IDC MarketScape: Worldwide Industrial IoT Platforms and Applications in Manufacturing 2021 Vendor Assessment

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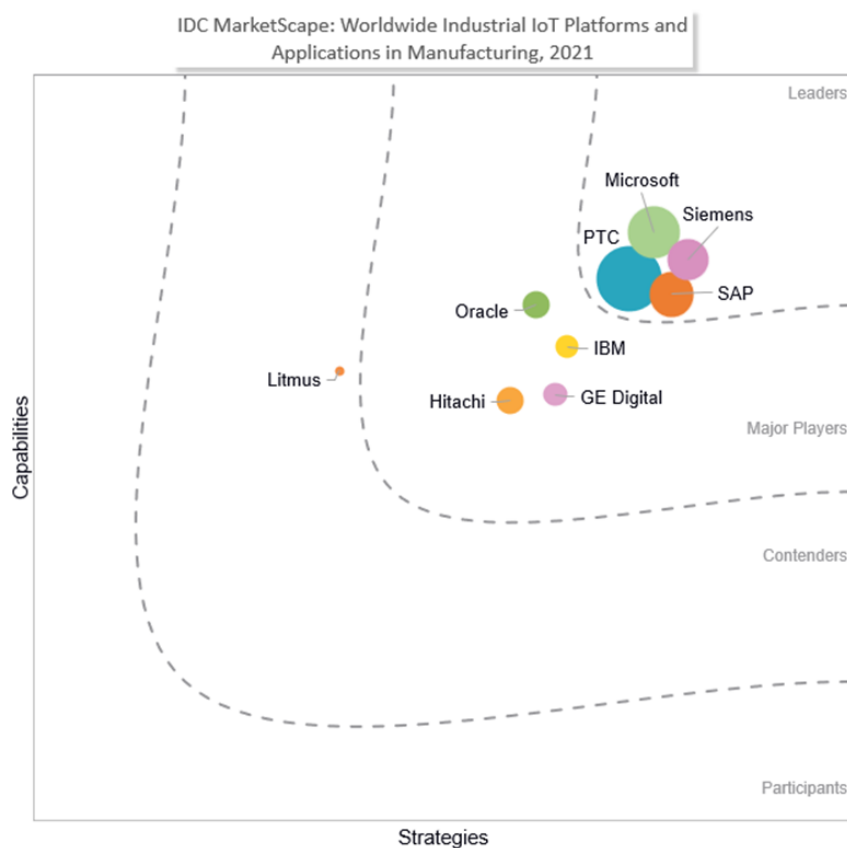
THIS IDC MARKETSCAPE EXCERPT FEATURES PTC

IDC MARKETSCAPE FIGURE

FIGURE 1

IDC MarketScape Worldwide Industrial IoT Platforms and Applications in Manufacturing Vendor Assessment

Source: IDC, 2021

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

IN THIS EXCERPT

The content for this excerpt was taken directly from IDC MarketScape: Worldwide Industrial IoT Platforms and Applications in Manufacturing 2021 Vendor Assessment (Doc # US47956021). All or parts of the following sections are included in this excerpt: IDC Opinion, IDC MarketScape Vendor Inclusion Criteria, Essential Guidance, Vendor Summary Profile, Appendix and Learn More. Also included is Figure 1.

IDC OPINION

While the entire world has had to deal with the disruption caused by COVID-19, manufacturers, on average, have felt the pressure more than most. In fact, IDC's Worldwide ICT Spending Guide has shown that roughly $1.3 trillion has been lost because of COVID-19, with the manufacturing industry bearing the greatest impact of the crisis by far. Manufacturers are still struggling to respond to supply chain disruption, evolving government/regulatory requirements, and shifting production capabilities to meet public demand for their goods and services. In response, manufacturers are beginning to define their future success by how well they react to market disruptions. They are doing so through a process IDC calls resilient decision making. This process is the combination of ongoing efficiency measures by manufacturers and a new focus on providing employees with near-real-time information, detailed insights on performance, and analytics to improve the decision-making process

Manufacturers recognize that technology will play a key role in their long-term success. Internet of Things (IoT) in particular, will be among the technologies with the greatest impact on the manufacturing industry over the next five years, especially as remote access to information has become essential. IoT provides manufacturers access to more data than ever before, which can fuel a company's transformation efforts. IoT is pervasive throughout the manufacturing value chain, with ongoing activity across the four primary strategic priorities:

- **Supply chain optimization** – Using IoT and sensors to improve supply chain orchestration
- **Smart manufacturing** – Using IoT and sensors to improve factory performance in the plant
- **Product innovation** – Using IoT and sensors to improve new product introduction (NPI)
- **Field service** – Using IoT and sensors to enhance service offerings and delivery

The biggest opportunity for transformation comes from a product/service standpoint. Manufacturers (discrete manufacturers in particular) are looking to IoT-connected products as a way of transforming business models that capitalize on the intersection of products and services. This link between customer products and real-time IoT data is an opportunity for manufacturers to better understand customers, as well as their behaviors and what they value, in order to deliver customized offers.

IDC MARKETSCAPE VENDOR INCLUSION CRITERIA

The vendor inclusion list for this IDC MarketScape is intended to include the most prominent industrial IoT (IIoT) platforms and applications providers focused on the manufacturing industry.

To qualify for this study, an organization had to provide:

- A commercially available – and generally available – software platform that can be used to build and deploy IoT applications and manage IoT devices

- Native support for industrial protocols within the platform offering, OPC at a minimum
- Edge application frameworks and runtimes, in addition to cloud development capabilities
- Analytics tools including dashboards and advanced analytics (machine learning/artificial intelligence [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 2020
- Be able to support global IoT deployments (the Americas, EMEA, and APAC)
- Have at least 20% of their current IoT revenue stemming from the manufacturing vertical
- Be able to provide a minimum of two customer references for the manufacturing vertical (Reference customers had to have had at least six months experience with the platforms and applications by January 2021.)

For this IDC MarketScape, vendors had to meet a strict series of criteria as laid out previously. Other vendors that may play in the industrial IoT platforms and applications software space for manufacturers but that did not meet the criteria for inclusion in this document include:

- ABB
- Altizon
- Augury
- AVEVA
- AWS
- C3.ai
- Elevat IoT
- Honeywell
- Huawei
- MachineMetrics
- Plataine
- Schneider Electric
- SoftwareAG
- Tulip
- Uptake

ADVICE FOR TECHNOLOGY BUYERS

This IDC MarketScape assessed the capabilities of vendors in three areas: the offering and offering portfolio, the go to market, and the business itself. We suggest technology buyers pay particular attention to these areas, which are discussed in the sections that follow.

Offering and Offering Portfolio

- **Platform functionality:** In this study, we evaluated the core IoT platform functionality from many aspects, including how applications can access data, device management, data management, analytics, security, app development, deployment options, DevOps support, and the user interface (UI). However, IoT platforms have varying requirements in terms of the depth of technical skill needed to work with them so organizations should also internally assess their skill sets when choosing an IoT platform.

- **Integration:** We suggest technology buyers thoroughly vet possible suppliers for their integration capabilities with both the systems that generate the IoT data and the back-end systems they want to integrate this data with:

    - **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 more directly communicate with various types of industrial equipment. In addition to the ability to access the data, such tools may also be able to get data from disparate sources into a common data model so that it can be more readily used by applications.

    - **Back-end integration:** While there are some IoT use cases that can be driven off IoT data alone, we believe much of the value of IoT will be realized by the integration of that data with other key systems driving business processes. In the manufacturing space, we recommend evaluating integration with systems such as ERP, CRM, supply chain, asset management, manufacturing execution systems, and product life-cycle management (PLM).

        IIoT platforms and applications vendors should also be able to integrate with historians as these systems hold important historical and contextual information about equipment and processes.

- **IIoT data and analytics:** As the IoT market matures, and more data becomes available, the opportunity exists to analyze data using various tools and techniques. In addition, the cloud adds the ability to be able to gather data across geographically dispersed areas and do cross-site analysis. However, an effective analytics strategy does require a strong data management foundation that feeds clean, trustworthy, and properly contextualized data into the analytics model. The data and analytics strategy should also take data access into consideration. The more people that can access and work with the data, the more overall value an organization can derive from this valuable asset. Finally, organizations should assess what prebuilt models and algorithms the vendor offers for the manufacturing industry that may be able to speed up their own deployment time.

- **Deployment options:** Over the past several years, it has become increasingly apparent that, for most organizations, workloads will live in a hybrid cloud, multicloud world. IoT applications are no different, and in fact, they can drive up the complexity by needing to run in offline edge scenarios. It is important to understand how well the vendor you are engaging with can support your unique application deployment needs. In addition to the proper infrastructure to run distributed applications, we would recommend asking if you can use the same programming model for applications that run on different endpoints and if those applications can be managed in a similar way to your other workloads.

- **Solution/application portfolio:** In recent years, there has been a clear shift by providers in the space to focus more on the outcomes achievable through IoT rather than IoT platforms themselves. This has led to the rise in importance of solution/application portfolio as it will enable manufacturers to quickly deliver results on the outcomes they prioritize. IDC expects this shift to continue to occur as IoT portfolios continue to mature:

  - While IoT can be utilized across the previously mentioned four main manufacturing strategic priorities, platform providers usually have certain use cases they are stronger in than others. IDC recommends that you examine a provider's current portfolio and future road map to ensure it aligns with your overall transformation goals. Select the vendor that can help you achieve results today but also set you up for future success.

Go to Market

- **Ecosystem development:** The Internet of Things is highly ecosystem driven, and the development of industry ecosystems is a major trend as the world becomes more and more interconnected. IoT software (as covered in this assessment) is only one part of a full IoT solution, however. Therefore, it is important to understand how well the vendor you are working with has built up its partner ecosystem, specifically in the manufacturing vertical. Organizations we speak with consistently bring this factor up in terms of their choice to work with a certain vendor. A vendor with a strong ecosystem can help customers be successful in a number of ways: by doing pre-integrations with other software, hardware, and connectivity providers that help an organization get to market faster, by helping customers find services companies knowledgeable in their software to make the implementation smoother, by providing user groups that allow organizations to share best practices among themselves, and by providing opportunities to monetize software built on the platform, and more.

- **Customer success:** Historically, many IoT projects failed to move past the proof-of-concept (POC) stage. There is no single reason why this happens, but one of the most prominent causes is that the organization failed to consider how the IoT project fed into the larger digital transformation (DX) goals of the company. We recommend evaluating IoT platform providers that not only have good technology but also take the time to understand – or help you work through – the key goals and KPIs for the project. This consultative approach is important for not only exploring the initial alignment between the vendor offering and your requirements but also ensuring that the vendor's longer-term road map is well synchronized with your strategy.

- **Pricing:** IoT platforms and applications can be priced in a variety of ways. We asked about 4 different types of pricing and licensing terms and 10 different pricing models, and at least one vendor said yes to almost every category. The most common *pricing and licensing term* for IoT platforms and applications is the *subscription model,* and the next is on premises. A few vendors offer consumption-based pricing; none of the vendors that participated in this study offer outcome-based pricing for the platform. For pricing *models* for the platform, the most popular model is tiered pricing based on number of assets or devices. Other popular models are pricing based on named users or pricing based on data streams/tags. For pricing *models*

for applications, the most popular model is pricing based on named users; the second is tiered pricing based on number of assets or devices.

We recommend carefully assessing if a pricing model used for a POC will scale, taking into consideration your specific IoT use case and any business models you plan to put in place based on IoT data. It is also prudent to ask vendors if they offer any try-before-you-buy options.

Business

- **Investment in IoT:** IoT is a complex phenomenon that spans across heterogeneous hardware, networks, and software – and therefore requires significant investment from vendors for successful market participation. This effort includes not only internal R&D into innovative technology but also externally focused ecosystem development, which beyond the typical partnerships and integrations may also include participation in consortia, test beds, and the like. While not every vendor can invest at the same dollar amount, IDC recommends ensuring that the platform vendor you partner with is seriously invested in IIoT and Industry 4.0 for the long run.

- **Connected products past POCs:** A noticeable shift from the 2019 version of this IDC MarketScape is the number of customer references highlighting their work on connecting their products and the new service opportunities available to them. While most manufacturers tend to start with smart manufacturing use cases for IoT, the product/service opportunity is being realized by a growing portion of the industry and will only become more important as competitive differentiation and revenue growth are top priorities. One reference stated the top challenge they had to get past in their connected product initiative was from a security perspective, namely keeping customer data secure as they remotely monitored assets in their factories. This security piece is an important aspect to keep in mind from the start for manufacturers with connected product/service aspirations.

- **Industry knowledge:** There are unique industry challenges and business processes within different segments of manufacturing, and it is critical to understand these differences to be successful in an IoT deployment. IDC recommends you work with a platform provider that recognizes the requirements for your industry. Included in this IDC MarketScape are providers with offerings for manufacturing, which includes product-centric organizations across four distinct value chains:

  - **Asset-oriented value chain (AOVC) –** Industries include chemicals, metals, and pulp and paper.

  - **Brand-oriented value chain (BOVC) –** Industries include consumer packaged goods (CPG), food and beverage (F&B), fashion, and life sciences.

  - **Engineering-oriented value chain (EOVC) –** Industries include automotive, aerospace and defense (A&D), and industrial machinery.

  - **Technology-oriented value chain (TOVC) –** Industries include electronics and semiconductors (high tech).

VENDOR SUMMARY PROFILES

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 worldwide 2021 IDC MarketScape for IIoT platforms and applications in the manufacturing sector.

Company Overview

PTC is a provider of technology solutions that help industrial companies transform how they create, operate, and service smart connected operations and products. The company's heritage is in the PLM and CAD space, offering solutions for digital engineering, manufacturing, and service organizations. PTC's IoT strategy is anchored in the concept of the digital thread that offers various stakeholders within an organization the ability to leverage a single source of truth for data related to an asset or a process across multiple systems and business processes. PTC's industrial IoT solutions platform, ThingWorx, plays a key role in this strategy, enabling organizations to gather, contextualize, and orchestrate real-time data within the digital thread. From a partnership perspective, the company continues to work closely with Rockwell Automation around the FactoryTalk InnovationSuite, powered by PTC, with Microsoft, that provides a scalable foundation for the ThingWorx platform and with Ansys for customers that are looking to build physics-based simulations for digital twin models.

IoT Platform Offering

- PTC's IIoT Solutions Platform is ThingWorx.
- ThingWorx consists of a core IoT platform that allows developers and LOB staff to create IoT applications centered around the concept of a Thing Model and a set of applications and solutions that address common industrial IoT use cases.
- The focus for ThingWorx is to provide the tools for organizations to connect to various industrial devices and applications; build or extend applications; analyze IoT data; manage connected devices, processes, and systems; and create engaging experiences for the end users of IoT applications.
- PTC's Kepware product is a key contributor to the "connect" capabilities of the portfolio. This product can translate a broad range of proprietary protocols into a common format to give applications a single source of industrial automation data.
- PTC's Vuforia Studio allows companies to leverage their IoT data in an augmented reality (AR) experience.

Manufacturing IoT Offering

- PTC offers solutions in all four manufacturing value chains, with discrete industries (EOVC and TOVC) being the company's largest manufacturing customer segments.
- PTC offers IIoT applications across all manufacturing DX strategic priorities, with Field Service and Product Innovation use cases being the company's strongest areas, traditionally.
- Over the past two years, PTC's partnership with Rockwell Automation around the FactoryTalk InnovationSuite powered by PTC has bolstered the company's smart manufacturing capabilities.

Strengths

- **Enabling the digital thread:** IoT is an enabling technology for designing, managing, and improving products, services, and experiences that manufacturers require today. PTC's software portfolio (IoT, AR, PLM, ALM, and SLM) has the ability to support the integration, unification, and decision support of data, processes, resources, and people from business, IT, engineering, R&D, production, supply chain, and service.

- **Continued focus on digital/physical convergence:** The first step in IoT maturity is being able to visualize the current status of digital things and processes using IoT data; the next step is being able to interact with and optimize things and processes using analytics, simulation and, in some cases, augmented reality. The value of the company's augmented reality strategy and increased focus on SaaS was demonstrated during the pandemic, where organizations relied on these technologies to connect employees across different locations to support the operation, maintenance, and repair of all types of products and equipment.

- **Feature breadth:** Customers gave ThingWorx high ratings for breadth of platform functionality, flexible deployment options, and integration capabilities. Customers have consistently rated the company well in this area over the past few years.

Challenges

- **Competitive landscape:** The competitive landscape for industrial IoT is challenging as tech giants continue to fold industrial IoT capabilities into other core product lines. PTC has created a "better together" strategy with Microsoft and Rockwell Automation, but as the middle layer of this three-tiered partnership, PTC must continue to create its own differentiating market value.

- **Balancing the strategy:** There are two branches of PTC's IoT strategy: smart connected products (SCP) and smart connected operations (SCO). As a company in the engineering software space, PTC's original focus in IoT was more in the realm of product and service innovation, or the SCP side of the strategy. Therefore, the company's partnership with Rockwell was to be better able to access smart factory use cases, as well as an expanded set of verticals, which plays to the SCO strategy. Although the messaging around the SCO use case has been strongly amplified over the past two years due to this partnership, it is important for PTC to continue to focus on the SCP opportunity as well. While these types of use cases aren't always the low-hanging fruit in the market, they are well aligned with PTC's portfolio, and once organizations are able to successfully get connected products initiatives off the ground, there is a strong opportunity to scale.

- **Pricing:** Although PTC's pricing is considered well within the average range for the market in IDC's analysis, customers mentioned that they would like the company to offer additional pricing and contracting options.

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 estimated 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 a competitive software market representing portions of selected application development and deployment and system infrastructure software markets. There are two main segments of the market that IDC currently tracks: IoT application platforms and IoT connectivity management platforms. Vendors in this study primarily sit in the IoT application platform segment of the market. Further:

- **IoT application platforms** are software platforms that provide a bundled set of capabilities required to continuously connect, manage, and visualize IoT devices and data, often offered in a platform-as-a-service (PaaS) model.

- **Industrial IoT platforms** covered in this study represent a subsegment of the IoT application platform market that are specifically focused on providing applications with access to data gathered from industrial equipment and systems.

- An **IIoT application** is a code set designed to automate 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).

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LEARN MORE

Related Research

- *Asset-Oriented Manufacturing Value Chain 2021 Investment Guide* (IDC #US47583821, April 2021)
- *Brand-Oriented Manufacturing Value Chain 2021 Investment Guide* (IDC #US47583921, April 2021)
- *Engineering-Oriented Manufacturing Value Chain 2021 Investment Guide* (IDC #US47584021, April 2021)
- *Technology-Oriented Manufacturing Value Chain 2021 Investment Guide* (IDC #US47584121, April 2021)
- *IDC's Worldwide IoT Platforms and Analytics Taxonomy, 2021* (IDC #US46462521, April 2021)
- *Top 5 Trends for IoT Platform and Analytics in 2021* (IDC #US46462221, March 2021)
- *IDC Market Glance: IoT Platforms and Analytics, 1Q21* (IDC #US46462021, February 2021)
- *Worldwide Internet of Things Software Platform Forecast, 2019-2023* (IDC #US43880319, September 2019)

Synopsis

This IDC study uses the IDC MarketScape model to provide an assessment of vendors participating in the industrial IoT platforms and applications market. This study specifically analyzed these offerings from a manufacturing industry perspective.

"IoT is not a new topic for manufacturing; companies have been utilizing the technology for years, and it remains a high priority. What has been noticeable this year is the number of manufacturers utilizing IoT to connect their products and uncover new service opportunities," says Reid Paquin, research director, IDC Manufacturing IT Priorities and Strategies (ITP&S).

"By providing industrial companies with a common way to access, manage, and visualize IoT data, as well as build and deploy IoT applications, industrial IoT platforms play a key role in supporting the goals of manufacturing organizations today," says Stacy Crook, research director, IoT, IDC. "As the market has matured, manufacturers can now take advantage of prepackaged IoT applications that can help them realize value from their IoT data faster."

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. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world"s leading technology media, research, and events company.

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