



IDC MarketScape

IDC MarketScape: Worldwide IoT Platforms (Software Vendors) 2017 Vendor Assessment

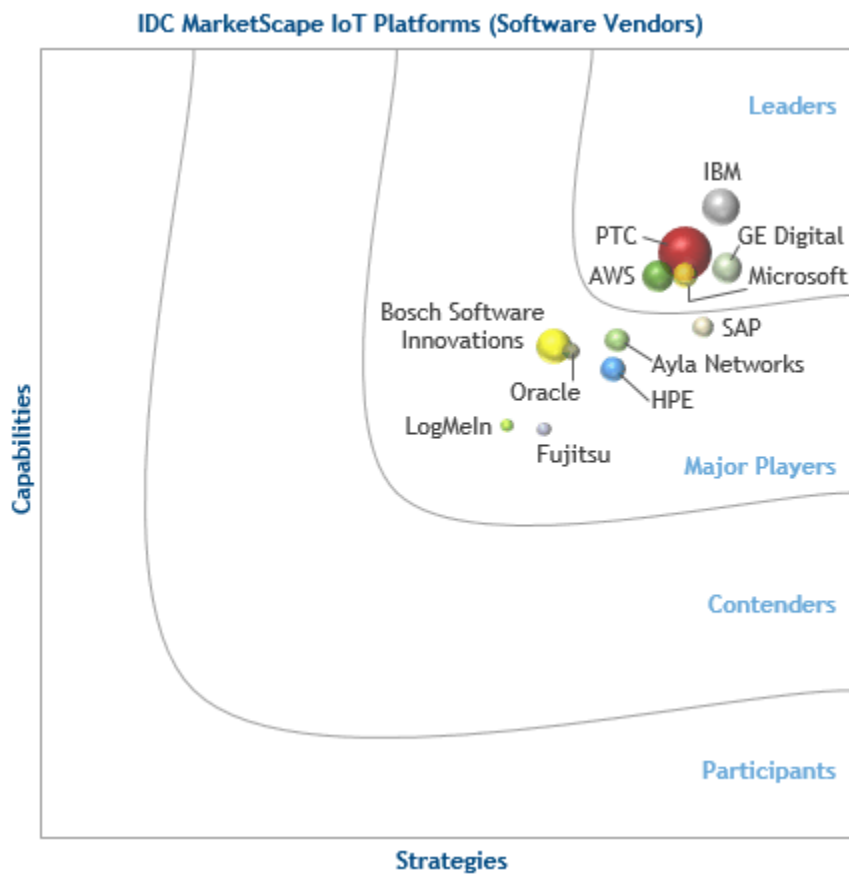
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IDC MARKETSCAPE FIGURE

FIGURE 1

IDC MarketScape Worldwide IoT Platforms Vendor Assessment



Source: IDC, 2017

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

IDC OPINION

The Internet of Things (IoT) is a natural evolution of the current technological and cultural environment. It will impact almost every industry and country around the world. IoT platforms sit in the middle of this vast ecosystem, providing the middleware between the IoT endpoints and the repositories where the data collected from the endpoints will eventually reside. There are consumer-focused platforms, horizontally focused enterprise platforms, and industry-specific platforms. Because of the many use cases these platforms will serve and the pivotal role they play in enabling the IoT, there are many providers of such products.

In IDC's view, an IoT platform is a commercial software product that offers some combination of the following capabilities (for the full market definition, see the Market Definition section):

- Connect to IoT endpoints
- Manage IoT endpoints/identities
- Ingest and process IoT data
- Visualize and analyze IoT data
- Build IoT applications
- Integrate IoT data into existing applications

Needless to say, the IoT platforms market is complex. The segment studied for this document – horizontally focused commercial platforms – is also fairly immature and rapidly evolving. With this said, there is a high amount of interest in these products from IDC customers; so we looked to find a group of providers whose platforms offered (or would offer) a similar set of capabilities and address a relatively similar group of use cases. The majority of the vendors in this study target – or have near-term plans to target – connected operations and connected products use cases. Some of these vendors fall more squarely into the industrial/connected operations realm and others fall more squarely into the connected products realm – yet others see opportunity across both. When we consider a connected building scenario, for example, it is obvious that there are use cases that cross into both sides of the world.

IDC MARKETSCOPE VENDOR INCLUSION CRITERIA

The IoT platform market is vast and there are many ways in which to segment it. Companies studied for this IDC MarketScape generally hail from an enterprise or industrial software heritage and tend to have strength in IT infrastructure, applications, and analytics. These companies generally (though not all) partner to provide cellular connectivity options. In the coming months, IDC will publish another view of the IoT platform market, studying companies from a communications service provider or network equipment heritage. These companies tend to start with strength in the connectivity layer of the platform and are in various stages of building additional application enablement services upon that connectivity layer.

Vendors included in this study:

- Had a standalone commercial IoT platform offering in market by December 2016
- Offered horizontally appropriate capabilities and sell into multiple vertical industries
- Provided at least four of the five core IoT platform elements in their offering (Device connectivity capabilities were necessary for consideration.)

- Provided three customer references that ideally had been using the product for six months or more

ADVICE FOR TECHNOLOGY BUYERS

In general, this study rated vendors across a horizontal set of capabilities that would lead to success across various use cases. However, when we analyzed product attributes specifically, we considered some use case-specific characteristics but ensured that these were not more heavily weighted toward one use case or another. For instance, vendors targeting industrial use cases will need to have strong edge capabilities, and those in the connected product realm would be expected to offer mobile application development tools. Overall, we believe technology buyers should look for IoT platform software providers with the attributes discussed in the section that follows.

Key Strategy Measures for Success

- **Product functionality breadth:** IDC evaluated vendors on how comprehensive each offering was across the six core elements of an IoT platform (connectivity management, device management, data ingestion, processing, management, visualization tools, application enablement tools, and analytics). We considered how many of these capabilities were packaged into the core IoT platform offering versus requiring additional purchases on the part of the customer. IDC understands that not all organizations will use all components of functionality; however, we believe customers should evaluate whether a vendor is packaging a product in a way that makes it easy to administer and manage the product – and costs – over the lifetime of the offering.
- **Protocol/device support:** IDC evaluated vendors on the current protocols, device types, and operating system types supported. In the connected product scenario, it is critical to build strong partnerships with IoT endpoint OEMs to help customers get their devices connected to the internet quickly. This is also important in the industrial world, although the integration point may be at the gateway or at the machine/sensor level, depending on the project requirements. Technology buyers should enquire as to whether the vendor can support the IoT endpoints they will need to connect to – over the preferred protocols for connecting to those devices – and ask what is supported out of the box versus requiring additional custom development work.
- **Integration capabilities:** Companies must consider how the IoT platform will integrate with back-end systems and/or other cloud services, which could include databases, applications, and analytics programs, among others. It is important to understand how IoT data will be secured in the context of integration with other systems. In this vein, APIs and API management will grow increasingly important as companies look to monetize IoT data.
- **Edge support:** According to IDC's *Global IoT Decision Maker Survey*, over half of companies will "collect and transmit IoT data to an enterprise-grade datacenter (i.e., they have a preference for a centralized computing model). However, edge computing is the choice for 43% of the companies surveyed. These survey results demonstrate the importance of the IoT platform's ability to collect data as well as process and analyze those capabilities at the edge (see *2015 Global IoT Decision Maker Survey: Vertical Analysis*, IDC #US40756916, June 2016). These capabilities are especially critical in industrial scenarios.
- **Breadth of complementary portfolio offerings:** The majority of IoT platform implementations today require services support. We recommend that technology buyers evaluate the vendor's portfolio of services offerings aimed at successfully strategizing, implementing, and managing IoT deployments. In addition to services, we believe a portfolio of applications (or solutions)

will help customers realize faster time to value. Finally, while we expect that prescriptive analytics will be part of the typical IoT platform arsenal, customers should also understand how the vendor will support predictive/prescriptive analytics.

- **Delivery model options:** This is always an important consideration in a technology purchase. While some customers are okay with limited options for their initial pilots, they could see the need for additional delivery models on the horizon as they expanded the IoT program into additional business units or geographies with strict data privacy rules. Managed cloud offerings were also praised for their ability to reduce operational upkeep.
- **Pricing:** Pricing was a sore spot for most customers interviewed for this research. Many felt current pricing models were too opaque and offered little ability to predict costs. However, they also had some tolerance for this ambiguity due to the early stage of the roll out. Technology buyers should consider the various use cases the IoT platform may need to support and whether the vendor's pricing model will be appropriate across all of those.
- **Ecosystem:** IoT is an ecosystem play with various companies providing technology at the device, network, and software layer. No one vendor can do it all, nor should they aspire to. Customers should discuss their IoT strategies with potential platform providers to understand what kind of partnerships they have in place to support those plans.
- **Customer service:** One of the challenges in this space is that the IoT data will interact with many potential points of failure and security risk as the data moves from the initial point of collection to its final destination (which may be more than one place). Customers should ask vendors which potential issues are supported within the umbrella of the IoT platform and which issues may be referred to a third party for resolution.

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.

AWS

According to IDC analysis and buyer perception, Amazon Web Services (AWS) is a Leader in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

AWS aligns its IoT strategy around the concepts of intelligence, cloud orchestration, and things. The company provides the building blocks required for organizations to connect to devices as well as gather and process information wherever the computing needs to take place. This architecture also provides out-of-the-box integration to other IoT-related AWS services.

Vendor Offering in This Space

AWS IoT is Amazon's cloud-based IoT service. The core components of AWS IoT consists of the device gateway, device shadows, device registry, and a rules engine. These work together to securely connect devices to AWS services and other devices, process and act upon data from these devices, enable applications to interact with devices even when they are offline, and fully integrate with other AWS services to manage the data and gather insights from it. On the device side, AWS offers a zero-touch provisioning kit that can be embedded into devices to allow for just-in-time registration and for companies to use their own certificate authority.

AWS Greengrass is Amazon's complementary edge technology. AWS Greengrass is a runtime environment for Lambda functions, pub/sub message broker, device shadow, and security, which brings local compute, messaging, data caching, and sync in a secure way to connected devices – even when they are not connected to the internet.

AWS also offers a number of starter kits for connecting to various device types.

Other Related Portfolio Offerings

AWS has over 25 separate cloud services that have relevance to IoT. Included directly in the AWS IoT service is the Rules Engine. The Rules Engine enables straightforward, scalable processing of messages using services such as:

- Amazon Lambda – serverless compute
- Amazon Kinesis – analytics
- Amazon S3 – storage
- Amazon Machine Learning – artificial intelligence (AI)
- Amazon DynamoDB – database
- Amazon CloudWatch – management tool
- AWS CloudTrail – management tool
- Amazon Elasticsearch Service with built-in Kibana integration – analytics

Strengths

- A key strength for Amazon is its growing presence in enterprise environments and the many complementary services it offers to AWS IoT. Customers see AWS IoT as a way to on-ramp their IoT devices to the broader AWS environment they have already invested in.
- Companies are envisioning IoT as an enabler of digital transformation strategies and need a partner that can provide innovative technology to assist them in this journey. AWS' record of disruption and innovation is a good match for this fast-moving space.
- AWS' security model has been noted as a strength by customers.
- AWS has a large and diverse ecosystem of partners supporting IoT, ranging from hardware and chip makers to platform providers and systems integrators. AWS has extensive requirements, backed by a third-party audit, for validating its IoT competency partners. These requirements include Advanced APN tier status and partner must have public IoT customer references and offer product availability in three or more AWS regions.

Challenges

- In contrast to some of the other offerings in the IoT platforms market, AWS provides a "building blocks" approach that allows customers to choose and configure the functionality they need at a more granular level. Some organizations like the flexibility this approach affords; smaller companies with complex IoT deployments may not be comfortable with the additional custom development this may require.
- AWS is both an IoT platform provider and a cloud service provider that other IoT platform providers sit upon. While the popularity of the AWS platform among IoT PaaS providers is positive for the company overall, this also means that some of the architectural elements of the solution that currently help differentiate AWS IoT (such as serverless computing) could also be leveraged by the competition.

- Customers believe AWS still has some maturing to do in terms of developing enterprise-friendly processes and contracts.

Ayla Networks

According to IDC analysis and buyer perception, Ayla Networks is a Major Player in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

Founded in 2010, Ayla Networks is a pure-play IoT platform start-up based out of Silicon Valley, California. Ayla Networks focuses on providing a comprehensive solution with components across IoT endpoints, cloud, and applications that minimizes the amount of work product manufacturers must do to get their products connected to the internet.

Vendor Offering in This Space

Ayla's flagship offering is the Ayla Agile IoT platform. The core of the platform is Ayla PaaS, a cloud service that includes user, device, data management, data reporting and dashboards, as well as features like over-the-air updates. In addition, Ayla pre-integrates its client software with communication chip and module providers, so customers do not have to do the front-end integration work themselves. On the application side, Ayla offers native mobile libraries as well as partially configured mobile applications to speed application development.

Other Related Portfolio Offerings

- Ayla offers advanced analytics via a partnership with mnuvo
- Value-added security offerings such as IDaaS/SSO

Strengths

- Ayla is laser focused on providing an integrated end-to-end (device, cloud, and application) solution to help customers get their products connected to the internet quickly.
- Ayla's tight integration with chip and module manufacturers can help take the risk out of selecting the right hardware partners and enable a faster time to market.
- Customers cite security as a strength; certificates and encryption keys are device specific and are added during the manufacturing phase of device.
- Customers cite Ayla's customer support and services offerings as top strengths.

Challenges

- Customers cited the need for improved visualization tools; Ayla has recently introduced a new set of such tools with Ayla Insights v2.0 that were not available at the time these customer conversations took place. These tools will give insights into batch data; real-time insights are offered through a partner product. Over time, customers will have increasingly high demands for analytics and Ayla will need to figure out the best way to cost-effectively integrate those capabilities into its platform.
- Ayla has the opportunity to build more out-of-the-box connectors for improved integration into back-end enterprise systems.
- Customers cite the need for more comprehensive data governance tools.

Bosch Software Innovations

According to IDC analysis and buyer perception, Bosch Software Innovations is a Major Player in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

Bosch Software Innovations is the software business within Robert Bosch GmbH, one of the largest multinational engineering and electronics companies in the world. Bosch GmbH is focused on its "3 S" pillars around sensors, software, and services to simplify and automate to ease organizations' business processes and consumers' everyday lives. Over the past five years, Bosch has invested more than €100 million in artificial intelligence to drive its IoT effort. Bosch Software Innovations supports this vision by developing software and services that help companies bring their IoT ideas from strategy to implementation.

Vendor Offering in This Space

Bosch's IoT platform is Bosch IoT Suite. The Bosch IoT Suite consists of several modules that may be leveraged alone or in conjunction with one another. These modules include:

- **Bosch IoT Hub:** Messaging backbone for device-related communication as the attach point for various protocol connectors
- **Bosch IoT Remote Manager:** Administration of device functions like network connection, configuration, monitoring, and so forth
- **Bosch IoT Things:** Managing assets, reading data from assets, controlling assets, and so forth
- **Bosch IoT Rollouts:** Manages large-scale rollouts of device software or firmware updates, both wired and over the air
- **Bosch IoT Integrations:** Integration with third-party services and systems
- **Bosch IoT Permissions:** User management, role-based access control, and multitenancy for IoT applications
- **Bosch IoT Analytics:** Leverage the data of IoT devices

Other Related Portfolio Offerings

- SaaS applications offered by Bosch SI include connected mobility, connected industry, connected home and building, connected energy, and connected city.
- Bosch also offers business process management and business rules management that can help streamline and automate IoT processes.
- Bosch offers ProSyst Gateway.

Strengths

- As a prominent supplier of products to various vertical industries, Bosch has a strong opportunity to internet enable such products and offer its platform to help customers and partners gain greater value from their investments. At the same time, its platform offers Bosch the opportunity to leverage that momentum to become more of a product-agnostic software/services company.
- Bosch's deep industry expertise and prebuilt industry solutions can give Bosch a leg up in platform deals where the customer is looking for a solution provider that can deliver specific applications tailored to its industry.

- The modular design of the offering allows Bosch to build partnerships with other software providers for specific areas of functionality.
- Bosch's own cloud is hosted in Germany to meet the compliance needs of its European customers.

Challenges

- Currently, the Bosch IoT Suite has one microservice, Bosch IoT Integrations. With this service, Bosch ensures customers and partners are able to integrate their software or tune the suite via API. As Bosch's customers increasingly look to build new business models around IoT data, however, the company should consider API-enabling additional platform components.
- Bosch is in the process of porting the product to various public clouds – while this is a move in the right direction to support Bosch's hybrid cloud strategy, it is a time-consuming process and one that won't offer as much differentiation as adding new features and functions.
- Currently, Bosch does have some level of dependence on partners for technologies like complex event processing and analytics; while this approach may allow it to get to market faster, it generally offers less control of the road map.

Fujitsu

According to IDC analysis and buyer perception, Fujitsu is a Major Player in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

Fujitsu's current strategy is focused on human-centric innovation and digital cocreation – the belief that a collaborative and customer-centric approach to the development of ICT solutions has the greatest potential for delivering the best value. In support of this mission, Fujitsu has said that creating connected services will sit at the foundation of its growth strategy – and the company sees the IoT platform as being positioned at the nucleus of these services.

Vendor Offering in This Space

Fujitsu has a broad range of offerings that encompass the company's IoT platform strategy (see Other Related Portfolio Offerings section). However, the primary cloud data ingestion cloud service is the FUJITSU Cloud Service K5 IoT Platform (K5 IoT Platform). The K5 IoT Platform includes capabilities across connectivity management, device and security management, and data management. For customers with cellular connectivity needs, Fujitsu offers an M2M service. Analytics, visualization tools, and application enablement are handled by complementary cloud services. The K5 IoT Platform is offered in either a public cloud or private mode today, but Fujitsu also plans to offer these capabilities on-premise by the end of 2017.

Other Related Portfolio Offerings

- FUJITSU Managed Infrastructure Service FENICS II M2M service (M2M service) – Connectivity
- FUJITSU Network EdgIoT GW1500 (M2M gateway) – Edge gateway
- FUJITSU AI Solution Zinrai Platform Service (Zinrai) – AI
- FUJITSU IoT Solution UBIQUITOUSWARE (UBIQUITOUSWARE) – Human sensor and analytics

- FUJITSU Business Application Operational Data Management & Analytics (ODMA) – Analytics
- FUJITSU Intelligent Society Solution SPATIOWL (SPATIOWL) – Location data analytics
- FUJITSU Cloud Service RunMyProcess (RunMyProcess) – Workflow and visualization
- FUJITSU Enterprise Application Intelligent Dashboard (Dashboard) – Visualization
- COLMINA Platform and COLMINA Edge – Vertical-specific IoT solution for the manufacturing industry
- Reference architectures for mobility, digital marketing, manufacturing, retail logistics, food-agriculture, and home safety

Strengths

- Fujitsu is not only a provider of ICT products and services but also a manufacturer of various technology products. It can use these facilities as a test bed for new IoT products and then leverage that knowledge to build improved products for its customer base.
- Fujitsu's UBIQUITOUSWARE product line is highly complementary to its IoT platform strategy. The UBIQUITOUSWARE sensor algorithm detects the behavior and status of people and things and is offered via Fujitsu-specific products or can be embedded into customer products and services.
- Fujitsu offers its own edge gateway and its own technology named Dynamic Resource Controller to optimize load balancing between edge devices and the cloud platform.
- Fujitsu can leverage its well-developed services arm to drive its software business forward. This capability can also increase horizontal industry knowledge as Fujitsu consultants cocreate solutions with its clients.

Challenges

- While Fujitsu has a comprehensive portfolio of offerings of IoT software, there is an opportunity to bring more of these capabilities into the core IoT service, therefore making it easier for customers to deploy and manage costs. To address this, Fujitsu plans to bring a series of feature-rich vertical platforms to market. The first of these is targeted toward the manufacturing industry and is called COLMINA.
- Customers noted the opportunity to better integrate extract, transform, and load (ETL) capabilities into the platform. Fujitsu believes this topic is best addressed on an industry by industry basis and will look to build these capabilities into their vertical platforms.
- Fujitsu currently offers its solution on the Fujitsu K5 Cloud, which is in production in five countries today (Japan, United Kingdom, Finland, Germany, and Spain) with three more planned in the near future (United States, Australia, and Singapore). While the company does have datacenter expansion plans, the relatively small footprint of K5 Cloud (relative to other major cloud providers) could be an issue for large multinational companies (MNCs).

GE Digital

According to IDC analysis and buyer perception, GE Digital is a Leader in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

As one of the largest industrial multinational conglomerates in the world, GE saw an opportunity to transform the company and take advantage of the digitization of its own – and others' – machines and

processes. To do that, the company built its IoT platform, Predix, deployed it inside of GE, and now deploys Predix in its customers' businesses. GE also formed a new, commercial business unit called GE Digital to ensure that GE could guide its internal and external customers and partners through what it calls the "digital industrial transformation" journey.

Vendor Offering in This Space

GE's Industrial IoT platform is called Predix. With Predix, GE aims to help companies build, manage, and monetize Industrial IoT solutions that optimize their assets and operations. Supported by an edge-to-cloud, distributed application and service architecture, the platform offers various microservices for connectivity, device management, data management, analytics, security, and various operational services. In addition to runtimes, UIs, and frameworks for analytics, the company also offers several analytical models developers and data scientists can use to build analytics applications. While most these services are GE-owned IP, the company also offers some partner solutions where it makes sense to do so. Predix offers the ability for customers to build dynamic digital models of physical assets and systems, otherwise known as digital twins. These digital twins can help customers gain knowledge and insights about performance and predictions of future operations. Predix mobile provides cross-platform SDKs and a mobile service for building apps.

Other Related Portfolio Offerings

GE has made several recent acquisitions to enhance the Predix strategy. These include Wurldtech for security, Meridium for asset performance management capabilities, ServiceMax for field service solutions, Wise.io for machine learning, and Bit Stew for data integration capabilities. Some of these capabilities will be integrated into the platform, others will serve as complementary offerings.

GE offers various solutions in the following areas:

- Asset performance management
- Field service
- Brilliant manufacturing

GE provides these solutions to customers in industries around the world, including:

- Oil and gas
- Power and utility
- Chemical
- Transportation
- Healthcare
- Aviation

In addition, the company has over 40 services offerings that span horizontal and vertical industry needs.

Strengths

- GE's own story of successful digital industrial transformation helps the company appeal to customers that are trying to navigate the same path. GE's deep well of industrial expertise allows the company to become a trusted partner on that journey.

- GE offers a large portfolio of analytics tools; customer conversations pointed to the fact that analytics will be the most valued aspect of IoT platforms moving forward.
- Customers cite comfort with the security model, given that GE is currently protecting mission-critical infrastructure with its solutions.
- GE partners say the company excels at tying the value chain together for customer outcomes.

Challenges

- Many companies with a commercial IoT platform come from an IT heritage and have the challenge of trying to infiltrate the OT landscape. GE is in the opposite position of traditionally having deep ties into OT/LOB and less so with horizontal IT leadership. However, trends such as IT budgets moving to LOB and the increasing power and relevance of industry clouds bode well for GE's strategy.
- GE has the ongoing challenge of managing the cultural change required to be an innovative company in a sector that moves at a breakneck pace.
- Customers say there is some work that needs to be done to mature the product in the areas of device management and visualization tools.

HPE

According to IDC analysis and buyer perception, Hewlett Packard Enterprise (HPE) is a Major Player in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

Hewlett Packard Enterprise's strategy centers on making hybrid IT simple, powering the Intelligent Edge, and providing the services expertise necessary for delivering IT and OT solutions. For the Intelligent Edge, HPE sees IoT holding great strategic value as the market moves toward the edge where more and more compute power is required. HPE has a unique portfolio of IoT products, ranging from its HPE Edgeline Converged Edge Systems to its Aruba wired and WiFi/BLE-enabled products – ranging from a family of edge to core switches, platforms such as Meridian for location-based services, asset tracking for high-value physical devices, and integrated ClearPass networked access control and IntroSpect UEBA behavioral analytics software perimeter security defenses. The HPE Universal IoT Platform (UIoT) provides the link between the edge, connectivity, and datacenters, completing the HPE portfolio in this space.

Vendor Offering in This Space

HPE's flagship offering in the IoT platform market is the HPE Universal IoT Platform. UIoT includes capabilities across connectivity, device management, data management, application enablement, and visualization tools. The platform can send data to an analytic engine based on Kafka message propagation where partners would then provide analytical functionality. HPE's UIoT product was developed within the HPE telecom services business unit and is therefore built to run in either a service provider environment or an enterprise environment. Because of the focus on telecom customers, HPE's platform supports cellular connections out of the box, whereas many other solutions require partnership with a third party for this functionality. The HPE Universal IoT Platform architecture is aligned with the oneM2M industry standard and designed to be industry, data source, connectivity, and device agnostic.

Other Related Portfolio Offerings

- HPE Edgeline IoT Systems:
 - **Converged Edge Systems.** Industrial high-performance compute, control systems, data acquisition, and management for IoT edge environments
 - **Intelligent Gateway Systems.** Small, rugged footprint for device, sensor, and data aggregation with compute for IoT edge environments
- Aruba Network:
 - **Edge to core.** Edge-to-core switching portfolio with software that enables actionable insights to maintain high availability for connected IoT devices
 - **ClearPass.** Multivendor wired and wireless NAC, with end-to-end visibility and per-device control, that integrates with security vendors to secure corporate, BYOD, and IoT devices
 - **IntroSpect.** Multidimensional behavioral analytics integrated with ClearPass' endpoint control response capabilities for automated enforcement
 - **Meridian.** Mobile app platform for indoor location services and asset tracking
- HPE Pointnext: Advisory, transformation, professional, and operational services
- A series of horizontal and vertical IoT solutions that span automotive, cities, transportation, manufacturing, healthcare, buildings, and retail

Strengths

- HPE has 25 years of experience in providing scalable device management solutions for telco environments; it is now using this expertise to rapidly onboard and manage IoT devices at scale. These relationships, as well as the company's global partner ecosystem of SIs, and partners for device, apps, and IoT field services, are important channels to help HPE bring its solution to market.
- HPE has global delivery capabilities with in-house expertise for quickly building industry applications and use cases. HPE has spent much of its development time thinking about how it can help customers build IoT applications more efficiently so they can monetize their data faster. Capabilities such as the ability to rapidly transform information coming in from various protocols into a common data model and the ability to parse data coming from one device into subcategories are useful toward this goal.
- HPE has strength on the connectivity side of the platform, where it has built in support for in-built protocol libraries of most standardized M2M protocols like LWM2M, MQTT, LTN Gateway, DLMS, TR-069, ZigBee, and OMA DM together with both device management and subscription management as API Exposure and Interaction Studio (web GUI) tools for enabling real-time IoT applications.
- HPE has built in integration with HPE Edgeline IoT Systems to offload device data acquisition and analytics at the edge and integration with HPE Aruba location and WiFi access hot spots-based data to mash up with IoT devices to enhance the value-add for location-centric IoT use cases.

Challenges

- HPE's UIoT is positioned to compete with connectivity-focused players as well as those more focused on the back end (data processing, analytics, etc.); it needs to ensure the value proposition is clear to customers and partners.

- HPE is targeting complex use cases, such as connected car and smart cities. While the payoff for the winners in these deals could be huge, they will require strong partnering skills – and time – before significant revenue results are achieved.
- While the Intelligent Edge is one of HPE's core pillars, much of the IoT focus in the company has been on the Aruba and Edgeline products. The company will have to keep a strong marketing focus on UIoT to ensure it doesn't get shadowed by the other IoT portfolio assets.

IBM

According to IDC analysis and buyer perception, IBM is a Leader in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

IoT is one of the lynchpins of IBM's strategy and is critical in helping its customers on their journeys to becoming cognitive businesses. IBM announced a \$3 billion investment into IoT that was announced in April 2015. This investment enabled the launch of a new business unit in IBM focused specifically on integrating IBM's security, cloud, analytics, cognitive, and industry expertise to drive leadership in the IoT market. Based on the Watson IoT Platform, IBM is currently helping customers transform in three discrete areas: improving operational performance and lowering costs, creating new products and business models, and driving engagement and customer experience.

Vendor Offering in This Space

IBM's IoT platform is called Watson IoT Platform. The core Watson IoT Platform capabilities can be organized into four quadrants. These four quadrants are:

- **Connectivity:**
 - Secure connectivity, device management, and visualization
- **Risk management:**
 - Proactive protection, security analytics, and anomaly detection
- **Information management:**
 - Storage, data transformation/integration/augmentation, and weather
- **Analytics:**
 - Predictive, cognitive (ML, NLP, video/image analytics, and text analytics), real time, and edge

(IBM's Watson IoT does include various capabilities within each of these constructs within the platform; however, some capabilities, such as machine learning and security analytics are add-on products.)

IBM offers a gateway SDK that can be pre-embedded into hardware for edge capabilities.

IBM has also integrated Blockchain and payment processing capabilities (via a partnership with Visa) into the platform.

Other Related Portfolio Offerings

- Industry-specific solutions (IBM IoT for Automotive, IBM IoT for Electronics, IBM IoT for Insurance, IBM IoT for Manufacturing, IBM IoT for Retail, etc.)
- Horizontal applications from the Maximo, Rational, and TRIRIGA families (asset management, asset performance, facilities management, systems engineering, predictive maintenance)

- Watson IoT that runs on IBM's Bluemix PaaS and Bluemix services can be used in concert with the platform (IBM Streaming Analytics, Watson Machine Learning, etc.)
- IBM Bluemix and Node-RED for building IoT applications
- IBM Global Services that offers a broad suite of complementary IoT services offerings

Strengths

- Watson IoT is available in three deployment options (public/private/on-premise) across 175 countries, including China. This enables IBM to meet the needs of local companies or MNCs with strict regulatory compliance regarding data privacy.
- IBM has created a strong analytics brand with Watson and can demonstrate the power of cognitive analytics in the IoT.
- IBM has made investments into innovative technologies that will provide value above and beyond what a standard IoT platform may provide (Node-RED for rapidly building IoT applications, Blockchain for supply chain management, and payments processing).
- IBM's multilayered security strategy (security built into the architecture, security analytics dashboards, services for blockchain, threat intelligence, data anonymization, etc.) sets it apart.

Challenges

- While IBM can offer both software and services, a customer mentioned it is challenging for IBM's services arm to keep up with the innovation happening on the software side of the house.
- Customers would like to see improved visualization capabilities.
- Customers that are using a mix of IoT-specific and non-IoT-specific cloud services would like to see improved coordination between the various teams within IBM.

LogMeIn

According to IDC analysis and buyer perception, LogMeIn is a Major Player in the IDC MarketScope for IoT platforms.

Vendor IoT Strategy

LogMeIn's strategy is to empower organizations to deliver more human, personalized, and intelligent customer engagement and support across all digital channels, devices, and media to drive increased satisfaction, engagement, and productivity. LogMeIn sees its Xively offering as a natural progression to the support-of-things opportunity, as the product accelerates its evolution from supporting connected PCs and mobile phones to connected objects and products. The company is largely focused on the connected products segment of the IoT versus the industrial internet.

Vendor Offering in This Space

Xively is LogMeIn's IoT platform. Xively is a SaaS-based offering that offers capabilities to connect and manage devices, manage the data coming off the devices, and integrate the data with back-end systems such as Salesforce. Xively includes visualization tools, but more advanced analytics are offered through partners. To help companies get their products connected to the internet as quickly as possible, Xively offers product launcher templates that help companies create a connected product concept, visualize their product data in an end-user app, and provide guidance on how they can make the IoT data actionable. From an architectural point of view, LogMeIn is highly focused on product

scalability and security. Xively supports data collection and device management at the edge; other capabilities are generally supported through partnership.

Other Related Portfolio Offerings

- Smart Home Solution
- Rescue Lens – for augmented reality
- LogMeIn Rescue – PC/phone support
- A suite of services to support Xively implementations, including application development

Strengths

- LogMeIn's heritage is in building intuitive, UX-focused SaaS applications; it has taken this expertise and applied it to a complex market. Customers cite ease of use in connecting their products to the cloud as a key benefit of Xively.
- Xively was rated highly for the ease of integration capabilities; customers said the company offers clear, well-documented APIs, and the out-of-the-box integration to Salesforce is valuable.
- Xively has well-developed data governance and identity capabilities; this is important for cross-OEM support organizations – like a GeekSquad, for example – or larger companies with many connected products.
- LogMeIn bundles in services with Xively pricing; customers commented that this saved them significant time and money on application development.

Challenges

- Customers cite dashboards and analytics as two areas where there is room for improvement.
- Xively's revenue growth hasn't been as strong as some of LogMeIn's other products in the company's early days. However, the company has just been infused with new capital via the Citrix GoTo Merger, and there are product strategy changes currently taking place that could set up Xively to be a better integrated part of the LogMeIn story moving forward.
- The IoT platform market has been infiltrated by a number of large, influential players from both the IT and OT worlds. LogMeIn's niche is in connected products and support – it needs to double down on securing current relationships and making significant moves to build new relationships to future-proof its place in the market.

Microsoft

According to IDC analysis and buyer perception, Microsoft is a Leader in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

Microsoft views IoT as a business revolution being fueled by technology. IoT is central to Microsoft's intelligent cloud and intelligent edge strategy as it drives the ingestion of data and continued use of complementary Azure services. The company sees the business value of IoT realized in three stages: connecting and monitoring assets, analyzing IoT data to take action and improve processes based on that data, and transformation, where customers can introduce new business models and product lines based on the insights they've gathered.

Vendor Offering in This Space

Microsoft's IoT platform is the Microsoft Azure IoT Suite. The key value propositions of the Azure IoT Suite include the ability to quickly connect IoT devices and systems, discover new insights, and enhance security. The Azure IoT suite is a collection of cloud services including:

- **IoT Hub:** Device-to-cloud and cloud-to-device messaging capabilities and acts as the gateway to the cloud and the other key IoT Suite services
- **Stream Analytics:** In-motion data analysis
- **Machine learning:** Predictive analytics tool
- **Azure Web Apps and Microsoft Power BI:** Data visualization capabilities
- **Azure Storage and Azure Cosmos DB:** Data storage capabilities
- In addition, Microsoft offers preconfigured solutions on top of this suite to speed time to market

Microsoft also offers three categories of SDKs:

- **Azure IoT Device SDK,** to build apps that run on IoT devices
- **Azure IoT Service SDK,** to manage IoT the hub, and optionally send messages to IoT devices
- **Azure IoT Edge,** to build gateways to enable devices that don't use one of the supported protocols or to process messages on the edge

Other Related Portfolio Offerings

- Microsoft offers three preconfigured solutions to run on top of the Azure Suite:
 - Remote monitoring
 - Predictive maintenance
 - Connected factory
- Cortana Intelligence Suite – big data/advanced analytics platform
- Microsoft Dynamics 365 – intelligent cloud applications
- Microsoft HoloLens for augmented reality

Strengths

- Microsoft has assembled a large collection of certified device partners (545 devices from 182 partners) and SI partners to help customers get their products connected to the internet faster.
- Microsoft has bundled into its suite important IoT capabilities such as machine learning and streaming analytics that are often available as add-ons from other companies. Doing so can help lower complexity and manage costs for customers.
- Microsoft's Azure IoT offerings are part of the company's broader Azure cloud distribution channel, offering the company a well-developed global distribution network that includes training, incentives, and so forth.
- Integration and device management capabilities are rated highly by customers.

Challenges

- Microsoft is still in the process of developing the capabilities to offer a consistent experience from cloud to edge. However, the company has recently announced Azure IoT Edge, which adds device management and data processing at the edge.

- Microsoft offers horizontal preconfigured solutions with IoT Suite; the vertical go to market is through partners, which gives Microsoft itself less direct control of marketing these solutions to prospective customers.
- Customers feel the pricing model needs to be simplified. However, the Azure IoT Suite is offered in single SKU pricing.

Oracle

According to IDC analysis and buyer perception, Oracle is a Major Player in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

IoT is a strategic area of innovation and growth for Oracle's cloud offerings. IoT Cloud solutions bring together other related areas such as connectivity, big data, AI/machine learning, mobile, and analytics (both on the edge and in the cloud). From a growth perspective, IoT is driving growth for both PaaS and SaaS offerings, and Oracle's IoT Cloud applications help drive growth in the company's supply chain (SCM), ERP, and customer experience (CX) cloud offerings. Customers are also building new applications and solutions using a combination of Oracle's PaaS offerings – IoT, mobile, integration, BI, and so forth.

Vendor Offering in This Space

Oracle's IoT platform is called Oracle IoT Cloud Service. Oracle IoT Cloud Service includes features to connect devices, visualize/analyze data, and integrate that data with back-end applications. Oracle provides some device management capabilities but also depends on partners for some components. In detail:

- **Connect:** Device virtualization, messaging, endpoint management
- **Analyze:** Stream processing, data enrichment, event store
- **Integrate:** Integration via REST API with back-end data sources

Edge scenarios are supported by Oracle IoT Cloud Gateway software, which is an OSGi-based middleware for gateway devices.

Other Related Portfolio Offerings

- Oracle IoT Cloud applications:
 - Oracle IoT Asset Monitoring Cloud
 - Oracle IoT Production Monitoring Cloud
 - Oracle IoT Fleet Monitoring Cloud
- Oracle PaaS services (mobile, analytics, integration, etc.)
- End-to-end IoT solution development services

Strengths

- Oracle is in a good position to capitalize on IoT due to its strong base of enterprise applications, information management, integration, and analytics technologies.
- As part of the platform, Oracle provides a set of analytics tools appropriate for business analysts – and also provides more advanced analytics capabilities for developers and data scientists.

- Oracle is working to build applications that create a layer of contextual information around IoT data that gives it more meaning and therefore can translate into more customer ROI.
- Oracle's security model was mentioned as a strength by customers.

Challenges

- Oracle could stand to raise its visibility in the IoT market overall. While customer conversations give the impression that Oracle is still in early days with IoT deployments, the company has a significant opportunity to be more vocal about its strategy and offerings in the space.
- Device management appears to be a place where Oracle will look for partners to supplement the core offering. This is understandable given the complexity of supporting many device types, but could also be a place for additional focus in the future.
- Oracle currently offers the product in a public cloud delivery model; we believe customers in various industries/regions that Oracle is targeting will require the company to expand its delivery options in the future. However, Oracle IoT Cloud Service will run on Oracle Cloud Machine (Oracle cloud services, now available to run in the customer's datacenter) later this year.

PTC

According to IDC analysis and buyer perception, PTC is a Leader in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

PTC is a provider of technology solutions that help industrial companies transform how they create, operate, and service smart, connected operations, products, and solutions. The company's heritage is in the produce life-cycle management (PLM) and computer-aided design (CAD) space, offering solutions for digital engineering, manufacturing, and service organizations. Given the strategic importance of IoT in these industries, PTC has transformed itself around the company's IoT initiatives, and PTC's industrial IoT platform, ThingWorx, is key to the company's strategy and overall product road map.

Vendor Offering in This Space

ThingWorx is PTC's IoT platform. At the heart of the ThingWorx platform is the ThingWorx Foundation, which is the core application enablement platform and connects to all the other ThingWorx components listed below:

- ThingWorx Foundation – Includes the ThingModel (digital twin), connectivity management, data management, development tools, reporting, and basic analytics
- ThingWorx Utilities – Device management and system integration hub
- ThingWorx Analytics – Automated advanced analytics and anomaly detection
- ThingWorx Studio (powered by Vuforia) – Codeless augmented reality experience authoring
- ThingWorx Industrial Connectivity (powered by Kepware) – Industrial connectivity and edge server

Other Related Portfolio Offerings

PTC offers a series of prebuilt applications that run upon – and can be extended by – the ThingWorx platform:

- ThingWorx Navigate
- ThingWorx Manufacturing Apps
 - ThingWorx Controls Advisor
 - ThingWorx Asset Advisor
 - ThingWorx Production Advisor
- PTC Creo: Computer-aided design software
- PTC Windchill: Product life-cycle management software

Strengths

- PTC offers one of the more robust application enablement platforms available today with ThingWorx. While many companies offer application development tools, ThingWorx helps developers (and citizen developers) structure their data in a way that makes sense for IoT use cases and has helped PTC gain partnerships with significant players in the IoT ecosystem.
- PTC offers ThingWorx via numerous delivery models and does not have allegiance to any one cloud platform, giving customers flexible deployment options.
- PTC's heritage in CAD and engineering software plus its augmented reality assets make PTC well suited to develop digital twin technology like that found in its ThingModel inside ThingWorx – a feature that will be in increasingly high demand from industrial customers.
- PTC has made many investments in industrial IoT technology that demonstrate its commitment to the space. Customers note that PTC offers a feature-rich platform.

Challenges

- The flip side of making many acquisitions at once is the technical and business challenges of integration. Customers noted that PTC is making good strides on the technical side with ThingWorx, but that there is still work to be done in both aspects.
- Customers have noted that PTC has room for improvement in supporting customers with advanced deployments, a not uncommon situation in a developing market.
- PTC has made some major purchases at the same time as it is navigating the transition from a license- to subscription-based revenue model. Industrial IoT is the company's future growth engine, and PTC will have to keep an aggressive pace of momentum to ensure the newer entrants into the market don't put a damper on achieving growth targets.

SAP

According to IDC analysis and buyer perception, SAP is a Major Player in the IDC MarketScape for IoT platforms.

Vendor IoT Strategy

SAP's IoT strategy sits within the company's digital business initiative, which is enabled by SAP's Leonardo portfolio. The IoT strategy specifically is to connect things with people and processes. This vision will be achieved by combining SAP Leonardo IoT – which provides the ability to capture real-time data from IoT sensors at any time – with the breadth of business systems offered by SAP that can leverage real-time IoT-driven big data.

Vendor Offering in This Space

SAP's core IoT platform is the SAP Cloud Platform Internet of Things, which includes connectivity management, device management, and data management capabilities. The company offers visualization and application development and advanced analytics through related SAP offerings. The IoT service provides flexibility about where and how to process IoT data – either at the edge of the network (via SAP Cloud Platform IoT Gateway) or on the SAP Cloud Platform. Customers can leverage additional SAP Cloud Platform services to feed the IoT data into IoT applications, enabling real-time IoT analytics or interacting with core business processes.

SAP also offers SAP IoT Application Enablement, a cloud service that allows users to create an enhanced virtual representation of a product, service, or process, combining sensor data, business data, and contextual data (digital twin).

Other Related Portfolio Offerings

- SAP Leonardo applications for connected goods, connected operations, track and trace, predictive maintenance, and others
- SAP Cloud Platform Streaming Analytics, a cloud service that provides the ability to build applications that process streams of incoming event data in real time and to collect and act on incoming information
- SAP Cloud Platform Integration, which supports a variety of adapters for enterprise back-end integration as well as an SDK to build custom adapters for SAP cloud integration
- SAP Cloud Platform services for API management, web and mobile application development, machine learning, and advanced analytics

Strengths

- As a well-entrenched provider of business applications and analytics, SAP is ideally situated to offer technology that creates business value from data.
- SAP's platform supports many protocols out of the box; other protocols are supported by the IoT adapter development kit; and customers noted ease of data acquisition.
- SAP has put focus on its edge strategy and customers see it as a strength.
- SAP is also rated highly for customer support.

Challenges

- While SAP has a dense portfolio of IoT-related offerings, the capabilities are spread out among several cloud services; this can create complexity in managing the solution.
- Customers have noted that the current pricing model can be confusing.
- Customers would like to see improved visualization and application enablement tools. SAP has launched IoT Application Enablement to aid in the development of digital twins.

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 size 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 platforms market is a competitive software market representing portions of selected application development and deployment and systems infrastructure software markets as described in *IDC's Worldwide Software Taxonomy, 2016* (IDC #US41572216, July 2016). The architecture of an IoT platform is very diverse from vendor to vendor but typically includes some combination of the following components:

- *Device management* is for endpoint provisioning, remote configuration, data monitoring, software updates, and error reporting. Device management ensures the ongoing ability of the endpoint to send and receive data. Software is often deployed via an agent client installed on endpoints. Some solutions may also include an identity management component that stores device information and device identities.
- *Connectivity management* ensures data flows from the edge to the cloud and is managed and secured in transit with encryption capabilities. This may be limited to IP communication via a cloud gateway, which communicates bidirectionally with endpoints typically through protocols such as MQTT, AMQP, CoAP, or REST APIs. For deployments relying on cellular connectivity, some IoT platform vendors can provide SIM management, including billing and SIM alerts. Partnerships are common in this area to meet the requirements of global deployments running over various communication networks.
- *Data ingestion, processing, and management.* IoT platforms often include rules engines that route incoming data to the correct destination. Typical destinations include storage mechanisms, other applications, or web services. They may also perform basic anomaly detection by comparing incoming data to a set of rules defined by an organization. Data

transformation, aggregation, and enrichment, and complex event processing capabilities may also be included in some IoT platform products.

- *Visualization tools* and *dashboards* allow companies to manipulate IoT data or visualize it in real time.
- *Application enablement* is often in the form of APIs to platform services. With APIs fully documented, organizations or third parties (e.g., app developers, systems integrators, and SaaS vendors) can push and customize IoT platform data according to their requirements. Marketplaces are emerging in this area, and partnerships are often localized to a country or verticalized by industry. Some vendors also package application development tools as a standardized platform component.
- *Advanced Analytics*, such as machine learning and predictive analytics tools, are most often not a standard platform component today but offer a differentiation opportunity for IoT platform vendors.

Vendors Included in This IDC MarketScape

- Amazon Web Services
- Ayla Networks
- Bosch Software Innovations
- Fujitsu
- GE Digital
- HPE
- IBM
- LogMeIn
- Microsoft
- Oracle
- PTC
- SAP

Inclusion Criteria

All vendors included in this IDC MarketScape met the following criteria:

- Has a standalone commercial IoT platform offering in market by December 2016
- Offer horizontally appropriate capabilities and sell into multiple vertical industries
- Provide at least four of the six core IoT platform elements in their offering (Connectivity management capabilities were necessary for consideration.)
- Has customers that had been leveraging the platform for six months or more

Strategies and Capabilities Criteria

This section includes an introduction of market-specific weightings definitions and weightings. The factors were weighted because IDC believes that some are more important than others in maximizing market opportunity and realizing market success (see Tables 1 and 2).

TABLE 1

Key Strategy Measures for Success: Worldwide IoT Platforms (Software Vendors)

Strategies Criteria	Market-Specific Definition	Weighting
Offering strategy		
Functionality or offering road map	Future plans for offering functionality are well aligned with current and future customer needs. Functionality in the IoT platforms market includes device management, connectivity management, data management, analytics, visualization tools, and application enablement. The edge strategy, security strategy, future device/protocol support, and future enhancements to usability will also be considered.	3.0
Delivery model	Plans are in place for support of offering delivery model(s) that will match customers' shifting preferences for adoption/consumption in the next five years. In this market that means planning to support multiple deployment models.	2.0
Portfolio strategy	The offering is well supported and enhanced by a portfolio of complementary offerings offered by the company or its ecosystem of partners. IDC considered the current portfolio and plans the vendor had in place to expand upon that in its road map.	2.0
Range of services strategy	IoT platform implementations generally require some level of services during the life cycle of the project. The vendor has a comprehensive strategy in place to fulfill these needs — on its own or via partnership.	1.0
Future integration strategy	The vendor places importance on ecosystem alliances and has a strategy to support various IoT endpoints as well as plans to integrate with various enterprise back-end systems and third-party services. Here, integration road maps were considered.	2.0
Offering strategy total		10.0
Go-to-market strategy		
Pricing model	The supplier's pricing model strategy is directly aligned with customers' preferences for payment (e.g., license, service, per seat, per transaction) Current pricing models were considered and also any plans in place to make changes. If no changes were planned, there was no change in score from capabilities to strategy.	3.0
Sales/distribution strategy	The sales/distribution strategy is aligned with the way customers want to buy the offering (e.g., online, offline, direct, and indirect). Channel program strategy will also be taken into consideration. IDC considered any plans the vendor has in place to enhance its existing sales/distribution strategy.	2.0

TABLE 1

Key Strategy Measures for Success: Worldwide IoT Platforms (Software Vendors)

Strategies Criteria	Market-Specific Definition	Weighting
Marketing strategy	There is a robust game plan/strategy for all relevant facets of marketing (e.g., brand development, promotion, and demand generation) that matches where revenue is predicted to flow over the next five years. How well corporate marketing is expected to support business unit marketing was also considered.	2.0
Customer service strategy	The company effectively retains customers and continues to innovate in customer retention and service areas; with the implication that the company will be able to achieve the level of service and support demanded by customers over the next three years.	3.0
Go-to-market strategy total		10.0
Business strategy		
Growth strategy	Management has a strong formula for growth for the company and one that aligns well with the market trends anticipated over the next three to five years.	4.0
Innovation/R&D pace and productivity	The company's innovation model maximizes its potential to generate market value.	2.0
Financial/funding model	The company's strategy for generating, attracting, and managing capital maximizes its potential for creating market value.	3.0
Employee strategy	The company's strategy for attracting, motivating, and retaining talent maximizes its opportunity for creating market value.	1.0
Business strategy total		10.0

Source: IDC, June 2017

TABLE 2

**Key Capability Measures for Success: Worldwide IoT Platforms
(Software Vendors)**

Capabilities Criteria	Market-Specific Definition	Weighting
Offering capabilities		
Functionality/offering delivered	Current offering functionality is well aligned with customer needs and with priority customer segments. Functionality in the IoT platform market includes device management, connectivity management, data management, dashboards/analytics, and application enablement. Device/protocol support, edge support, security models, and ease of use were also evaluated.	3.0
Delivery model appropriateness and execution	The offering is delivered today in the way(s) that matches customers' preferences for adoption/consumption.	2.0
Portfolio benefits delivered	The offering is well supported and enhanced by a portfolio of complementary offerings offered by the company or its ecosystem of partners. IDC believes two of the most important portfolio items to have in this market are applications and analytics.	2.0
Range of services	IoT platform implementations generally require some level of services during the life cycle of the project. IDC evaluated the vendors' ability to fulfill these needs — either on their own or via partnership.	1.0
Integration	The vendor places importance on ecosystem alliances and integrates with a variety of IoT endpoints as well as various enterprise back-end systems and services.	2.0
Offering capabilities total		10.0
Go-to-market capabilities		
Pricing model options and alignment	The pricing model is currently aligned with customers' preferences for payment (e.g., license, service, per seat, and per transaction).	2.5
Sales/distribution structure, capabilities	The current sales/distribution structure is aligned with the way customers, especially those in high-growth market segments, want to buy (e.g., online, offline, direct, and indirect).	2.5
Marketing	The company's marketing organization is aligned with the priority customer segments and executing well.	3.0
Customer service	According to customer feedback, the company's service organization is executing well.	2.0
Go-to-market capabilities total		10.0

TABLE 2**Key Capability Measures for Success: Worldwide IoT Platforms
(Software Vendors)**

Capabilities Criteria	Market-Specific Definition	Weighting
Business capabilities		
Growth strategy execution	Management is executing well on its formula for growth for the company (e.g., by acquisition, organic).	3.5
Innovation/R&D pace and productivity	The company's pace and productivity of innovation is generating market value.	3.0
Financial/funding management	The company is generating, attracting, and managing capital to create market value.	3.0
Employee management	The company is attracting, motivating, and retaining the necessary talent to create market value.	0.5
Business capabilities total		10.0

Source: IDC, June 2017

LEARN MORE**Related Research**

- *IDC's Worldwide Semiannual Internet of Things Spending Guide Taxonomy, 2017* (IDC #US42556315, May 2017)
- *Huawei's IoT Strategy: Evolved* (IDC #US42519417, May 2017)
- *Worldwide Internet of Things Installed Base by Connectivity Forecast, 2017-2021* (IDC #US42331917, March 2017)
- *The IBM Genius of Things Summit and the Role of the IBM Watson IoT Platform* (IDC #EMEA42358617, March 2017)
- *IoT Decision Maker Perspectives: Enterprise IoT Budget Allocations in the United States Versus Worldwide* (IDC #US42303817, February 2017)
- *IoT Decision-Maker Perspectives: Vendor Selection Preferences in the United States and Worldwide* (IDC #US42303717, February 2017)
- *IoT Platforms – A Worldwide Analysis* (IDC #US42186716, January 2017)
- *Market Analysis Perspective: Worldwide IoT Ecosystem and Trends, 2016* (IDC #US40757416, September 2016)

Synopsis

This IDC study represents a vendor assessment of the current worldwide IoT platforms market through the IDC MarketScape model. This research is a quantitative and qualitative assessment of the characteristics that explain a vendor's success in the marketplace and help anticipate its ascendancy. This IDC MarketScape covers 12 software vendors participating in the worldwide IoT platforms market. This evaluation is based on a comprehensive set of parameters expected to be most conducive to success in the short term and long term.

"As a core technology product responsible for collecting IoT data and feeding that data into analytical models and services, IoT platforms play a critical role in the IoT ecosystem," said Stacy Crook, research director within IDC's Internet of Things Ecosystem and Trends research practice.

"Organizations around the world must now decide which IoT platform offers the best alignment with their digital transformation goals."

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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