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Win More Business in Manufacturing With Composable Hyperautomation Capabilities

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Initiatives: Industry Product Planning and Strategy

Hyperautomation enables the creation of workflows across siloed processes and applications. Product leaders should create composable hyperautomation capabilities to help targeted customers close the IT/OT/ET alignment and integration gaps.

Overview

Key Findings

- The triple squeeze of global supply chain constraints, labor market shortfalls and inflation is driving a greater need for composable implementation of modular hyperautomation technologies to deliver cost-optimized and outcome-driven benefits.
- Manufacturing customers see hyperautomation not only as a technology trend helping them transform toward smart manufacturing or Industrie 4.0, but also as a buzzword, as they are overwhelmed by the technical complexity of aligning IT/OT/ET solutions.
- A modular and outcome-driven hyperautomation implementation approach requires a mix of industry, technology and business transformation skills that no single technology or service provider can deliver alone.

Recommendations

Product leaders of IT implementation services and software providers responsible for product planning and strategy should:

- Assess readiness for becoming an HA provider by performing capability analysis of coverage of the top hyperautomation technologies such as IoT, AI/ML or smart robots.

- Position HA as a business-outcome-driven approach by creating a composable portfolio of packaged business capabilities that can be linked to HA technologies — core business applications such as PLM, ERP or MES. Enable scoping based on digital maturity and business requirements of your customers.
- Build joint GTM strategies with partners by creating integrated HA solutions to support Industrie 4.0 or smart manufacturing initiatives consisting of packaged business capabilities for business use cases and accelerators such as readiness workshops and implementation roadmaps.

Analysis

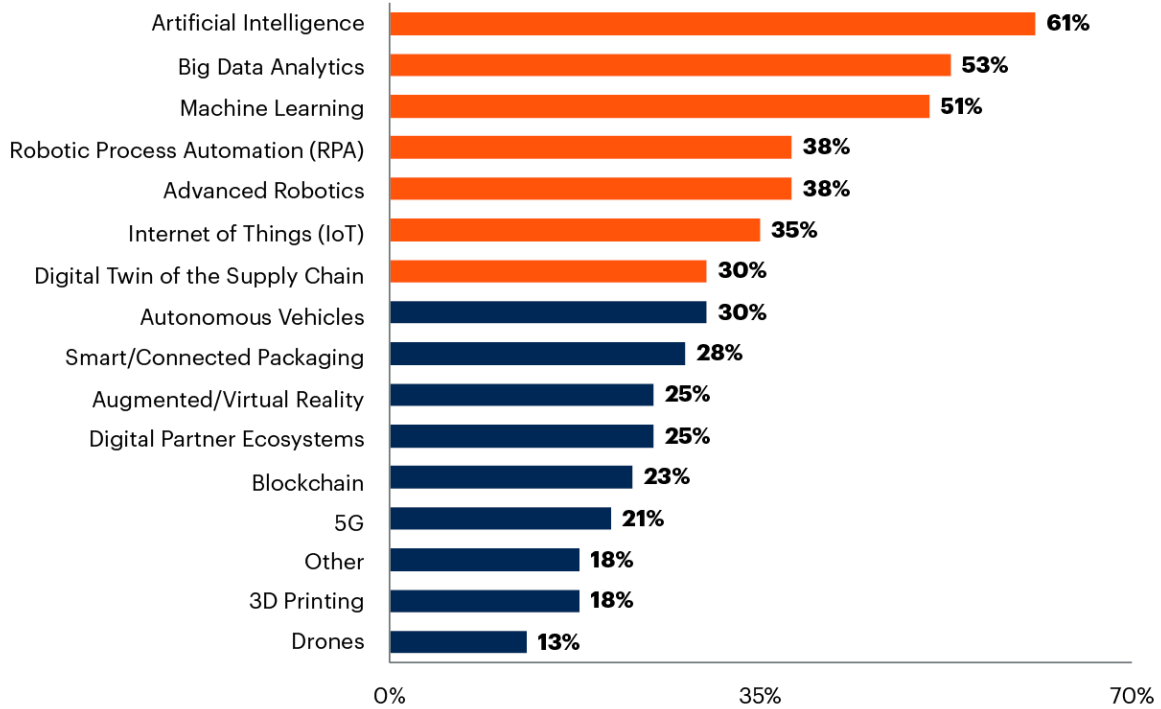
Hyperautomation — What Is It and Why Is It Important?

Hyperautomation (HA) is a combination of advanced technologies that can facilitate or automate tasks that originally required some form of human judgment or action. These tasks relate not only to activities in the execution, working or operational environment, but also to thinking, discovering and decision making.

HA involves a combination of technologies including robotic process automation (RPA), data and analytics (D&A), machine learning (ML), artificial intelligence (AI), advanced robotics and many others via Internet of Things (IoT) and digital twin capabilities. Figure 1 shows essential HA technologies for manufacturing operations and adjacent supply chain processes.

Figure 1: Hyperautomation Technologies in Manufacturing and Supply Chain

Hyperautomation Technologies in Manufacturing and Supply Chain
Percentage of Respondents



n = 1,232

Q. With respect of your company's future supply chain strategy, how do you assume the importance of the following technologies?

Source: 2020 Gartner Future of Supply Chain Survey

Note: Percentage of respondents selecting important and disruptive.

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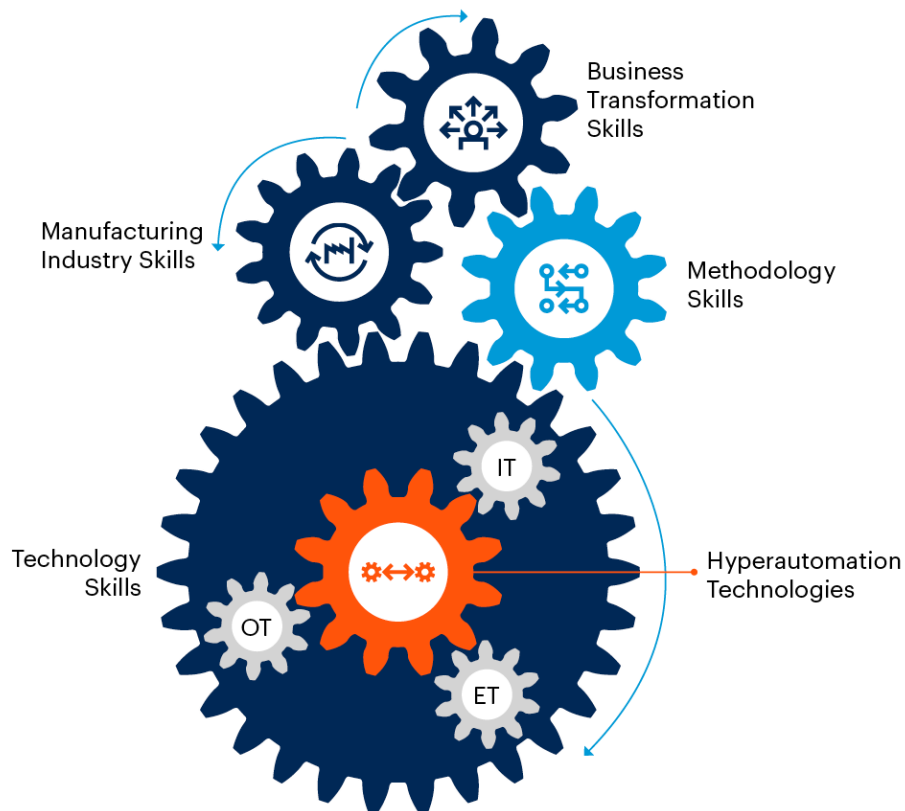
HA automation technologies augment core IT systems (such as MES, ERP, CRM) , operational technology (OT) systems (such as SCADA, robotics software) and engineering technology (ET) systems (such as CAD, CAE, PDM), and help execute processes across siloed organizations, processes, assets and systems (see Innovation Insight: Why Engineering Technology, IT and OT Are More Than the Sum of Their Parts).

Capabilities Needed to Upgrade Manufacturing Portfolios With Hyperautomation

HA helps integrate processes and systems across multiple business functions such as R&D, manufacturing operations and other chain processes. HA technologies are often perceived as the glue between siloed processes and systems, and need to work well together to support, augment or even execute one or a number of integrated use cases. To implement HA technologies processes, a variety of different skills need to be provided by technology and service providers (see Figure 2).

Figure 2: Key Capabilities Needed to Accelerate or Upgrade Portfolios Toward Hyperautomation

Key Capabilities Needed to Accelerate or Upgrade Portfolios Toward Hyperautomation



Source: Gartner
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Product leaders should examine their hyperautomation portfolio capabilities across these four areas and look for partners and suppliers to help customers deliver large-scale Industrie 4.0 or smart manufacturing initiatives:

- **Manufacturing industry skills:** Deep understanding of the manufacturing industry or specific subindustries with regard to business needs, challenges, use cases, value-generating processes such as PLM, SCM, CRM and AM (asset management) and manufacturing (sub)industry-specific regulations.
- **Business transformation skills:** Provision onboarding and training capabilities as well as provision of early “look and feel” experiences with end users, helping them build trust in the value of new technologies.
- **Technology skills:** Proven experience with the potential and the integration of key HA technologies such as IoT platforms or AI/ML and other emerging technologies. Having detailed skills in all HA technologies is unrealistic; therefore, creation of integrated portfolios and GTM strategies with partners is a must-have requirement in order to build trust in the ability to deliver HA solutions end-to-end. Technology skills also include core business applications such as engineering technology (ET) systems (CAD, CAE, PDM), IT systems (MES, ERP, or CRM) and OT systems (SCADA, robotics software) that support key value generating processes. They contain predefined data models for products, business partners, assets and orders, but due to lack of generic data models and integration, these data models are fragmented. Therefore, technology is needed to allow for an efficient integration leveraging HA technologies.
- **Methodology skills:** Reference architectures, standards and implementation guidelines published by IoT consortia and Industry associations make up the “glue” between industry skills, change management and technology skills. In addition, the principles of composable business must be applied to create modular portfolios, allowing for both agile and top-down, step-by-step sales and implementation approaches in aligning with manufacturing clients’ short-term operational challenges and performance metrics as well as their long-term strategies.

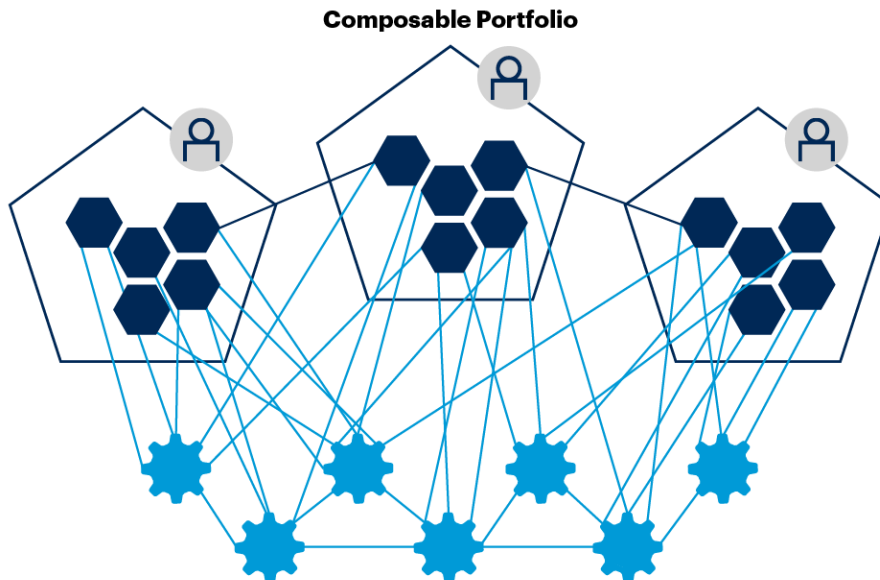
Key Principles of a Composable, Outcome-Driven Hyperautomation Portfolio

Product leaders — especially those who work for large systems integrators that aim to act as implementation providers of one or more HA technologies — are challenged to build composable portfolios that combine packaged business capabilities (PBCs) representing business use cases with core business applications such as IoT, ERP, PLM with HA technologies. Composable portfolios are needed to not only manage complex portfolios but also facilitate integration into partner offerings, as the one and only vendor being able to sell smart manufacturing or Industrie 4.0 solutions end-to-end does not exist (see Product Leader Insight: Why You Need Composable Solutions to Address Manufacturer Needs). Figure 3 shows the complexities.

Figure 3: Relationship Between Composable Portfolio, Application Suites, Use Cases and HA Technologies

Relationship Between Composable Portfolio, Application Suites, Use Cases and HA Technologies

- ◻ Precomposed Application Suite — For example, connected vehicle solutions, smart factory or PLM platforms, each containing multiple PBCs
- Packaged Business Capabilities (PBCs) — Use cases that can be integrated within and even across application suites leveraging open connectivity standards
- ⚙ Composable Technologies and/or Applications — The same technology could support multiple PBCs, while one PBC requires multiple different technologies
- 👤 Business Users



Source: Gartner
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HA technologies represent business applications or services that act as authoring systems to execute analyses or even processes, but many of them also represent the “glue” between siloed IT, OT and ET applications.

HA technologies also help generate new insights into often siloed data, so that new use cases or even operational or business models can be derived. This circumstance makes it difficult to map HA technologies to PBCs. Multiple technologies are needed to execute one single use case (such as predictive maintenance), while one HA technology (such as an industrial IoT [IIoT] platform) can and should support multiple use cases.

While IoT reference architectures such as RAMI 4.0 help perform these n:m mappings, product leaders should enhance these models and frameworks with their own reference content in order to make them operational.

U.S.-based simulation vendor Voovio offers an HA-enabled case study. Voovio delivered a simulated training experience to an oil and gas end-user organization in hyperautomating training through digital twin technologies (see Note 1).

Hyperautomation Vendor Landscape

Hyperautomation vendors combine multiple HA technologies on their products. They also provide integrated solutions or platforms in the form of aggregated data insights or even PBCs that represent manufacturing use cases to operate assets or autonomous vehicles remotely, such as:

- Predictive maintenance
- Industrial automation
- In-process quality control
- Fleet management solutions

Hyperautomation providers often drive ecosystems or offer industrial cloud platforms. Therefore, product leaders should consider them as partners if they aim to increase awareness and scalability of their products and services. These large vendors drive standards and have a large customer base in the manufacturing sector and adjacent industries like retail, logistics and transportation, or utilities. Many of these large HA vendors offer software one or more segments in the areas of:

- D&A – e.g., AI/ML, IIoT platforms or services

- IT core business applications – e.g., ERP, CRM or MES
- OT – e.g., SCADA, robotics software
- ET – e.g., PLM, CAD or CAE

But none of the major HA providers offering multiple segments has full coverage (see Table 1).

Table 1: Hyperautomation Vendors and Capabilities (Examples)

(Enlarged table in Appendix)

Sample Vendors	IT Core Manufacturing Applications (One or Multiple of ERP, MES, CRM, SCM, EAM, APM, MDM)	OT Solutions (One or Multiple of SCADA, Edge AI, Industrial Automation, Robotics)	ET Applications (One or Multiple of CAD, CAE, PLM, ALM)	D&A Platform	IoT Platform	IoT and OT Integration and Enablement
ABB		x				x
Amazon	x	x		x	x	x
Aras			x			
Autodesk			x			
Dassault Systèmes	x		x			
GE	x	x		x		x
Google				x		x
Hitachi				x	x	x
Honeywell		x				
Infor	x			x		x
Microsoft	x			x	x	x
Oracle	x			x	x	x
PTC			x	x	x	x
IBM	x		x	x		
Rockwell Automation	x	x				x
Salesforce	x			x		x
SAP	x		x	x		x
Schneider	x	x				
Siemens	x	x	x	x	x	x

Source: Gartner (December 2022)

Market leading product vendors in process automation are establishing technology partnerships with other leading product vendors like ServiceNow, Salesforce, Alteryx, SAP, Tableau and industry cloud platforms (ICPs) like AWS, and Azure to provide a ready and tailored solution for every platform (system and solution combinations).

An example is UiPath, whose RPA capabilities are measured by the magnitude of automations in the end-to-end IT operations landscape. Partnering with the leading software providers enables co-development of robust integrations of data and processes.

IoT platform providers like Software AG, Microsoft Azure IoT, PTC ThingWorx and Hitachi Lumada are end-to-end industrial IoT platform providers that support and enable industrial hyperautomation capabilities like:

- Asset reliability
- IT/OT integration of industrial machinery and assets
- Condition-based monitoring of energy usage of the assets

Systems integrators (SIs) increasingly move beyond IT/ET SIs toward OT, and even start to develop their own D&A applications or IT/ET/OT system suites or solution frameworks. They build their value proposition on end-to-end solution delivery, leveraging best-of-breed from different technology partners.

SIs also want to act as trusted advisor and general contractor across multiple phases of the digital journey toward I4.0, smart manufacturing (or smart factory) or product servitization initiatives including positioning with their strong change and transition management capabilities. Examples are Accenture, Wipro, Tata, Tech Mahindra, IBM, Fujitsu, Cognizant, Capgemini, TCS, Atos, DXC, Deloitte, PwC, EY and T-Systems.

Conclusion

Hyperautomation and composability are closely related, as product leaders need to bundle multiple technologies into packaged business capabilities that address not only long-term strategic objectives but also short-term business needs and challenges of their manufacturing clients. Even large vendors that cover a variety of different technologies need to build joint offerings and GTM strategies with partners to deliver Industrie 4.0, smart manufacturing or product servitization initiatives end-to-end.

Evidence

2020 Gartner Future of Supply Chain Survey. The survey was conducted online from September through October 2020, and circulated to Gartner Supply Chain Research community members, Gartner clients and a wider group of practitioners in supply chain and other functions globally. There were 1,346 completed responses from participants across industries: high tech (20%), healthcare and pharma (14%), CPG (11%), industrial (10%), food and beverage (9%) and retail (9%). Respondents mostly worked in supply-chain-related functions: supply chain (49%), logistics or transportation and distribution (9%), purchasing or procurement (9%), and operations (7%). Of the respondents, 57% were from North and South America, 29% were from EMEA, 13% were from Asia and Australia, and 1% were from the rest of the world. Additionally, 63% of the participants were from \$10-billion-plus revenue companies, and 62% of the participants were at VP or director levels, or above.

Note 1

Voovio delivers digital twins of the person (DToP) by mirroring a near-real-time synchronized multipresence of the individual in both digital and physical spaces. This digital instantiation (or multiple instantiations) of a physical individual continuously intertwines, updates, influences and represents the person in multiple use cases, scenarios, experiences, personas and software tools.

Voovio's DToPs covers a broad spectrum of goals and drivers, including solutions developed for simulated training of industrial equipment. These digital twins can tie into anticipated behaviors, for example, for hyperautomation projects, based on past behaviors of other people working with physical machines.

Voovio delivered a simulated training experience to an oil and gas customer in hyperautomating training through digital twin technologies. Voovio's VR solution captured procedural steps and unlocked knowledge of machine maintenance to a comprehensive training simulation through virtual collaboration.

The results were:

- Exceeded regulatory compliance requirements on regulation and certification using procedure simulators
- Approximately \$1 million in efficiency and operations cost savings, evaluating for other plants

- Employees trained and engaged on solutions
-

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ABB		x				x
Amazon	x	x		x	x	x
Aras			x			
Autodesk			x			
Dassault Systèmes	x		x			
GE	x	x		x		x
Google				x		x
Hitachi				x	x	x
Honeywell		x				
Infor	x			x		x
Microsoft	x			x	x	x
Oracle	x			x	x	x

PTC				X		X		X		X
IBM	X			X		X				
Rockwell Automation	X		X							X
Salesforce	X					X				X
SAP	X			X		X				X
Schneider	X		X							
Siemens	X		X	X		X		X		X

Source: Gartner (December 2022)

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