# IDC MarketScape: Worldwide Industrial Internet of Things Platforms and Applications 2024 Vendor Assessment

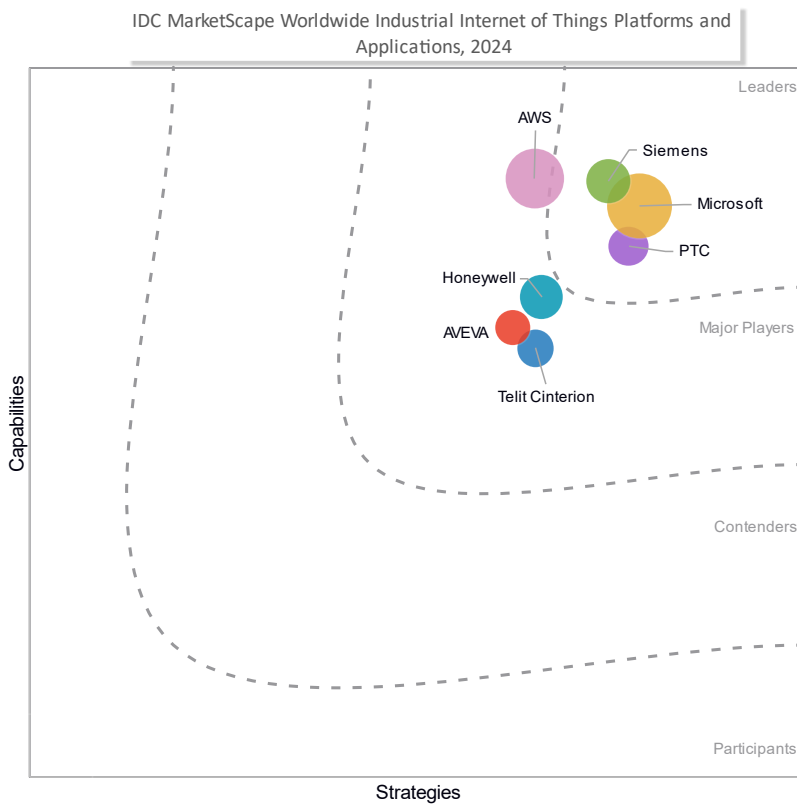Carlos Gonzalez        John Villali        Sarah Lee

**THIS EXCERPT FEATURES PTC AS A LEADER**

## IDC MARKETSCAPE FIGURE

### FIGURE 1

**IDC MarketScape Worldwide Industrial Internet of Things Platforms and Applications Vendor Assessment**



IDC MarketScape Worldwide Industrial Internet of Things Platforms and Applications, 2024

Source: IDC, 2024

Please see the Appendix for detailed methodology, market definition, and scoring criteria.

## ABOUT THIS EXCERPT

The content for this excerpt was taken directly from IDC MarketScape: Worldwide Industrial Internet of Things Platforms and Applications 2024 Vendor Assessment (Doc # US52036924).

## IDC OPINION

Internet of Things (IoT) networks and device connectivity are among the most important leading trends in technology, particularly in industrial settings. According to IDC's Worldwide Internet of Things Spending Guide, investment in the Internet of Things ecosystems, including hardware, software, and services, is projected to exceed $1.29 trillion by 2028, with a compound annual growth rate (CAGR) of 10.1% from 2023 to 2028.

The IoT market is poised for substantial growth driven by advancements in artificial intelligence (AI), increased use of edge devices, and deeper integration of IoT technologies across various sectors. Data-driven operations are central to this growth, with IoT platforms organizing, analyzing, and providing actionable intelligence and insights from the data collected from devices.

The rise of Industry 4.0 sparked a data race in the operational function in many asset-intensive industries, leading companies to embrace digital transformation (DX) through sensors, edge devices, and cloud networks. This shift created data-centric IoT ecosystems, but many organizations still struggle to act meaningfully on the vast amounts of data generated.

Moreover, AI, machine learning (ML), and generative AI (GenAI) have sparked another data race, with a significant increase in organizations initiating AI/ML and Industrial Internet of Things (IIoT) projects — from 52% in 2022 to 81% in 2023, according to IDC's *Future of Operations Survey.*

Industry 5.0 reflects this shift, focusing on a human-centric approach to leveraging AI, automation, and robotics so workers can focus on higher-level tasks while automating mundane or hazardous work. Despite these advancements, challenges such as data reliability, cybersecurity, and interoperability remain critical as IoT networks expand because of their diverse and heterogeneous device landscapes.

Today's IoT platforms and applications face many challenges, including managing assets, organizing data, analyzing operations, securing information, connecting workers to data, enhancing operations, and growing partner and end-user ecosystems. IoT platform providers are fueling industrial organizations' digital transformation efforts, targeting primary strategic priorities such as:

- **Supply chain resilience and optimization:** Leveraging IoT networks and platforms to improve and secure supply chains
- **Smart automation:** Utilizing IoT platforms and sensors to automate processes in operational technology (OT) and information technology (IT) environments
- **Product innovation:** Using IoT platforms and applications to enhance design and enable the creation of digital twins and simulation for efficiency
- **AI analysis and generative AI integration:** Using IoT data to leverage next-generation technologies to assist workers with operational decisions
- **Cybersecurity protection:** Leveraging IoT platforms to secure connected assets and protect operational data
- **Sustainability:** Using IoT and sensors to monitor energy usage, resources, and labor efforts to achieve more sustainable operations

Today's most significant opportunity for IoT digital transformation is leveraging data to improve operations and access to critical data. Data insights can enhance operations, provide paths to scale, connect workers to data, and provide consumer insights.

## IDC MARKETSCAPE VENDOR INCLUSION CRITERIA

The vendor inclusion list for this IDC MarketScape comprises the most prominent IIoT platforms and application providers.

To qualify for this study, vendors had to provide:

- A commercially available software platform that can help build and deploy IoT applications and manage IoT devices
- Native support for industrial protocols within the platform, offering open platform communications (OPC) at a minimum
- Edge application frameworks and runtimes and cloud development capabilities
- Analytics tools, including dashboards and advanced analytics (ML/AI)
- Security capabilities within the platform architecture
- Tools to create a "thing model" (This model abstracts raw sensor data into a hierarchical semantic model and presents it as a "thing" to an application.)
- API access to IoT data

- Commercially available IoT applications

In addition, participating vendors had to:

- Have cleared at least $15 million in IoT platforms and applications software revenue for 2023
- Have the ability to support global IoT deployments (in the Americas, EMEA, and APAC)
- Have at least 20% of their current IoT revenue stemming from the industrial IoT market

## ADVICE FOR TECHNOLOGY BUYERS

This IDC MarketScape assessed vendors' capabilities in three areas: the offering and offering portfolio, the go-to-market and innovation strategy, and the business model itself. IDC advises technology buyers to pay particular attention to these areas, which are discussed in the sections that follow.

# Offering and Offering Portfolio

- **Platform functionality:** In this study, IDC evaluated the core IoT platform functionalities that vendors offer, including data accessibility, data management, analytics, security, application development, deployment options, user interfaces (UIs), customer services, partner ecosystems, and future innovation strategies such as the deployment of AI tools and interfaces. Although many IoT platforms currently offer a wide array of solutions and services, the success of an IoT platform's deployment also depends on the organization's existing infrastructure and the depth of internal technical skills. Organizations should consider partners that can help them launch their IoT strategies while internally upskilling their workforce and training their operators to use these platforms effectively.
- **Integration capabilities:** IDC recommends that buyers explore IoT platforms and application vendors that offer various integration solutions and have capabilities for systems that generate IoT data and back-end systems that integrate data into or from external systems:
  - **Front-end integration:** Although some customization may be unavoidable due to equipment that speaks proprietary protocol formats, vendors that are serious about this space are investing in capabilities to communicate more directly with diverse types of industrial equipment. Many vendors have adopted open standards, such as OPC-UA, to enhance interoperability between disparate systems. These protocols enable operators to gather data into a common data model so that applications can more readily use it.

- **Back-end integration:** While IoT data alone can drive some IoT use cases, IDC believes much of IoT's value will come from integrating that data with other key systems driving business processes. For example, in manufacturing, IDC recommends evaluating integration with systems such as ERP, CRM, the supply chain, asset management, manufacturing execution systems, and product life-cycle management (PLM).

  IIoT platforms and application vendors should also be able to integrate with historians as these systems hold essential historical and contextual information about equipment and processes. Data operations are becoming a crucial part of IoT platforms. The data collected by operational technology systems is raw and often needs to be organized and cataloged for information technology (IT) systems. Data pipelines and data lakehouses are assisting in data integration for IoT analytics. IDC recommends exploring vendors that offer these services or have partnered with other organizations to integrate these services into their IoT platforms.

- **Solutions and services:** IDC research shows that customers are eager to quickly launch and scale IoT solutions. As a result, IoT platform and application vendors are now offering more out-of-the-box (OOTB) solutions and services to help users deploy faster and deliver timely results on the outcomes they prioritize. IDC recommends examining a provider's portfolio and future road map to ensure it aligns with the buyer's business and goals and the overall industry trends.

- **Deployment flexibility:** Many IoT platforms and application vendors offer a mix of cloud, on-premises, or hybrid deployment solutions. IDC evaluated the trend of hybrid deployment to curb cloud costs and control operations at the edge for greater efficiency with lower latency and faster response times. IDC recommends that buyers be aware of a vendor's deployment capabilities and how these would impact their current deployment strategy. Some vendors strongly prefer cloud adoption or vice versa for on-premises solutions. A one-size-fits-all solution does not exist, and buyers should explore their options and ensure a vendor's deployment solution meets their unique needs.

- **Scalability:** After operators successfully integrate IoT solutions into their processes, the next step is scalability. Scalability and duplicating IoT results from one site to another is challenging, as no two work sites are identical, particularly across various geographies and regions. Buyers should consider vendors with experience in scaling IoT solutions based on realistic expectations and timelines.

## Go-to-Market and Innovation Strategy

- **Ecosystem and marketplace development:** Developing industry ecosystems is a significant trend for IoT systems in an increasingly interconnected world.

Buyers must recognize the role of the vendor's partner ecosystem and determine whether the partner network will benefit their organization in their specific industry. A vendor with a robust ecosystem can enhance customer success in several ways:

- Performing pre-integrations with various software, hardware, and connectivity providers to help expedite market entry
- Helping customers locate service companies that are knowledgeable about their software for smoother implementation
- Facilitating user groups that enable organizations to exchange best practices
- Providing opportunities to monetize software developed on their platform

When choosing an IoT platform and application vendor, buyers should explore their ecosystem for options to expand services and future integration solutions that can add significant value to customers.

- **Customer service:** When speaking with IoT platform users, customer service abilities with their current vendor is a high priority. IoT platform and application integration can be quite complex, and operators new to IoT solutions may struggle with integration, data management, and tool interfacing. IDC recommends considering IoT platform providers that have a robust customer service strategy and can offer strong post-implementation support, remote assistance, onsite training, and regular updates on industry trends and knowledge. From initial consultation to solution deployment and ongoing operations, customer service and support are essential to successful IoT deployment and adoption.

- **Pricing:** In its research, IDC explored four distinct types of pricing and licensing terms in addition to 10 distinct pricing models. The most common pricing and licensing terms for IoT platforms and applications are now subscription and consumption models, marking a shift from the previous report, which indicated that IoT platforms are moving toward a data-first strategy. Among the platform pricing models, tiered pricing based on service groups was the most popular. Other common models include pricing based on named users, data streams/tags, and the number of assets. The most popular approach for application pricing models is also pricing based on tiered groups of service.

- **AI and machine learning development:** AI trends and how to integrate more AI and machine learning solutions into industrial processes have dominated the past two years. IoT vendors have already begun incorporating GenAI tools into their platforms for operator assistance. According to IDC's April 2024 *Supply Chain Survey,* artificial intelligence and generative AI are projected to be the most important technologies for companies over the next three years at 10.4% and 11.5%, respectively.

IoT platforms with AI will leverage the data collected by IoT networks and sensors to provide prescriptive rather than predictive or reactionary actions. Through predictive analytics, many IoT platforms today use data to anticipate failures and alert operators. It is still dependent on the operator to maintain and correct the error. The impact of automation is that it demands a different set of skills from the workforce to be able to analyze and react to the data.

According to IDC's March 2024 *Future Enterprise Resiliency and Spending Survey, Wave 3,* the most significant impact of automation on employees is the need to reskill and retrain them to operate technologies properly. The promise of AI is its ability to assist operators in correcting their actions. This assistance will help close the skills gap threatening many industrial companies. However, AI development is still in its early stages, and many vendors are piloting projects to determine the best way to roll out AI-powered tools. IDC recommends that buyers explore a vendor's road map for integrating AI solutions and assess how it evolves as the AI market develops.

## Business Model

- **Scaling IoT networks:** IoT investment includes growing systems throughout the operational framework. Buyers must focus on hardware assets, edge networking, distributed control systems, network connectivity, cybersecurity, data management and operation systems, and software platforms. Vendors are developing their ecosystems to include most of these offerings, meeting customers where they are to ensure ease of integration, interoperability, and quick deployment. IDC recommends that the platform vendor you partner with is flexible and that its model can provide a solution through the entire IoT framework or guide its partner ecosystem to meet your needs.

- **Increased connectivity:** The OT environment is moving at full speed to establish connected networks. Historically, the approach to operational systems, including PLCs, HMIs, and other automated equipment, was to "airgap" them and keep them disconnected from the network. Today, operators need more data as organizations look to leverage AI and reap the benefits of advanced data analytics. The OT environment will become another consistent branch of IoT networks, shifting from sporadic data integration to constant data streaming, analytics at the edge, simulation modeling, and AI integration. IDC recommends partnering with vendors that can help manage this increased level of connectivity and organize and manage data influx. There is also a focus on cybersecurity. Many vendors have partnered with security companies to offer solutions to customers. IDC recommends exploring a vendor's security options and ensuring that security services include OT assets.

- **Data accessibility:** As IoT platforms become large aggregators of data, access to data must improve. In IDC's research for this MarketScape, customers demanded solutions to create low-code applications and dashboards to access data. The future of AI will depend on how users can interface with the data. Operators being able to interact with GenAI interfaces will provide benefits in data accessibility and how they make decisions, with the future goal of AI evolving into an assistive tool to help guide operators in their processes. IDC recommends partnering with a vendor that provides data accessibility solutions, helping connect operators at all levels with relevant data.
- **Industry knowledge:** Every industry has unique challenges and business processes. IoT platforms are now expanding outside of the world of manufacturing and energy verticals. They are being used in consumer markets, chemicals, electronics, warehousing, and medical facilities. IDC recommends that you work with a platform that is familiar to your industry and can provide insight into the unique needs of your business, recognizing the unique requirements you face.

## VENDOR SUMMARY PROFILE

This section briefly explains IDC's key observations resulting in a vendor's position in the IDC MarketScape. While every vendor is evaluated against each of the criteria outlined in the Appendix, the description here provides a summary of each vendor's strengths and challenges.

## PTC

PTC is positioned in the Leaders category in this 2024 IDC MarketScape for worldwide Industrial Internet of Things platforms and applications.

### Company Overview

PTC is a global technology vendor headquartered in Boston, Massachusetts. It offers end-to-end digital thread technologies to manage the entire product life cycle. With 37 years of experience in the discrete manufacturing sector, PTC has strengthened its digital thread offerings through acquisitions such as ServiceMax, pure::variants, and Codebeamer in the past three years.

PTC has deep roots in the PLM and computer-aided design sectors, providing solutions for digital engineering, manufacturing, and service organizations. Its IoT strategy centers on the digital thread, enabling various stakeholders to access a single source of truth for asset- and process-related data across multiple systems.

# Vendor IoT Platform Offering

The ThingWorx platform is a cornerstone of PTC's industrial IoT strategy, enabling organizations to gather, contextualize, and orchestrate real-time data within the digital thread. ThingWorx provides a core IoT platform for developers and business professionals to create IoT applications and solutions that address common industrial use cases. The platform helps organizations connect various industrial devices and applications; build or extend applications; analyze IoT data; manage connected devices, processes, and systems; and create engaging user experiences.

ThingWorx is complemented by PTC's Industrial IoT portfolio comprising of the following industrial IoT applications:

- Kepware connects legacy OT devices to software applications, supporting multiple protocols within a single server for efficient remote visualization.
- Smart Connected Products Accelerator (SCPA) is an Industrial IoT application that accelerates the implementation of remote service use cases, ensuring faster time to value.
- Digital Performance Management (DPM) connects manual and automated data in manufacturing to identify bottlenecks and improve plant performance.
- Asset Monitoring and Utilization (AMU) provides real-time monitoring and alerts for predictive maintenance and operational failure detection.
- Real-Time Production Performance Monitoring (RTPPM) offers real-time monitoring, customizable KPIs, and visual data comparisons to deliver actionable insights.
- Connected Work Cell (CWC) streamlines information delivery to frontline workers by aggregating data into a user-friendly visual application with step-by-step work instructions and quality validation.
- Vuforia Studio allows companies to utilize IoT data in an augmented reality experience.

The company is also prioritizing investment in manufacturing-focused applications such as Windchill Navigate, which provides access to PLM data in the most practical, actionable formats for shop floor workers interacting with and leveraging product data.

## Strengths

- PTC excels in industrial connectivity, particularly through Kepware's communication capability, which uses various industrial protocols. This feature offers a significant advantage for connecting and monitoring a wide range of OT equipment. Many users operate a mix of legacy and new assets, which makes

increasing connectivity within these hybrid networks a common challenge for IoT users today.

- Clients highly recommend PTC's customer success management, which offers regular calls, assistance, and expert access to help users develop their IoT projects. The training resources are also highly regarded, featuring an online university designed to assist with user onboarding.

## Challenges

- Some customers mentioned that implementation time frames took slightly longer than expected for out-of-the-box (OOTB) templates, requiring assistance from PTC, system integrators, or programmer developers. PTC currently offers three main forms of fast starts: OOTB applications for top use cases; Application Accelerators, which are basic screens and models for quick starts; and Building Blocks for modular components to create or extend applications. PTC has announced ongoing investments in expanding these prepackaged solutions and would benefit from additional options to increase flexibility to meet customer needs.

- PTC must be more vigilant and proactively market its GenAI/ML road map. Current market sentiment suggests that PTC focuses less on GenAI/ML innovation. However, PTC's IoT Roadmap indicates that the company is actively pursuing the high-priority uses, incorporation, and adoption of future technologies such as Gen AI within its road map.

## APPENDIX

## Reading an IDC MarketScape Graph

For the purposes of this analysis, IDC divided potential key measures for success into two primary categories: capabilities and strategies.

Positioning on the y-axis reflects the vendor's current capabilities and menu of services and how well aligned the vendor is to customer needs. The capabilities category focuses on the capabilities of the company and product today, here and now. Under this category, IDC analysts will look at how well a vendor is building/delivering capabilities that enable it to execute its chosen strategy in the market.

Positioning on the x-axis, or strategies axis, indicates how well the vendor's future strategy aligns with what customers will require in three to five years. The strategies category focuses on high-level decisions and underlying assumptions about offerings, customer segments, and business and go-to-market plans for the next three to five years.

The size of the individual vendor markers in the IDC MarketScape represents the market share of each individual vendor within the specific market segment being assessed.

## IDC MarketScape Methodology

IDC MarketScape criteria selection, weightings, and vendor scores represent well-researched IDC judgment about the market and specific vendors. IDC analysts tailor the range of standard characteristics by which vendors are measured through structured discussions, surveys, and interviews with market leaders, participants, and end users. Market weightings are based on user interviews, buyer surveys, and the input of IDC experts in each market. IDC analysts base individual vendor scores and, ultimately, vendor positions on the IDC MarketScape on detailed surveys and interviews with the vendors, publicly available information, and end-user experiences in an effort to provide an accurate and consistent assessment of each vendor's characteristics, behavior, and capability.

## Market Definition

IDC's IoT software platform market is competitive, representing portions of selected application development and deployment and system infrastructure software markets. IDC currently tracks two main segments of the market: IoT application platforms and IoT connectivity management platforms.

Vendors in this study primarily sit in the IoT application platform segment. In addition:

- IoT application platforms are software platforms that provide a bundled set of capabilities required to continuously connect, manage, and visualize IoT devices and data. Vendors often offer these solutions in a PaaS model.
- The Industrial IoT platforms this study covers represent a subsegment of the IoT application platform market that specifically provides applications with access to data gathered from industrial equipment and systems.
- An IIoT application is a code set that automates specific sets of business processes in an industry or a business function.

For a more detailed description of the IoT platform and analytics market, see IDC's *Worldwide IoT Platforms and Analytics Taxonomy, 2021* (IDC #US46462521, April 2021).

## Related Research

- *Worldwide IDC Global DataSphere IoT Device Installed Base and Data Generated Forecast, 2024–2028* (IDC #US51667324, September 2024)
- *Top Trends for Internet of Things Ecosystems, 2024* (IDC #US51110724, February 2024)
- *The Rise of Cybersecurity for Connected Devices* (IDC #US51109823, November 2023)
- *Overview of Key Vendor Capabilities of Cloud Application Platforms* (IDC #US50619823, May 2023)
- *IDC MarketScape: Worldwide Industrial Internet-of-Things Service Providers for Utilities 2022 Vendor Assessment* (IDC #US47587121, October 2022)

## Synopsis

This IDC study evaluates key Industrial IoT platforms and applications for 2024, highlighting significant growth driven by AI, edge devices, and data integration. It emphasizes the importance of data-driven operations, digital transformation, and Industry 5.0's human-centric approach. The document also addresses challenges such as data reliability, cybersecurity, and interoperability. Key strategic priorities include supply chain optimization, smart automation, product innovation, AI integration, and sustainability. The assessment criteria focus on platform functionality, integration capabilities, customer service, pricing models, and AI development.

"The IoT market is projected to exceed $1.29 trillion by 2028, driven by advancements in AI, edge devices, and increased IoT integration. Industrial IoT platforms and applications have enhanced their capabilities, focusing on data gathering, analytics, and user-friendly dashboards for data presentation. Tech buyers seeking solutions for asset management and data interpretation from IoT systems will find a variety of options available in the current IIoT platform and applications marketplace," says Carlos M. González, research manager, Industrial IoT and Intelligence Strategies.

## ABOUT IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. With more than 1,300 analysts worldwide, IDC offers global, regional, and local expertise on technology, IT benchmarking and sourcing, and industry opportunities and trends in over 110 countries. IDC's analysis and insight helps IT professionals, business executives, and the investment community to make fact-based technology decisions and to achieve their key business objectives. Founded in 1964, IDC is a wholly owned subsidiary of International Data Group (IDG, Inc.).

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