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INTELLIGENT INDUSTRY:

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INTRODUCTION TO INTELLIGENT INDUSTRY

POST-COVID-19, WHICHEVER INDUSTRY YOU LOOK AT—TRANSPORTATION, ELECTRONICS, AEROSPACE, AUTOMOTIVE, COMMUNICATIONS, ENERGY, UTILITIES, LIFE SCIENCES, SEMICONDUCTORS, AND MANUFACTURING— CHANGES ARE HAPPENING IN THE MOMENT AND IN WAYS THAT WILL UNFOLD OVER THE YEARS. WHETHER IT'S DRIVING ASSISTANCE, CURATIVE HEALTHCARE, OR GREENER ECONOMIC MODELS FOR AIR MOBILITY, COMPANIES NEED THE STAMINA TO RIDE THEIR OWN UNIQUE WAVE OF GROWTH.

The way products and the services are designed, manufactured and consumed is driving game-changing business models and redefining value chains. In every industry, companies must find smarter ways to compete and meet customer expectations in three ways:

01 Designing now for the next generation where digital is embedded in everything

02 Gain an unfair advantage by optimization in increasingly complex value chains

03 Breakthrough in environmental sustainability, while finding small wins

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Designing now for the next generation where digital is embedded in everything

Companies are seeking to control more of their destiny – and digital allows for that – by paving the way for direct relationships with customers. That's not new. The status quo is to embed data, cloud, software, and silicon into vertical offers – which is now business as usual. What is relatively new is the full appreciation that enterprises with physical products and field operations must quickly scale technology and innovation for broader adoption.
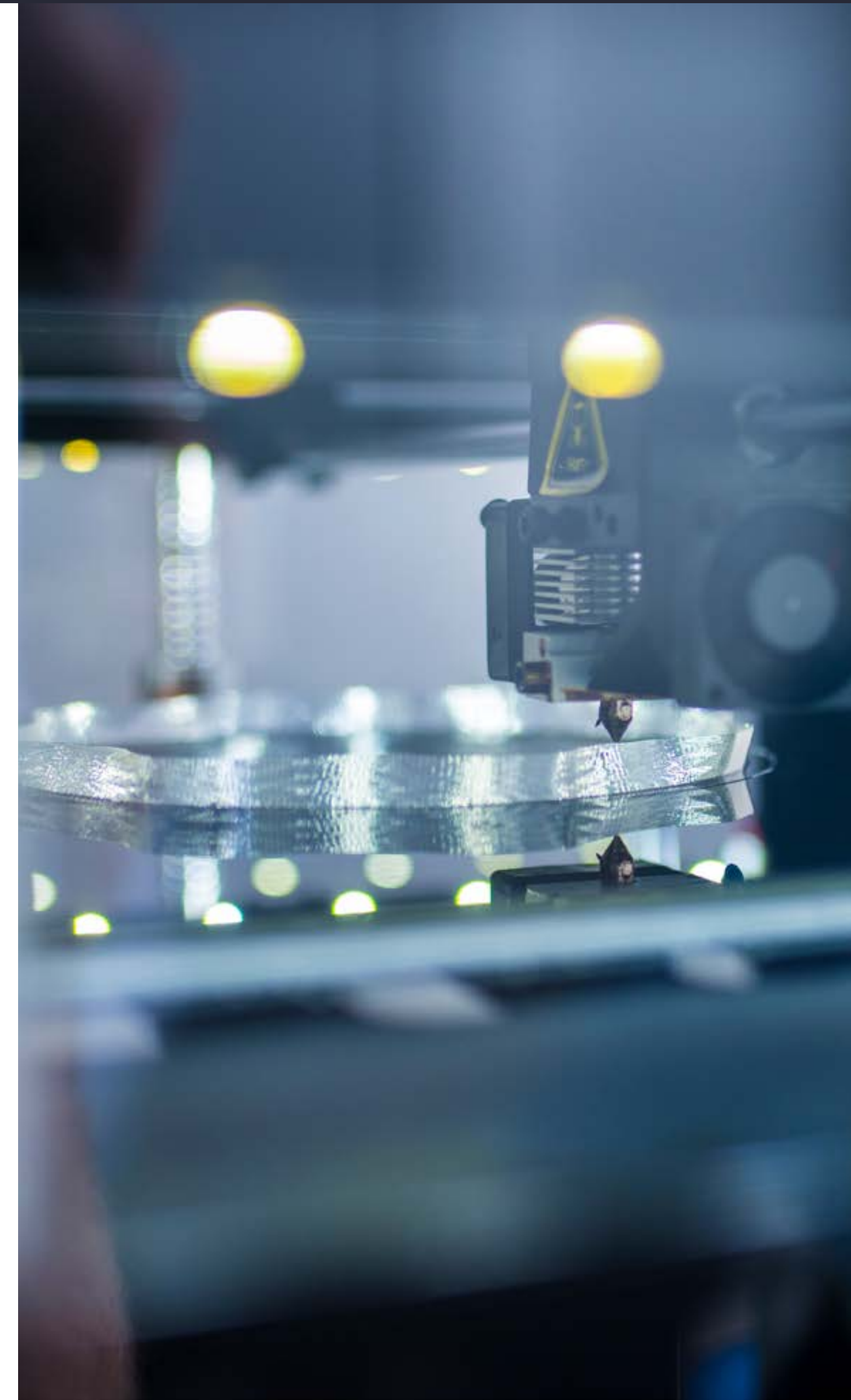
Long, drawn-out transformations are outdated. Instead, companies are now forced to "just do it." Last year alone, we saw food delivery become a new habit, rapid vaccine development, measured in months, not decades, hybrid sports for virtual spectators, remote doctor visits, and the acceleration of product design, engineering, and manufacturing because of digital capabilities.

There is no ivory tower of innovation – technology must be diffused quickly into operations because it is a pillar of growth. Of course, there are innovations that are still exotic, such as quantum computing, brain-machine interfaces or fully autonomous driving where the full value is not yet clear for industry. But for the most part, digital technology as we know it is now a mainstream endeavor.

Consider buying a car. It is no longer about the metal or horsepower. It's about the software that defines the brand. The "car" as a product is determined by car ownership models, a digital interior, and whether the vehicle can make informed decisions. Emphasizing the paramount importance of technology implies a strong engineering discipline with software at the core to solve complex problems in safety-critical mobility experiences, whether it is all-electric vehicles, robo-taxis, or autonomous trucks and shuttles. Companies are grappling with how best to merge the physical and digital in trains, planes, automobiles, healthcare products and services, smart factories, smart cities, etc. The best margins and strongest growth will come when the core of the physical product is software and sensors.

💡 Key Insights

• Deploy software-defined functions to avoid pushing new hardware and develop roadmaps for the roll-out of microservices and associated technologies like containerization and orchestration

• Scale the application of scientific knowledge, mathematics, and algorithms to do things differently in the customer experience

• Scale AI and automate manufacturing to improve yield, unit margin, quality control, etc.

Gain an unfair advantage by optimization in increasingly complex value chains

Most companies that design or manufacture products do not fail because of a poor concept or market opportunity. They fail because they don't have enough runway to scale operations to meet demanding customer expectations. They face heavy investments in manufacturing, onerous safety certification approvals, and complex production, supply chain, and production activities. Designing with critical issues of scale in mind, from the ground up, helps when there is high-intensity product development.

While "design for" techniques are well known, companies can now simulate the entire production process and supply chain dynamics and find ways to innovate, lower cost, reduce waste, and design for anything. Even before a product is manufactured, the design can anticipate alternatives through the up-front power of simulation of both discrete and model-based systems engineering. Companies can experiment with different scenarios before and after the fact with customers, supply chain and ecosystem partners by answering questions such as "what's best?", "what if?" and "what's next?" They can evaluate the impact of each decision before taking too many real-world risks.

For example:

88%+
supply chain leaders reported that their supply chains were negatively impacted during Covid-19.

66%
said supply chains needed to change significantly to adapt to a new normal after the pandemic.[1]

One consequence has been the severe semiconductor shortages in the first half of 2021 that touched just about everything we use daily, at least anything that needs electricity. While revisiting the supply side of the equation is part of the solution, another is to revisit the consumption model of chip-centric products by placing more of an emphasis on software-defined functionality in the design so there is more independence from hardware changes.

Key insights:

- Apply high performance simulation technology in the design phase as well as in the validation/certification of products and algorithms

- Stress the importance of "design for" techniques that are supported by numerical simulations, machine learning, generative design and "good old-fashioned AI" for better reasoning

- Integrate as-designed, as-built, as-operated product and process digital twins to optimize the quality and availability of information

Breaking through in environmental sustainability while finding small wins

Sustainability and climate change are integral to business and political conversations. For example, sustainability was center stage at the 2020 WEF conference in Davos2 and G20 summit.3 It's also a high priority for the Biden Administration's agenda, and of course, the COP26. Now, corporate sustainability initiatives are discussed at the board level and impact all aspects of the business, whether at the product, process, or system level.

A bias for action is the need of the hour for corporate sustainability initiatives. It is about setting long-term targets and achieving them with a series of modest short-term wins. This approach includes aligning with government agencies to tackle longer-term ambitions. Companies have many options to pursue corporate energy and resource efficiency initiatives to reduce CO2 emissions, improve operational health and safety, and initiate circular economy principles. Companies can progress their sustainability goals by implementing a comprehensive six R approach that includes **reduce, recycle, reuse, recover, redesign, and re-manufacture.**

For example, successful manufacturers are looking at reducing their transport carbon footprint by environmentally focused inventory management, using recycling, sourcing sustainable parts and materials, and taking back end-of-life products from customers so as to disassemble and use them in the remanufacturing process.

💡 Key insights:

• Take a more comprehensive approach across the six Rs of sustainable manufacturing to expand the meaning of a product's lifecycle beyond design, build, operate and dispose to include beyond end-of-life

• Use innovation to scale sustainability solutions such as simulation to forecast energy consumption and industrial impact on the environment

• Work with customers and suppliers to reduce indirect emissions and build transparency through credible reporting

2

CAPGEMINI AND AMAZON WEB SERVICES –

Intelligent industry approach

Everything a company does is being digitized, leading to new platforms and portfolios. For example, interconnected systems drive predictive maintenance for entire infrastructure projects across transport, manufacturing, and beyond. IoT sensors installed into machines, products, and workstations collect data which allows businesses to minimize downtime and improve safety.

This is where the Capgemini and AWS partnership delivers fresh possibilities. We creatively combine operational technology and information technology, from edge and IoT to cloud, data, analytics, 5G connectivity, AI and machine learning.

Our Intelligent Industry approach encompasses four components to unleash unstoppable innovation:

01 **Intelligent products** that are smart and connected to create new capabilities for everyday devices

02 **Intelligent systems** producing these products through IoT and machine learning, minimizing manual intervention

03 **Intelligent products** that enable supply chains, factories, plants and networks to become more sustainable, efficient and cheaper to run by reducing waste and environmental impact

04 **Intelligent support and services** that allow for products to become the center of ecosystems, leading to new business and revenue models

Realize limitless potential with Capgemini and AWS

The launch of Capgemini Engineering unites a unique set of strengths – the world-leading engineering and R&D services of Altran and Capgemini's digital manufacturing expertise. Together, Capgemini and AWS are driving breakthroughs in how industries engineer the products and services of tomorrow.

Capgemini is the only global partner with both the depth of product engineering and the breadth of ability to master data and deploy operational and information technology at scale. Uniquely placed to help the industry reach new heights, we help our clients innovate and differentiate in this dynamic space. Capgemini Engineering supports the convergence of the physical and digital worlds with broad industry knowledge and cutting-edge technologies in digital and software.

Starting with manufacturing, this eBook explores how AWS and Capgemini have put together sector-specific, technology-driven solutions with expertise and services, so manufactured products are relevant, get to market faster, and have an impact.

Capgemini Engineering's powerful expertise is combined with AWS's driving force behind Amazon's stellar track record of designing, manufacturing, and distributing billions of smart products with automation, machine learning, AI, and robotics. Together we make it easier for industrial customers to innovate, automate, and scale workloads on AWS through purpose-built and managed services and solutions.

Premier consulting partner

Capgemini

Recognised for:

5
Partner programs

3
AWS service validations

7
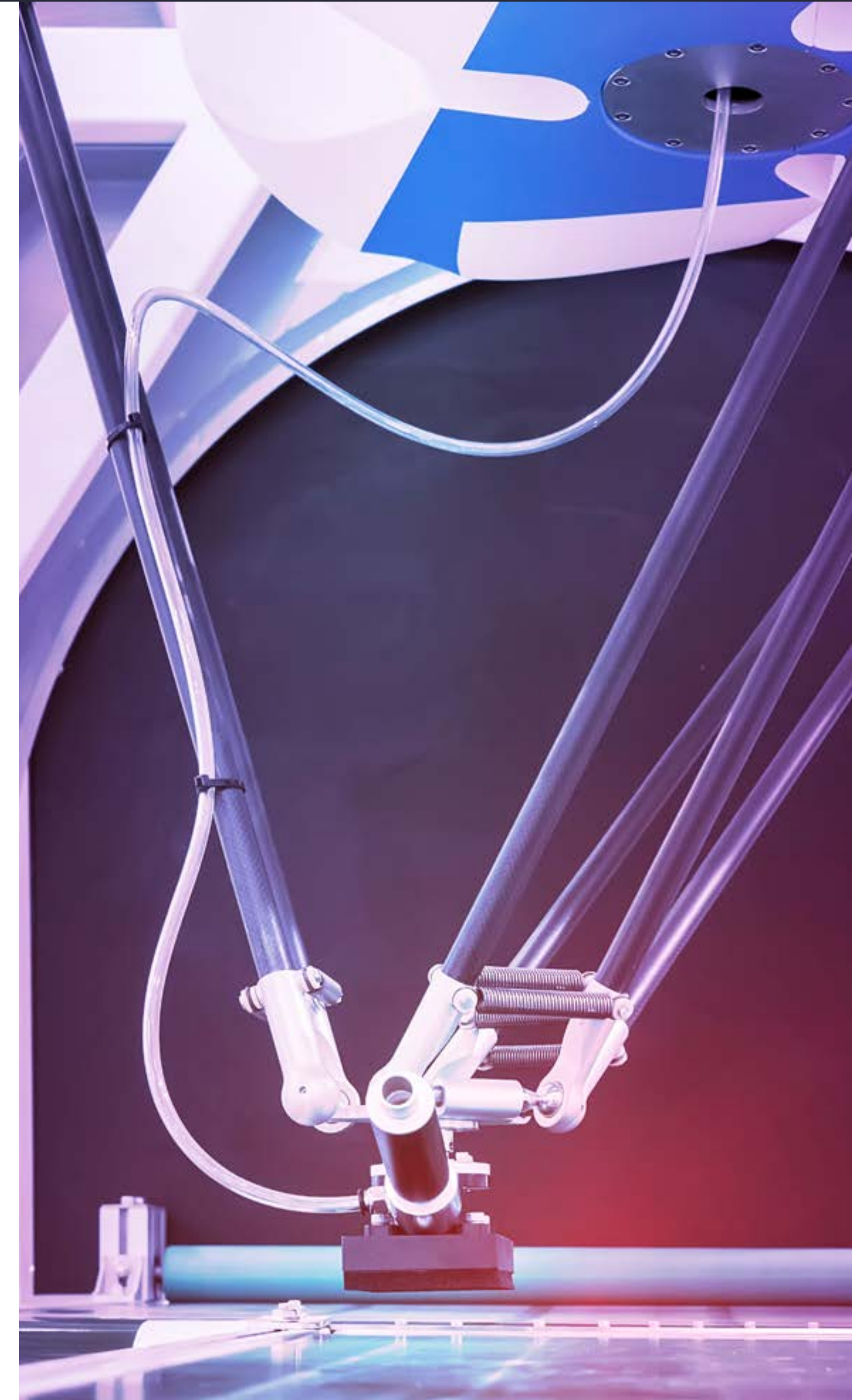AWS APN Competencies, including IoT and Industrial Software

100+
AWS customer launches

4000+
AWS certifications

3

UNLOCKING THE VALUE OF INTELLIGENT INDUSTRY IN MANUFACTURING

It's never been more important to improve productivity and stay competitive. Since the arrival of Covid-19, challenges have been amplified, and new ones have emerged, such as changing safety standards in production and keeping up with the rise in online purchasing.

In 2020, manufacturers ranked their top business objectives for digital investments[6] as:

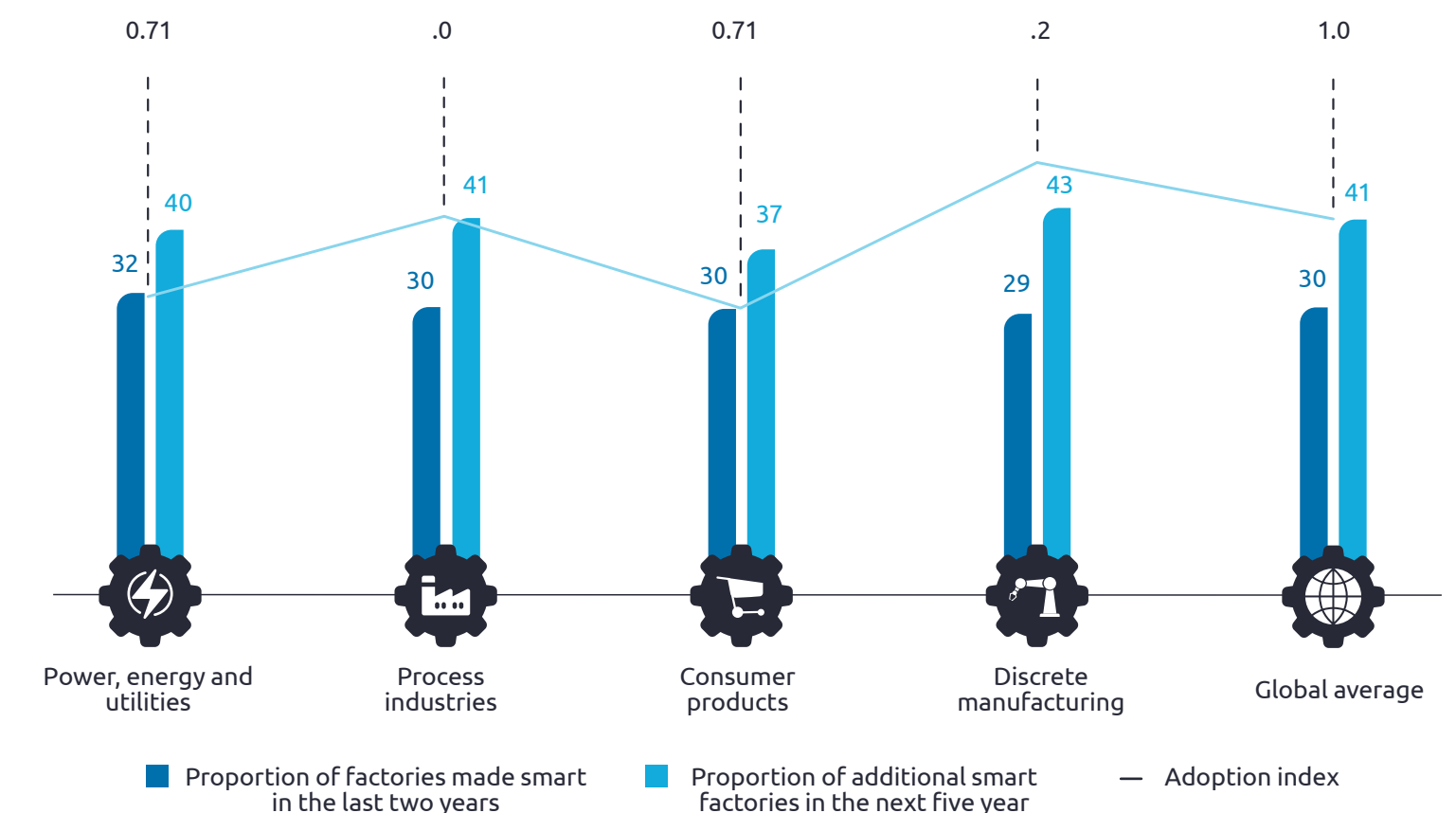**42%** improving customer experience and satisfaction

41% enhancing operational efficiencies

40% launching new products and services

Source: Capgemini Research Institute

The growing appetite for smart factories – a crucial part of Intelligent Industry – is a testament to its powerful benefits. For example, **68% of manufacturers now have ongoing smart factory initiatives, compared to just 43% in 2017.[7]** The economic potential is staggering, driven equally by closed-loop operations and efficiency by design. Recognized across the globe, China, Germany, and Japan aim to aggressively adopt smart factories in the next five years, closely followed by South Korea, the US, and France.

Percentage of factories that were transformed into "smart" operations in the last two years and future expansion plans, by sector

	Power, energy and utilities	Process industries	Consumer products	Discrete manufacturing	Global average
Adoption index	0.71	.0	0.71	.2	1.0
Proportion of factories made smart in the last two years	32	30	30	29	30
Proportion of additional smart factories in the next five year	40	41	37	43	41

■ Proportion of factories made smart in the last two years ■ Proportion of additional smart factories in the next five year — Adoption index

Relevant trends in manufacturing:

Operational intelligence

Scaling AI in manufacturing operations from product development to quality control is uncovering clear business value. Using readily available data and know-how, operational teams can accelerate transformation and achieve results rapidly. For example, a computer vision system allowed GM to detect 72 instances of component failure, preventing substantial downtime **(a single minute of which can cost a company of that size up to USD 20,000)**.[8]

Visibility, analysis and optimization of business processes

Identifying and reducing bottlenecks, manufacturing processes are benefiting from real-time vision. Risks of breakdowns can be tackled before they even happen, making way for fast and effective industrialization of new products.

Smart factories

By turbo-charging manufacturing performance, **manufacturers can expect on-time delivery of the finished products to accelerate by 13 times**, while quality indicators are set to improve at more than 12 times the rate of improvement since 1990. What's more, overall productivity and labor cost improvements are reported to accelerate at seven times and nine times the rate of growth since 1990, respectively.

Cyber-physical systems

Producing vast amounts of new data to harness sources such as smart manufacturing equipment, connected machines, and digital assets revolutionizes how manufacturing is planned and executed. For instance, digital twins help integrate information technology with operational technology, while the Internet of Things and predictive analytics enable actionable insights to improve capital efficiency, production capacity, and capability.

Relevant trends in manufacturing:

Product-as-a-Service

It's no longer a question of whether you will need to develop and adopt new business models for the digital era – it's how. Capgemini has helped many organizations embrace and achieve this, including a manufacturing powerhouse, by bringing together its experience and expertise to create a new digital agency.
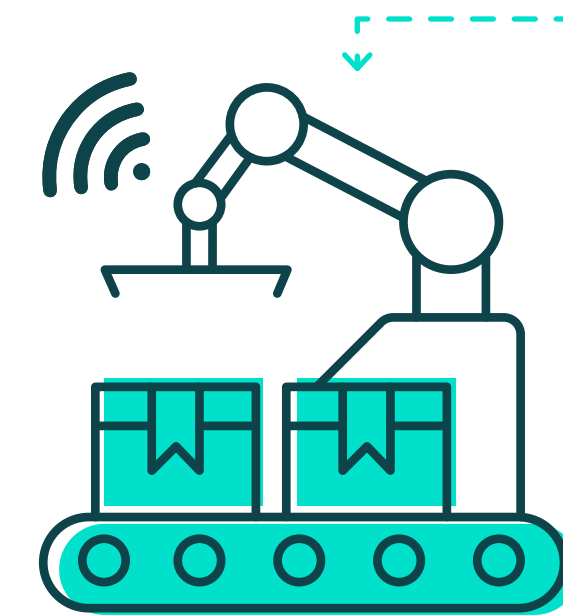
Digital supply chain

Keeping the supply chain connected without compromising time-to-market is crucial for manufacturers. To achieve this, they need connected products driven by APIs.

4
BARRIERS TO INTELLIGENT INDUSTRY

Despite the overwhelming benefits for manufacturers, many are struggling to embed digital into all products and processes – and do the things necessary to move to more productive manufacturing and operations.

Just 6% of manufacturing companies believe their organization has been fully digitized.[10]

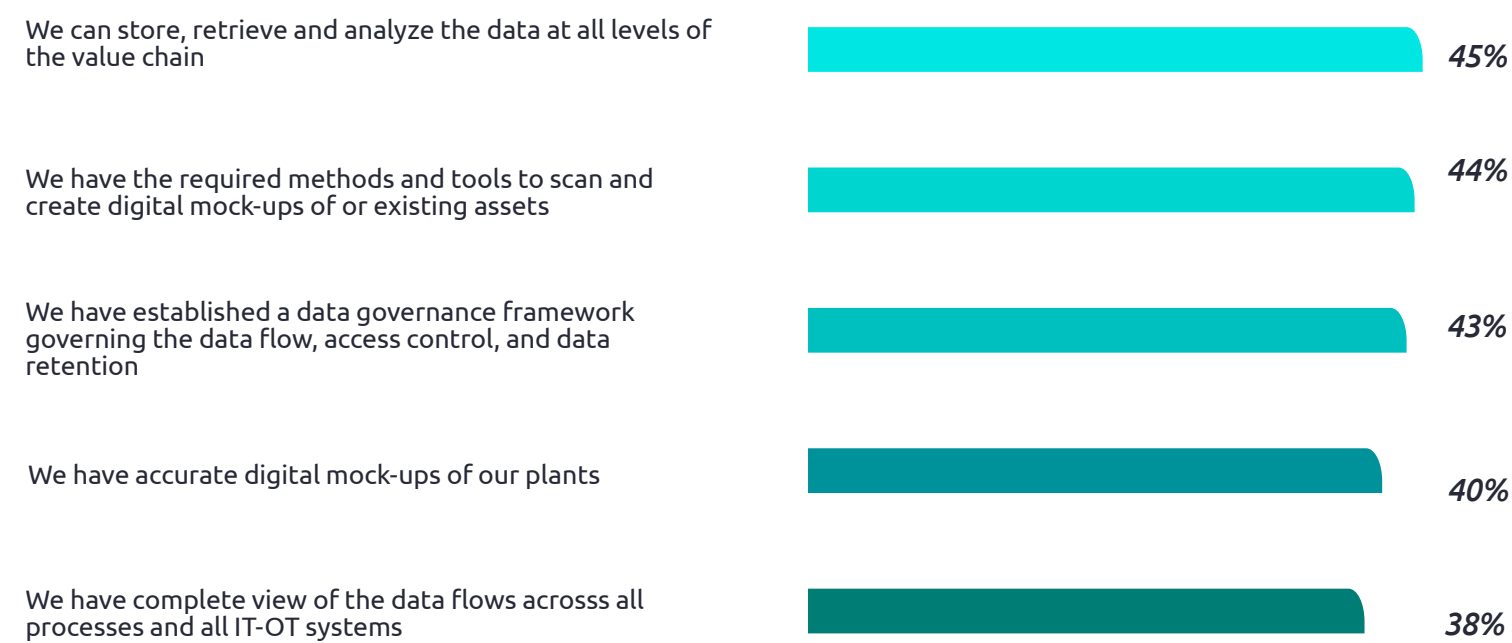Source: Capgemini Research Institute

What's stopping them from scaling their initiatives and how can they turn challenges into opportunities?

The key challenges manufacturers face today:

1. Distributed and decentralized data access

Manufacturers struggle to access and integrate data from multiple machines with hundreds of different machine communication protocols, on-premises software applications, and legacy automation systems. **Just 45% of organizations can access and analyze data from across their value chain.[11]** Despite this, data readiness can be achieved by converging IT and OT using AWS services such as **IoT Sitewise, Greengrass, Panorama, and Monitron** to ensure data accessibility and continuity at every point.

Share of organizations with advanced data capabilities

We can store, retrieve and analyze the data at all levels of the value chain	45%
We have the required methods and tools to scan and create digital mock-ups of or existing assets	44%
We have established a data governance framework governing the data flow, access control, and data retention	43%
We have accurate digital mock-ups of our plants	40%
We have complete view of the data flows acrosss all processes and all IT-OT systems	38%

Source: Capgemini Research Institute, Smart factory survey, April-May 2019, N=1,000 manufacturers.

2. Data quality and management

Once this crucial data is accessed, businesses are held back by the seemingly impossible task of organizing abundant, unstructured streams of machine data combined with structured data from information technology systems. Implementing data lakes using **Amazon S3** combined with **Redshift**, a cloud data warehouse, overcomes this issue, giving manufacturers the means to have flexible and scalable management. The result is "closed-loop" operations that will ultimately become self-optimizing.

3. Scale of operations

Scaling is key to managing industrial assets, device fleets, and data across sites. However, many companies struggle to do this due to impeding factors such as remote sites with limited connectivity. So far, no technology or platform has been completely adopted in the majority of production lines, which has halted the ability to scale smart factories. Manufacturers can achieve scale by leveraging 5G, **AWS wavelength**, and **AWS outposts**. This fully managed service extends AWS infrastructure, AWS services, APIs, and tools to virtually any data center or co-location space, thus digitizing every business process in every location to accelerate progress. The AWS Snow Family offers many physical, highly secure, and rugged appliances, with built-in computing capabilities ready to collect and process data at the edge and migrate data in and out of AWS.

The key challenges manufacturers face today:

4. Real-time decision making and automation

In many cases, there's minimal tolerance for latency on decision-making due to the speed of production.

Advanced analytics with **Amazon Kinesis, IoT Analytics, Lookout for Vision, Lookout for Metrics, Lookout for Equipment,** and edge AI with **Panorama**, and **SageMaker Neo** are used in smart factories to combat this, as they support rapid decision-making and will ultimately self-optimize.

This means that the factory will be able to adapt constantly to demand and variations in supply, process deviations, detect and fix equipment issues, spot inefficiencies, and maximize production output. Edge computing capabilities also offer real-time processing and hybrid scenarios to benefit cloud off-load of industrial workloads, including continuous data collection from existing historical or specialized industrial servers.

5. Security and critical safety

Industrial settings are connected to external environments, meaning that risks can be exposed when not managed properly.
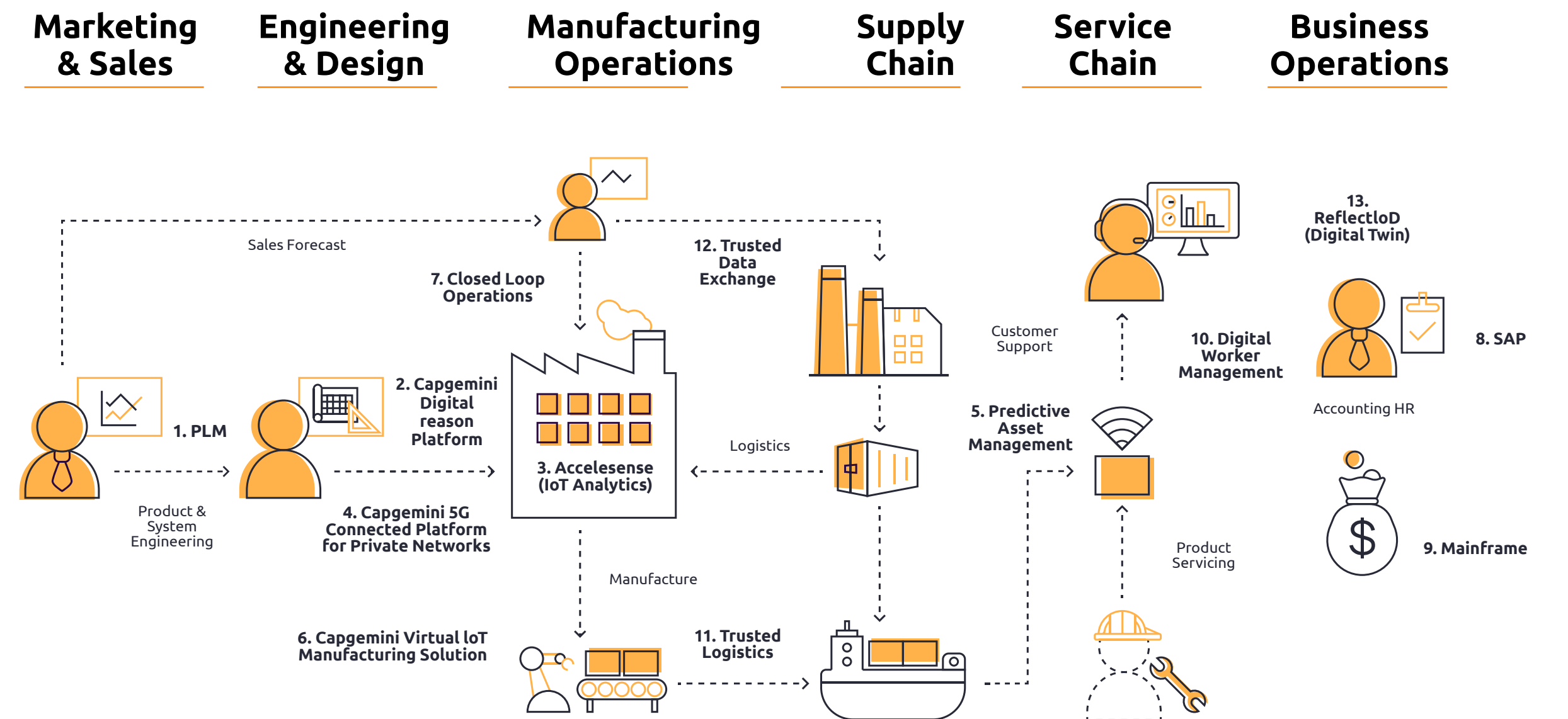
Tactics for improving security measures in the case of smart factories include: mapping all entry and exit points of data and attack surfaces, securing networks through mechanisms such as firewalls or intrusion detection systems, adopting "security by design" principles to reduce vulnerabilities using policies like device and fleet identity management encryption, access control and implementing continuous monitoring and periodic security audits. AWS enables this with services including **IAM, Guard Duty, Cognito, IoT Device Defender,** and many more.

5

INNOVATION AT EVERY STAGE OF THE VALUE CHAIN

Capgemini has developed intelligent industry solutions for manufacturing organizations on AWS that span the value chain from engineering and design, manufacturing operations, logistics, after-market services, and business operations.

Capgemini's AWS Engineering & Manufacturing Solutions

Marketing & Sales	Engineering & Design	Manufacturing Operations	Supply Chain	Service Chain	Business Operations

Sales Forecast

7. Closed Loop Operations

12. Trusted Data Exchange

13. ReflectloD (Digital Twin)

10. Digital Worker Management

8. SAP

Customer Support

1. PLM

2. Capgemini Digital reason Platform

3. Accelesense (IoT Analytics)

4. Capgemini 5G Connected Platform for Private Networks

5. Predictive Asset Management

Logistics

Accounting HR

9. Mainframe

Product & System Engineering

Manufacture

Product Servicing

6. Capgemini Virtual loT Manufacturing Solution

11. Trusted Logistics

Make better informed decisions with cloud based PLM and Digital Twins

PLM has been on-premises in traditional sectors for decades. The next generation includes minimizing recurring costs and avoiding customization of software with a focus on process. The critical movement here is towards standard digital engineering platforms that allow companies to share standards, methods, tools, and part designs between teams in the production, testing, and certification phases. In turn, this would enable an information feedback loop for future modifications. Digital engineering tools allow customers to innovate faster, without the constraints of on-premises IT services or guaranteeing data consistency across teams.

Cloud PLM

Cloud services are transforming the entire corporate landscape, changing markets in many domains. PLM is poised to be next. To maintain an edge, companies must leave the servers behind and embrace the cloud. Cloud-based PLM enables companies to make faster and better-informed decisions using data across the entire product lifecycle and drive digital transformation initiatives. Bringing people, product data, and processes together at a given time around the world helps to eliminate the silos that lead to product design problems, quality issues, and production errors. PLM on AWS ultimately helps drive increased profits by helping companies deliver products on time, with optimized budgets.

01 **Capgemini PLM Deployment Acceleration Tools** allow customers to innovate faster, without the constraints of on-premises IT, and guarantee data consistency across teams. Businesses can lower infrastructure costs and improve collaboration securely by running PLM solutions such as PTC Windchill, Aras, Dassault Systems Enovia, and Siemens Teamcenter on AWS. Moreover, in a post-Covid world, virtual manufacturing facilitates remote work models are now the new normal.

Digital twins

Manufacturers need to innovate fast, accelerate time-to-market, find a way to create data consistency across the product design process, and uncover transparency and strengthen security throughout engineering and manufacturing. To justify calling something a digital twin requires answering questions like, "why is that hole there?" and getting a complete answer. That means operating in more than 3D (not just CAD). It is more than just rendering a 3D model, that's called a digital mock-up. Instead, you need the actual high-level and low-level requirements from PLM, maybe the MBSE model itself plus interfaces, simulations that run on multiple physical models, and computation, but with live data and more than one data source.

02 **Capgemini Digital Reason Platform** allows product owners and manufacturing operations to make highly complex decisions by considering expert knowledge from different enterprise domains, using key concepts like self-building digital twins, ontologies, and knowledge graphs. Deep reasoning derives facts that are not expressed explicitly in ontologies and knowledge graphs by combining MLOps that helps to create new rules by learning from the data patterns using AI.

Intelligent 5G and edge

5G offers a significant reduction in latency and improvements in network performance over existing connectivity technologies. This is vital for time-sensitive and mission-critical applications within a network. However, 5G enables this for the last mile of data transmission – for example, between the tower and the endpoint. Much of this gain in performance and speed is lost if the data needs to travel from the tower to a remote cloud location for further processing and then return to the source. Edge architecture offers significant improvements by enabling advanced data processing on-premises and avoiding the latency introduced by remote cloud locations.

Industrial software solutions

Manufacturers need solutions to connect, modify, transport, store, and compute the data, whatever the business case (e.g., plant control tower, PM, KPI, quality, etc.). So, we need edge and cloud solutions (mirror architectures), Greengrass with AWS, data streaming, device management, time-series storage, NoSQL, and data science.
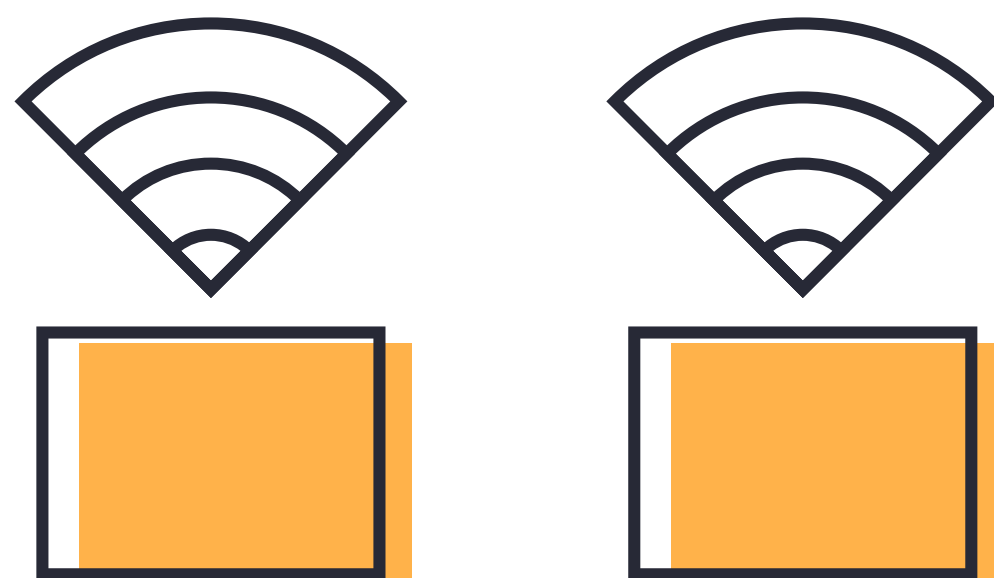
03 **Capgemini AcceleSense Industrial IoT solution** makes it possible to ingest and process massive volumes of IoT data (up to eight billion samples a day). This enables better asset monitoring, predictive maintenance, network monitoring, and geospatial data processing, all with real-time analytics and visualization. In addition, thanks to configurable UI widgets, development time is diminished by up to 80% and businesses are armed with a full suite of exploration and analysis tools**.**

5G-connected platforms and private networks

Networks set up within an industrial site or campus using privately owned 5G spectrum are becoming a preferred industrial 5G implementation model, in contrast to using an operator's spectrum. Given that they are physically isolated from public networks, private 5G networks provide organizations complete control over their networks and data. Manufacturers can achieve scale by leveraging 5G, **AWS Wavelength**, and **AWS Outposts**.

This fully managed service extends AWS infrastructure, AWS services, APIs, and tools to virtually any data center or co-location space, digitizing every business process in every location to accelerate progress. In addition, the AWS Snow Family offers many physical, highly secured, and rugged appliances with built-in computing capabilities ready to collect and process data at the edge and migrate data in and out of AWS.
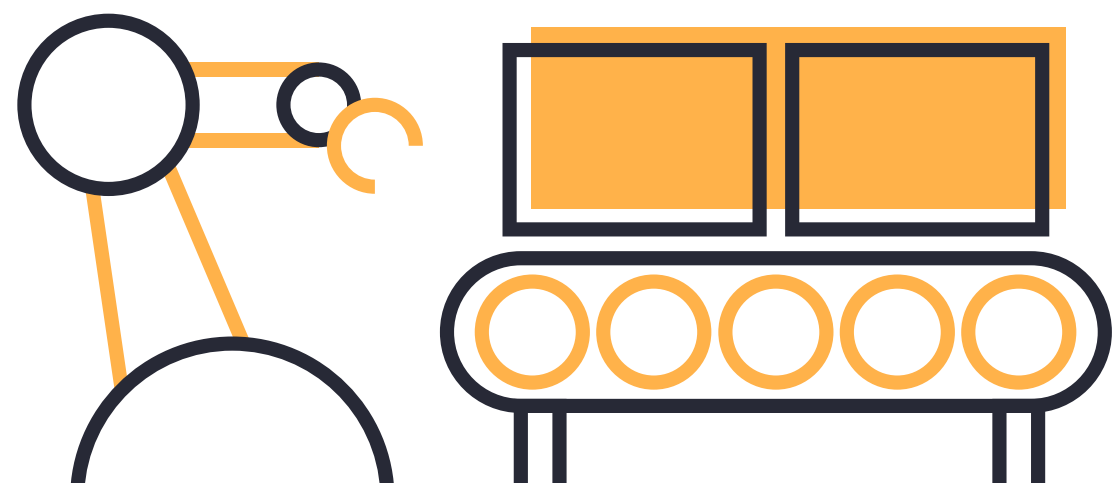
04 **Capgemini Engineering 5G Connected Platform for private networks** allows companies to stand up use cases with a Connectivity-as-a-Service platform, a 5G radio access network and core network infrastructure, hardware-accelerated compute, and cloud-native edge application management.
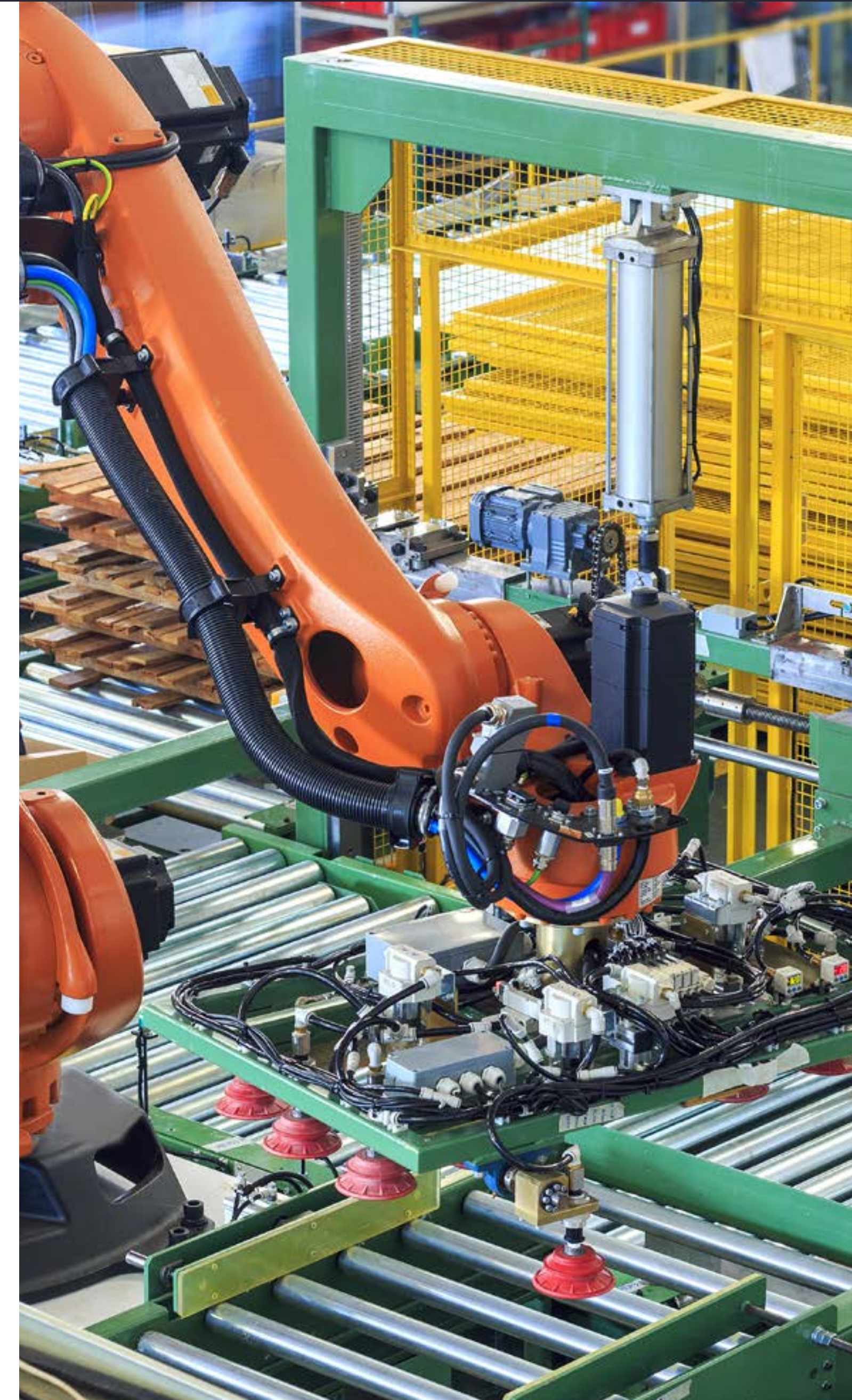
Advanced manufacturing

Manufacturers face an estimated $38 billion yearly cost because of logistical inefficiencies, on top of a $60 billion loss due to supply chain theft[12]. Weighed down by limited visibility, transparency, and traceability, supply chains are often subject to counterfeiting and uncertain delivery times. Not to mention the adulteration and spoilage of goods. Dependencies on tired manual processes further exasperate these problems. In addition, end-to-end traceability remains a challenge, as does mapping supplier networks to achieve greater visibility within complex supply chains.

Many manufacturers rely on a preventive or corrective maintenance strategy that exposes them to lower overall equipment efficiency, higher downtime, breakdowns, and safety incidents. Therefore, they need to be able to combat these issues before they even happen.

05 **Capgemini Predictive Asset Maintenance solution** shifts the focus from reactive to predictive maintenance. As a result, businesses can monitor equipment health to predict issues and stop them in their tracks. The solution leverages next-generation data collection, analytics, communication with AWS computer vision, and artificial-intelligence and machine-learning services to monitor equipment parameters such as temperature, pressure, flow rate, and vibration.

06 **Capgemini Virtual IoT Manufacturing solution (VIMS)** is a new, complete, and integrated digital ecosystem for industrial and manufacturing environments. The core of VIMS combines an Industrial Internet of Things (IIoT) platform with a digital twin of the factory or production line. The IIoT platform collects and organizes data harvested directly from the manufacturing process on the shop floor (from PLCs, SCADA, smart sensors, etc.) as well as from other information systems (MES, ERP, etc.). The digital twin yields a fully immersive, bi-directional experience of the factory or production line thanks to virtual-reality and augmented-reality technologies.

07 **Capgemini Closed Loop Operations** enables agile operations by removing the manual intervention from reconfiguring robotic machinery and other operational technology. Automation allows for quicker production times, results in fewer production sites, and increases flexibility as elastic resources automatically adjust for higher factory output. What's more, managing the demand for personalization paves the way for improved customer satisfaction.

Move enterprise applications to the cloud

The cost of maintaining a monolithic SAP landscape on-premises is unsustainable. The SAP landscape is customized and complex; however, customers are hesitant to launch another SAP infrastructure project given previous investments. They require a high degree of confidence in the proposed solution. In addition, the evolution of ERP systems has left many manufacturers with traditional IT data silos, which are not conducive to future business needs. Separately, legacy mainframe workloads pose problems for the industry. From the surging operating and maintenance costs to the business risks of limited agility and scalability, manufacturers are constrained by MIPS as a finite resource. The need to migrate and modernize mainframes is paramount to overcoming these and other issues such as operational complexity.

08 **Capgemini SAP Move to AWS** - AWS recognizes that SAP is core to the enterprise and appreciates that making changes introduces business continuity risks that need to be mitigated with competent partners. Referencing other manufacturers who have successfully migrated and modernized their SAP landscape with AWS demonstrates our competency to mitigate risks. In addition, to efficiently meet business requirements with new technologies, such as IoT, machine learning, artificial intelligence, and more, the data needs to move from a data-silo to a data-lake model. Modernizing the SAP landscape with AWS builds the foundation for this future innovation.

09 **Capgemini Mainframe Move to AWS** - Capgemini mitigates business risk by migrating and modernizing legacy mainframe workloads on AWS. Our scalable, robust, and highly secure solution distinguishes critical mainframe components from the obsolete and redundant components that can be unloaded before migration. Those that are retained are configured as business function-based modules that can be regenerated as microservices. Businesses can also unlock additional value by gaining visibility to legacy data and applying advanced analytics capabilities to uncover insights.

Intelligent operations and supply chain

Digital workers and logistics

In the US, productivity growth is the lowest it has been since the 1970s, at just 1.3% of gross domestic product per hour worked in 2020.[13] The slowing growth rate of productivity leads to a domino effect of schedule slippage, revenue leakage, and monumental cost implications. Seventy-five percent of American workers do not believe they have access to the latest efficiency-boosting technology and are calling for better resources.

10 **Capgemini Digital Worker Management solution** uses cloud-based, wearable technology to help organizations promote health and safety and optimize efficiency. As an IoT solution combined with computer vision, it empowers real-time worker and equipment tracking, time capture and tracking, proximity alerts, and notifications in case of an emergency.

Up and running in as little as three weeks, it leverages Bluetooth technology and image analytics to rapidly enable social distancing, contact tracing, and contactless interactions such as clocking-in and out.

11 **Capgemini Trusted Logistics** tackles these issues head-on thanks to the power of IoT, which enables real-time distribution shipping visibility and alerts. By optimizing routes with insights and analytics, preventing loss, and protecting product integrity, businesses can increase earnings by 13%, reduce cargo theft by 84%, and cut cargo delays by 49% throughout the shipping process.[14]

12 **Capgemini Trusted Data Exchange** is an AWS-based blockchain solution. It enables supplier onboarding and assessment, workflow management, a tamper-proof audit trail, and supplier network maps. The Exchange can digitize contracts, orders, payments, warranties, service agreements, and much more.
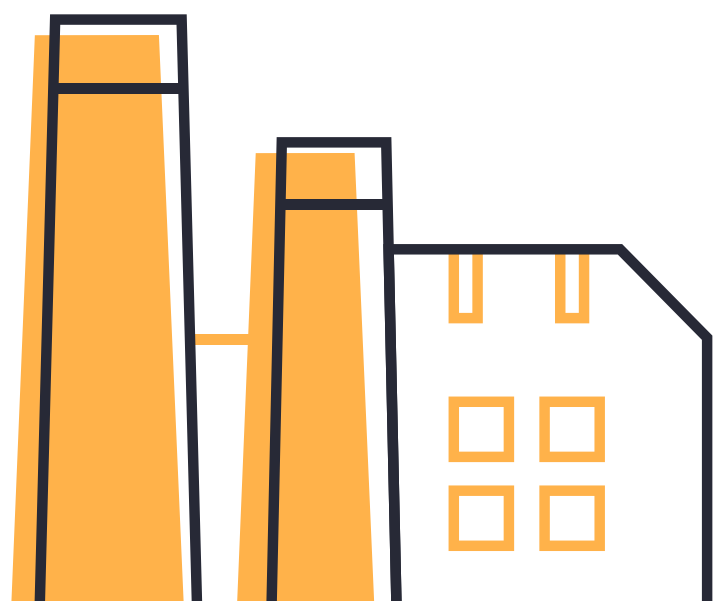
Intelligent operations and supply chain

Building management

Companies are faced with managing a massive influx of data and demands on different departments. The digital twin promises to connect siloed departments and external operations to visualize, monitor, predict, and simulate how businesses and assets might perform in the future. However, building an accurate graphics-rich digital twin is proving to be a significant challenge in manufacturing.

13 **Capgemini Building IoT Solution Reflect IoD**
is a cloud-based, secure digital twin platform that enables data-centric collaboration for building and infrastructure operations and maintenance. The platform integrates natively 1D to 3D, point cloud, geographical information, and IoT data while offering value-added services to improve operations.

6 PARTNERSHIP FOR PROGRESS:

How We Can Help

Capgemini and AWS solutions are grounded in decades of expertise and innovation across a diverse set of industries. Together we are uniquely positioned to accelerate manufacturing into the digital era.

For over 15 years, AWS has helped leading manufacturers transform their operations with the first and most advanced set of cloud and edge capabilities while taking advantage of the highest levels of security. In addition, AWS leverages Amazon's years of unmatched experience with factory operations, helping drive digital transformation with leading industrial customers worldwide.

Capgemini Engineering is at the forefront of Intelligent Industry offerings, providing a complete portfolio of services, reference architectures, platforms, and solutions to accelerate transformation.

The organization unites more than 52,000 engineers, consultants, and scientists in over 30 countries.

52k+
Engineers, consultants and scientists

30+
Countries

7

A COMBINED FORCE FOR INNOVATION

Intelligent Industry offers manufacturers huge potential for growth in an increasingly challenging landscape. Tapping into this potential and unleashing its power starts by recognizing your challenges and understanding the long-term growth of technology investments. Strategies for success unite three core capabilities: intelligent products, intelligent operations, and intelligent support and services. Making Intelligent Industry a reality relies on achieving:

Digital Inside with technologies

Digital Convergence with partners

Digital Continuity across **the lifecycle**

Contact Capgemini to find out how to accelerate your journey to Intelligent Industry, and connect with Capgemini Engineering Experts

References:

1- Sustainable Operations (capgemini.com)
2- World Economic Forum, "5 things we learned about climate change at Davos 2020," January 2020.
3- EU, "G20 Summit: G20 leaders united to address major global pandemic and economic challenges," November 2020.
4- Reuters, "Trump, Biden clash over climate, oil industry in final debate," October 2020.
5- Sustainable Operations (capgemini.com)
6- Smart Factories report (capgemini.com)
7- Smart Factories report (capgemini.com)
8- AI in Automotive Industry research report (capgemini.com)
9- Smart Factories and the Modern Manufacturer – Capgemini Worldwide
10- Shaping the Future of Manufcaturing (pwc.de)
11- Smart Factories at Scale (capgemini.com)
12- Trusted Logistics with AWS brochure
13- The U.S. productivity slowdown: an economy-wide and industry-level analysis: Monthly Labor Review: U.S. Bureau of Labor Statistics (bls.gov)
14- Trusted Logistics with AWS (capgemini.com)

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Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided everyday by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of 270,000 team members in nearly 50 countries. With its strong 50 year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering and platforms. The Group reported in 2020 global revenues of €16 billion.

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