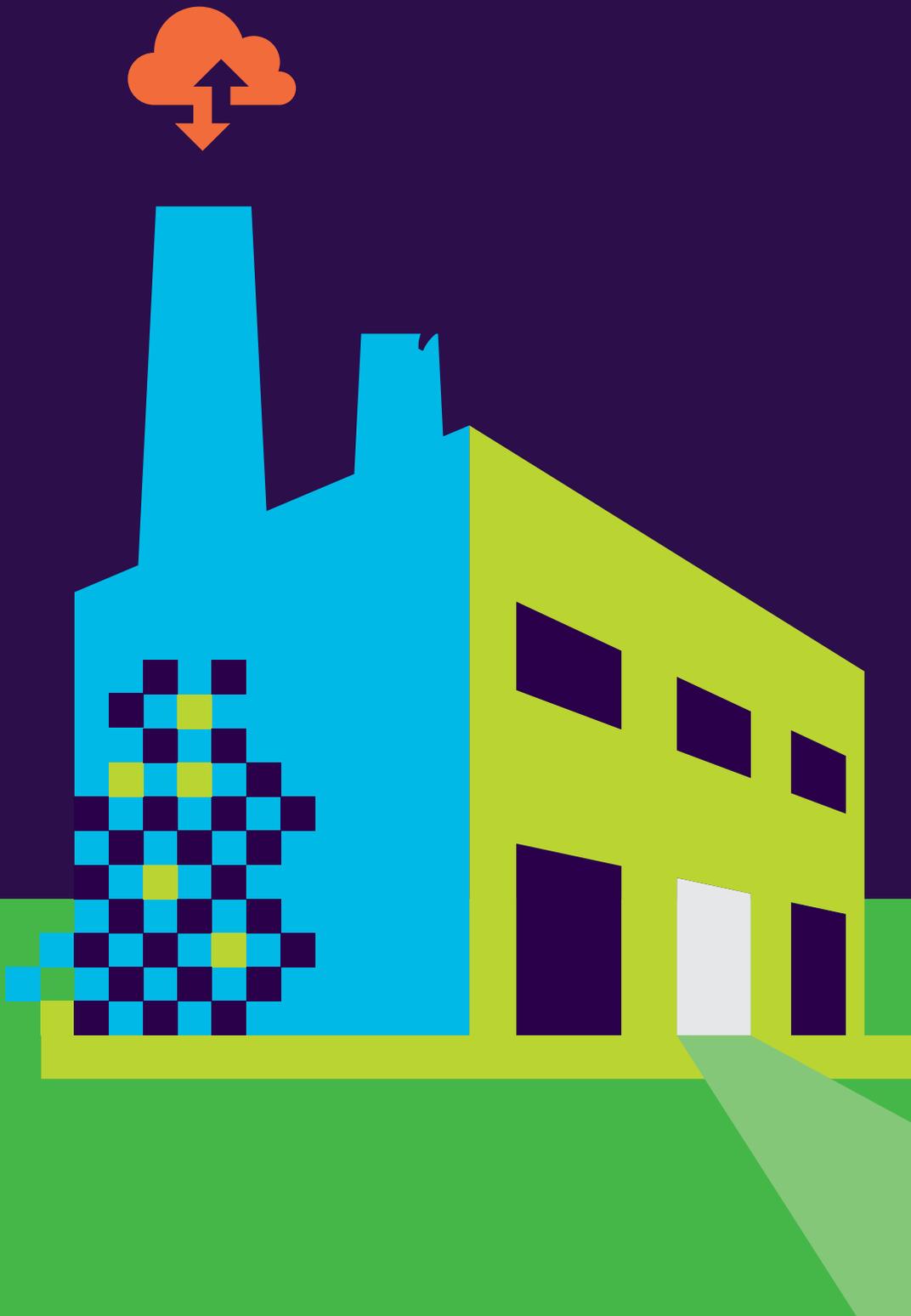# Empowering Discrete Manufacturers for the **Digital Age**
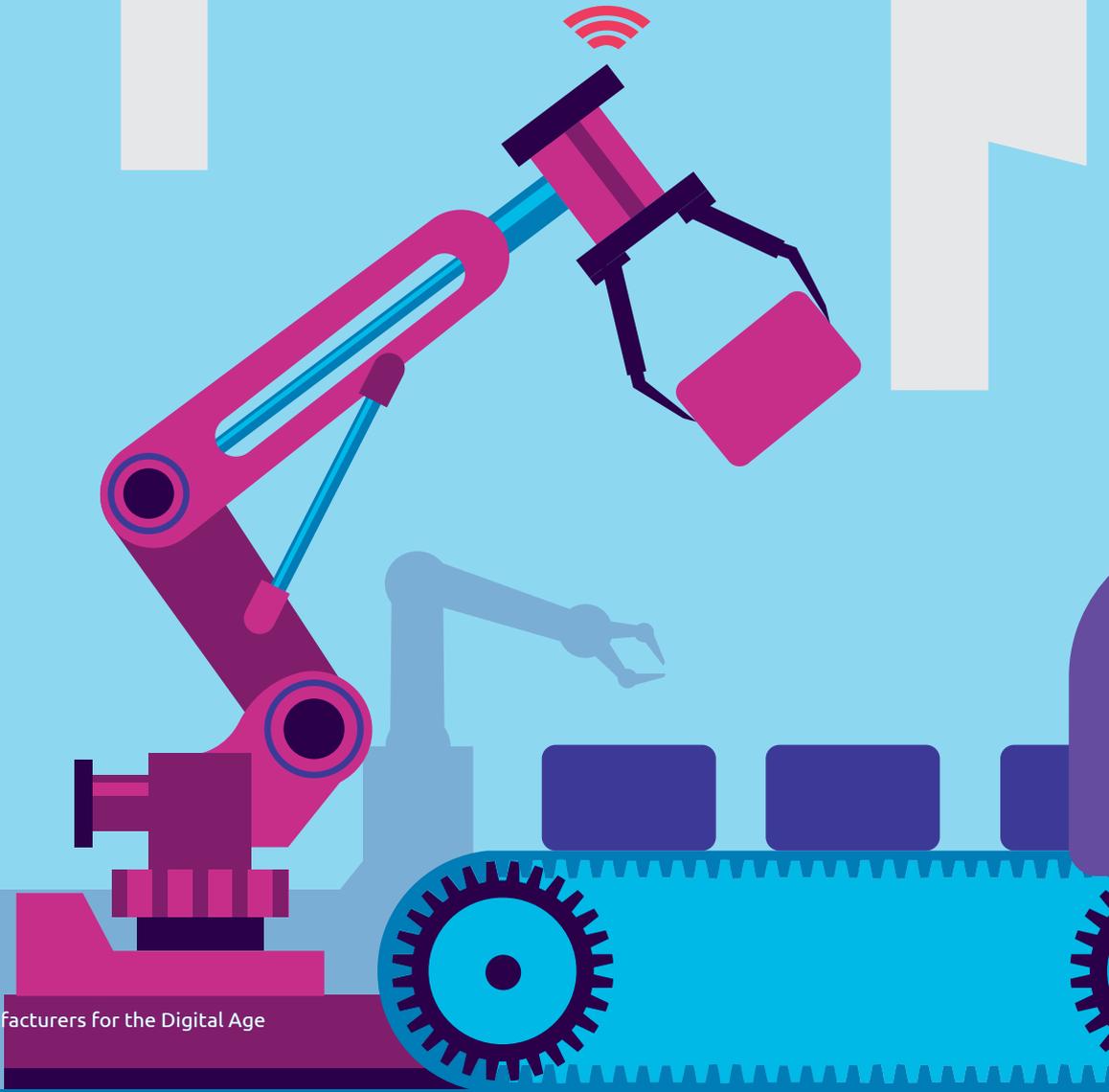
Empowering Discrete
Manufacturers for
the Digital Age

Contents

Abstract

Capgemini, a global leader in consulting, technology, and outsourcing services, and SAP™, the world's market leader in enterprise application software, have broadened their strategic partnership with the launch of the "Fast Digital 4 Discrete Industries by SAP and Capgemini" initiative. This joint initiative helps clients in discrete manufacturing industries manage their digital transformation as they seek to adopt innovative concepts driven by Industry 4.0: the industrial Internet of Things, Cloud, Big Data, and Smart Automation.

This paper presents the vision and market understanding that have led Capgemini and SAP to jointly drive the digital transformation in the discrete manufacturing industries.

Empowering Discrete Manufacturers for the Digital Age
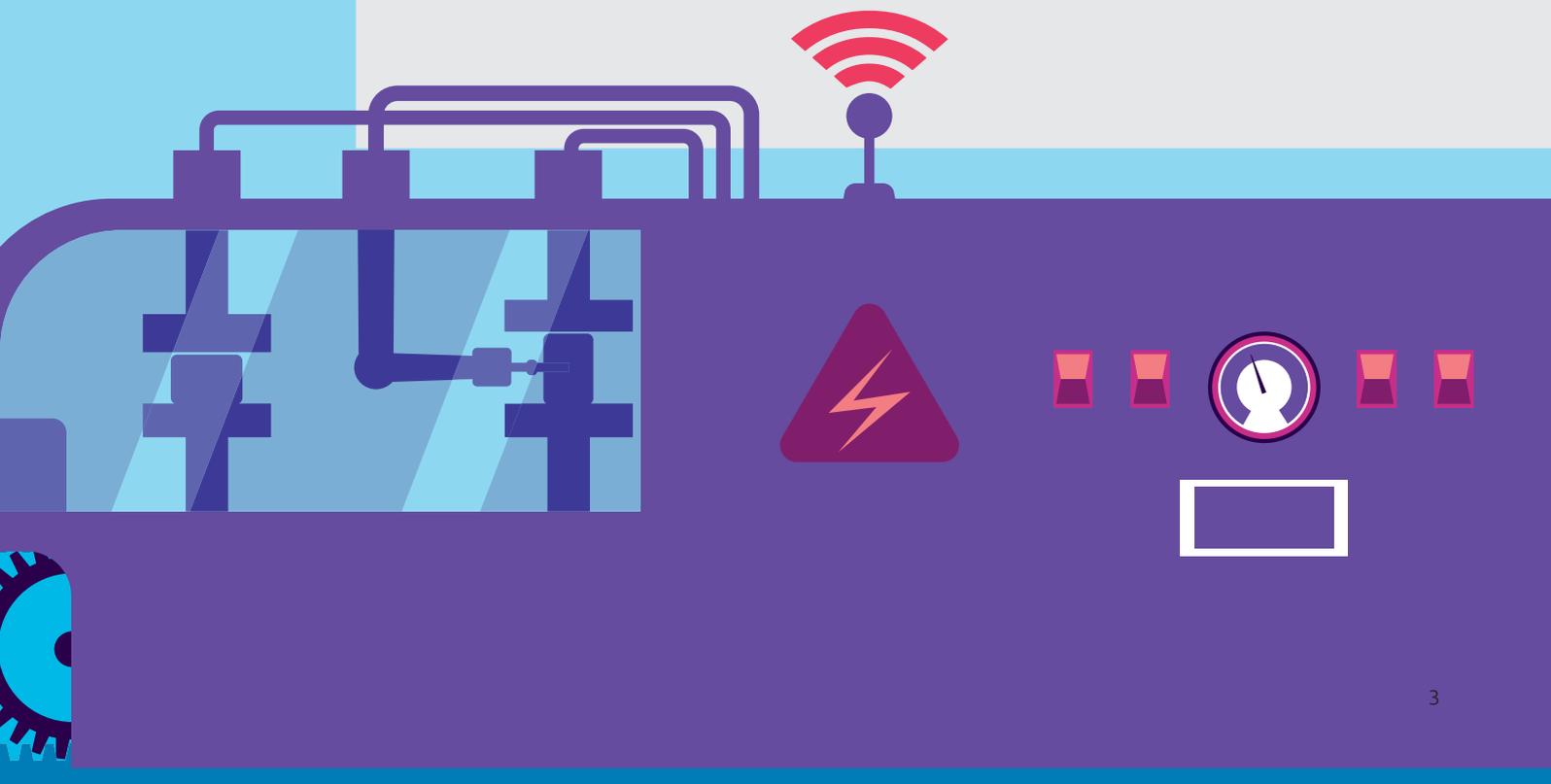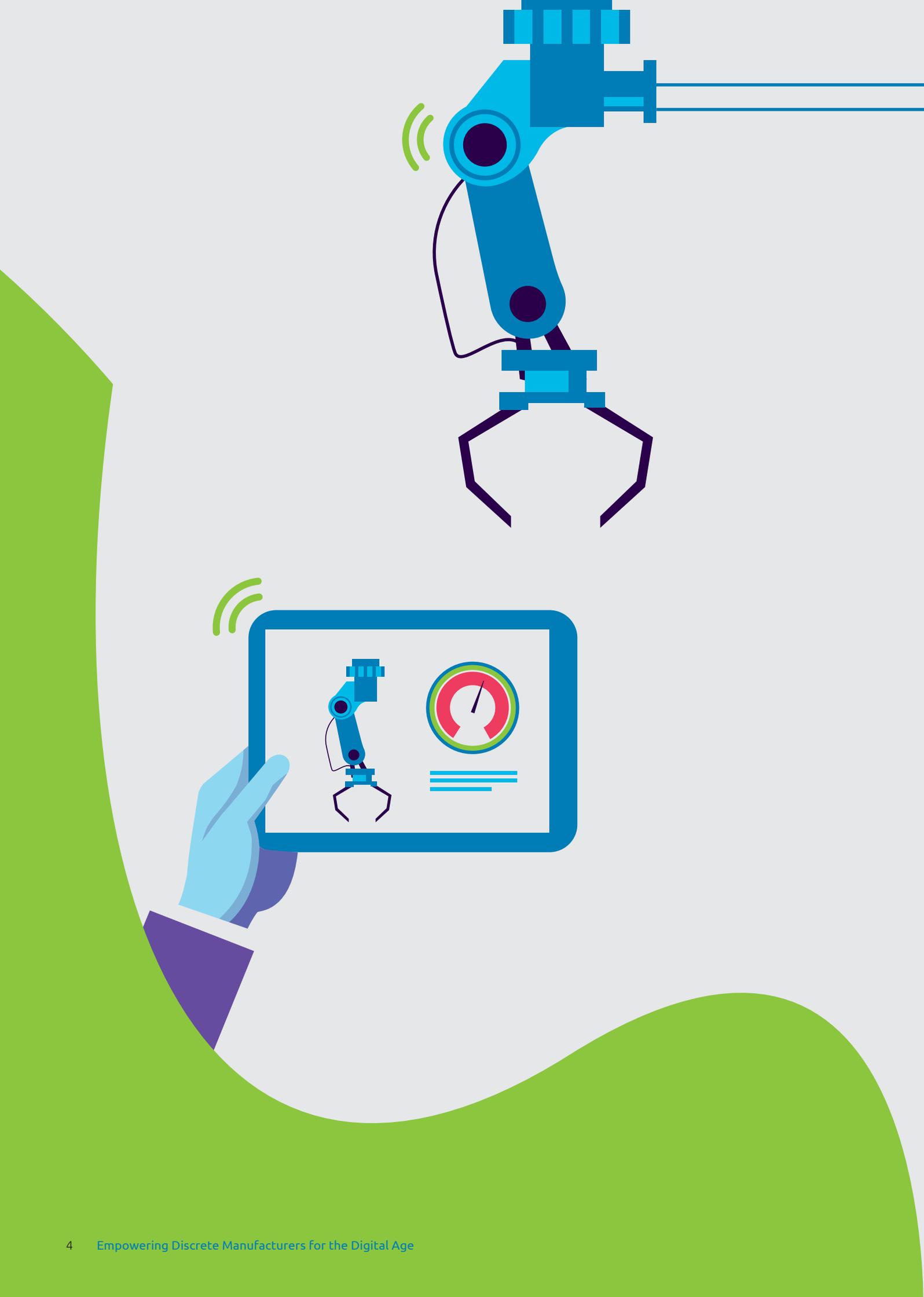
Opportunities for digital transformation in the discrete manufacturing industry

Forward-thinking manufacturing companies are aware that digital transformation is essential for profitable growth and sustainable competitiveness. Digital is changing the game for manufacturers. Smart, connected products, plants, assets, and operations offer the potential for productivity gains, increased quality, cost savings, and improved revenue.

A recent IDC study looked at companies globally in order to better understand which actions taken by "data smart" manufacturing organizations would yield the most impactful outcomes, both in terms of growth and efficiency. The study provides some eye-popping results: the potential net value of the "data dividend" over a four-year period for a manufacturing sector embracing data smart technology clocked in at $371 billion.

Over this four-year period, manufacturing organizations stand to achieve a 60% greater return on their data assets. Potential productivity improvements are worth $162 billion, while operational improvements can amount to $117 billion. Product innovation adds $55 billion, and customer-facing processes add $38 billion to the economic potential of digitization in manufacturing.
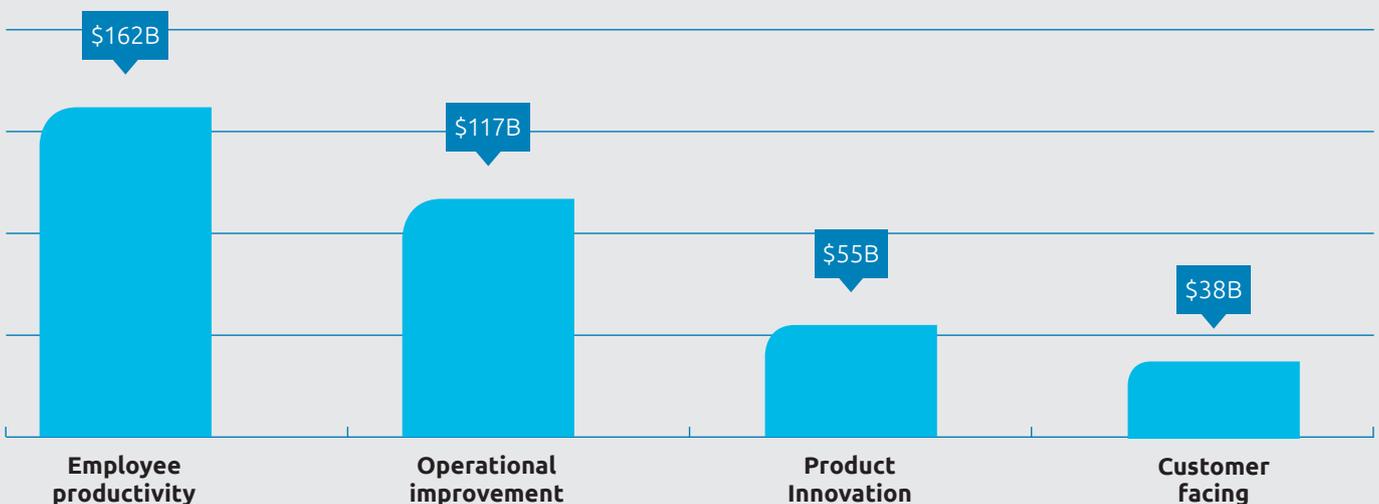
The case for collaborative ecosystems

The digital transformation has a major impact on how manufacturers share ideas and collaborate with partners along the extended value chain, from R&D and design, to shop floor operations, to the use of products by customers. Engineers from one company collaborate with engineers in another, while machines communicate with other machines and products at third-party facilities. In the collaborative ecosystem, resources are pooled and plant utilization is optimized to achieve communal gains in productivity and cost effectiveness. To maximize uptime, plant maintenance and retooling can be scheduled to coincide with predicted lulls in demand.

Vital insight for smarter decisions

Thanks to real-time analysis of massive data streams, manufacturers gain unprecedented insight into upstream and downstream processes along the value chain. This end-to-end insight enables them to both anticipate and respond to changes in demand. It also helps manufacturers make the right decisions to ensure business continuity, drive business outcomes, and enhance profit margins.

Areas where manufacturing companies can use digitization to gain benefits

$162B	$117B	$55B	$38B
Employee productivity	Operational improvement	Product Innovation	Customer facing

Source: Technet, "The $371 Billion Opportunity for 'Data Smart' Manufacturers", May 2014

Smart, connected products pay dividends

Adding digital capabilities to products presents excellent opportunities for manufacturers to enhance customer value and sharpen their competitive edge. For instance, smart and connected products are able to establish their own maintenance schedule, or even initiate their replacement at the right time to prevent costly outages.

Predictive maintenance and servicing is only the beginning. Digitally enabled and connected products can be leveraged to take proven methodologies—such as Failure Mode and Effects Analysis (FMEA) and its extension to Criticality Analysis (FMECA)—to the next level. What's the potential economic impact of equipment failure at a customer site? What needs to be done to mitigate failures and ensure sustained customer satisfaction? Massive amounts of data need to be continually analyzed in real-time to deliver the answers. By identifying, prioritizing, and tackling issues upfront, before vital business processes are affected, manufacturers can prevent liabilities or a damaged reputation. For instance, if a product has to undergo maintenance work or needs to be replaced, a maintenance process or a purchase order can be initiated automatically.

Embedded intelligence drives differentiation

By providing their high-value products with communication capabilities and embedded software, manufacturers can differentiate and grow their business. For instance, manufacturers can enable customers to configure products for their specific needs via a standard web interface and monitor operating parameters during the product lifecycle. Alternatively, manufacturers can offer software-based services and the Connected Service Experience (CSX) to optimize the uptime and performance of their smart products. Digitally enabled products thus support manufacturers to improve the customer experience, strengthening their position in the marketplace, and preventing plagiarism.

Digital Manufacturing: The digital transformation journey to smart, connected products and plants
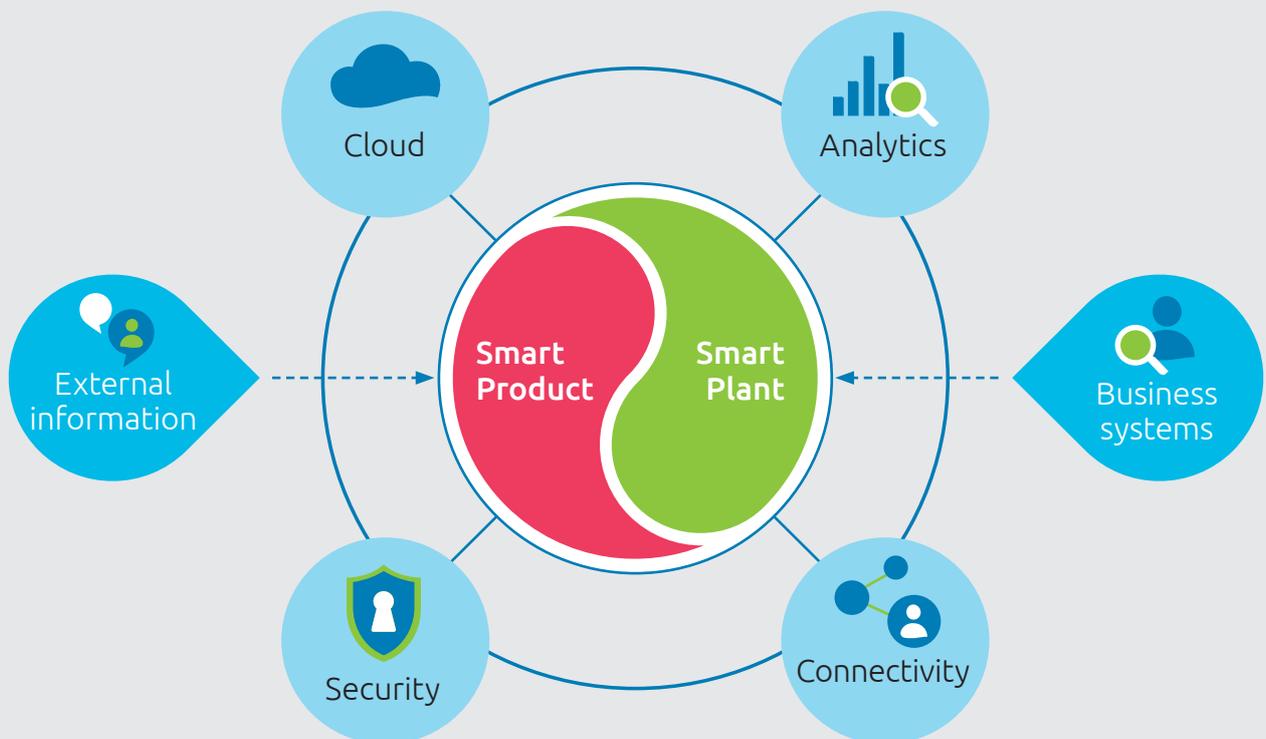
Source: https://www.capgemini.com/resource-file-access/resource/pdf/digital_manufacturing_services.pdf

Paving the way for innovative business models

From the conceptual design of products and assets to full production, digital technologies are transforming the discrete manufacturing business. The growing expectations of digitally empowered customers further accentuate the need to embrace digitization across the manufacturing value chain. Smart, connected products, assets, and operations offer considerable potential for time to market reduction, productivity gains, cost savings, new revenue streams, and new business models such as mass customization, product-as-a-service, or customer-of-customer needs.

End-to-end support along the digital transformation journey

Through their partnership, Capgemini and SAP jointly address the digital transformation needs of companies in the discrete manufacturing industries. This partnership combines SAP's suite of SAP S/4HANA® software solutions with Capgemini's global expertise in consulting, insights and data, cloud, and digital manufacturing. Providing highly secure connectivity, mobility, analytics, and cloud business solutions, Capgemini and SAP jointly help manufacturers steer their digital transformation journey toward smart, connected products and plants plus new business models.

Going digital creates significant opportunities for companies in the discrete manufacturing industries. The "Fast Digital 4 Discrete Industries by SAP and Capgemini" initiative helps manufacturers create smart, connected products, assets, and operations that offer the potential for time-to-market reduction, productivity gains, cost savings, and new revenue streams.

Why now for manufacturers? The driving forces behind the move to digital

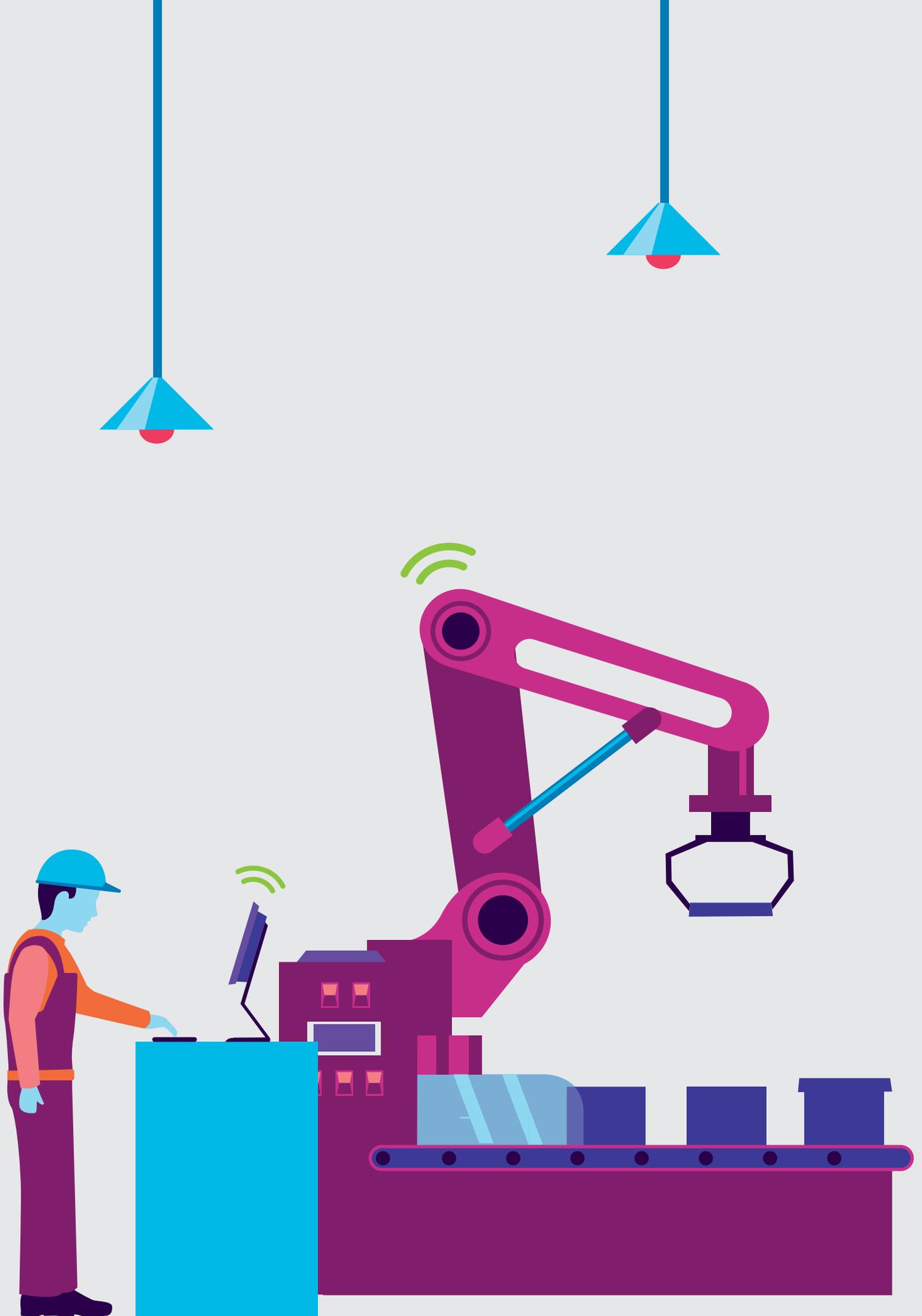**Customers of customers' needs**
Extended customer experience

Mass customization
Configure/make to order

Product as a Service
Pay per use, pay how you use

Manufacturers must address these fast growing expectations and become even more competitive in the face of globalization.

Source: supplied by Capgemini

Imperatives and challenges of going digital

While entire industries including telecommunications, financial services, and the travel industry recognize the digitization of business as a strategic imperative, the vast majority of manufacturing companies remain reluctant to brave the challenges of going digital. As a result, many manufacturing companies have started to go digital only in specific disciplines, such as operational excellence.

Sustained business success in the digital economy hinges on both company initiative and organizational realignment. The digital transformation requires new thinking as operations and information technology converge. Capgemini and SAP together provide what it takes to help manufacturers overcome the challenges of their digital transformation journey.

Digital maturity of the manufacturing industry
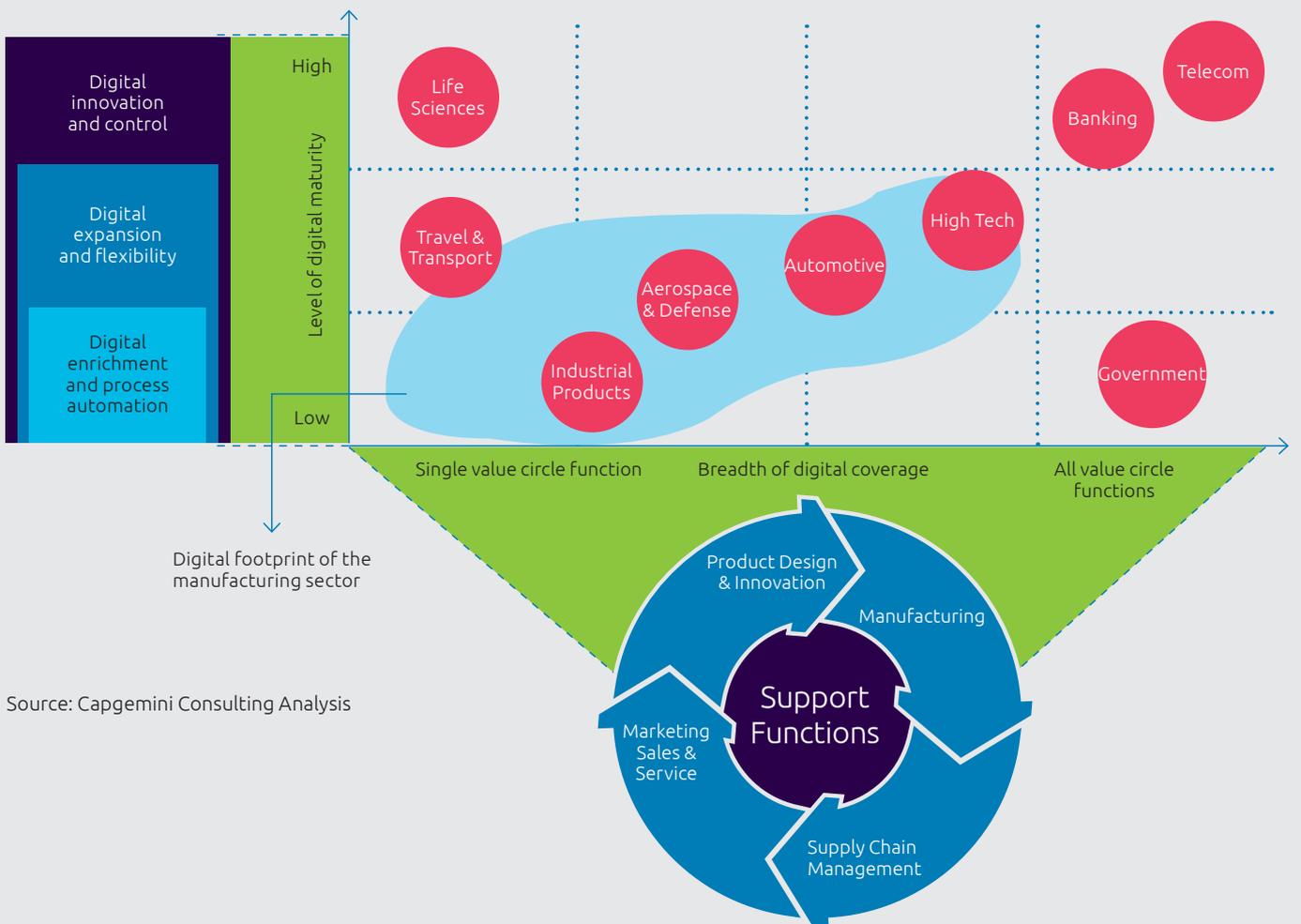
Source: Capgemini Consulting Analysis

Ecosystems for collaboration

A considerable number of manufacturers have made good progress in connecting their internal plant and digitally transforming their internal processes. Numerous companies are incorporating Cyber Physical Production Systems (CPPS) in their production processes. These systems enable machine-to-machine communication and help render manufacturing facilities increasingly autonomous.

Nevertheless, the horizontal integration of business partners along the supply chain is still seen as a major challenge. For many manufacturers, this means exploring unfamiliar terrain. That is because building ecosystems for collaboration with external partners requires manufacturers to thoroughly rethink their organizational structures as operations and information technology converge.

Digital transformation is about business transformation

First and foremost, the digital transformation is also about business transformation. To make this transformation deliver on its promise, manufacturers need to adopt a mindset that drives and supports collaboration with external partners along the extended value chain. Organizational structures need to be continually revised and adapted to ensure that collaborative business models can be leveraged for productivity and efficiency gains.

A Capgemini study entitled "Digitizing Manufacturing: Ready, Set, Go!" points out that one of the biggest hurdles for manufacturers is to change the traditional understanding of roles and responsibilities in which IT is seen as a service provider. In the course of the digital transformation, the IT organization becomes more involved in manufacturing core competencies. The same study identifies digital leadership as key to changing this mindset and promoting the IT organization as a business partner.

Capgemini uses an agile model for business transformation based on its Digital Transformation Framework. It is uniquely tailored for the manufacturing industry and spans the exploration, design, and development of specific solutions to pave the way for new, collaborative business models and scenarios.

In their business transformation, manufacturers can employ SAP's digital business framework as a holistic approach that embraces supplier collaboration across spend categories, customer experience across all channels, core business processes (engineering, sales, supply chain, manufacturing, aftermarket service, procurement, finance, IT, and human resources), workforce engagement and digital products to drive differentiation and shape new business models.

From vision to roadmap

To be successful, the digital transformation needs to build on a consistent digital vision shared by the manufacturing company's senior management, including the C-level, as well as by all lines of business involved. This vision provides the basis for an agenda on how and where to leverage digital across all business functions. Manufacturers should design their digital agenda with a clear outline of the strategic business objectives to be achieved. Commitment to these objectives by all management layers must be ensured before the transformation process commences.

When the transformation domains and initiatives have been selected and prioritized, a digital roadmap needs to be created outlining the phases of transformation details. The digital roadmap makes the transformation journey tangible and is ideally built on a common set of actions defined by management, business representatives from different functions, and IT.

Identifying and closing gaps

Manufacturers are keen to reap the potential benefits of organizational transformation by using digital technologies such as real-time tracking, 3D modeling and visualization, the industrial Internet of Things (IoT), or connected objects. However, these technologies can be challenging to implement on a large scale. Midsize manufacturing companies in particular may feel hard-pressed to design, implement, run, and manage a digitized environment that reaches beyond their boundaries.

Before they embark on their digitization journey, manufacturing companies should undertake a comprehensive digital maturity assessment. A thorough understanding of the current status of digitization in the organization acts as an excellent starting point for a successful digital transformation.

As a trusted advisor to the manufacturing industry, Capgemini provides the expertise to assess the manufacturer's digital maturity and identify any gaps that need to be closed before the company embarks on its digital transformation. In close collaboration with the manufacturer's IT organization, Capgemini consultants deliver training, coaching, and hands-on support during and after the client's digital transformation.

Approach to initiating digital transformation
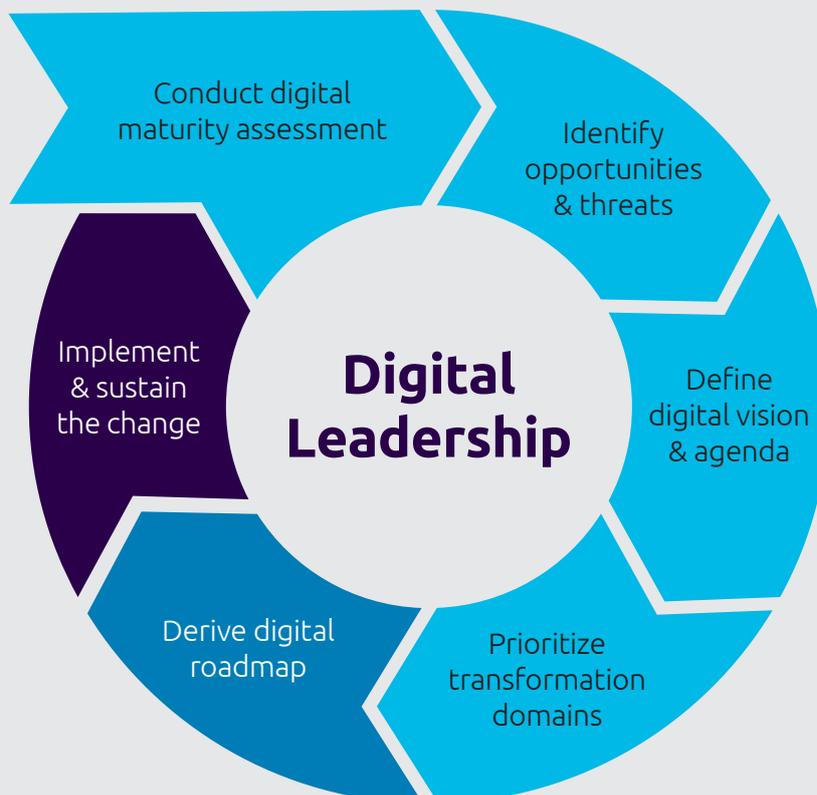
Source: Capgemini Consulting

Many manufacturers are still thinking of "going digital" in terms of either the shop floor or their customer but not both. Only by looking at digitizing and connecting customers, supply chain partners, and smart operations can manufacturers truly realize the optimization and disruptive capabilities of digital to drive growth.

Why manufacturers need to focus on operational analytics

Evidence of the transformative potential of digital and the urgency among manufacturers for digital transformation comes from a recent Capgemini Consulting study of operations analytics adoption by manufacturers. This study indicates that the strategic priority of operational analytics has remained largely unexploited. Today, more than 70 percent of respondents put more emphasis on operations analytics initiatives than on customer-focused processes. However, only 18 percent had extensively integrated their analytics initiatives across business operations and successfully realized their objectives.

Digital maturity dashboard of the manufacturing industry

Digital maturity score
1 = very low
7 = very high

■ **Manufacturing industry**

- - - **Digital top-performers ("Digirati") in manufacturing**
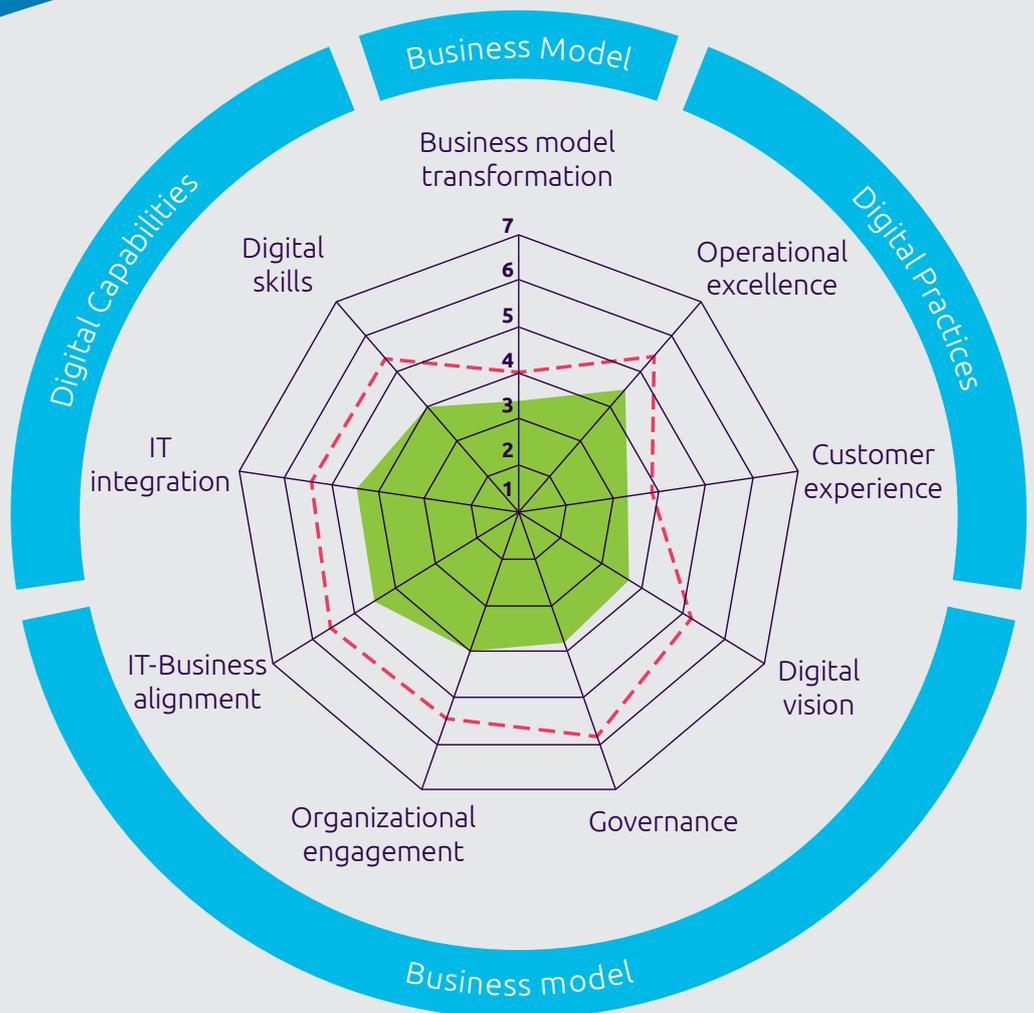
Source: Capgemini Consulting

SAP S/4HANA—at the heart of the digital transformation in manufacturing

The "Fast Digital 4 Discrete Industries by SAP and Capgemini" initiative addresses the technological and organizational challenges of going digital. It leverages Capgemini's proven Digital Transformation Framework and global expertise in consulting, insights and data, cloud, and digital manufacturing with SAP S/4HANA as the digital core.

SAP S/4HANA is an in-memory, end-to-end software suite designed for a digital and connected world. This suite delivers the business intelligence that helps manufacturing companies establish collaborative R&D processes based on one single configurable bill of materials. SAP S/4HANA integrates multi-site manufacturing processes with production planning and work instructions, leveraging current operational data from the shop floor. It supports predictive maintenance and service of the manufacturer's own assets as well as products sold and deployed at customer sites. SAP S/4HANA also takes into account all relevant customer information in real-time to help manufacturers differentiate their respective customer engagements.

SAP S/4HANA is the digital core which clients can use to deliver on the value proposition described in this document. It allows companies to unlock productivity by leveraging a people centric and decision-oriented user experience, as well as expedite time-to-value by utilizing a robust and scalable modern architecture allowing a real-time single source of truth concept.

New revenue streams can ultimately be created by using simulation capabilities to explore new market opportunities, and building on an open platform to maximize Big Data, IoT and social media.

Mitigating risks and vulnerabilities

Capgemini and SAP jointly support companies in the discrete manufacturing industries in their digital transformation journey while keeping mobility, connectivity, analytics, and cloud solutions inherently secure.

High-value industrial installations and manufacturing facilities are prime targets for digital attacks and sabotage. Trust remains the ultimate business currency, making cybersecurity a top priority in the design and operations of digitally- enabled industrial machinery, equipment, and components. Both Capgemini and SAP have cybersecurity solutions in their portfolio that help manufacturers secure their digital transformation initiatives by protecting operations against cyber-attacks and malicious internal behavior. These solutions help to detect and eliminate vulnerabilities, providing robust protection for manufacturers and their customers' and partners' data and business.

Key security services from Capgemini include audit maturity assessment, risk analysis, security policy governance, secure coding, security functional testing, penetration testing, threat intelligence, vulnerability management, security monitoring, and security response and reporting.

On the SAP Cloud Platform (SCP), SAP's API management software provides simple, scalable, and secure access to digital assets through straightforward application programming interfaces (APIs). APIs enable manufacturers to securely integrate their applications with those of third parties via the cloud. There is no need for manufacturers to grant others access to their internal IT environment in order to engage in collaborative business models.
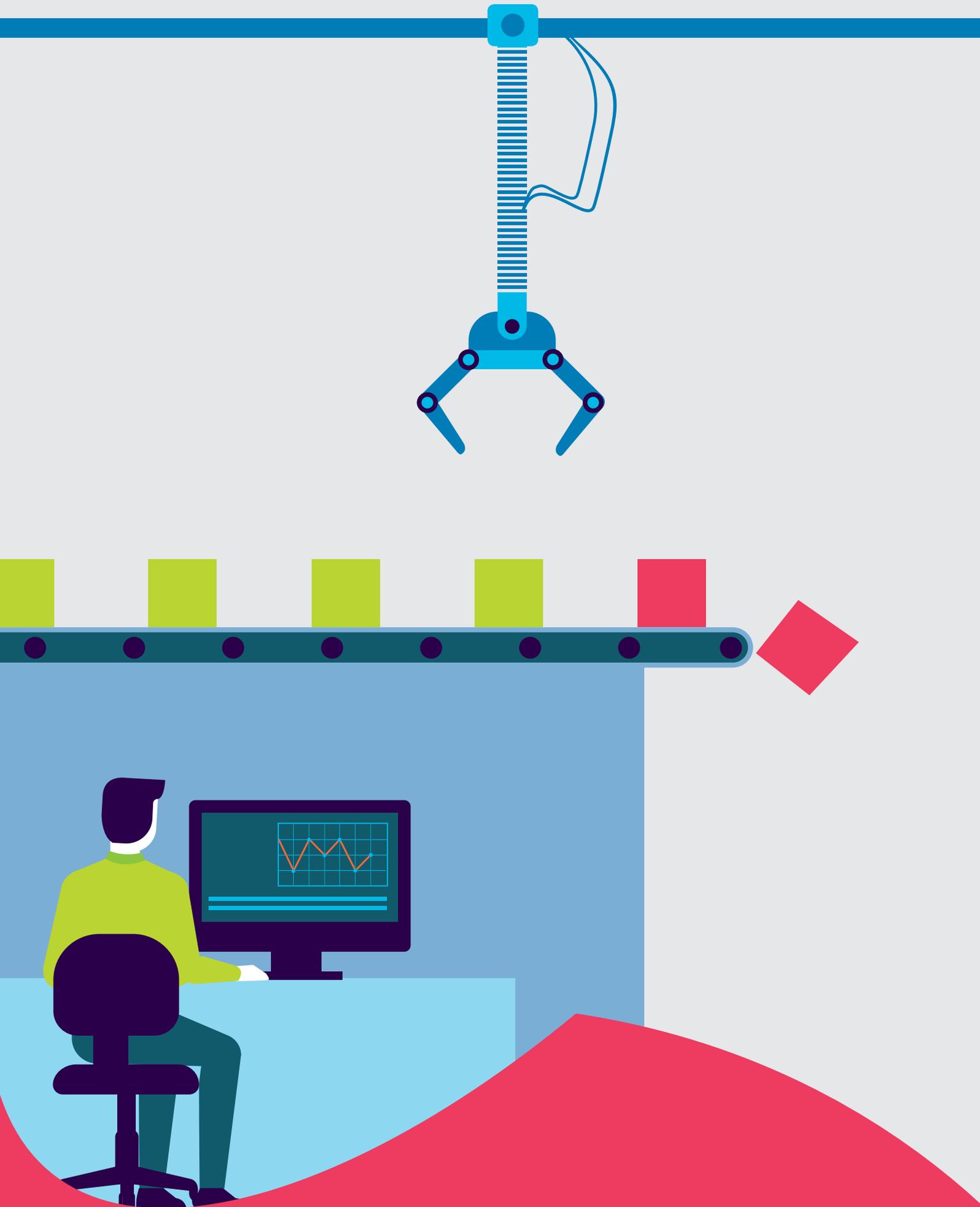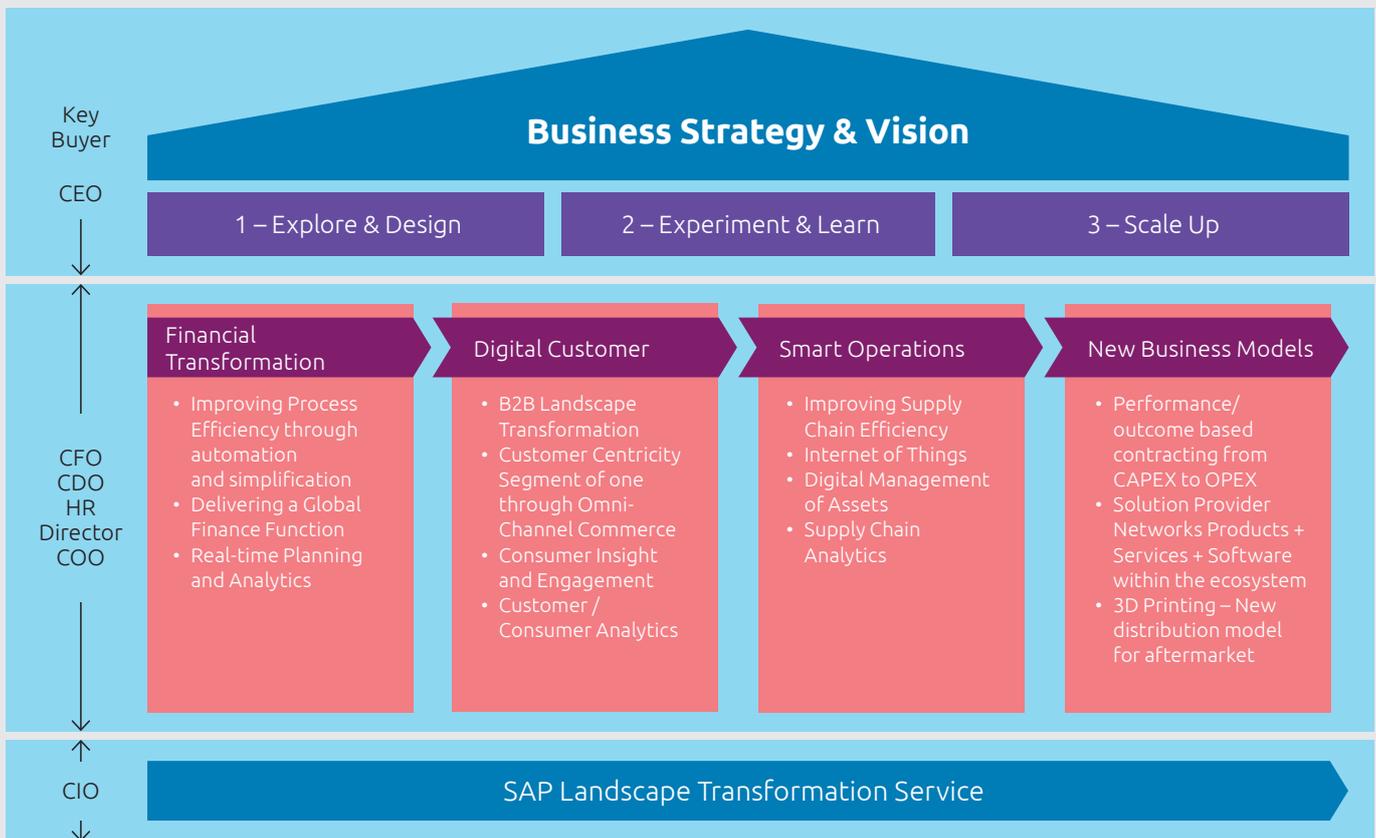
Digital transformation journey

The digital economy is real and will continue to transform the discrete manufacturing industries. Digital value creation implies that manufacturers engage their business partners and customers in entirely new ways. The goal of Capgemini and SAP is to help manufacturers successfully master their digital transformation. Together, Capgemini and SAP, two global players, are uniquely positioned to help manufacturers score quick wins and build on the success of their digital transformation.

How do we drive end-to-end digital transformation?

Key Buyer			
	Business Strategy & Vision		
CEO	1 – Explore & Design	2 – Experiment & Learn	3 – Scale Up

	Financial Transformation	Digital Customer	Smart Operations	New Business Models
CFO CDO HR Director COO	• Improving Process Efficiency through automation and simplification • Delivering a Global Finance Function • Real-time Planning and Analytics	• B2B Landscape Transformation • Customer Centricity Segment of one through Omni-Channel Commerce • Consumer Insight and Engagement • Customer / Consumer Analytics	• Improving Supply Chain Efficiency • Internet of Things • Digital Management of Assets • Supply Chain Analytics	• Performance/ outcome based contracting from CAPEX to OPEX • Solution Provider Networks Products + Services + Software within the ecosystem • 3D Printing – New distribution model for aftermarket

CIO	SAP Landscape Transformation Service

Source: supplied by Capgemini

From mass production to mass customization

The digital transformation paves the way for new revenue streams, generated through innovative business models—such as mass customization or product-as-a-service—that enable organizations to collaboratively create value across corporate boundaries.

A leading automotive manufacturer reports that only two identical cars from one of its top series have been ordered during the last 18 months. The art is to achieve economies of scale in the face of tremendous product variety and ever-shorter product lifecycles. A highly responsive, digitally enabled supply chain is key to generating healthy margins in this scenario.

Taking automation to the next level

In the digital age, it's the intelligent use of technology that drives business success in manufacturing, not low-cost labor. Digital manufacturing allows products to be built-to-order on very short notice. An incoming customer order sets the entire value chain in motion across multiple organizations and multiple sites. Highly flexible processes lower the break-even barrier for short production runs or even for a one-off product.

There are quite a few examples of companies that have started to relocate some of their operations to the United States—General Electric, Ford, or Caterpillar—with the help of automation. They can achieve their ROI goals and they can do it in a way that does not sacrifice flexibility.

The same is happening in Europe. For instance, chainsaw manufacturer Stihl has relocated the bulk of its manufacturing operations to Germany. Ongoing quality issues have prompted Steiff, a traditional German toymaker, to discontinue some of its overseas manufacturing operations and ramp up capacities in Germany. A survey conducted by Fraunhofer ISI identifies the key reasons for this trend.

## *Digitized manufacturing takes adaptability to the next level*

Conventional manufacturing

- Mass production
- Large quantities
- Small margins
- Sequential value chain
- Long turnaround time
- Low flexibility

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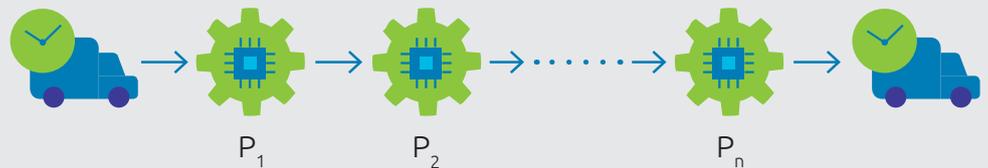
Digitized manufacturing

- Custom production
- Small quantities, short run
- High margins
- Changing collaborative partnerships
- Short turnaround time
- Highly flexible and adaptive

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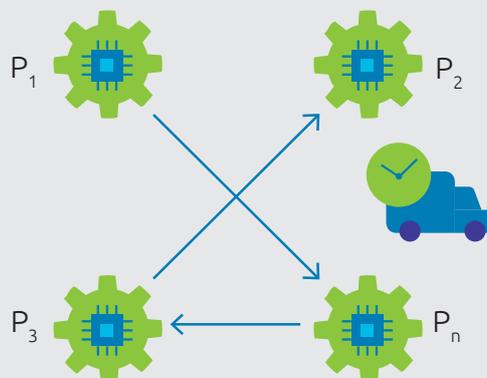
Source: GPS Consulting
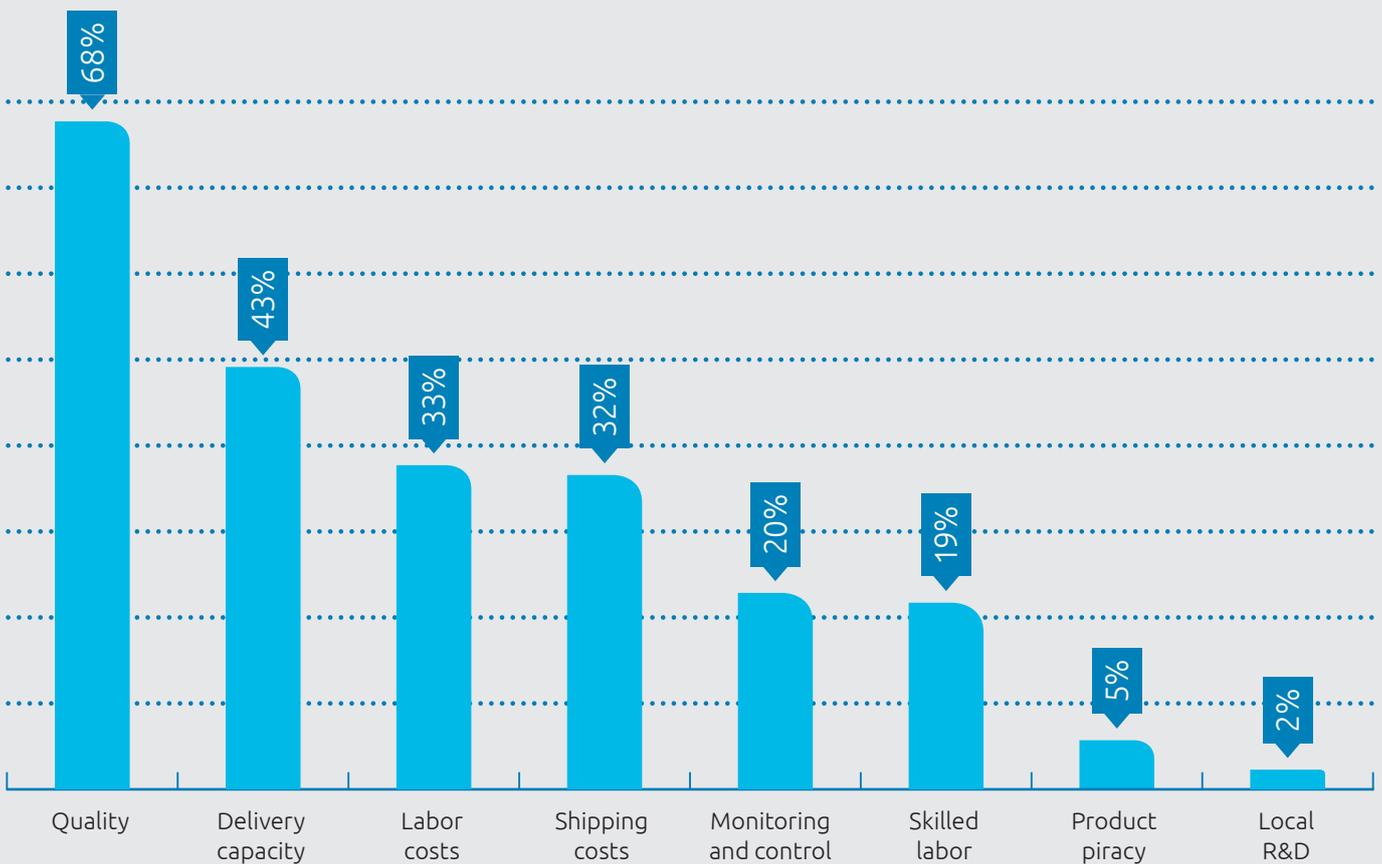
Digitally accelerated development cycles

Technologies such as embedded systems for enhanced product intelligence, smart glasses that leverage augmented reality software, and geospatial technologies that assign geographic information to objects and procedures have begun to deliver a significant productivity boost in manufacturing.

Increasingly, virtual prototyping—a methodology that relies entirely on digitization—reduces or even eliminates the need for physical prototypes by leveraging 3D printing technologies for example. The digital "twin" of the physical product undergoes functional simulation, testing, and proving in a digital environment.

In the automotive and aerospace industries, the rapid pace of innovation could not be sustained without virtual prototyping. In view of the highly complex supply chains in both of these industries, each virtual prototype needs to be made available early on to development partners and products that interact with the prototype. For instance, an engine pod developed by an aircraft manufacturer's supplier needs to be designed such that it safely accommodates a next-generation jet engine.

What motivates German companies to relocate their manufacturing operations back to Germany?

Quality	Delivery capacity	Labor costs	Shipping costs	Monitoring and control	Skilled labor	Product piracy	Local R&D
68%	43%	33%	32%	20%	19%	5%	2%

Source: Fraunhofer ISI survey,
quoted in: http://www.wiwo.de/politik/deutschland/standort-warum-es-viele-unternehmen-zurueck-nach-deutschland-zieht/5609956.html

Digital twin keeps the world's northernmost wind farm in business

One example of the value derived from digitalization can be found in Norway. At Arctic Wind, the world's northernmost wind farm, operators and engineers are always mindful of the weather. Located in Havoysund, Norway, Arctic Wind braves heavy precipitation and blizzards that howl by at 100 miles per hour. To remain alive and well even in the most adverse conditions, Arctic Wind relies on its smart twin. This digital twin mimics two things. Firstly, it mimics the physical structure. Secondly, it mimics the behavior of nature through the Newtonian laws of physics. The digital twin thus provides vital data for predictive insight into what needs to be done to keep Arctic Wind in business.

Improving workplace safety

The Internet of Things (IoT) and the Connected Service Experience (CSX) can be harnessed to make manufacturing workplaces safer for workers. By monitoring machine performance and operator behavior, a company can quickly identify the causes of workplace injury and take immediate preventive action. For example, when the data indicates that an operator is using a machine in an unsafe manner, the operator can receive a message providing specific instructions or an invitation to participate in training. If early indicators of performance degradation are identified, the operator can receive an alert to stop using, or reduce the load on the equipment, and technicians can be assigned a preventive maintenance task.

Enhancing customer retention through better service

Service and parts account for a fair share of car dealer profits. This profit is lost when car owners take their vehicles to independent garages to be serviced instead of to the original dealership. Using CSX, automakers can monitor vehicle conditions in real-time, identify performance issues that prompt an error code or warning light, and proactively contact the driver to order parts and schedule service before the driver realizes that service is required. Initially, some drivers considered the proactive alerts from the dealership to be a clever sales trick; however, when the warning light eventually did come on and their mobility was compromised, they quickly learned to trust the system and accept the proactive offers.

Eliminating scrap and rework

In a manufacturing environment, non-quality means extra cost and a drop in customer satisfaction. On average, non-quality amounts to a 2% sales revenue, mainly due to scrapping and rework. Cloud, connected machines, Big Data and analytics open up new opportunities for both understanding the underlying causes of non-quality within the manufacturing process and drastically reducing the associated costs.

Predictive quality is one of the golden nuggets in the digital manufacturing revolution. Capgemini's predictive quality methodology delivers insights and action plans that envisage changes in the machine configuration, the line organization, or the timely replacement of tools. Predictive quality employs the Internet of Things, sensors, Big Data and analytics to reduce scrap and rework by up to 20%, while reducing raw material consumption by up to 5%.

The Digital Manufacturing Services page on Capgemini's website discusses ways to improve the digital maturity of core manufacturing functions and provides access to video case studies on this topic.

Achieving top scores in Overall Equipment Effectiveness

Manufacturing facilities produce information from a wide range of sources: shop-floor equipment, emissions control systems, quality tracking systems, and more. There are other systems that support these systems too, such as maintenance systems, monitoring systems, and the like. Visibility into the systems on the line is critical, but effective action requires a level of visibility that goes beyond the components on the line itself.

Overall Equipment Effectiveness (OEE) is a key indicator of how well an entire manufacturing operation is used. Visibility into OEE enables manufacturers to take quick action to maintain or improve asset utilization rates, product consistency, quality and yield, energy consumption, emissions compliance, product mix, and other indicators tied to plant operations. Plant managers also benefit from the ability to compare different production lines and plants, helping to establish best practices and drive optimal delivery of production orders to their highest-performing locations. They can identify opportunities for continuous improvement in real-time and rapidly respond to deviations and exceptions.

Digital transformation is not a goal. It's a journey that requires a transparent roadmap with clear milestones and deliverables.

The SAP Industry 4.0 Jumpstart package first assesses system connectivity and the level of automation in the current manufacturing processes. It then initiates operational and business system connectivity as a foundation for OEE monitoring and insight into shop floor operations.

Driving efficiency in production operations

Companies in the discrete manufacturing industries are looking to enhance efficiency on the shop floor and the degree of automation in their production process. To achieve both goals, they need intelligent, interconnected systems as well as visibility into operational performance.

SAP's suite of Industry 4.0 packages spans all stages of the digital transformation of manufacturing operations. In addition to the Jumpstart package mentioned above, SAP provides an Accelerator package and an Advanced package. The Accelerator package establishes an automated, paperless, manufacturing execution and control environment. The Advanced package, slated for delivery in 2017, includes finite and infinite production planning within a single plant or across multiple plants, as well as the assessment of optimal production sequencing. This package is intended to provide advanced manufacturing insight and controls, machine learning, and predictive analysis in quality and maintenance.

What makes a top performer in digital manufacturing?

The digital top performers in discrete manufacturing have started to exploit the growing business potential of their digital transformation across the extended value chain and typical business model. Digital initiatives in manufacturing have created game-changing performance leaps in the top line as well as in the bottom line. Compelling success stories, such as Kaeser Kompressoren, have turned much of the skepticism into a drive for action.

## Helping customers accelerate time-to-value in their digital transformation

Predictive maintenance management and asset intelligence management help manufacturers enhance the uptime, usability, and cost effectiveness of their plant and products. Capgemini's SAP IoT Starter Kit supports manufacturers to accelerate the digitization of their assets. This "Solution-as-a-Service" comes with a preconfigured KPI dashboard, sensors, and middleware for connecting machines, as well as data acquisition and interface capabilities for the SAP S/4HANA back end.

Manufacturing companies need a fast and efficient way to resolve the business process challenges they face on their digital transformation journey. Capgemini's MFGPath helps accelerate the digital transformation while reducing implementation time and upfront investments. Preconfigured to industry-leading practices, MFGPath provides a smart way to implement SAP software solutions in manufacturing operations.

For example, automotive suppliers can use AutoPath, Capgemini's industry-tailored SAP All-in-One ERP solution, to streamline operations. This provides greater visibility and control of core business processes. AutoPath helps organizations both align different operational and production plans with execution and review performance measures for continuous improvement.

The industry knowledge and digitization expertise of Capgemini and SAP support manufacturers in deriving business value and economic benefits from their digital transformation journey.
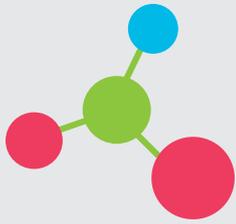
Service-centric business models

In the digital economy, profitable growth is not about working better. It is about working differently. Increasingly, machines and products become part of the information infrastructure, interacting in real time with their users and the world in which they live. This shift generates attractive opportunities for manufacturers to adopt service-centric business models that augment their product offerings.

The following examples have been published and promoted by the manufacturers mentioned via their associated websites. This paper does not suggest that these examples involve the "Fast Digital 4 Discrete Industries by SAP and Capgemini" initiative. However, each example demonstrates how digitization can be leveraged for service-centric business.

Schindler rises to digital service excellence

Schindler, a global manufacturer of elevators and escalators that move a billion people daily, is continually looking at technology innovations that will keep it at the forefront of its industry.

How did Schindler manage to create this level of digital innovation in a venerable company? The answer lies in a structured approach to digital transformation. Schindler had a vision to achieve "Leadership through Customer Service," driven by technology innovation. This includes an online portal—the "Schindler Dashboard"—where customers can check the operational status of their elevators or escalators, make service requests, and get alerts in case of equipment malfunction. This dashboard is also offered as a mobile application.

Rather than wait for customers to inform them of an elevator breakdown, Schindler shares real-time alerts on current or future outages not only with their service engineers but also with their customers. Service engineers use an app to access this information in real-time and attend to the problem without the need for customer intervention. This closed-loop service platform, where everyone has the same, real-time information, marks a first for the elevator industry.

Digitizing its workforce has bestowed multiple benefits to Schindler. For example, the company uses an app that optimizes service routes for technicians by providing them with instant access to data on both iPhones and iPads, saving 40 million kilometers of driving and preventing more than 4,000 tons of emissions per year.

Schindler won the 2015 Digital Business Innovation Award for its "Digital Toolcase," an application that is used by more than 20,000 Schindler front-line employees every day to access technical data, analyze errors, or order parts from the customer site. The company also won the MIT Sloan CIO Leadership Award in 2015 and has been featured in Forbes' Most Innovative Companies list multiple times in the past five years.

Office equipment as a service

One of the world's leading makers of office equipment has shifted its business focus from making and selling its products to delivering holistic document management services. This shift to services involves a pay-per-use billing model supported by a powerful digitization platform that captures, aggregates and analyzes Big Data in real-time. Changes and trends in product usage patterns are readily identified, enabling the company to both realign its service offering or to add services in time with customer demand. For example, customers tend to switch from monochrome to color printing and copying. Today, the company generates more than 50% of its revenues through this service model.

Rolls Royce delivers engine power by the hour

Known for the quality and reliability of its products, Rolls Royce ranks among the aerospace industry's pioneers in offering products as a service. For a selected range of jet engines, the Rolls Royce "Engine Power by the Hour" program delivers a complete engine maintenance service at a fixed rate per flying hour. The key benefit of this program is that it provides aircraft operators with an accurate cost projection and helps them avoid the costs associated with defects or breakdowns.

Service-centric business models have been in use for some time in the discrete manufacturing industries. Digitization can be harnessed in order to lower the barrier to generating lucrative revenue streams through product-related services.
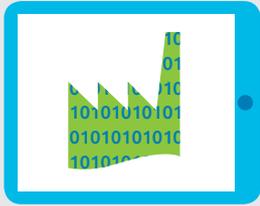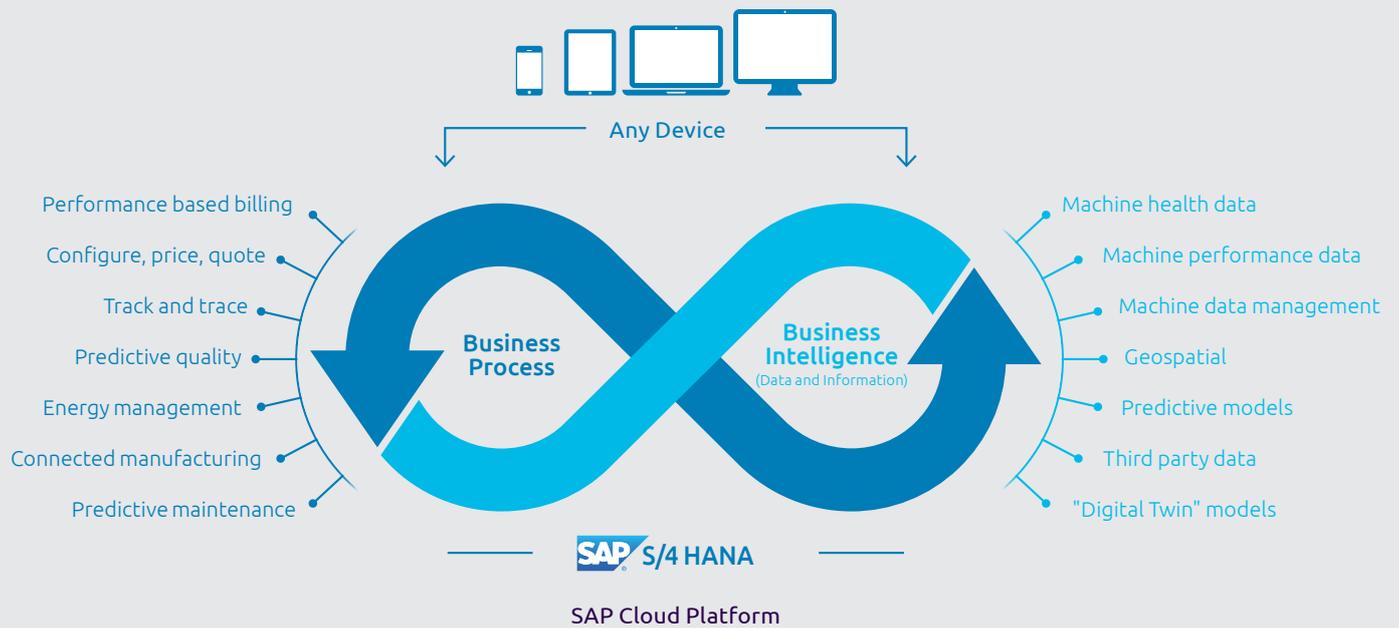
Making the digital manufacturing transformation happen

Companies in the discrete manufacturing industries need to see their digital transformation as a journey. This journey requires a vision, a roadmap, a comprehensive approach, and a long-term commitment to changing processes, IT, mindsets, and the culture of an organization. As information technology (IT) and operations technology (OT) converge, digital technologies will be the main drivers for the fusion of the physical and the virtual worlds.

Building a seamless, connected, and live enterprise that can work in harmony across departments, such as finance, human resources, extended supply chain, procurement and customer engagement, in combination with insights collected in real-time from your operations and externally, through machines and IoT, to serve and delight customers has become the holy grail of many business and IT leaders. Top performing companies will look beyond simple, isolated, projects to a broader digital vision—a live enterprise. From the very core, to the edge of the enterprise and beyond,

Smarter decisions + smarter transactions = smarter business

Any Device

Performance based billing
Configure, price, quote
Track and trace
Predictive quality
Energy management
Connected manufacturing
Predictive maintenance

Business Process

Business Intelligence
(Data and Information)

Machine health data
Machine performance data
Machine data management
Geospatial
Predictive models
Third party data
"Digital Twin" models

SAP S/4 HANA

SAP Cloud Platform

Source: SAP

Capgemini and SAP have joined forces to drive the complexity out of the digital transformation.

Are you ready to go digital? - This is the perfect time to get started.

digitization stands to transform every facet of your organization. Embracing this transformation allows companies to capture every opportunity presented in a digital world.

SAP S/4HANA, SAP's digital core and next-generation in-memory ERP suite, together with SAP's cloud applications and SAP Cloud Platform, work in sync to help businesses become live and break away from boundaries and limitations of the past. Today, in-memory computing and modern cloud architectures have removed the technical constraints of the past, opening the door to a new suite of in-memory integrated enterprise applications. Whereas enterprise line of business software applications of the past were heterogeneous, disparate, and siloed, the new SAP modular suite of solutions powered by SAP HANA is seamless, connected, and integrated.

To benefit from new digital opportunities, manufacturing companies need partnerships that provide skills, competencies, and technologies beyond the scope of their core business. This is where the "Fast Digital 4 Discrete Industries by SAP and Capgemini" initiative comes in. This joint GTM initiative

drives the complexity out of the digital transformation, allowing manufacturers to attain the agility they need for sustained success in digital business.

Combining Capgemini's global expertise in consulting, insight, and digital customer experience with SAP's suite of SAP S/4HANA digital solutions, we have what it takes to make the digital manufacturing transformation happen. Together, we provide our customers with the digital foundation for their core business processes and the platform for effective collaboration both within and beyond company boundaries.

Capgemini and SAP plan to innovate and invest in the development of new applications and extensions on SAP Cloud Platform, all while engaging with an ecosystem of start-ups and vendors in the manufacturing space to provide clients with end-to-end solutions.

Discover the value a digital core can deliver to your organization with the SAP S/4HANA Value Advisor and explore the SAP S/4HANA roadmap today.

For more information

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About SAP

As the market leader in enterprise application software, SAP is at the center of today's business and technology revolution. SAP helps you streamline your processes, giving you the ability to use live data to predict customer trends – live and in the moment. Across your entire business. When you run live, you run simple with SAP.

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About Capgemini

A global leader in consulting and technology services, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of 200,000 team members in over 40 countries. The Group reported 2016 global revenues of EUR 12.5 billion.

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Find out how our Discrete Manufacturer services help empower your organization's digital transformation journey.

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