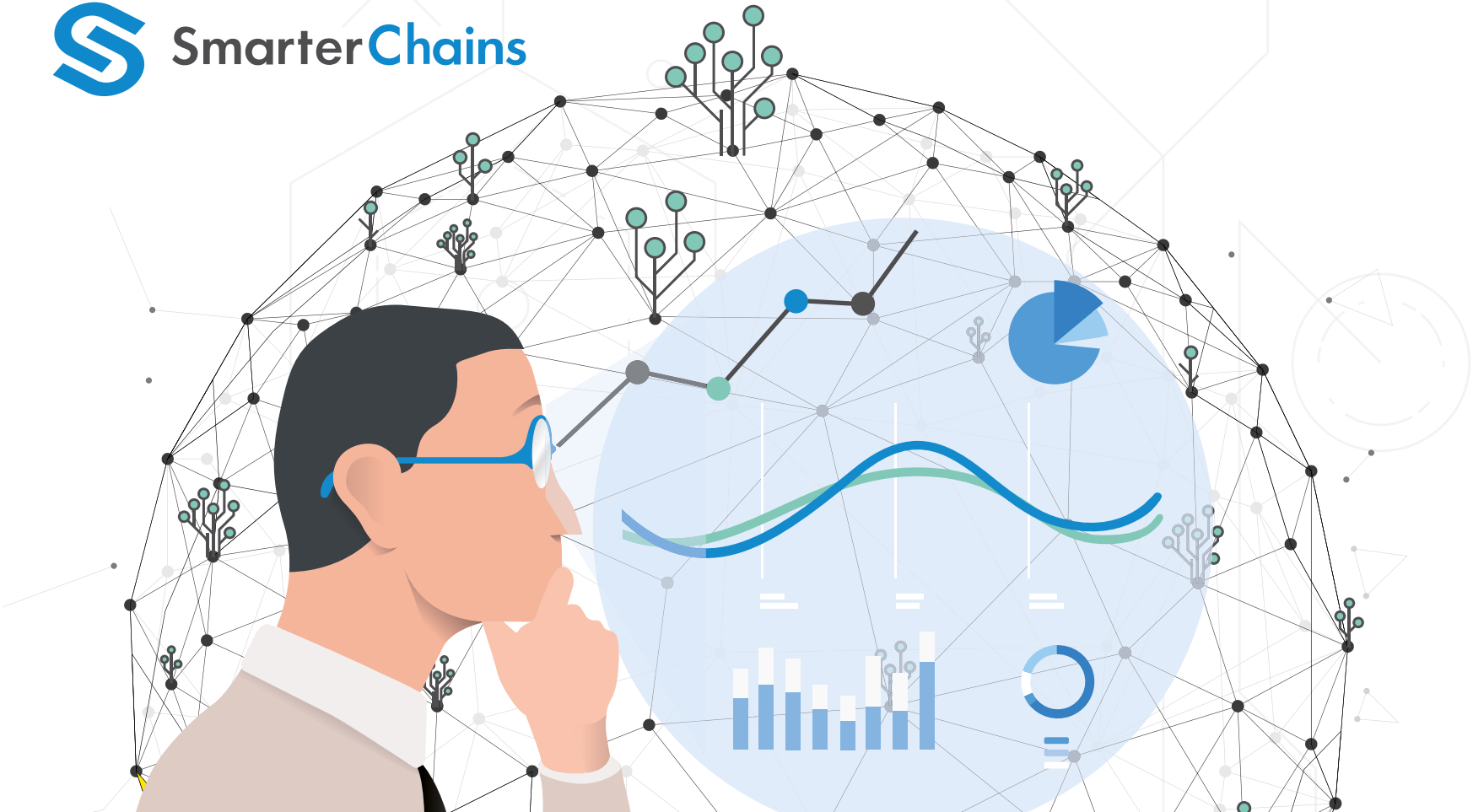
Consumer Packaged Goods industry:

Factory of the Future Benchmarking Study

The time for Industry 4.0 is now!

SmarterChains



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Preface

Around the world, the coronavirus (Covid-19) outbreak has exposed the limited resilience of many manufacturers – in particular, their fragile supply chains, overdependence on human assets, and often insufficient agility. Indeed, with a global recession looming, further volatility expected, and investors growing more cautious, the need for manufacturing industries to step up performance – for them and for society – has never been greater.

This study of the Industry 4.0 capabilities in Consumer Packaged Goods industry, conducted by SmarterChains and sponsored by EY, shows that only 10% of manufacturing plants are, after many years of investments, leveraging the benefits of Factory of the Future. The majority of plants remain in technology pilot phases and pursue investments that cannot be scaled or leveraged successfully.

Clearly, the time to move, to get ahead of the curve, is now by preparing and defining your future capabilities for what is next and beyond. At SmarterChains, our three-stage approach – Prepare, Define, Execute – helps manufacturers embrace the possibilities of Industry 4.0.

What to do now?

- Benchmark your current Factory of the Future capabilities by performing remote diagnostics across your plants with our Assessment.

What to do next?

- Create an enterprise-wide strategy and roadmap of technologies that fit the realities of your operations.
- Promote a culture of continuous learning and problem-solving, with experimentation integrated and rewarded in the work plans across the enterprise.
- Accelerate operational excellence to standardize processes and operating procedures, and to increase problem-solving capabilities on the shopfloor.
- Drive enterprise-wide learnings by democratizing knowledge and monitoring progress on the 10 Factory of the Future dimensions across the entire estate.
- Implement and track the journey toward value creation.

What to do beyond?

- Operate a new normal in a different business environment and futureproof for the next disruptive event.
- Optimize infrastructure and organization, including sourcing strategy, product complexity and manufacturing and distribution footprint.
- Transform the supply chain operating model to an agile, networked ecosystem in which all parties work collectively.
- Create end-to-end supply chain visibility through the development of digital twins to help react at pace to disruption.

But above all, to gain advantage over competitors, it is imperative to start the journey right now...

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Executive summary

To drive operational efficiency, enhance their value proposition, and market relevance, companies from across the global Consumer Packaged Goods (CPG) industry urgently need a better understanding of technological capabilities. Industry 4.0, above all, is opening up new and exciting pathways for companies to level up their capabilities and performance – but it is also accelerating the demise of companies that cannot successfully leverage these possibilities and adapt fast enough to the changing landscapes around them.

To address these issues and help companies in the CPG industry embrace the opportunities of Industry 4.0, SmarterChains has developed a platform to enable strategy definition and drive decision-making. In this way, SmarterChains helps manufacturers in CPG and beyond to leverage Industry 4.0 technologies to cope with the challenges of changing landscapes and deliver improved margins.

Leveraging its platformized methodology, SmarterChains presents a first-of-its-kind study: CPG Factory of the Future Benchmarking Study. This study is based on an in-depth analysis of more than 336,000 data points gathered from 327 production lines in 50 participating plants worldwide, employing more than 24,000 people in 9 industry sectors, and involving 500 participating manufacturing professionals. Specifically, by reading this study and leveraging SmarterChains' common language and Factory of the Future benchmarking system, manufacturing leaders within the CPG industry will be able to obtain insights into:

- How the leading industry companies are strategizing and operating differently to the majority of late adopters of digital technology.
- The state of play in adopting Industry 4.0 technologies, driving accountability, and helping to steer decision-making.
- New, measurable digital and automation technologies and organizational practices that are available and deliver significant value.
- Where, how, and what to focus on to maintain competitiveness and drive organizational robustness.
- How to foster a learning environment that enables organization-wide knowledge sharing and the adoption of ideas and innovations relating to Industry 4.0.

As is further detailed in the key CPG insights and recommendations (pages 19 to 20), it is clear that – given Industry 4.0 is here to stay – companies must apply sustained action in adapting to new technological realities. Indeed, 90% of participating sample plants are yet to successfully leverage digital at scale.

In the pages ahead, you will find many detailed insights that will help to equip manufacturing leaders with the knowledge they need to make the most of Industry 4.0.

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Introduction

In the 18th century, maritime navigation was very different to what it is today. Much of seafaring life depended on guesstimates; determining position, distance, and direction depended on one sailor's knowledge of winds and currents. A particularly choppy sea or heavy storm could endanger crews, cause navigational chaos, and spoil even the best-laid plans.

That all changed when clockmaker John Harrison set about establishing longitude to within half a degree. In particular, Harrison produced an astonishing set of discoveries that led to the invention of the marine chronometer – and with it, a revolution in navigation. Charts were plotted accurately, sailors sailed safely, and international trade flourished.

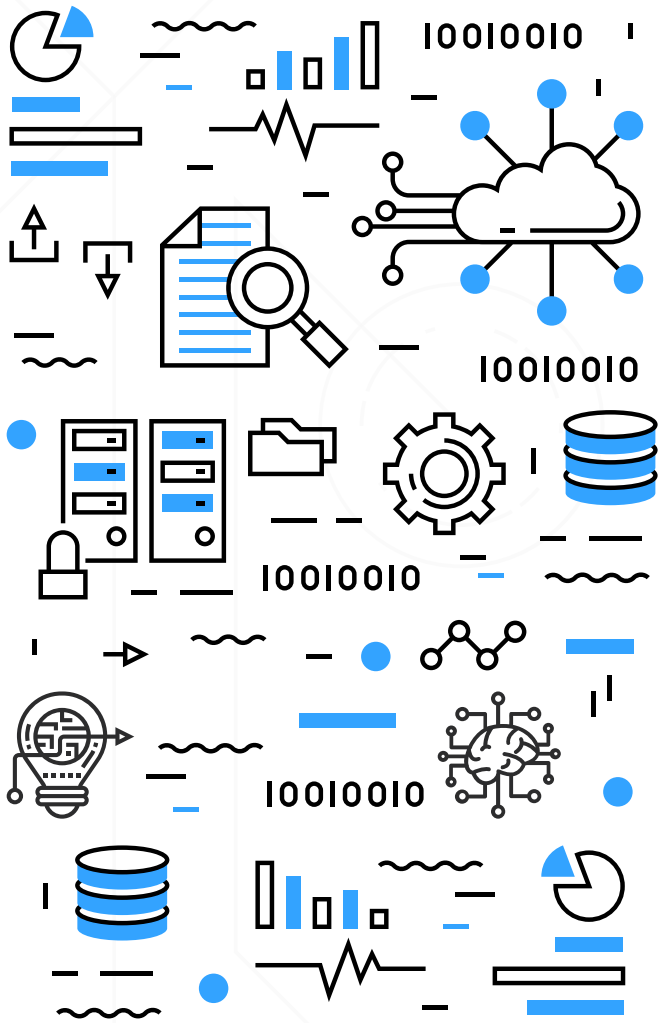
Nowadays, in 2020, we face a new set of navigational challenges and business continuity risks. With digital technology disrupting how we live and work, how can businesses effectively steer through transitions? More specifically, how can manufacturing companies set sail toward Industry 4.0 with confidence? And how can they accurately chart their progress along the way?

To address these issues, offer solutions, and provide better insights into areas manufacturers must focus on to drive momentum toward successful digital technology usage, **SmarterChains has developed a standardized Industry 4.0 transformation platform**. Using this as a starting point, companies have the tools to build systematic progress in driving digital capabilities.

This is an important development for manufacturing industries. With this benchmarking system, and our subsequent comprehensive analysis of the state-of-play in leveraging Industry 4.0 within the Consumer Packaged Goods (CPG) industry, we can clearly see the range of levels of maturity in adopting Industry 4.0 technologies.

Building on the insights derived from our proprietary methodology, we outline a series of recommendations for leaders within CPG manufacturers (page 20). These are designed to help tackle the widespread lack of organizational urgency to adopt Industry 4.0 and focus attention and investments in the areas of greatest need.

All in all, the CPG industry stands at the beginning of a new age in manufacturing. With the right guidance and support, actors within this industry can leverage the power of data and technology to deliver a better, more agile, and integrated manufacturing ecosystem that ultimately unlocks value for a wide range of stakeholders across society.



A unique study: Methodology and analysis

To deliver ahead-of-the-curve insights of true value, this study applied a first-of-its-kind Industry 4.0 benchmarking system on a large scale across the CPG industry. This unique combination of pioneering methodology and in-depth analysis ensures the study's reliability and relevance to manufacturing leaders around the world.

A common language for Industry 4.0

Leveraging decades of experience in analyzing and optimizing operational excellence programs across global industries, and deep engineering knowledge of digital technologies and their functional applications, SmarterChains developed a proprietary, industry-wide measurement system to track progress in Industry 4.0 development.

Applied extensively across Fortune 500 companies, the benchmarking system covers the ten key dimensions of the Factory of the Future. These dimensions follow the application of digital and automation technologies to the conventional pillars of operational excellence programs. By tracking progress across these dimensions, and understanding the digital capabilities at both plant and enterprise level, leaders can identify key areas for improvement and strategize at scale.

A close look at CPG

From June 2019 to February 2020, SmarterChains undertook the most comprehensive data-driven analysis of Industry 4.0 capabilities in the CPG industry to date. This analysis covered digital, automation, organization, and leadership capabilities. Specifically, more than 336,000 data points covered 400 evolving technologies down to production line level, and across teams of all factory operations. All study participants were significant players within the CPG industry.

In particular, the study involved the following:

50
Plants

327
Production lines

336k
Data points

24,365
Employees

500
Manufacturing experts

Production Manager	17%	Engineering Manager	10%
Head of IT	15%	Head of EHS	10%
Head of Quality	12%	Warehouse Leader	8%
Maintenance Manager	12%	Digital Officer	6%
Plant Manager	10%		

9
CPG industries

- Food
- Beverage
- Fragrance
- Cosmetics
- Dairy
- Tobacco
- Confectionery
- Snacks
- Personal care

How did this Assessment work exactly?

By implementing the scalable SmarterChains virtual platform, on average ten participants from each plant – comprised from the plant's leadership team – remotely answered a series of questions covering technology and organization in just 3 hours.

100% data quality

What's more, step-by-step guided support from Industry 4.0 experts throughout the short three-hour Assessment ensured the total quality of information input, without compromising confidentiality. This distinguishes our guided Assessment from many Industry 4.0 self-assessment surveys, as per common industry reporting practice. After collection, all participant data was carefully verified and cross-referenced with the input of other participants, thereby guaranteeing process quality and the homogeneity of data, from which the benchmarking and insights would be derived.

With the data collection executed and process quality guaranteed, SmarterChains ranked each of the plant's capabilities against the 10 Factory of the Future dimensions, before analyzing the results to unveil strength and opportunity areas, indexing the data, and finally uncovering key focus areas. This journey is outlined on the right:

Data collection

Data points aquired through SmarterChains Assessment

1

Data quality control

SmarterChains ranks plant's capabilities across 10 Factory of the Future Dimensions

2

Benchmarking

For each Factory of the Future dimension, we provide data-driven insights that unveil strength and opportunity areas

3

Indexing

Factory of the Future Index is derived from the 10 Factory of the Future Dimensions

4

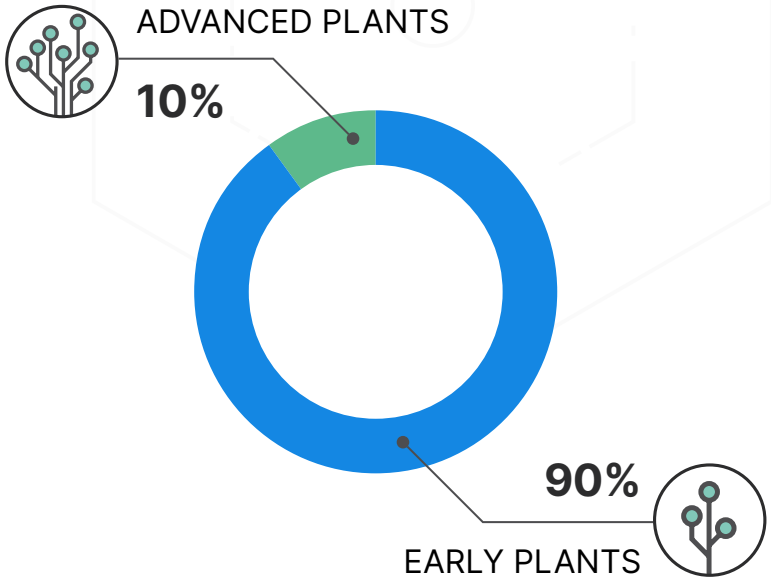
Insights

Analysis is concluded with the Key Focus Areas that reflect the dimensions in which we uncovered the most impactful opportunities

5

CPG industry: Benchmarking Dimensions

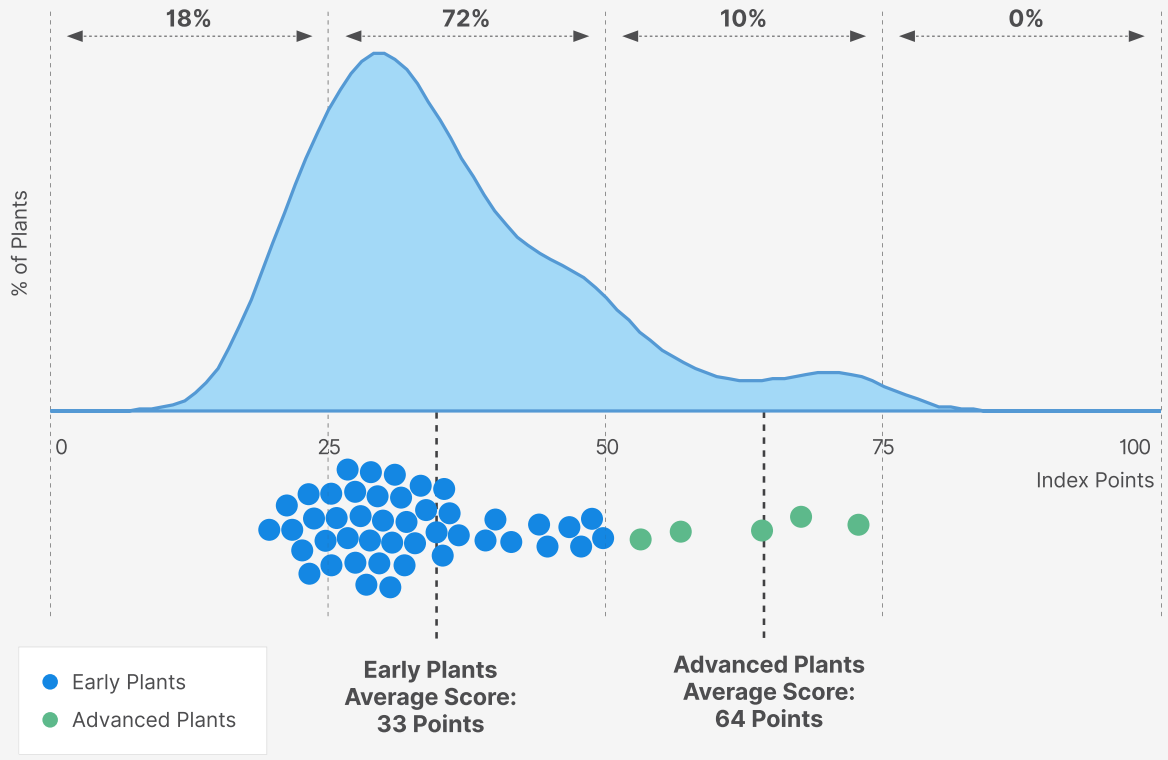
Among many other key findings, our study showed that 90% of plants are still in the process of understanding how to leverage new Industry 4.0 technologies. Only 10% of the participating sample plants are leveraging capabilities across their operations at scale. For this study, the former group is referred to as “early plants”, while the latter group is called “advanced plants”.



The pages ahead break down the performance across the 10 Factory of the Future dimensions, as defined by the proprietary platformized methodology.

Distribution of plants according to their Factory of the Future Index

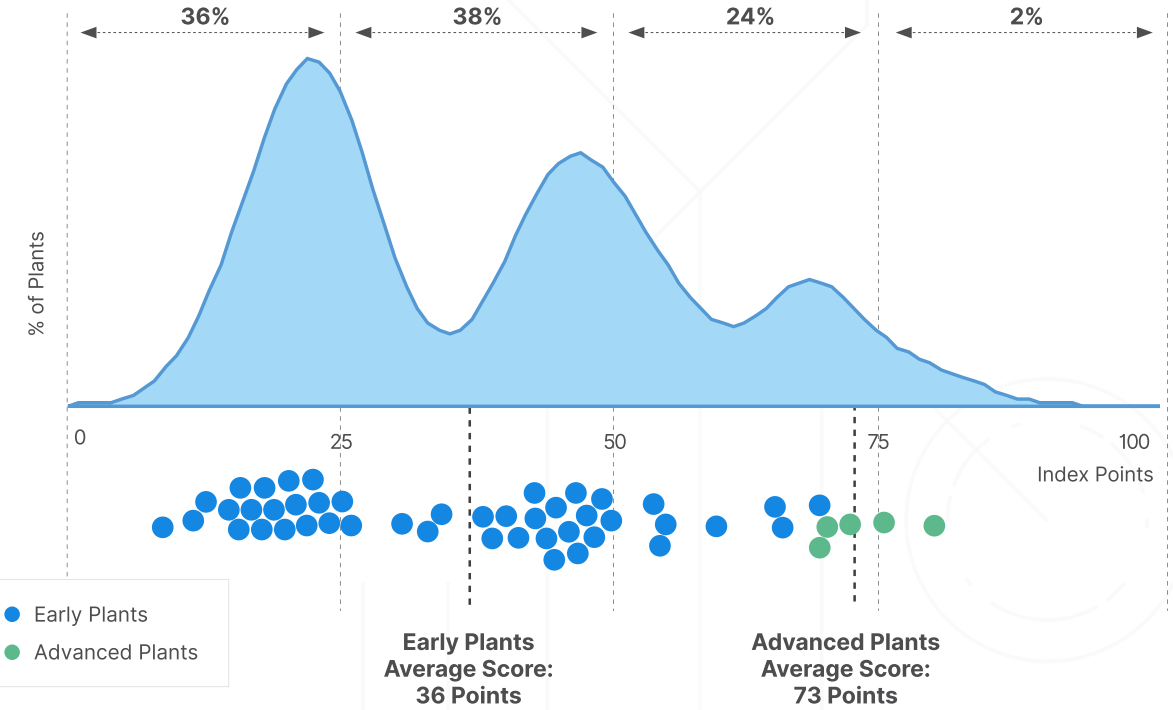
As you can see in the distribution below, which shows the average plant maturity score across the 10 Factory of the Future Dimensions detailed later, “advanced plants” (in green) outperform “early plants” (in blue) by a noticeable margin.



The 10 Factory of the Future Dimensions

1. Factory of the Future Leadership

Having structures and policies that inspire, support, and accelerate the digital transformation across the plant are crucial preconditions for success. The majority of our participating plants showed a lack of maturity in this dimension, even though advanced plants are doing well.



KEY TAKEAWAY

While all advanced plants are part of companies that have an **enterprise-wide Industry 4.0 strategy**, only one-third of early plants have this in place.

100% ADVANCED PLANTS

33% EARLY PLANTS

OTHER IMPORTANT TAKEAWAYS

Advanced plants successfully deploy the **digital and automation strategies, which integrated into a capability master plan**, across the site by allocating the projects and actions down to the line operator, engaging the organization bottom-up. For early plants, strategy implementation is still starting.

100% ADVANCED PLANTS
11% EARLY PLANTS

All advanced plants have access to a **centralized Industry 4.0 program office** that has clear ownership to drive enterprise-wide systemic changes, share know-how, initiate and monitor pilots, and scale learnings across the enterprise. This is true for half of the early plants.

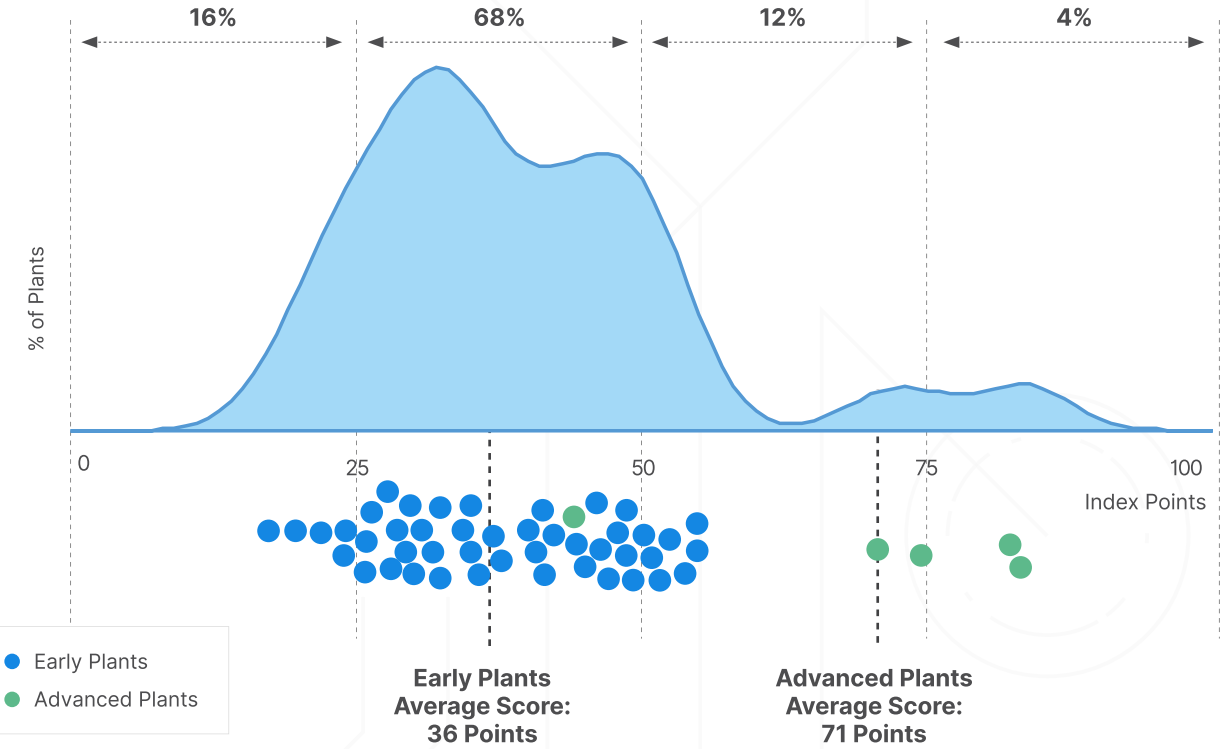
100% ADVANCED PLANTS
56% EARLY PLANTS

Most of the advanced plants have clearly defined and directed efforts to **cultivate the right leadership behaviors** – such as an agile mindset and continuous experimentation with new technologies – while only a few early plants are devoting resources to this cause.

60% ADVANCED PLANTS
20% EARLY PLANTS

2. Digital Organization

Structures and policies that provide the agility to design and roll out an effective digital strategy are crucial to successfully embracing the opportunities of Industry 4.0. As shown on the right, this dimension differentiates advanced plants from the rest of the pack.



KEY TAKEAWAY

Mature operational excellence programs rely on systemic problem-solving capabilities to effectively address complex technical and operational problems. While advanced plants are in the top phases of their company's operational excellence programs, early plants are significantly lagging.

80% ADVANCED PLANTS

TOP MATURITY LEVEL

0% EARLY PLANTS

TOP MATURITY LEVEL

OTHER IMPORTANT TAKEAWAYS

Most advanced plants have a single, **fully integrated IT/OT team** with clearly identified roles and governance, eliminating silos and simplifying decision-making, while IT and OT work in silos for most early plants.

80% ADVANCED PLANTS

20% EARLY PLANTS

Advanced plants have access to **Centers of Excellence** that combine data science with advanced production process expertise, while this is true for only a minority of early plants.

100% ADVANCED PLANTS

24% EARLY PLANTS

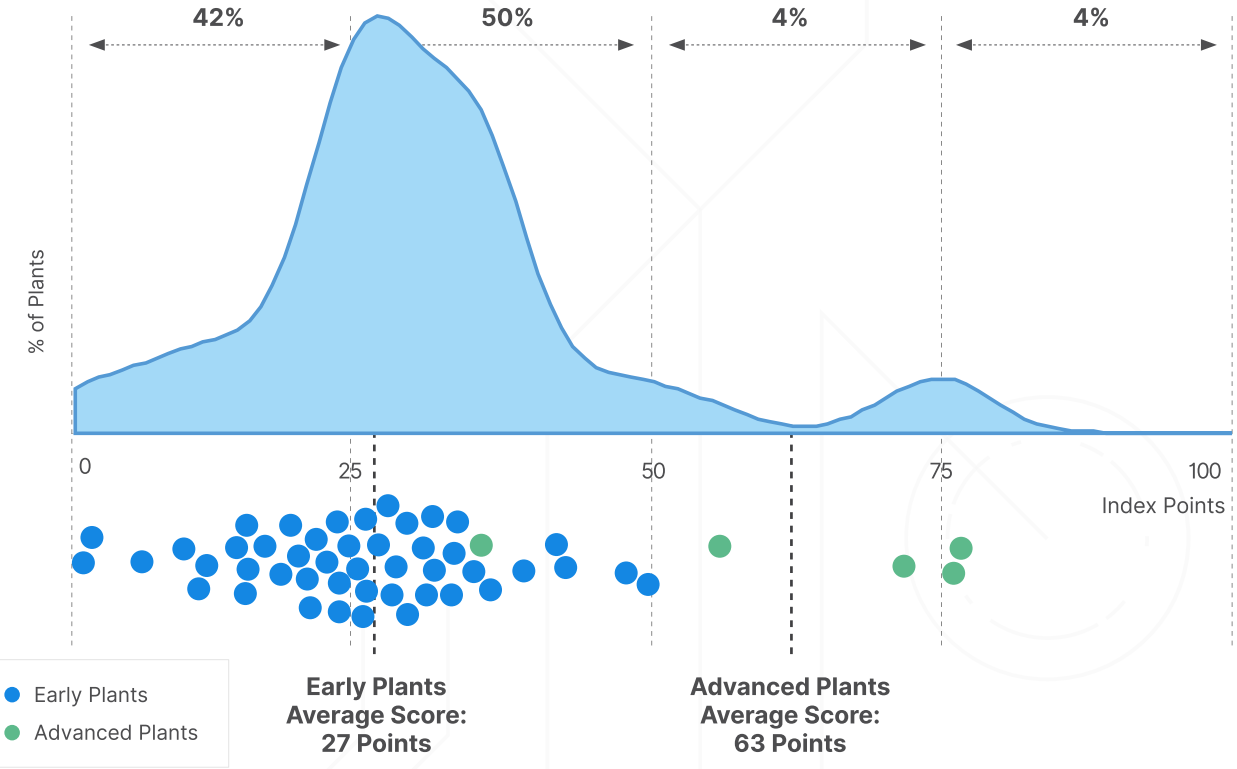
Most advanced plants are using **digital operational excellence tools** for capability development to track, plan, and enhance enterprise-wide collaboration, while only a few early plants have access to this solution.

80% ADVANCED PLANTS

20% EARLY PLANTS

3. Data-Driven Maintenance

The implementation of methods and systems to proactively manage maintenance based on data, such as equipment condition metrics and historical events, is key to driving operational efficiency and reducing downtime. While most advanced plants have created momentum in this dimension, most early plants still extensively apply reactive maintenance.



KEY TAKEAWAY

While most of the advanced plants invest in **smart sensorization for maintenance**, only a portion of the early plants are investing in this area.

80% ADVANCED PLANTS

31% EARLY PLANTS

OTHER IMPORTANT TAKEAWAYS

Most advanced plants in CPG have built **real-time condition monitoring capabilities** and redefined their workflows accordingly, a maintenance approach that none of the early plants are practicing.

80% ADVANCED PLANTS
0% EARLY PLANTS

Large volumes of data are needed to produce actionable insights and drive value-added maintenance activities. All advanced plants understand that and put effort into **data historization**, while only the minority of early plants follow this policy.

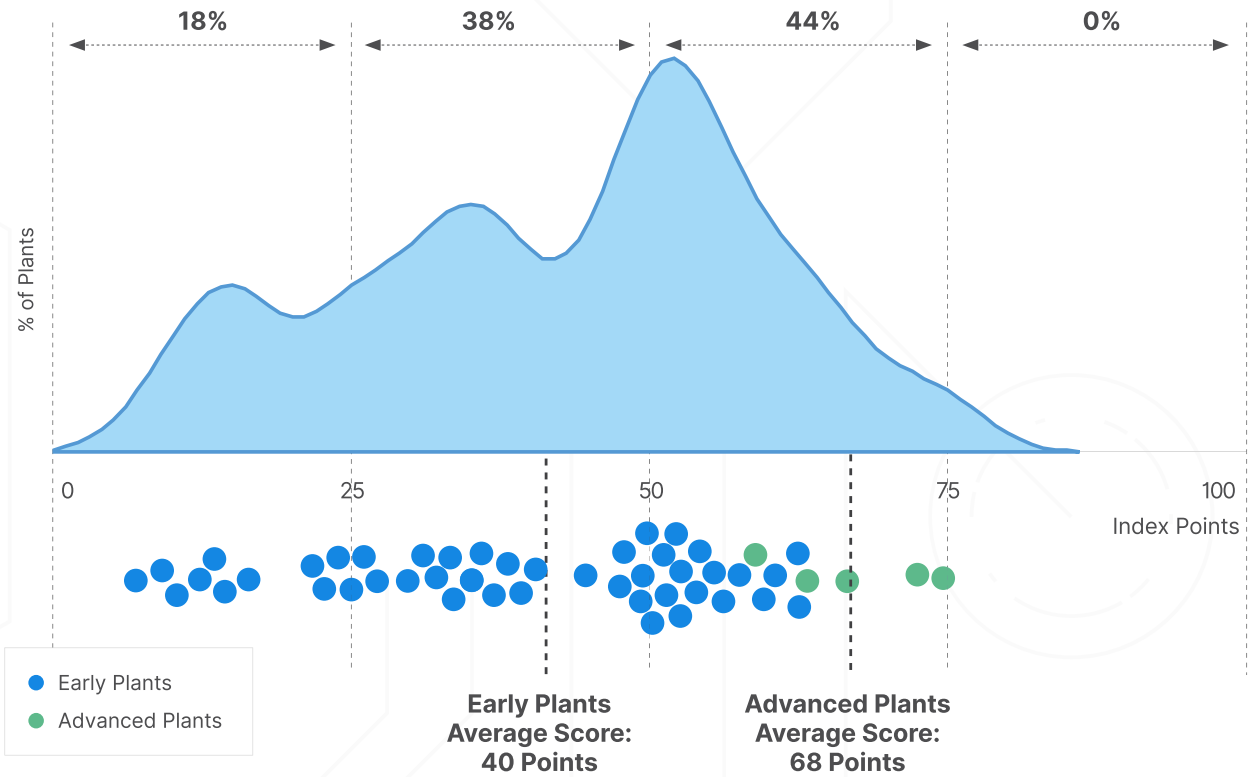
100% ADVANCED PLANTS
40% EARLY PLANTS

Most advanced plants have connected their sensors with **asset health monitoring platforms**, while only a small minority of the early plants are following this practice.

80% ADVANCED PLANTS
13% EARLY PLANTS

4. Automated Data Flow

The effective integration of different informational and operational systems provides fast and reliable access to data, and improves decision-making, reduces human error, and drives process efficiency. And how did our participating plants perform? As you can see on the right the industry is relatively mature in this dimension – advanced plants lead the pack, but some early plants outperform the lowest-scoring advanced plants.



KEY TAKEAWAY

The ever-growing understanding of the importance of data correlations is driving organizations to increase data connectivity by streaming them to **data platforms**. Both advanced and early plants are still not collecting the majority of the data they produce.

50% ADVANCED PLANTS

26% EARLY PLANTS

OTHER IMPORTANT TAKEAWAYS

Data lakes are rapidly being adopted by advanced plants to provide high data accessibility for data science teams, while early plants are making their first steps in this area.

80% ADVANCED PLANTS
13% EARLY PLANTS

Early plants are trying to catch up with advanced plants in establishing **data warehouses** to enable structural data gathering.

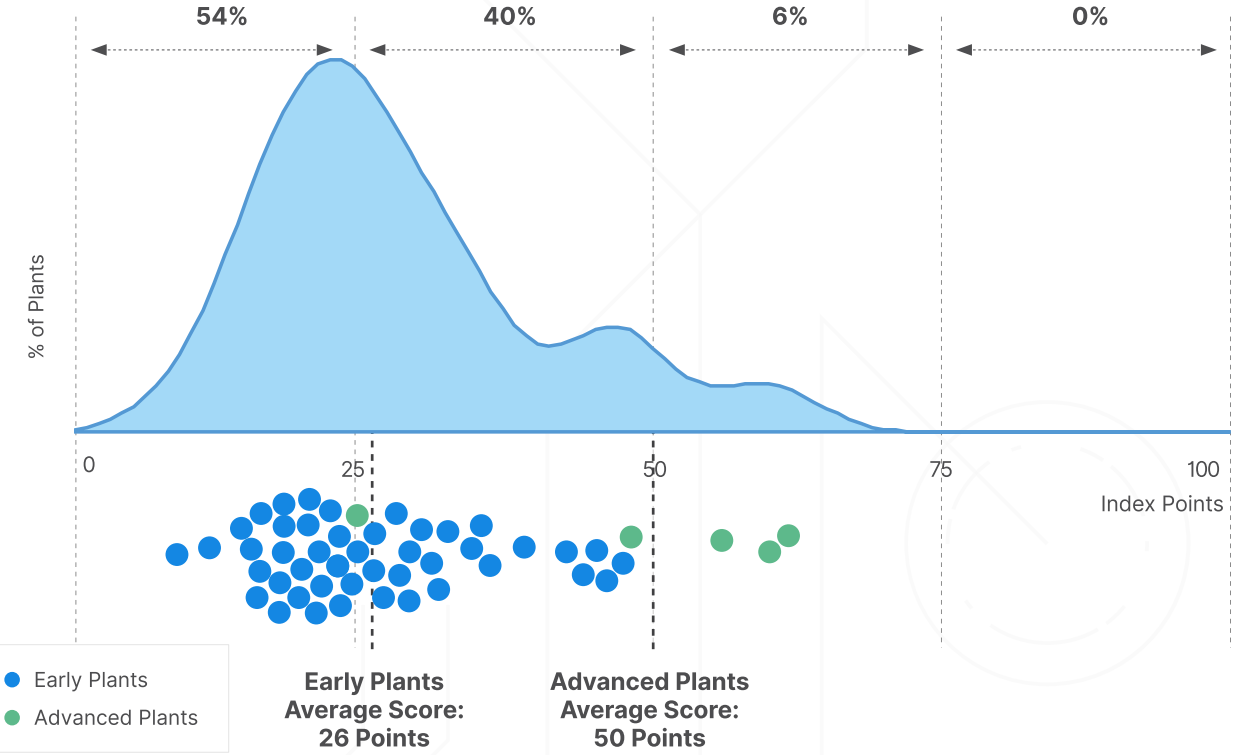
80% ADVANCED PLANTS
40% EARLY PLANTS

The majority of advanced plants have created **data flows that synchronize production and transport** – a practice that is rare among early plants.

75% ADVANCED PLANTS
15% EARLY PLANTS

5. Automated Material Flow

Machinery and systems that automate and optimize material handling processes throughout the manufacturing facility are key to driving efficiencies and minimizing delays or downtime. Most plants are on the lower end of the spectrum, driven by the extensive use of forklifts.



KEY TAKEAWAY

Despite the adoption of automated guided vehicles, predominantly by the advanced plants, **automated material handling movements** account for only a small percentage of movements across the whole CPG industry.

OF MOVEMENTS OF
8% ADVANCED PLANTS

OF MOVEMENTS OF
7% EARLY PLANTS

OTHER IMPORTANT TAKEAWAYS

Half of the advanced plants are investing in **automating workflows** by implementing and integrating management systems for warehouse and yard operations. This practice is a reality for only a small minority of the early plants.

50% of Workflows of ADVANCED PLANTS
17% of Workflows of EARLY PLANTS

Advanced plants have already introduced **automated guided vehicles for high-traffic material** movements, while the adoption for early plants is still low.

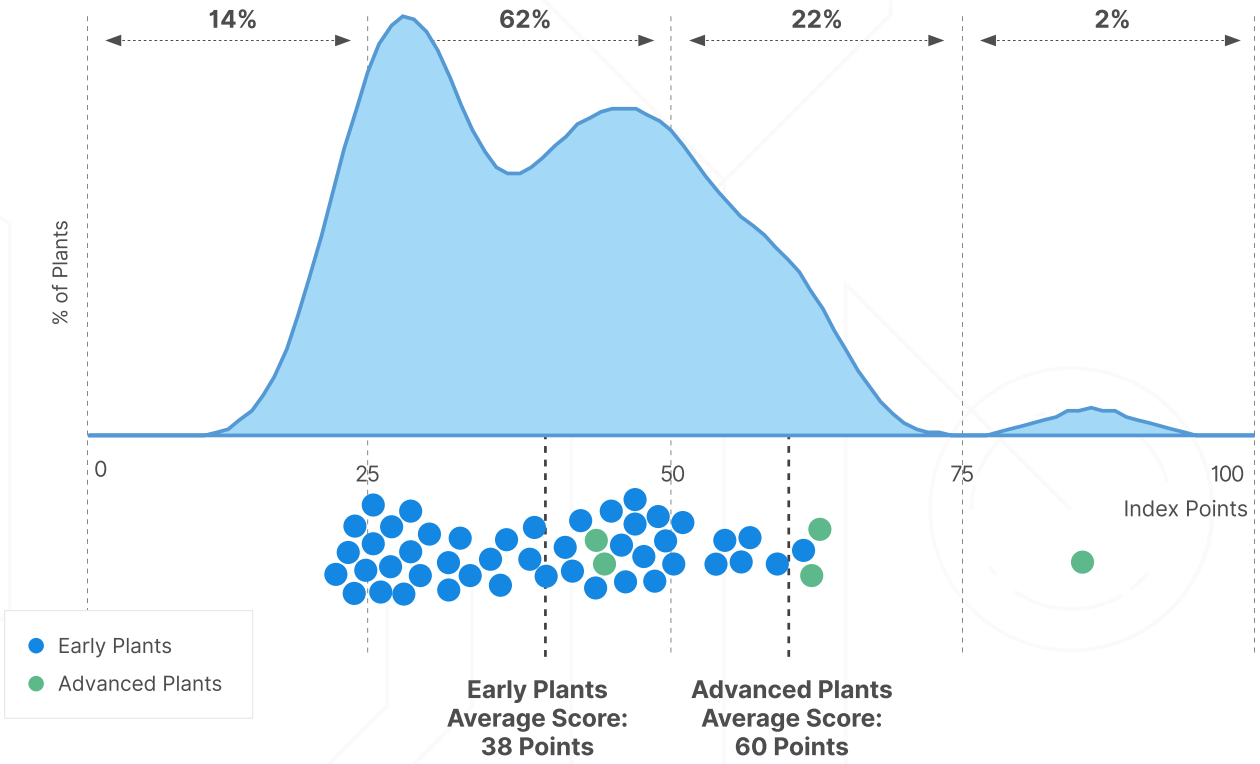
80% ADVANCED PLANTS
18% EARLY PLANTS

No advanced or early plants are leveraging **autonomous mobile robots** at scale across their operations.

0% ADVANCED PLANTS
0% EARLY PLANTS

6. Digital-Ready Infrastructure

Systems that safeguard and enable the plant's operations, such as communication networks and cybersecurity tools, are becoming increasingly important enablers of the Industry 4.0 transformation. The majority of sampled plants still have in place digital infrastructure that serves their current state rather than the plant's vision of the future.



KEY TAKEAWAY

Most advanced plants have an **industrial-grade wireless network** providing connectivity options to assets throughout the plant, while only about one-third of the early plants leverage wireless connectivity.

80% ADVANCED PLANTS

36% EARLY PLANTS

OTHER IMPORTANT TAKEAWAYS

The majority of advanced plants have defined and constantly update **cybersecurity contingency plans**, while this is a reality for the minority of the early plants.

80% ADVANCED PLANTS
20% EARLY PLANTS

Cutting-edge data analytics techniques such as **machine learning for cybersecurity incident prevention** are a growing trend among advanced plants, while these are completely new for early plants.

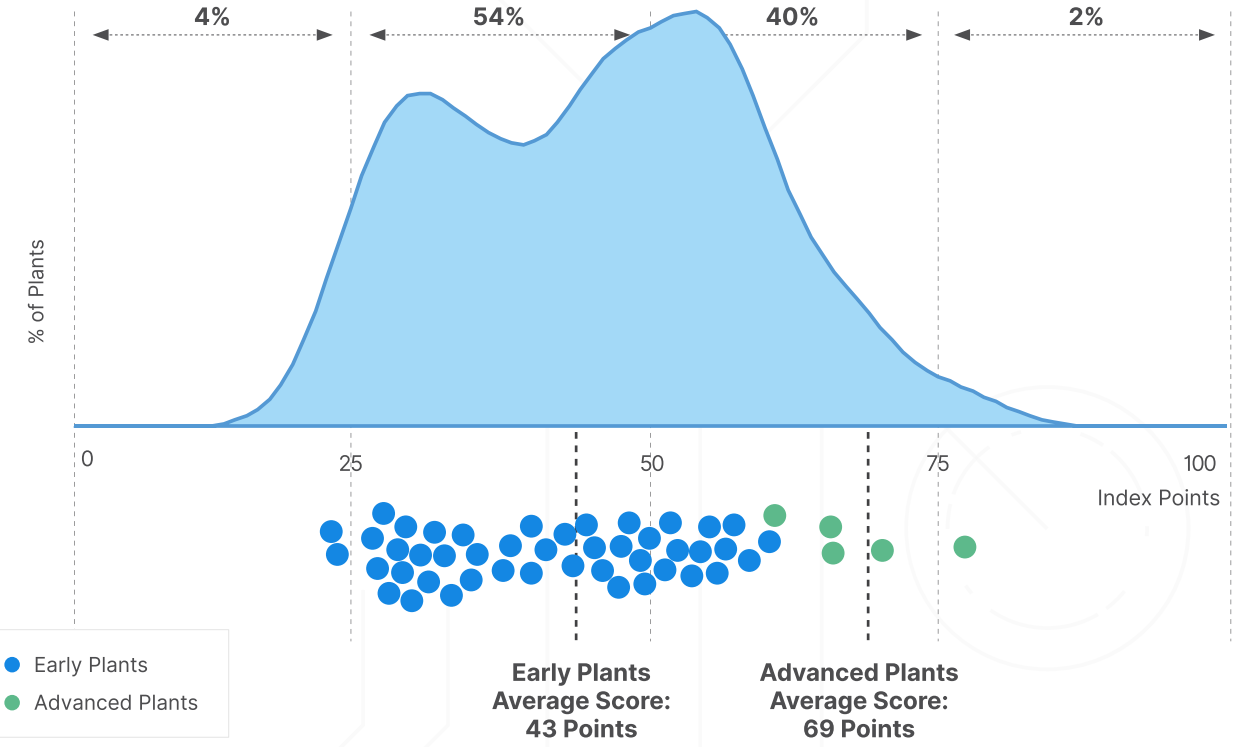
40% ADVANCED PLANTS
7% EARLY PLANTS

Ever-increasing connected assets mainly found in advanced plants and the need for agile decision-making are addressed by the adoption of **edge computing**. Early plants are not exploring this technology.

60% ADVANCED PLANTS
0% EARLY PLANTS

7. 360° Factory Visibility

Eliminating silos by combining data from various areas of the value chain can improve decision-making and drive agility. While this dimension was – on average – relatively well addressed by the participating sample plants, advanced plants are still clearly front-runners.



KEY TAKEAWAY

Almost half of the advanced plants focus on flexible collaboration through **remote and user-friendly interfaces** to enhance real-time access to critical information, while early plants are making their first steps in this area.

43% OF SYSTEMS OF ADVANCED PLANTS

19% OF SYSTEMS OF EARLY PLANTS

OTHER IMPORTANT TAKEAWAYS

Advanced plants are leading the way toward **cloud-based key systems of record**, such as Enterprise Resource Planning and Product Lifecycle Management, while early plants are lagging.

50% of Systems of ADVANCED PLANTS
20% of Systems of EARLY PLANTS

Although adoption is low for both types of plants, advanced plants have started using **industrial IoT platforms** to connect data from multiple systems to increase visibility and enhance decision-making.

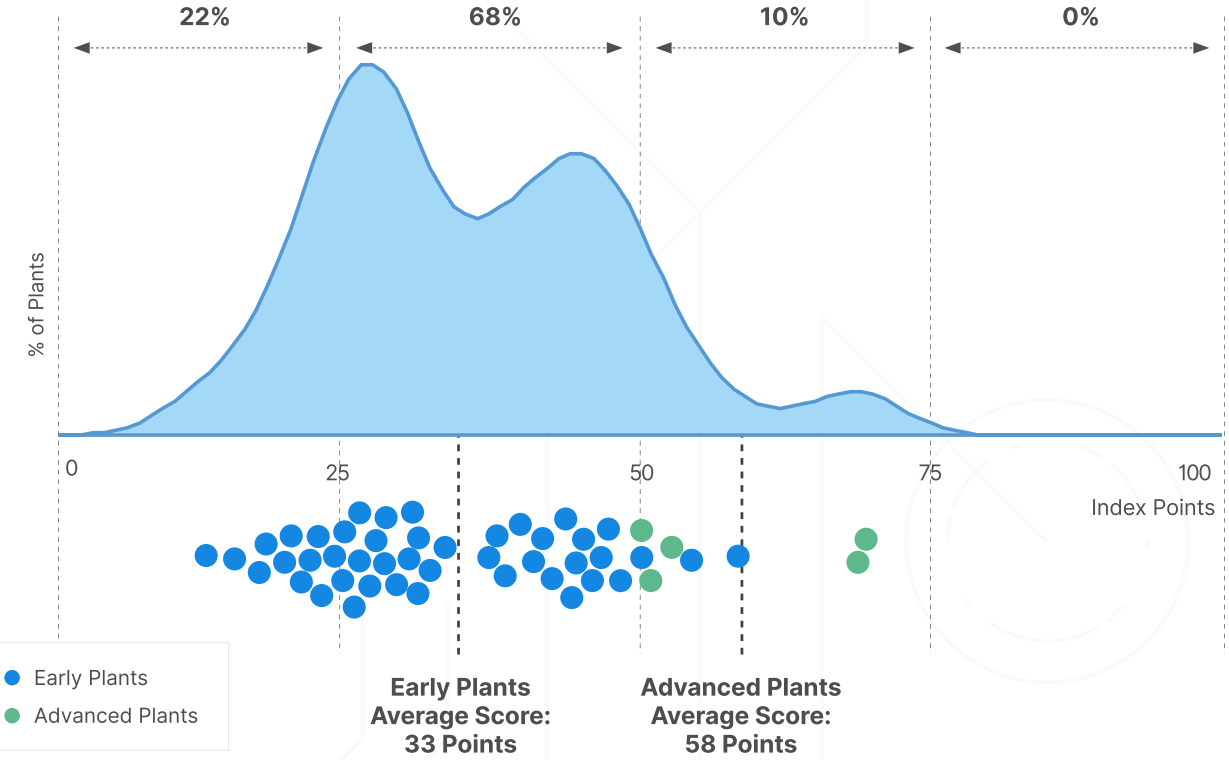
20% ADVANCED PLANTS
9% EARLY PLANTS

Despite the potential opportunities offered by **digital twins**, even advanced plants lack the data readiness and expertise to define real-time models that can drive timely decisions, effective resource allocation, and throughput optimization.

0% ADVANCED PLANTS
0% EARLY PLANTS

8. Intelligent Quality

Effective integration of sensors, software, and techniques that leverage real-time data to manage quality control and quality assurance can deliver important operational advantages. In this dimension, only a few of the advanced plants have managed to separate themselves from the top-scoring early plants.



KEY TAKEAWAY

Advanced plants are moving aggressively toward replacing sample testing with technologies that enable **real-time quality control and release**, while early plants are following at a slower pace.

60% ADVANCED PLANTS

31% EARLY PLANTS

OTHER IMPORTANT TAKEAWAYS

Advanced plants transition quality management to their **Manufacturing Execution System**, standardizing quality workflows in a systemic manner by integrating online and offline tasks, while early plants are trying to adapt to this trend.

60% of Workflows of ADVANCED PLANTS

29% of Workflows of EARLY PLANTS

The majority of the advanced plants leverage **advanced machine vision systems** to automate in-line quality tests, while only the minority of early plants are leveraging these capabilities.

60% ADVANCED PLANTS

29% EARLY PLANTS

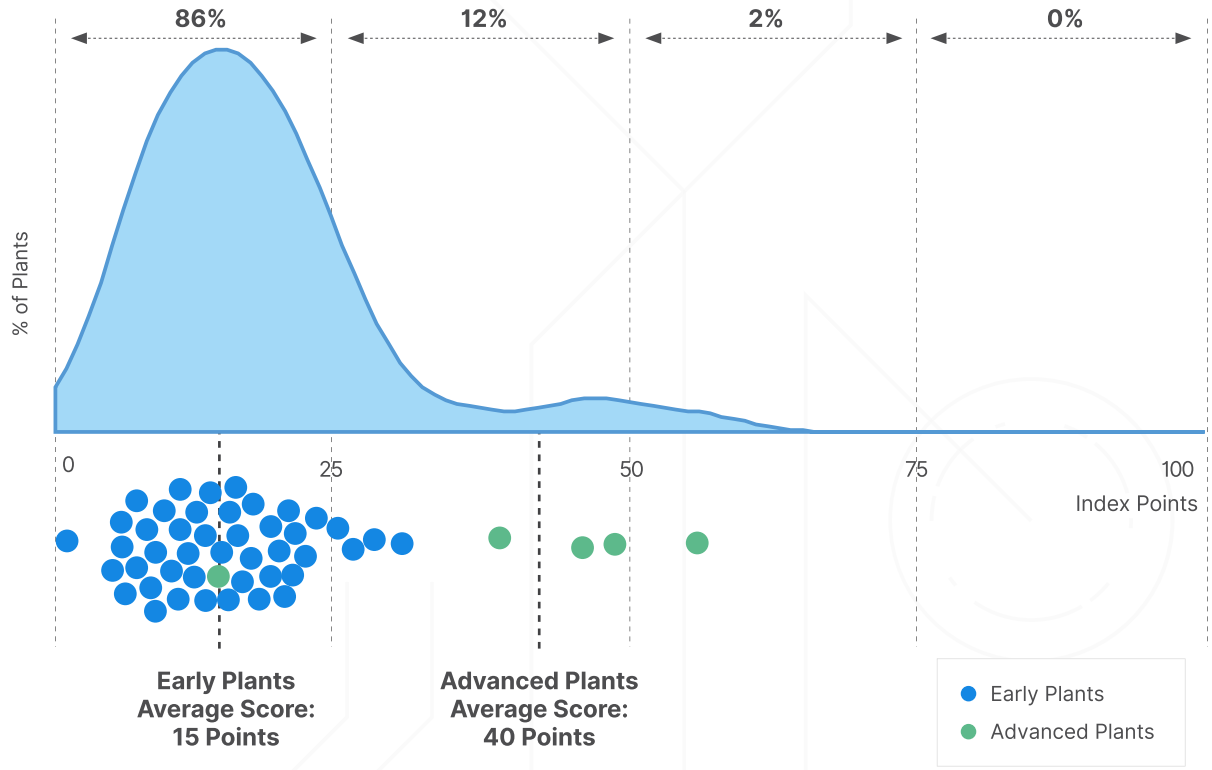
None of the early and only a fifth of the advanced plants have adopted **edge computing** to enable near real-time data analysis for quality purposes.

20% ADVANCED PLANTS

0% EARLY PLANTS

9. Tech-Augmented Workforce

Technologies that assist employees in their tasks by augmenting their skillsets and optimizing workflows are opening up new horizons in productivity and efficiency. The majority of the advanced plants have separated themselves from the rest of the sample, capitalizing on the lack of investment from the early plants in this dimension.



KEY TAKEAWAY

Digitization of work instructions across multiple processes, from production assembly to changeovers and maintenance, is commonly adopted by advanced plants, while early plants are still exploring the benefits of these solutions.

60% ADVANCED PLANTS

11% EARLY PLANTS

OTHER IMPORTANT TAKEAWAYS

Advanced plants widely use **handheld devices** such as smartphones or tablets on the shop floor focusing on data visualization, reporting, and auditing, while early plants are putting in serious effort to adopt them.

80% ADVANCED PLANTS
31% EARLY PLANTS

A small proportion of advanced plants leverage **augmented reality** to offer enhanced work assistance to employees, while this technology is not utilized at all by early plants.

20% ADVANCED PLANTS
0% EARLY PLANTS

Despite the potential of **virtual reality** for training to improve workforce capabilities while minimizing training time, it is only adopted by the minority of advanced plants.

20% ADVANCED PLANTS
0% EARLY PLANTS

10. Zero-Touch Production

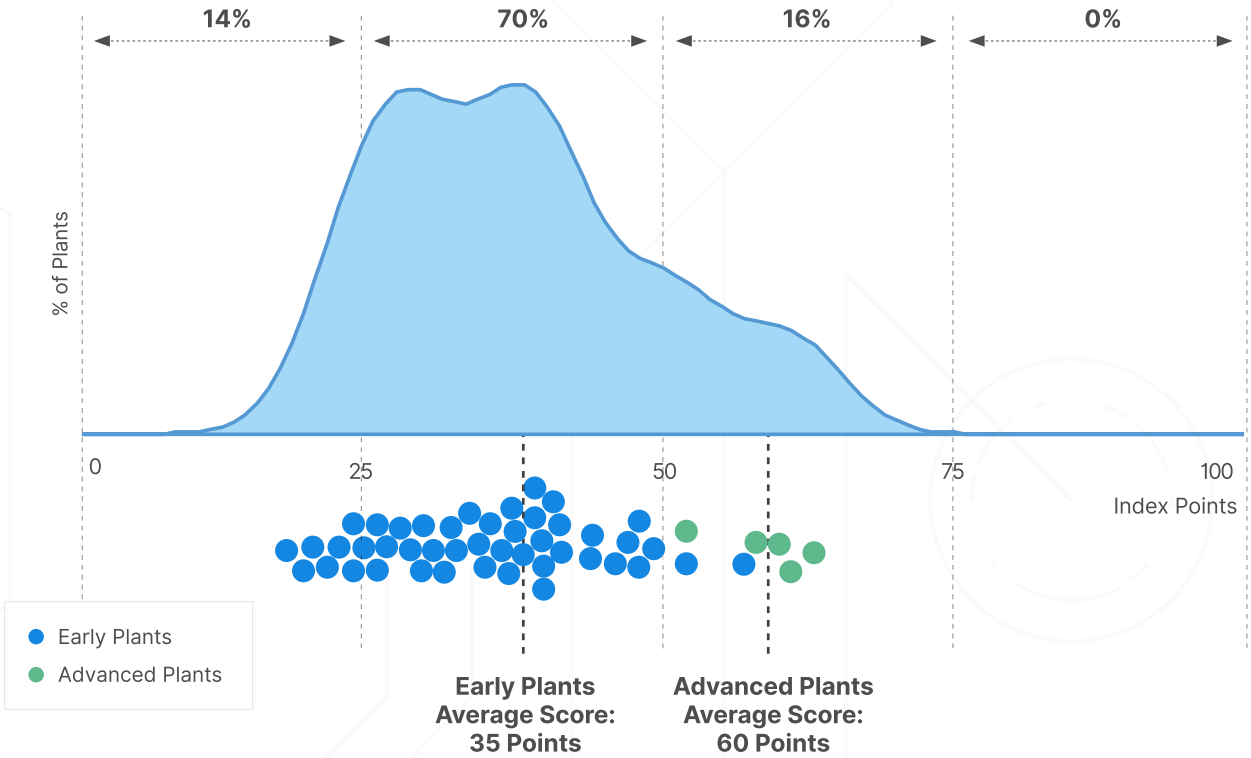
Hardware, software, and practices that eliminate human effort in production planning and execution can help to deliver important gains in production operations. In this dimension, we observe the biggest concentration of plants in the 25- to 50-point area, driven by the automation of core production activities.

KEY TAKEAWAY

Manufacturing Execution Systems are widely adopted across the industry; the differentiating factor is that advanced plants use on average twice the number of the functionalities that enable their specific operational and business needs, compared with early plants.

100% ADVANCED PLANTS

87% EARLY PLANTS



OTHER IMPORTANT TAKEAWAYS

Advanced plants' need for flexibility forces them to explore ways to increase the **automation of changeover tasks**, while this trend is not common for most of the early plants.

60% ADVANCED PLANTS
16% EARLY PLANTS

A few advanced plants work on **automating customization** to reduce manual labor, a practice that is not even in concept phase for early plants.

25% ADVANCED PLANTS
0% EARLY PLANTS

Most advanced plants leverage **end-of-line packaging automation**, while the majority of early plants do this process manually.

80% ADVANCED PLANTS
33% EARLY PLANTS

Key CPG insights and recommendations

This study of the CPG industry offers important insights into the strength and opportunity areas of participating plants in their Industry 4.0 transformation journey. It also shows that advanced and early plants should focus their efforts in different dimensions in creating their Factory of the Future programs – without neglecting other dimensions. Based on these unique insights, we offer some key recommendations for the global CPG industry (page 20), as well as specifically for early plants and advanced plants.

KEY INSIGHTS:

→ Advanced plants distinguish themselves through their Factory of the Future leadership (page 9) and digital organization (page 11). These enabling dimensions are key to fostering an environment in which Industry 4.0 can flourish. Early plants understand the importance of these dimensions but are still underinvesting in them.

→ The automated material flow (page 13) and tech-augmented workforce (page 17) offer significant opportunities for advanced and early plants alike. These dimensions showed the worst scores for both advanced and early plants.

→ 360° Factory visibility systems (page 15) and automated data flow (page 10) are relatively mature areas for advanced and early plants. Both early and advanced plants have some of their highest average scores in these dimensions.

→ Production (page 18) and quality (page 16) are areas in which early plants use a combination of conventional technologies and manual labor, while advanced plants are adopting new technologies at a slower pace compared with other dimensions.

→ While for the maintenance dimension (page 12) advanced plants have set the path and early plants are struggling to follow, for the infrastructure dimension (page 14) there is a smaller – yet still significant – difference compared with other dimensions between advanced plants and early plants.

Key CPG insights and recommendations

Based on these benchmarking insights, companies across the CPG industry should consider the following recommendations:

- → Nurture leadership behaviors for transformation through comprehensive education and training. Incentivize experimentation with new technologies and integrate into leadership work plans.
- → Maintain steadfastness of purpose in driving and accelerating operational excellence programs, such as by introducing tech-enabled workforce skill augmentation solutions.
- → Continue to invest in infrastructure, such as connectivity and cybersecurity, which will provide the foundation of successful transformations.
- → Instill a culture of continuous discovery that keeps the organization ready for the challenges ahead and provide the tools to enable it.
- → Ensure enterprise-wide visibility of opportunity to scale learnings and savings from platformizing technology choices.
- → Engage and inspire the organization to understand and embrace all phases of the transformation process and justify technology choices on total system cost and throughput benefits.

Indeed, early plants would do well to consider the following recommendations:

- → Create a strategy and roadmap of technologies that fit the realities of your operations.
- → Accelerate operational excellence to standardize processes and operating procedures, and to increase problem-solving capabilities on the shop floor.
- → Promote a culture of continuous learning and problem-solving, with experimentation integrated and rewarded in the work plans across the enterprise.

Finally, to stay ahead of the curve, advanced plants should:

- → Invest in leveling up material handling automation, quality processes that will enable real-time product release, and in creating the infrastructure that will support your future vision.
- → Use data as a collaboration medium to extend transformation beyond plant walls to the supply chain.
- → Seize the significant opportunities of end-to-end integration by working across the value chain and setting performance targets in operational excellence programs accordingly.

This study compares a wide range of operations and businesses within CPG; the wide range of proficiency identified indicates some important points and actions. If you are a corporate operations leader in a manufacturing company, the head of an industry association or have any other manufacturing responsibility, you will greatly benefit by having visibility of your own ecosystem of operations to lead the work forward. We urge you to conduct a similar study within your own operation.

Call us or order your enterprise-specific study or report – SmarterChains is ready to help you to jump start your digital transformation!

About SmarterChains

SmarterChains

A software-as-a-service platform enabling manufacturers to prepare, define and execute their Industry 4.0 strategy.

The challenge we address...

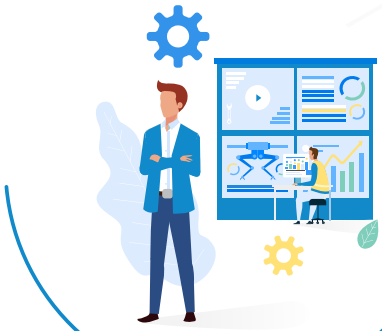
Too many companies find Industry 4.0 deployment problematic because of (1) unaligned enterprise strategies, (2) the fragmentation of intelligence across tools, people, and workflows, and (3) the failure to execute in a systemic and coordinated way.

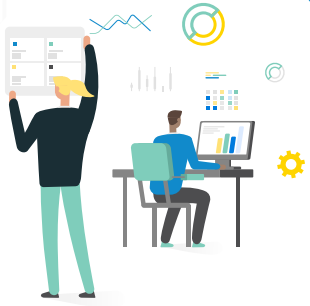
The solution we provide...

An all-in-one platform that connects all employees to comprehensively manage knowledge and Industry 4.0 capabilities. The platform enables easy, scalable data collection, covers all manufacturing areas, and offers transparent, scalable learnings from an objective and unbiased point of view.

Prepare

- → Enterprise Strategy Hub
- → Assess Connected Factory Maturity
- → Benchmark externally with industry
- → Benchmark internally across Plants
- → Prioritization insights for strategy
- → Engage and educate your teams



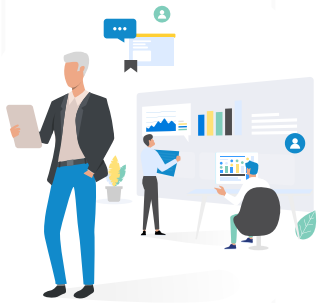


Define

- → Technology choices roadmap
- → Evaluate use cases value
- → Identify investment size
- → Define Size of the Price
- → Drive Build or Buy decisions
- → Discover Vendor Solutions

Execute

- → Masterplanning
- → AI-driven adaptive learning
- → Vendor evaluation & selection
- → Enterprise Collaboration



"The time for Industry 4.0 is now – and with SmarterChains, you can prepare, define, and execute your strategy through our all-in-one, software-as-a-service platform."

About EY

Building a better working world

EY in a nutshell

At EY, our purpose is building a better working world. Through the four highly integrated service lines – Assurance, Tax, Transactions and Advisory – and our deep sector EY knowledge, EY teams help clients to capitalize on new opportunities and assess and manage risk to help deliver responsible growth.

Re-thinking end-to-end supply chain

With the EY Supply Chain Reinvention framework, we have built a suite of asset-backed solutions enabled by advanced technologies such as data analytics, blockchain, machine learning, robotics and artificial intelligence. This suite of solutions extends from end-to-end supply chain strategy, strategic architecture, operational excellence, and supply chain resilience.

Future of manufacturing

In today's digital world, manufacturing performance is more critical than ever in order to enable businesses to deliver on their growth and margin targets. Companies are struggling to make a sustainable breakthrough in performance using traditional manufacturing excellence approaches.

The EY Smart Factory solution bridges this gap by integrating manufacturing excellence capabilities and smart technologies in factories to create a smarter workforce. EY Smart Factory drives a high-performance culture and continuous improvement approach to support employee ownership at the site level. The solution provides manufacturing transformation helping clients make smart decisions, realize loss elimination and increase productivity throughout the supply chain. It creates an organizational construct with a continuous improvement cycle, where people can continually upskill and leverage emerging technologies.

Leveraging powerful collaborations

EY capabilities are underpinned by unique collaborations with P&G and Microsoft. Together with P&G, we help our clients to achieve higher levels of manufacturing performance.
Our alliance with Microsoft combines deep EY insights and experiences with the scalable, enterprise cloud platform and digital technologies of Microsoft. Together, we can help accelerate digital strategies and amplify our clients' business performance.

>280,000

Globally Connected Consultants

>5,000

Supply Chain Professionals

EY Smart Factory

Building a better working world

Manufacturing transformation is one key element of the EY Supply Chain Reinvention framework. Our vision of digital manufacturing excellence is based on a rock-solid strategy, a proven Operational Excellence System, accelerated with new technologies and enabled by powerful manufacturing systems. Together with our long-lasting alliance partners, EY teams are positioned to cover the broad spectrum of manufacturing transformations.

With so much hype around new technologies pressuring companies to invest and make the most out of these digital enablers, the transformation into an entirely smart factory remains challenging. It can bring a high degree of uncertainty and often leaves the management with complex decisions on where to focus. All too frequently there are many experiments which are not scalable and unique to the situation within one plant or are not underpinned by a solid operational excellence foundation.

At EY, we have developed digital accelerators to make the equipment and the people smarter by combing technology with standard ways of working to help empower a capable workforce to contribute value and help accelerate the transformation journey.

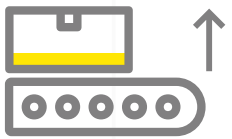
Our key accelerators for the Smart Factory are as follows:

→ **Smart Deployment solution:**
The Smart Deployment solution is an integrated set of cloud-based applications that enable organizations to implement and sustain self-guided continuous improvement journeys. Smart Deployment codifies and integrates program and coaching content, learning material, and leading practices, and it distributes these to where they are needed. It facilitates the deployment of standardized leading practice know-how, production system content, and improvement methodologies using a codified plan, do, check, act (PDCA) model.

→ **Operational Excellence System:**
P&G's Integrated Work System (IWS) is a proven operational excellence system that is focusing on zero loss and 100% employee ownership. After many years of collaboration between Ernst & Young Global Limited and P&G, IWS can be deployed in a modular and rapid way – as enabled by the Smart Progression Application. It sets the foundation for the broader digital transformation.

→ **Smart Daily Management:**
With the Smart Daily Management applications, the vision of a purely digital and paperless shop-floor becomes reality. The digital solution eliminates from the shop-floor highly manual, error-prone and time-consuming tracking activities and provides a powerful tool that supports digital standard work processes and real-time, on-demand analytics. In addition, it provides the platform for a single unifying portal for all manufacturing activities to be pushed to the user in a single "MyTasks" portal. Ultimately, the enterprise-wide usage unlocks the path to establishing control towers where operations can be monitored remotely.

→ **Smart Process Improvement:**
Disruptive technologies enable another level of process optimization on the shop-floor and across the supply chain. Leveraging digital twins for predictive maintenance or incorporating machine learning for smart quality management are just two examples of how the tailored solutions can further help the transformation journey.



Manufacturing Output

20%

Increase*

Unplanned Downtime

35%

Decrease*

* Example results, benefits from EY Smart Factory clients

Acknowledgements

I would like to thank all participating plants and our study sponsor, EY, for their contributions to this important work. Thanks to them, we have been able to collect the data that has led to important insights into the opportunities of CPG plants in developing toward the Factory of the Future.

Vasilis Karamalegos
CEO & Co-Founder

Contact

For more information about the details of this study, please reach out to our SmarterChains experts by emailing **info@smarterchains.com** or by visiting **www.smarterchains.com**

And to find out more data-driven insights, check out our interactive study.

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