enterprise road map



A smart manufacturing executive team can drive the strategy road map

- Set up an executive team to drive the ecosystem approach, which should include people from key business areas and operations. It should be business-led and technology-enabled.
- Focus on unlocking the benefits of ecosystem—that is, easier and faster access to capabilities to help mitigate the inevitable disruption.
- Allow for flexibility to help cater to division- or location-specific nuances. For instance, the cloud provider or data platform can be decided at the corporate level, but the committee can allow for flexibility at the facility or division level for different vision system or manufacturing execution system (MES)—depending on the need.

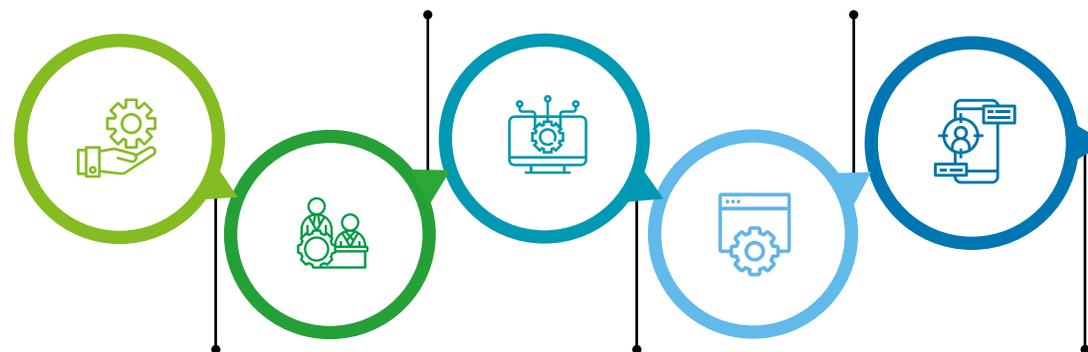
The executive team should represent different business areas...



...and allow multiple avenues to influence the road map

Leverage strategic sourcing organization to facilitate identifying new partners

Establish digital innovation committee or internal sensing function



Listen to the internal team for development, data analytics, and UX/UI design

Connect with existing technology and equipment vendors to identify possible partners within ecosystems

Listen to the primary stakeholder of the use case or initiative to identify potential partners

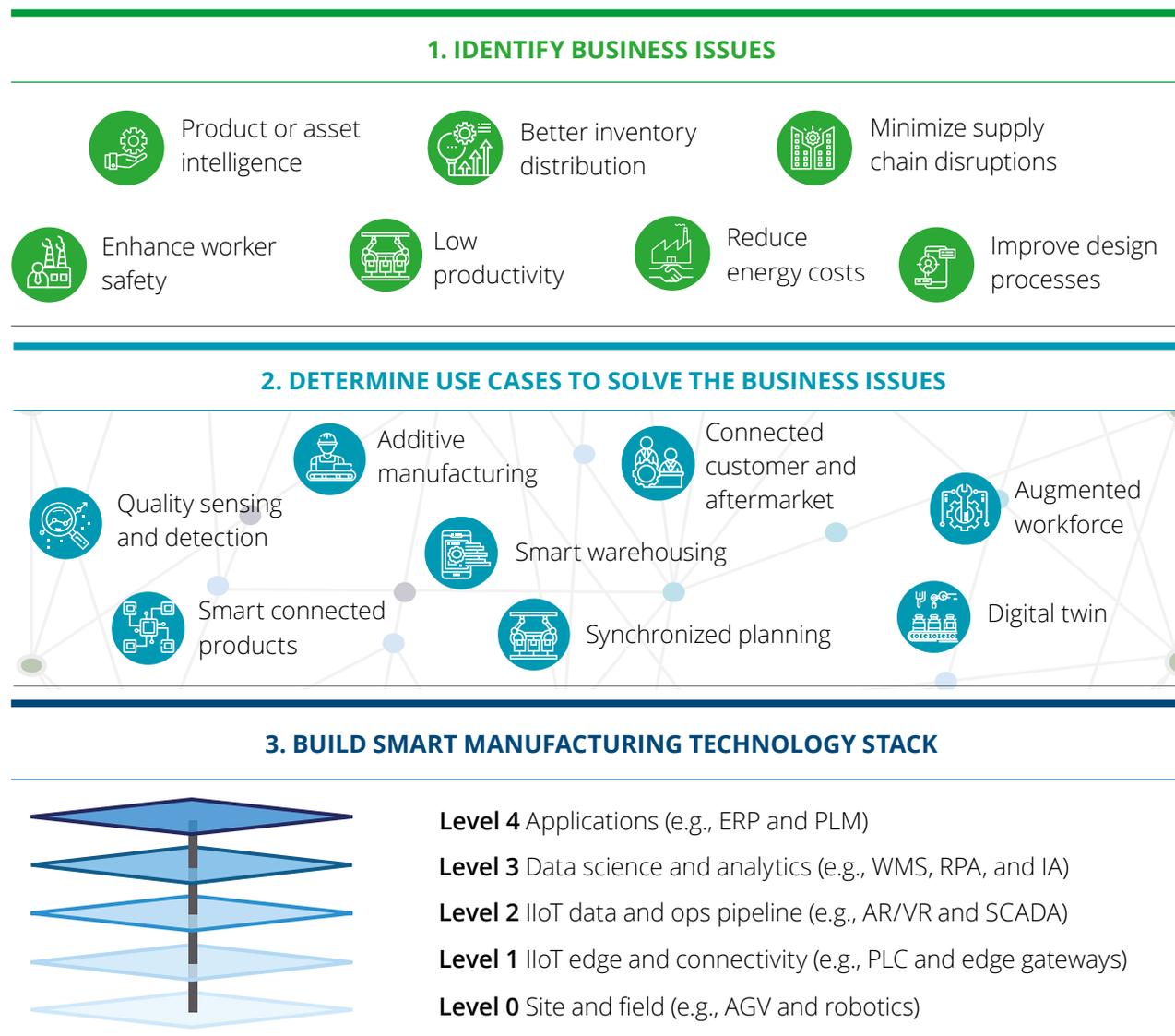
Build the platform and the enterprise architecture to support the road map

Building a digital platform in line with an enterprise architecture for smart manufacturing can be critical to support business priorities.

The strategies should include necessary core capabilities, but also reflect the use cases and the corresponding technologies that drive them.

The method here is driven by a layered approach to use cases wherein the underlying technology platform remains consistent, thereby helping A&D companies expand beyond current or include new use cases in future.

Agile production platform



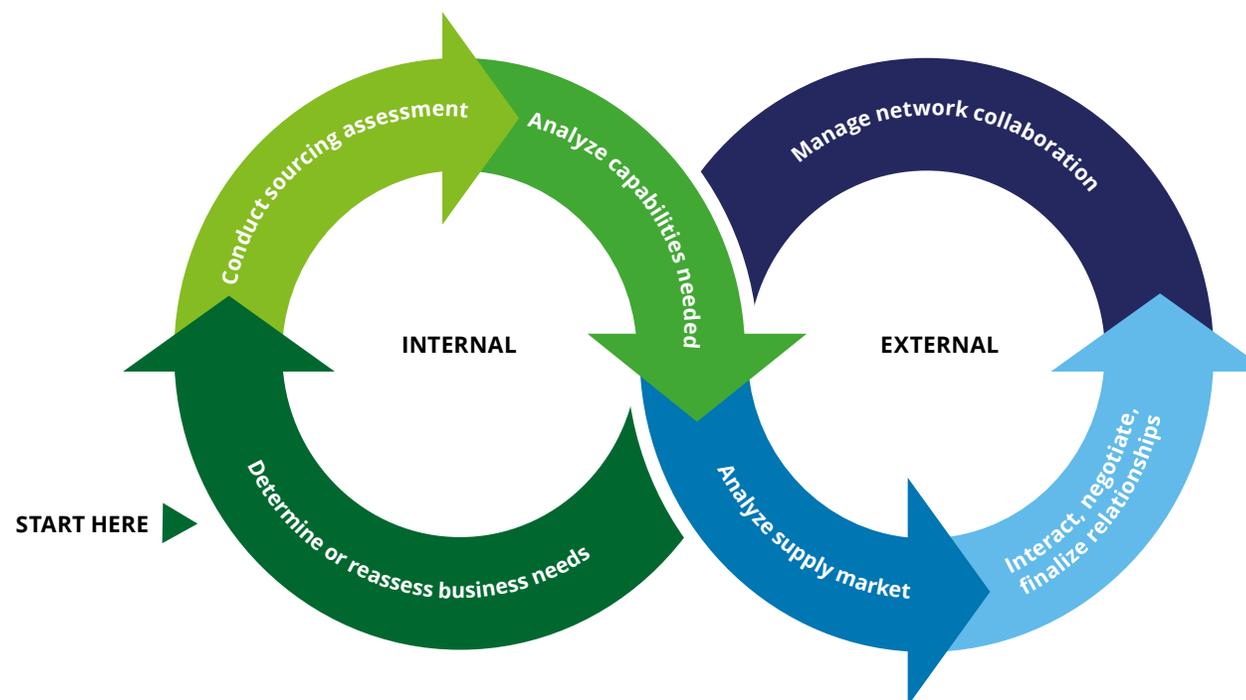


Adopt and maximize a strategic approach for ecosystem participants

A&D companies should consider applying the philosophy of strategic sourcing for their ecosystem approach, but frontload the approach with strong relationship development. Other aspects to consider:

- Collaborate and form relationships with partners that share your values and passion
- Focus on forming bidirectional relationships where you are bringing your challenge or opportunity to them, but they also bring things to you—making sure there's a give-take dynamic
- Agree how value will be measured from these relationships

Ecosystems strategic sourcing methodology



Other sourcing considerations

Surveyed A&D companies' top preferences to measure value from partners

- Productivity- or efficiency-related metrics: **71%**
- Pace of achieving our initiatives/target: **53%**
- Direct revenue-related metrics: **47%**



Surveyed A&D companies' top preferences to identify partners:

- Regional players or entities with networks that enhance the strength of the regional ecosystem: **29%**
- Player or entity with global presence and experience: **42%**
- Any player or entity with the required expertise or value, irrespective of their location: **29%**

Start your journey

Determine what capabilities should be cultivated in-house

While external partners can provide faster access to smart use cases and technologies, upgrading select in-house talent and capabilities can likely help manufacturers to scale those benefits.

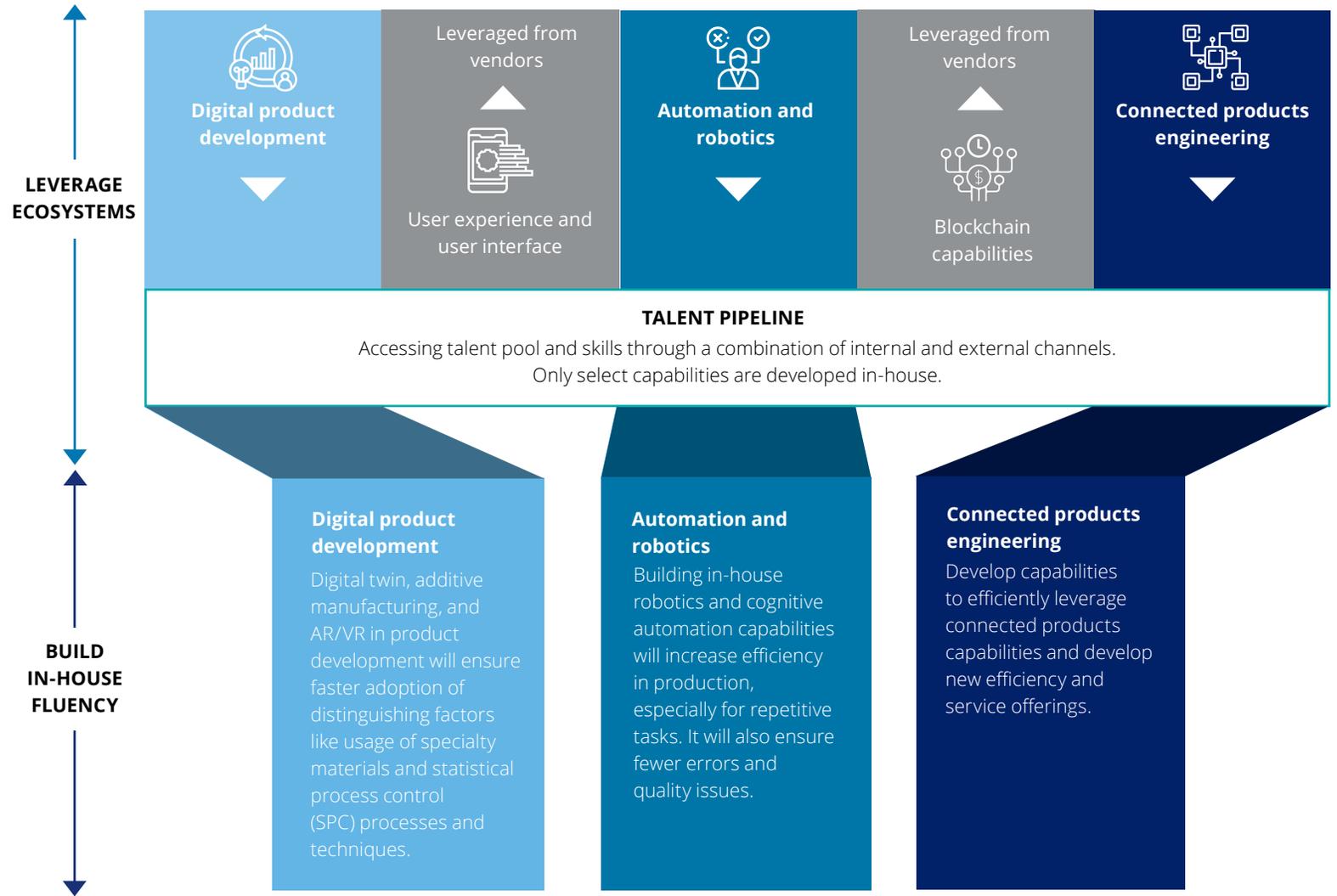
Determine which capabilities differentiate your business and support your long-term vision.

Include a talent pipeline strategy to continually upskill the capability.

Consider whether developing centers of excellence or technology influencers within the firm is appropriate.

Be deliberate about which capabilities make more sense to continue to source through the ecosystem's partnerships.

Leverage ecosystems and build in-house fluency



Start your smart manufacturing ecosystem

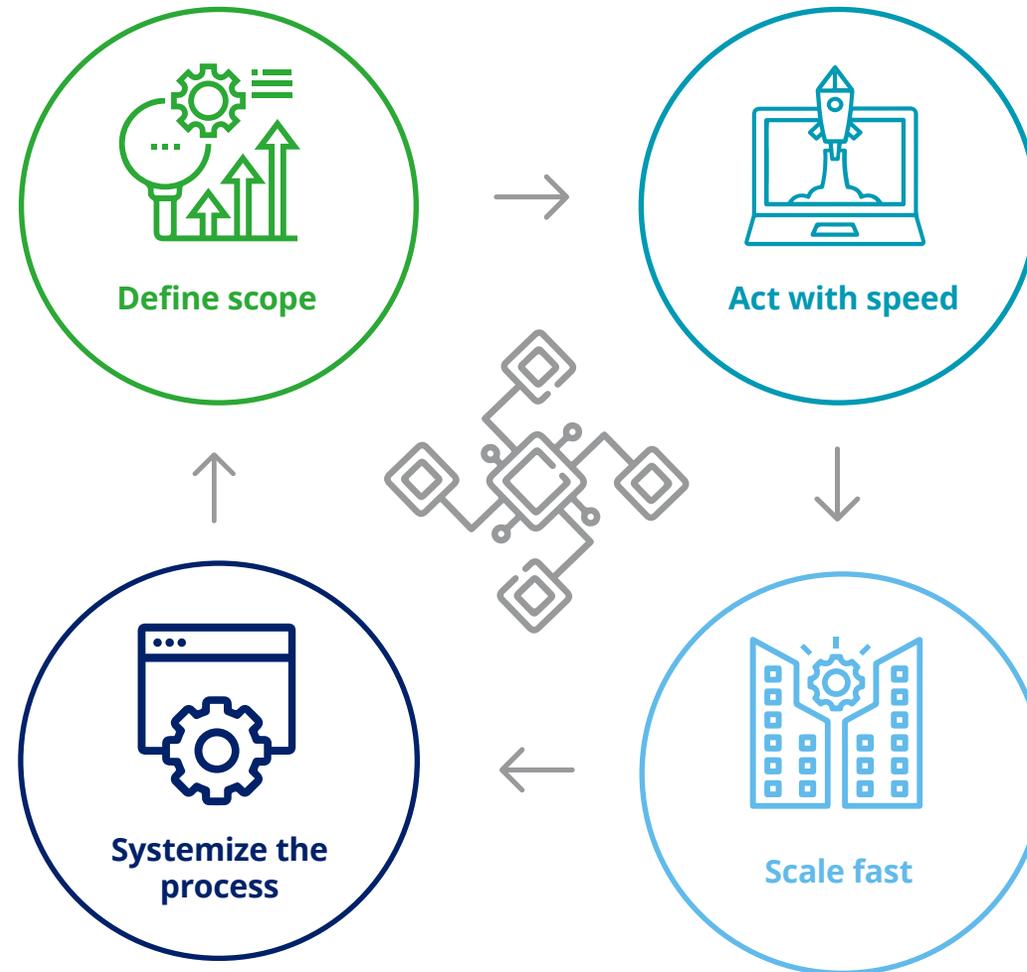
Define scope: Don't build capabilities you don't need to. If you understand the nature of the business issue, the scope of the solution becomes easier to understand.

Act with speed: Speed is one of the key benefits of tapping into an ecosystem.

Scale fast: It's easy to do a proof of concept in an unscalable way. The ecosystem is ready to scale your test case. It brings scalable capabilities that are ready to respond.

Systemize the process: Create repeatable steps so that as you continue to activate new business use cases, you can tap into the ecosystem more readily.

The ecosystem-led digital innovation road map



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About the study

Deloitte and MAPI jointly launched the study in June 2020 to identify the ways in which smart manufacturing ecosystems can potentially accelerate smart factory initiatives. The study included an online survey of more than 1,000 executives at manufacturing companies across three key regions globally: North America, Europe, and Asia. It also included executive interviews with more than 30 leaders from manufacturing companies and ecosystem participants.

See the full report for more insights from the survey and explore other reports on smart factory



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