

#befutureready



MANUFACTURING INDUSTRY TRENDS

Going Digital with Interconnection, Industry 4.0 and Hybrid IT

THE INTERSECTION OF **INTERCONNECTION**

Introduction

Manufacturers are paying attention to this famous quote from Benjamin Franklin: “By failing to prepare, you are preparing to fail.” For them, being prepared means investing heavily in digital transformation. Nearly 30% of worldwide digital transformation spending by 2026 is forecast to come from the discrete and process manufacturing industries.¹ The money is being spent on persistent issues such as supply chain disruption as well as new technologies and partnerships.

The next stage of digital transformation in manufacturing is the fourth industrial revolution (Industry 4.0), which will generate data like never before. Hallmarks and the advantages of Industry 4.0 include:

- **Interconnection – Elevate productivity leveraging reliable, secure, low-latency connectivity of engineering, supply chain, production, sales and distribution, and services**
- **Big Data and analytics – Real-time visibility into operations facilitates knowledge-based decisions**
- **Internet of Things and Industrial Internet of Things (IoT/IIoT) – Sometimes overlooked, IoT/IIoT enables remote monitoring and management; processes are optimized, and problems assessed without requiring personnel onsite**
- **Blockchain – Smart contracts streamline logistics and asset tracking, accelerate letters of credit, improve quality control and more**
- **Augmented reality (AR) – Quickly onboard people, attract top talent and reduce the time to productivity for new employees, on top of proven productivity gains**
- **Artificial intelligence/machine learning (AI/ML) – Smarter manufacturing processes keep getting smarter through edge-to-core data collection and analysis**
- **Automation – Workflow automation adds to productivity and helps address labor shortages**

A key enabler of Industry 4.0 is connectivity supporting low latency data collection and transport. This requires next-gen networks and modern IT technologies – a heavy lift for those who go it alone. Instead, many manufacturing companies turn to colocation data centers for the interconnection, private cloud workload hosting and scalability their hybrid IT strategies depend on, and to engage with strategic partners.

As manufacturers prepare for the future, they are studying industry trends and evaluating infrastructure requirements.

EXAMPLE AREAS OF VALUE POTENTIAL IN INDUSTRY 4.0 (FACTORY NETWORK)



Data, computational power, connectivity

- Blockchain
- Cloud Technology
- Internet of Things
- Sensors



Human-machine interaction

- Virtual and augmented reality
- Robotics and automation (collaborative robots, automated guided vehicles)
- Robotic process automation, chatbots



Analytics and intelligence

- Automation of knowledge work
- Big data, advanced analytics and AI



Advanced production methods

- Additive manufacturing (including 3D printing)
- Renewable energy

VALUE POTENTIAL

15-20%
inventory-
holding cost
reduction

15-30%
labor
productivity
increase

30-50%
machine
downtime
reduction

10-30%
throughput
increase

30-50%
forecasting
accuracy
improvement

10-30%
cost-of-quality
improvement

FIGURE 1: Manufacturers are poised to capture significant value from cloud, IoT, big data and other technologies.²

Trends Highlight Opportunities and Challenges of the Fourth Industrial Revolution

Industry trend insights help decision-makers set priorities, timing and budgets. The following trends are likely to factor significantly into modernization planning.

1. Edge Computing

Manufacturing applications at the edge use connected devices and technologies such as sensors, robotics and machine-to-machine communications. Edge computing, with or without cloud involvement, allows manufacturers to collect and analyze data close to the source and swiftly take action.

Edge data analysis, enabled by 5G, replaces the legacy practice of sending the data to and from a server or corporate data center. Low latency enables manufacturers to reduce downtime, speed diagnostics and repair, improve quality control and expedite decisions. All of these outcomes help boost efficiency and lower operational costs.

EDGE USE CASES INCLUDE:

- **Predictive maintenance** – which helps manufacturers avoid unscheduled, costly downtime. Connected devices generate data that is continuously monitored. AI/ML identify normal performance patterns and abnormalities that may trigger a problem or failure. Data insights allow manufacturers to complete maintenance before an equipment part fails and stops production.
- **Production line quality control** – which typically involves cameras and sensors that detect product irregularities and enable immediate detection and correction. Fewer defects, less waste.
- **Supply chain logistics** – which begins in the manufacturing facility. Technologies such as Radio Frequency Identification (RFID) or Bluetooth track products as they move from production to packaging to warehouses to distribution.

The average manufacturer confronts 800 hours of equipment downtime per year — more than 15 hours per week. The average automotive manufacturer loses \$22,000 per minute when the production line stops. That quickly adds up. Overall, unplanned downtime costs industrial manufacturers as much as \$50 billion a year.³

2. Smart Manufacturing

The White House Critical and Emerging Technologies Report shows smart manufacturing is a national priority.⁴ This prioritization makes sense, considering the impact of manufacturing on food supply, labor force, GDP and so much more.

Smart manufacturing – and its production arm, smart factories – focuses on increasing production efficiency and agility.

Connectivity, real-time access to data and clouds all play key roles. Data insights create improvements in areas such as factory performance, worker/vendor collaboration, problem-solving, data silos and sustainability.

Virtual processes enable manufacturers to simulate and model production processes before the physical production lines are built. By visualizing and adjusting the flow of materials, schedules, equipment and line activities, manufacturing companies iron out wrinkles early in the product development cycle. As product development progresses, the use of 3D and other tools saves missteps, money and time.

Smart manufacturing use cases aided by 5G include:

- **Augmented reality** – which provides visual instructions and overlays; workers don't have to rely on equipment manuals. If the metaverse momentum continues, the use of 3D will connect physical and digital worlds and create interactive environments – think of the training possibilities.
- **Autonomous mobile robots** – which move around a smart factory for logistics or quality control purposes.
- **Digital twins of factories** – which allow evaluating various configurations and test environments prior to implementation.

By 2030, there will be 4.7 billion wireless modules across smart manufacturing floors, with a value of over \$1 trillion.⁶

5G and the expanding attack surface add to manufacturers' security concerns. In addition to leaning into zero trust frameworks, revisit your cybersecurity strategies with the following points in mind:

- 5G environments, whether private or public, are usually custom-built. It follows that security also needs to be customized.
- A 5G network that encompasses the members of the supply chain introduces third-party risk.
- Traditional IT/OT security tools typically aren't designed for cellular networks.

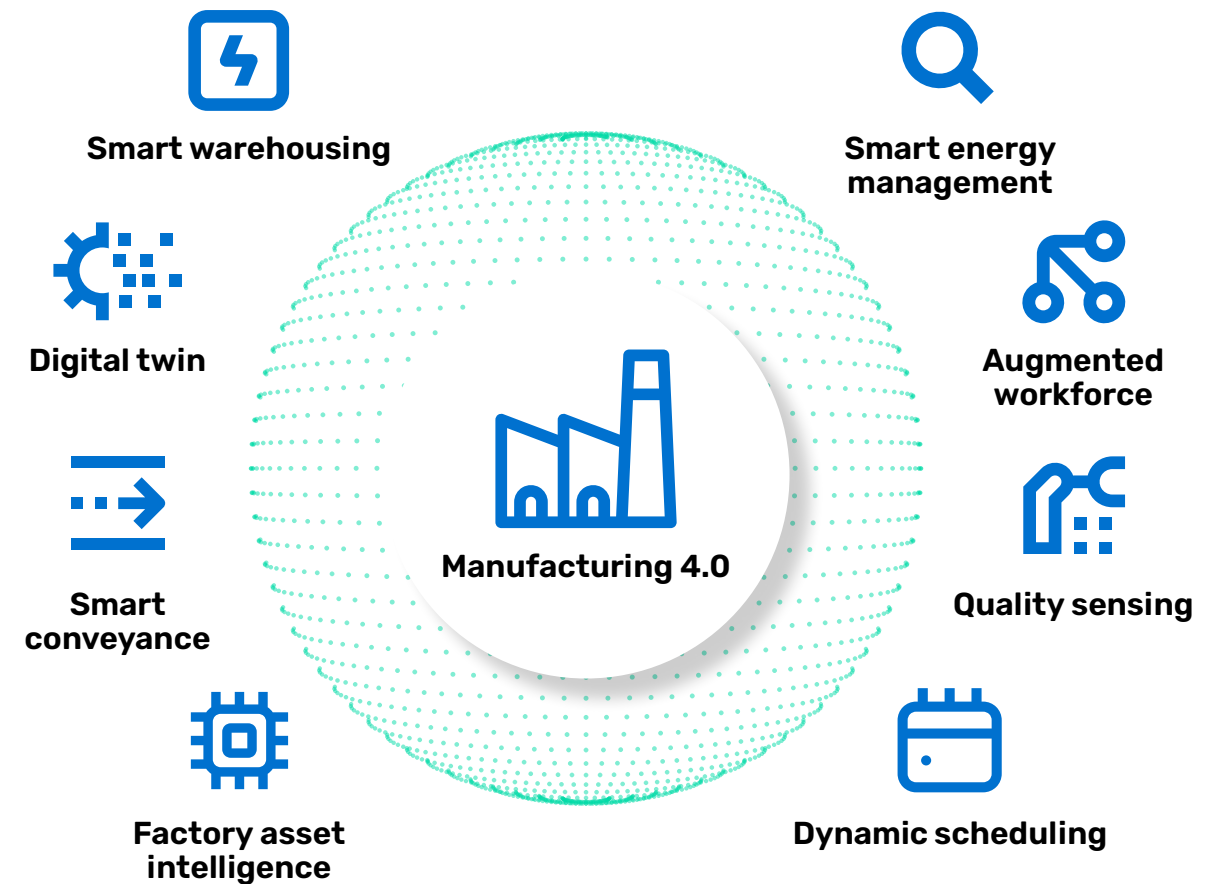


FIGURE 2: Use cases like digital twins and smart warehousing point to the increasing use of AI and ML as manufacturing businesses move into Industry 4.0.⁷

3. Cloud Adoption

Industry experts point to increasing cloud use. One IT outsourcing company says that up to 50% of software used by manufacturers will be cloud-based by 2024.⁸ A Wipro report states that European manufacturers are leading all other industries in cloud adoption.⁹

A top reason that manufacturers move to cloud is the ability to support centralized, data-driven operations. Cloud also enables:

- Real-time equipment monitoring and reporting, eliminating guesswork in decisions across the digital supply chain
- Collaboration software that speeds communication among workers, teams and suppliers, and enables access to documents from anywhere
- Connection of data management tools to facilitate centralized collection and analysis of edge data, internal data centers and colocation data centers
- AI-based visual inspection and real-time insights to improve quality control

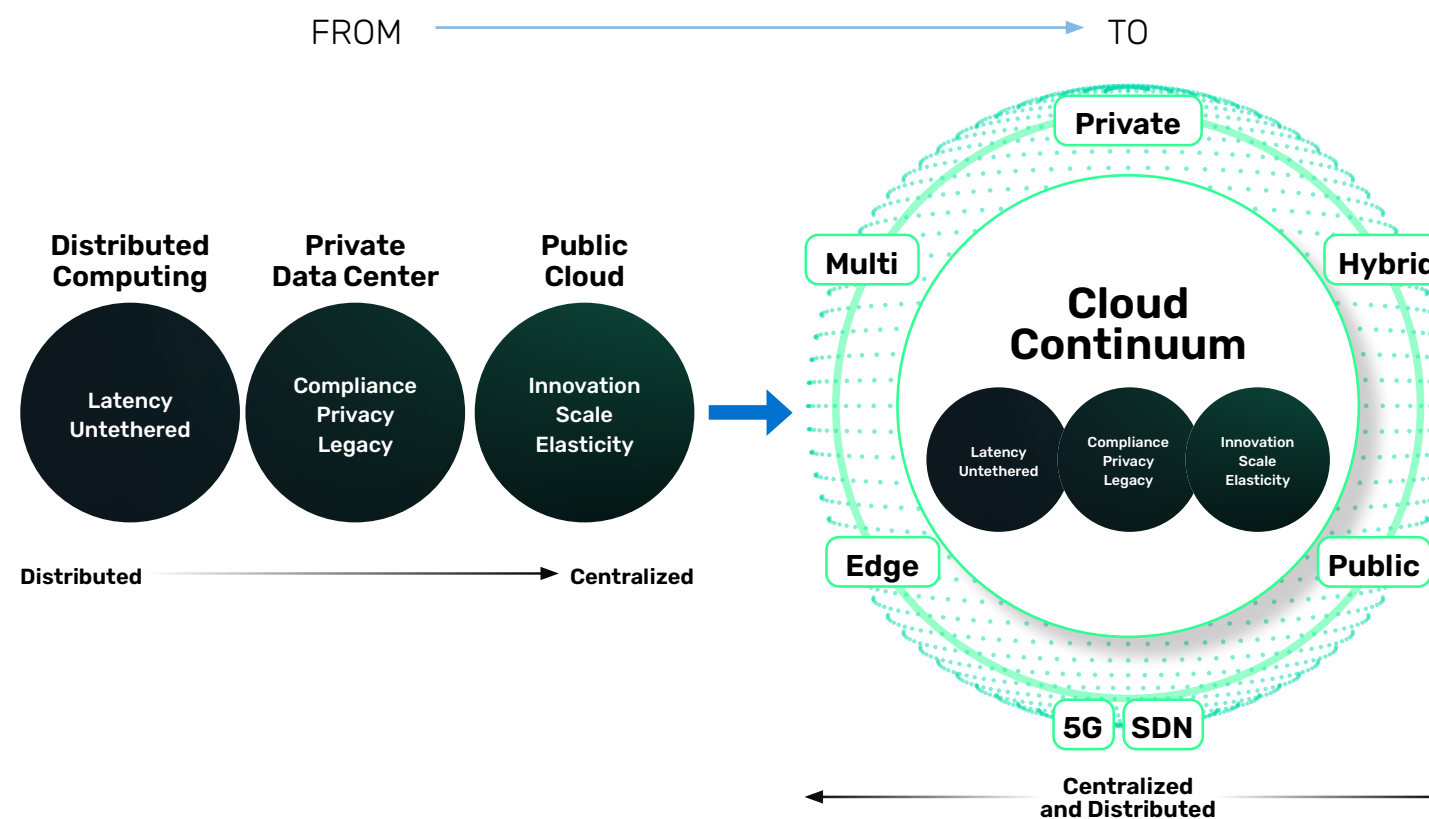


FIGURE 3: Treating the cloud as a continuum of capabilities makes sense for manufacturing companies.¹⁰

- Flexible, on-demand scalability, along with access to the latest technology, which enables rapid response when changes are needed or when opportunities arise
- Better management of carbon footprints to support sustainability programs
- Shorter time to market for new products



Cloud adoption can be complicated, especially when you think about how and when to make changes, how to prioritize use cases, addressing stakeholder concerns and evaluating network requirements. Here are a few questions that can help you get started:

- Which cloud readiness tools and assessments will help you best understand your current state?
- What pain points or problems do you want to solve?
- Which parts of your business are most susceptible to downtime and why?
- How will security, data privacy and compliance requirements be met?
- How will you augment your internal IT and security teams, if you need skills they don't have?

Accelerate Digital Transformation Outcomes with Colocation

A hybrid IT infrastructure is the gold standard to support modernization journeys and deliver the business outcomes you expect. CoreSite provides customized hybrid IT solutions and modern, compliant data centers that offer 100% uptime service level agreement (SLA) while helping you optimize cost, scale dynamically, manage risk and fill IT talent gaps.

Additional colocation advantages:

- Direct access to public cloud service providers – and their manufacturing solutions – helps you avoid the potential delays and cost of additional connections and routes. In fact, cloud direct connection can save you up to 70% in egress fees.¹¹
- Cloud services and IoT/IIoT solutions help you manage changing infrastructure needs without using your real estate.
- Private, automated connectivity bypasses the public internet and provides the low latency needed to move massive amounts of data securely to and from the edge.

- A large ecosystem of companies with which you can collaborate to accelerate digital transformation plans. Choose from hundreds of businesses, including as-a-service providers, private cloud and IT service providers.
- Interconnection capabilities allow you to expand edge operations and enter other geographic markets easily.
- Single pane of glass multicloud and hybrid IT management, which is enabled by a virtualized network services platform.

The last bullet point deserves elaboration. The Open Cloud Exchange[®] is a software-defined networking platform that provides automated, enterprise-class network and cloud services within CoreSite data centers. With it, you can quickly establish and deftly manage interconnection to public and private clouds, business partners and all CoreSite data centers.

Take the Next Step in Your Digital Transformation Journey

Every manufacturing business takes a unique modernization journey, considering goals, budget, resources and technical challenges. But digital transformation isn't a DIY effort. CoreSite experts can help you map out a hybrid IT strategy that immediately delivers measurable cost and productivity benefits. Collaboration can ensure your organization is future-ready.

SPEAK WITH AN EXPERT

Customer Profile

Supplyframe offers the world's largest collection of vertical search engines, supply chain tools and online communities to support the manufacture of electronics hardware. See how the partnership among Supplyframe, AWS and CoreSite enables global collaboration and 3x faster data file retrieval.

About CoreSite, An American Tower Company

CoreSite, an American Tower company, provides hybrid IT solutions that empower enterprises, cloud, network, and IT service providers to monetize and future-proof their digital business. Our highly interconnected data center campuses offer a native digital supply chain featuring direct cloud onramps to enable our customers to build customized hybrid IT infrastructure and accelerate digital transformation. For more than 20 years, CoreSite's team of technical experts has partnered with customers to optimize operations, elevate customer experience, dynamically scale, and leverage data to gain competitive edge.

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11. The Cloud Continuum, Accenture.
12. Cost savings are based on CoreSite cost comparisons using publicly available and private information and/or CoreSite customer reported costs savings and may not be indicative of the costs savings that may be experienced by every customer that switches to the applicable CoreSite service.